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AGRICULTURAL ENGINEERING

a DICTIONARY and HANDBOOK

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INTRODUCTION

This book is written for the purpose of providing ready information concerning words, terms, and data frequently used by all those who are concerned with the application of engineering to agriculture, in its broadest sense.

Authorities state that 85 percent of all of the problems involved in modern agriculture involve engineering in some manner. Modern developments in machinery and equipment require greater technical knowledge, and more specialization than heretofore.

This volume should be of particular interest to Agricultural Engineers, designers of farm equipment, food processers, plant and farm managers, teachers, county agricultural agents, extension specialists, soil conservation service workers, researchers, and farmers. It should also be of value to government and regulatory agencies, and of particular use to those engaged in agriculture in the underdeveloped countries.

This book is designed to provide several phases of information; for example, there are many definitions which are written in a simple, non-technical style. The word list is designed to be specialized and deal directly with engineering matters, and does not include broad terms such as are normally found in the standard dictionaries.

The second part of the book provides numerous reference tables and data which are frequently needed by designers, farmers, technicians and others interested in the application of engineering to agriculture. The third phase of the book illustrates the type of companies serving agriculture as shown by their advertisement.

The word list and reference material is designed to cover the major areas of Agricultural Engineering, namely, power, machinery, rural electrification, soil and water management and conservation, processing of

agricultural products, structures, and automation.

The words which are defined and the tables which are shown have been selected and edited by nationally recognized authorities, in all respective areas.

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Signed

A. W. Farrall
Editor-in-Chief

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PART I

DEFINITIONS AND GLOSSARY

- ABBE REFRACTOMETER** - A device for measuring the refraction of light by liquids for purpose of identification and description. A beam of light is passed through a thin film of the substance placed between two prisms kept at a constant temperature. The refraction of the beam is measured and the reading compared with the refractive index for similar liquids of known composition. It is used in food processing for the determination of total solids where sugar is a main constituent and for the identification of fats and oils, and many other organic compounds.
- ABRADING** - In erosion, soil detachment which occurs when soil particles, already in transit, strike or drag over particles in the soil surface and set them in motion. The wearing away of a surface.
- ABRASIVE** - A material which is employed in grinding or wearing away by friction or attrition, as powdered glass, sand, aluminum oxide and silicon carbide.
- ABRASIVE PROCESS** - That cutting which is performed by stones, sand, emery glass, silicon carbide, chilled globules of iron, and in some cases by soft friable iron alone.
- ABSOLUTE PRESSURE** - A pressure measured using a scale where the zero point is absolute zero pressure; also, gage pressure plus atmospheric pressure.
- ABSORBER PLATE** - A surface, usually black, part of a solar energy collection system which absorbs the solar energy.
- ABSORPTION DYNAMOMETER** - One in which the energy measured is absorbed as frictional or electrical resistance and dissipated as heat. For example, prony brake, eddy current dynamometer.
- ABSORPTION LOSS** - The initial loss of water from a canal or reservoir during priming, when first used.
- ABSORPTION TERRACE** - A terrace in the form of a ridge whose purpose is to slow down the flow or run-off water and retain it until it can be absorbed by the soil.
- ABSORPTION TRENCH** - A trench designed to absorb the effluent from sewage treatment tanks.
- ABSORPTIVE AGENT** - Any material or chemical compound which possesses the ability or tendency to absorb water or other liquid products.
- ABSORPTIVE CAPACITY** - The total capacity of a material to absorb a liquid, such as soil to absorb water.
- ABSORPTIVITY** - Possessing the power, tendency or ability to absorb a liquid.
- ABUTMENT** - 1. The part of a pier, wall, bridge, etc., that receives the pressure or thrust.
2. The support at either end of a bridge.
- ABUTTING JOINT** - In wood working, a joint in which the end of a piece is joined to the side of another piece, or the end.
- ACCELERATED ELECTRONS** - High energy electrons that have been artificially accelerated to high velocities by electric fields.
- ACCELERATED TESTING** - A testing procedure imposing loads much more rapidly than in normal use, thus giving durability results in a shorter time.
- ACCELERATING PUMP** - A plunger type pump which is attached to the carburetor of an engine for increasing the richness of the mixture and to give a quick pickup under load.
- ACCELERATION OF GRAVITY** - The rate of increase of velocity per unit time of a freely falling body, due to the attraction of gravity. Its value varies according to

- location and altitude and has the value 32.16 ft/sec^2 , or 980.62 cm/sec^2 at sea level and 45° latitude. This value is referred to as "g".
- ACCELERATOR PUMP** - A device used in carburetors to increase the richness of the fuel-air mixture temporarily in order to give the engine greater power.
- ACCESS ROAD** - A road which approaches a place but does not pass through or beyond, as a driveway to a house.
- ACETATE** - A salt or ester of acetic acid.
- ACETIC ACID** - A compound, CH_3COOH , which is a colorless, pungent, biting liquid. Vinegar contains $4\frac{1}{2}$ to 12% of acetic acid.
- ACETOMETER** - A device which is used to estimate the amount of acetic acid in any solution, especially in vinegar.
- ACETONE** - A volatile fragrant liquid with a characteristic smell, CH_3COCH_3 , which is obtained as a by-product in the distillation of wood alcohol. Acetone is a solvent for many organic compounds and plastics. It dissolves many times its own volume of acetylene gas, the quantity depending upon the pressure, and is therefore used in connection with reservoirs for storing acetylene.
- ACETYLENE WELDER** - A machine used for fusion welding or heating deriving its heat from the combustion of oxygen and acetylene stored in separate cylinders.
- ACME HARROW** - A harrow constructed with long, flat, twisted, knife blades that project rearward. It is used to cut clods and to stir the soil. Also called knife harrow, pulverizer harrow, curved knife-tooth harrow, blade harrow.
- ACME STANDARD 29° THREAD** - A form of thread used to transmit power, the sides of which form an included angle of 29° . Also used in sanitary pipe fittings.
- A-C NETWORK** - Electrical circuits, for A-C operation, which are composed of combinations of series and parallel connections. Often used in connection with transmission lines.
- ACOUSTICAL MATERIALS** - Materials which have had special treatment, used usually in construction of homes, to reduce noise in a room or from one room to another.
- ACROSS THE SLOPE** - Running parallel to the contour lines or perpendicular to the slope.
- ACTINIC** - A term coined for the "chemically active" constituent of white light -- that is, the blue, violet and ultra-violet parts of the spectrum.
- ACTINIC RAYS** - A light ray toward and beyond the violet end of the spectrum which affects a photographic plate and produces other chemical effects; ultra-violet rays.
- ACTIVATE** - To render (molecules) capable of reacting, (enzymes) capable of promoting reaction, or (certain substances) radioactive. To make active. To render sewage active with aerobic bacteria by prolonged aeration so that the purification of sewage added later is hastened. To treat charcoal or carbon as by heating in steam to enhance its absorptive property, as for purifying water or for use as a purifier in gas masks.
- ACTIVATED CARBON** - A material formed by burning organic matter in the absence of air, resulting in the property of having extremely high absorption capacity for gases.
- ACTIVATED CHARCOAL FILTER** - A filter that removes organic compounds, colors, odors and tastes from water.

ACTIVATION RANCIDITY - The process of causing milk to become rancid by adding warm milk to cold, too much stirring, or in some other way causing the milk to foam.

ADAPTER - A device which is used as a fitting to connect two variable products such as pipes of different sizes. An added device which allows using a product for purposes other than that originally intended.

ADDED WATER - Water which is combined legally or illegally with any product increasing its weight and volume. It is legally added in controlled amounts to sausage and canned fruit and vegetables. It is sometimes added to other products.

ADDENDUM - An addition, that portion of a gear which projects beyond the pitch circle. An addition or supplement as of a book. Part of a tooth of a gear wheel located between the pitch line and the extreme point of a tooth. The distance between the pitch line and the addendum circle.

ADHESION - 1. The force which holds together two bodies placed in close contact with each other.
 2. The adhering or sticking together of surfaces in contact.
 3. Cohesion - molecular attraction by which the particles of a body are united throughout the mass, whether like or unlike; distinguished from adhesion.

ADIABATIC - Anything occurring, such as expansion or compression of gases without loss or gain of heat.

ADIABATIC EVAPORATION - A constant pressure process of evaporation in farm buildings in which the air is held at a constant pressure and without addition of heat.

ADIABATIC EXPANSION - Expansion of air or gas without loss or gain of heat.

ADIABATIC SATURATION - The vapor in an air-water vapor mixture becomes saturated without the addition or loss of heat.

ADJUSTABLE BLADE - A blade such as found on fans, the pitch of which can be changed or adjusted.

ADJUSTABLE DRAWBAR - The device on a tractor to which the load is attached and which may be moved vertically or horizontally to provide the most satisfactory loading arrangement.

ADJUSTABLE GATE - A device which is used for varying the size of an opening, as in a seed drill, in an irrigation ditch, or in "gated" irrigation pipe.

ADJUSTABLE HITCH - The device capable of being moved vertically or horizontally to which a source of pulling power may be attached.

ADJUSTING NUT - A burr or threaded device used to locate a given item at a desired setting.

ADMIXTURE - Material added to cement or the concrete mix to increase workability, strength or imperviousness; to lower freezing point; to prevent scaling; or otherwise to affect the concrete. That which is added and mixed, for example, calcium chloride, clay sand, etc.

ADOBE - A building material made of puddled clay and straw; the building blocks or units are roughly molded of various sizes and sun dried.

ADOBE BRICK - Earth formed into bricks and dried in the sun for use in the construction of buildings. Commonly the bricks are 4 ins. by 18 ins. and are 12 ins. wide, although other sizes are used.

ADZ HOE - In forestry, a fire-trenching tool which resembles a carpenter's adz, but which has a broader blade and lighter head; its tapered, rectangular eye is designed for a standard ship-carpenter's (double-curved) adz handle.

AERATE - To remove odors from (milk, etc.) by passing in a thin layer over a surface, usually cooled, so that the odors are absorbed by the surrounding air. See; Aeration.

AERATION - The moving of (outside

- atmospheric) air through a grain with low air flow rates for purposes other than drying to maintain or improve its value. The movement of air so as to bring about intimate contact with all portions of a liquid or solid such as milk or soil.
- AERATION-COOLING** - The process of forcing a small amount of air through a stored grain crop in order to control the temperature.
- AERATION-DRYING** - The process of forcing air through grain at a minimum rate of 3 cfm per bushel to remove excess moisture up to 15% above the desired level.
- AERATION EQUIPMENT** - Mechanical devices used in the cooling of stored grain.
- AERATION SYSTEM** - See: Grain cooling system.
- AERIAL APPLICATION** - The spreading of agricultural materials by aircraft.
- AERIAL PHOTOGRAPH** - Picture of a certain land area, which is taken from a helicopter or plane to determine the lay of the land. Contour maps can be made from two adjoining photographs by use of a ketch plotter.
- AERIAL SURVEYING** - The study of land surfaces from the air to assist in the engineering of a specific project. See: Aerial photograph.
- AEROBIC CONDITION** - The condition of living or being active only in the presence of oxygen.
- AEROBIC MICROORGANISM** - Any micro-organism which is living or active only in the presence of oxygen.
- AEROMETER** - An instrument for measuring the specific gravity of liquids. It is practically the same as a hydrometer, the only difference being that the aerometer has the thermometer within its own stem, permitting temperature and gravity to be read from one instrument.
- AEROSOL** - A suspension of fine solid or liquid particles in air as a smoke, fog or mist.
- AEROSOL GENERATOR** - A machine which has a heating element and a very powerful fan whereby an oil solution is broken into tiny droplets by blasts of hot air. It is used to dispense insecticides, fumigants, etc.
- A-FLOAT** - A land leveling device used in preparing land for irrigation.
- A-FRAME** - A device, resembling the capital letter A, which consists of two rigid members fastened together at one end and braced in the middle. It is used as a derrick and for opening or building irrigation ditches, etc.
- A-FRAME FARROWING HOUSES** - Small individual, A-shaped buildings, usually of wood construction, in which sows are housed to give birth to their young.
- A-FRAME VENTILATOR** - A type of duct constructed in the shape of an A to provide passage for air horizontally through the center of a bin or crib.
- AFTER BURNING** - A defect in the working of internal combustion engines. The charge does not ignite instantaneously but sluggishly, and the combustion is prolonged causing a loss of power and imparting a series of shocks to the piston, instead of a single impulse.
- AGGRADATION** - The building up of any portion of the earth's surface toward a uniformity of grade or slope by the addition of materials; especially the deposition of sediment in the beds of streams, and on the floors of bodies of standing water.
- AGGRADATIONAL** - Formed by aggradation, the process of modifying the earth's surface to a uniform grade or slope as in a river bed.
- AGGREGATES** - Inert materials which are used as a filler for making concrete. Common aggregates are sand, gravel, cinders, crushed stone, etc.
- AGGREGATION** - The act or process of uniting small primary particles into soil aggregates.
- AGITATE** - To move often with a

- violent, irregular action; as to agitate water in a vessel, milk in a can or tank.
- AGITATING DISCONTINUOUS PRESSURE STERILIZER** - A type of sterilizer used primarily in the canning of milk in which the cans of milk are placed in a cage within the sterilizer and revolved to keep the milk in motion during sterilization so as to prevent scorching.
- AGITATING PRESSURE COOKER** - A cooker in a cannery consisting primarily of a large tank which keeps hot water in motion around the cans so as to increase the heat penetration throughout the cans and to enable the cannery to use a higher temperature of water than usual.
- AGITATOR** - An implement or apparatus for shaking or mixing; as a device for mixing oil with some material, a device usually consisting of revolving paddles for keeping a liquid, powder, or gas in motion so as to maintain a proper mixture within a tank. It is used in dairying, spraying, fertilizer drilling, etc. A mechanical or air means, usually provided with the bulk milk tank, for stirring the milk to facilitate cooling and to provide a uniform product for sampling.
- AGRICULTURAL CHOICE** - A choice made of one-piece stamped chain steel links.
- AGRICULTURAL ENGINEER** - One who applies engineering science to the solution of problems of and to research in power, machinery, structures, land development, soil and water management, and electrification, in connection with the production, processing, handling, and storage of food, feed, and natural fiber.
- AGRICULTURAL ENGINEERING** - A field of engineering in which both physical and biological sciences are specifically utilized, involving power, machines, structures, electronics, land development and soil and water management, dealing with the production, processing, handling, and storage of food, feed, and natural fiber.
- AGRICULTURAL LAND** - That land which is used in agricultural production, including all the land devoted to the enterprise; that is, the farmstead, roadways, drainage, and irrigation ditches, farm ponds, water supply, cropland, and grazing land of every kind. The term is not strictly synonymous with land in farms, cropland, pastureland, land suitable for crops, or land suitable for farming. The term non-agricultural land should not be used in the sense of land not suited to crops. Such terms as non-plowable, non-arable, land not in farms, and land unsuited to crops, to suit the case, are preferable.
- AGRICULTURAL PROCESS ENGINEERING** - Engineering dealing with the cleaning, sterilizing, heating, cooling, grinding, mixing, sorting, and preservation of agricultural products for market.
- AGRICULTURAL PROCESSING** - The operation which aims at increasing the value of the raw farm product by maintaining or raising its quality, or changing its form or characteristics.
- AGRICULTURAL SULPHUR** - A coarsely ground sulphur which is used in increasing the acidity of soil and/or in correcting sulphur deficiency symptoms in plants. Also called brimstone, or flowers of sulphur.
- AGRICULTURAL MECHANICS** - An agricultural field concerned with the practical application of mechanization in agricultural occupations and business related thereto.
- AGRICULTURE** - The art and science of production of food, feed, fiber, and forest products, and the transportation, handling, processing, and merchandizing of same.
- A-HARROW** - A spike-tooth harrow, shaped like the capital letter "A", which is dragged from a hitch at the apex.
- AIR BLAST** - A rapidly moving stream

- of air which is usually blown by a fan. It is often used to clean grain, seeds, etc., on threshing machines, combines, seed cleaners, corn shellers, etc.
- AIR BOUND** - The condition of a pipe line where air entrapped in a high point prevents the free flow of water through it.
- AIR BRAKE** - A type of dynamometer used in loading engines useful only for run-in purposes and rough testing. A device used for stopping motion using air pressure as a source of power.
- AIR CELL** - A cavity in a structural member wherein the air remains relatively stationary; i.e. cells in a concrete block to reduce weight and cost. Cells in insulating material to reduce the heat and sound conductivity of the material.
- AIR CHAMBER** - A container, part of a sprayer or other hydraulic apparatus, in which the air under pressure acts as a shock absorber reducing the pulsation on the sprayer system brought about by the quick changes of pressure caused by the pump or pressure regulator.
- AIR CELL COMBUSTION CHAMBER** - One of various designs of diesel engine combustion chambers. The arrangement is such as to give turbulence to the air-fuel mixture and thereby promote better and more complete combustion.
- AIR CLEANER** - Any device used to remove dust or foreign material from the air. On engines it is attached ahead of the carburetor for cleaning the air as it enters the carburetor. Three types are generally used on tractors; dry type, oil soaked type, and oil bath type. See: Air filter.
- AIR CLEANER TEST** - Tests set up under the Society of Automotive Engineers specifications to determine efficiency of removing dust and restriction to air flow of devices used for removing dust from engine intakes.
- AIR COMPRESSOR** - A pump that compresses and raises the pressure of air.
- AIR COMPRESSOR (MULTI-STAGE)** - One which builds up the air pressure to the required amount, in steps or stages instead of at one compression.
- AIR CONDITIONER** - Subject or limit to amount of heat, temperature or moisture of the air involved. Usually means to remove heat from air thereby reducing its temperature. A device for changing the temperature, pressure, or humidity of the air in a room.
- AIR CONDITIONING SYSTEM** - A system which humidifies, dehumidifies, heats or cools air before it enters a desired area.
- AIR-COOLED CONDENSER** - A unit for removing heat from a gas to change it to a liquid; as a refrigeration condenser which is used for removing heat from a refrigerant vapor to form a liquid, or a steam condenser to form water.
- AIR-COOLED ENGINE** - An internal combustion engine using air as a cooling media rather than a liquid. Such engines are usually constructed with many closely spaced fins on and around the cylinder block to aid in dissipation of heat.
- AIR-COOLED SHELTER** - A building for housing animals which is cooled by being open at the sides to allow free movement of air through the building.
- AIR COOLING** - Blowing air over or through a machine or product so that unwanted heat may be absorbed and carried away by the moving air.
- AIR-CURED** - Desirable physiological changes in a product brought about by exposure to natural air.
- AIR-CURED TOBACCO BARNs** - Ventilated barns in which tobacco is placed to be cured. Heat is used when the average humidity cannot be maintained between 65 and 75% during a 24 hour period.
- AIR DAMPING** - Arresting the oscillations of the moving parts of an electric measuring instrument by

- the use of a vane turning in a chamber of air. Similar in principle to the soil dash pot.
- AIR DISTRIBUTION SYSTEM** - The duct work and other parts which carry the air to the material being dried or to a room for heating.
- AIR DRIED** - Moisture removed from a product to the air by natural means. See: Seasoning.
- AIR DUCT** - A passage or tube through which air flows.
- AIR-ENTRAINING CEMENTS** - Type of cement containing an admixture which causes tiny pockets of air to form in the concrete.
- AIR-EXHAUST VENTILATOR** - A device for removing air from a space by mechanical means, by different density of air, or by wind velocity.
- AIR FILM** - A thin layer of stagnant, nearly stationary air through which heat moves principally by conduction, rather than convection.
- AIR FILTER** - See: Air cleaner.
- AIR FLOW PER ACCUMULATED BUSHEL** - Of grain (cfm/acc bu.). Used to determine rate of air flow at different locations in the bin.
- AIR-FUEL RATIO** - The proportion of air to fuel in an air fuel mixture to meet specific requirements such as power or economy in an internal combustion engine. The chemically perfect mixture being 15 parts air to 1 part of fuel for gasoline.
- AIR GAP ARRESTER** - A lightning arrester based on the air gap principle. The method is to connect a discharge air gap between some point on an electric conductor and the ground. Abnormally high voltage surges cause discharge across the air gap.
- AIR HORSEPOWER** - The work output of a fan in foot-pounds per minute divided by 33,000. Also called fluid horsepower.
- AIR HOSE** - A tube, usually of rubber or similar material, which is used to transmit air under pressure or to a vacuum. Specifically, such as a tube which transmits the suction from a vacuum pump to the teat cup of a milking machine or a tube which carries air under pressure to inflate pneumatic tires.
- AIR IONIZATION** - A situation wherein the field intensity around a high potential conductor is sufficient to cause electrons to leave the conductor and ionize the gas around it.
- AIR-LIFT** - A device for raising sewage or other liquid by injecting air into and near the bottom of an open discharge pipe submerged in a well of the liquid to be raised.
- AIR LIFT PUMPS** - A type of pump which introduces air to the liquid being pumped, thus reducing the apparent specific gravity of the liquid, and causing it to rise.
- AIR-LINE CLEANER** - A device which is used in a cotton gin for cleaning the cotton as it passes through large pipes in which the cotton is beaten or agitated to cause the dirt and foreign matter to drop out onto a dirt trap. (It is now being replaced by unit cleaners.) Also called cleaner.
- AIR MASS** - A large body of air of considerable depth having nearly uniform physical properties at any given level.
- AIR ORIFICE** - A small opening through which air may pass.
- AIR-OVEN** - An oven used for drying materials; warm air is circulated around the materials within the oven. See: Water oven.
- AIRPLANE SPRAYING** - A method of spraying which employs an airplane for covering large acreages of farm crops with chemicals for control of weeds or insect pests. Also used for application of fertilizer and seed. See: Aircraft spraying.
- AIR POCKET** - A space which is filled with air which should be filled with liquid or solid matter, as air trapped in a pipe or an air space in soil.
- AIR PRESSURE** - Pressure exerted by the confined gas (air) against the walls of the confining object. Measured in pounds per sq.in. sectional area.

- AIR PRESSURE REDUCING VALVE** - It is a mechanical device that receives air or gas at high pressure on the inlet side and automatically reduces it to the required lower pressure on the outlet side. Commonly used in the regulators on acetylene and oxygen tanks.
- AIR PUMP** - A device for exhausting air from a vessel or closed space; also, a device for compressing air, or for drawing or forcing it through a passage.
- AIR PURITY** - A state of being free from all foreign substances.
- AIR SLAKED** - The process of having taken up moisture from the air.
- AIR-STACK CAP** - A cover which fits on the air intake of an air cleaner. Sometimes used as a pre-cleaner; prevents water and other foreign material from entering the air intake.
- AIRSTREAM** - The current or flow of air.
- AIRTIGHT SECTION** - A portion or portions of a structure or enclosure that is impervious to flow of air; frequently used in grain drying installations. In a crop storage building or other structures, a section in which air is not allowed to enter.
- AIRTIGHT SEPARATOR** - A machine used to separate butterfat from whole milk in which the milk is fed to a fully enclosed machine by means of a positive displacement type pump. This type of machine does not produce foam and keeps the product from contacting the air. See: Gravity type separator.
- AIR VALVE** - A device that releases air from a pipe line automatically without permitting loss of water. It may also admit air to the pipe automatically if the internal pressure becomes less than atmospheric.
- AIR-WATER INTERFACE** - Refers to free water surface in contact with air.
- ALBEDO** - The ratio of light reflected from a surface to the total light falling on it.
- ALCOHOL ENGINE** - An engine in which the vapor of alcohol is used as the fuel. Similar to a gasoline engine.
- ALCOHOLMETER** - A special hydrometer used for determining the proportion of pure alcohol which a liquid contains. The scale is from zero to 100°, pure distilled water gives zero reading and absolute alcohol, 100°.
- ALCOHOL THERMOMETER** - A thermometer, especially suitable for use at low temperatures, in which alcohol is used as the expanding or retracting medium.
- ALFALFA DEHYDRATOR** - A large, continuous-type drying unit, usually of the rotating cylinder type, which is extensively used for preparing alfalfa meal from freshly cut alfalfa.
- ALFALFA DRILL** - A drill having furrow openers about four ins. apart, which is used for sowing small seeds, such as alfalfa, clover, redtop, bluegrass, rape, etc. See: Drill.
- ALFALFA SIFTER** - A machine which contains a sieve for the removal of extraneous matter from alfalfa meal.
- ALFALFA TEETH** - Detachable, narrow points for a spring-tooth harrow.
- ALFALFA VALVE** - A water valve used in connection with underground pipe systems through which irrigation water is released to ditches, checks, or basins (western United States).
- ALFALFA VALVE OUTLET** - An outlet with a disk on top to control flow, and with an opening equal in diameter to the inside diameter of the riser. Around the base outside of the disk is a ring to provide a seat and seal for a portable hydrant. Some alfalfa valves have a small air-release valve on the disk which provides for drainage of puddles following irrigation as a mosquito-abatement measure, and for supplemental air release from a pipeline during filling.
- ALIGNMENT** - The line to which adjustment is made, or the things arranged in line. The drawing of an imaginary straight line through

- two or more points or objects. Bringing into proper adjustment as done when aligning the cutter bar of a mowing machine. To place in line as per plan.
- ALIVE** - A term sometimes used to describe a circuit or wire charged with electricity.
- ALKALI** - A substance which yields a hydroxal on being dissolved in water. Alkalis give a caustic taste; they neutralize acids, and form a salt and water by the process; they turn red litmus paper blue.
- ALKALI CLAY PAN** - A layer of heavy clay strata containing 15% or more of exchangeable sodium.
- ALKALINE DETERGENT** - A cleansing agent that yields a distinct alkaline reaction in water solution. Tri-sodium phosphate (Na_3PO_4), washing soda (Na_2CO_3), and borax, ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$), are examples.
- ALKALI SOILS** - Soils for which the exchangeable sodium percentage is greater than 15. These soils are known as saline-alkali, if the conductivity of the saturation extract is greater than 4 millimhos/cm at 25° C. If the conductivity is less than 4, the soil is known as nonsaline-alkali.
- ALLIGATOR WRENCH** - A solid wrench with V-shaped jaws, one or both of which are notched or serrated, so that a firm grip may be secured on irregular or cylindrical pieces which are to be turned.
- ALLOTROPIC ELEMENT** - An element capable of existing in more than one crystalline form. For example, carbon is allotropic, existing as diamond and as graphite.
- ALLOWABLE STRESS** - The maximum stress considered desirable for design calculations, considering the characteristics of the material, the type of structure, the degree of exposure to deterioration, etc. The limiting value for the maximum induced stress used in designing members for safe strength.
- ALLOY STEEL** - A steel made by adding small amounts of some element to give the steel special properties of strength, hardness, ductility, etc.
- ALL PURPOSE TRACTORS** - Tractors designed to satisfy a variety of farm power requirements; such as plowing, seeding, cultivating and harvesting of farm products. Usually of the tricycle type. See: Row crop tractor.
- ALLUVIAL CONE** - Water deposited material at the place where a mountain stream debouches on to a plain; a debris cone. An alluvial cone carries the suggestion of finer material than a debris cone, which is a mixture of all sizes and kinds. See: Alluvial fan.
- ALLUVIAL FAN** - The soil, rock, and other material deposited by a stream when sudden reductions occur in its transport capacity, such as decreased velocity. These deposits often occur along a mountain front. Deposits from sheet erosion on sloping cultivated land which are long and narrow and at the foot of the slope are known as colluvial.
- ALLUVIAL FLOOD PLAINS** - The flat land along streams on which alluvial material is or has been deposited during flood stages -- this often is highly productive land.
- ALLUVIAL SOILS** - Those materials in the range of fine clay to boulders that have been brought in and deposited in layers, by streams and rivers in flood.
- ALPHA RAYS** - One of the three types of rays emitted by radioactive substances; alpha rays are regarded as positively charged material particles. They are given off with great velocity, but have small penetrating power. They have great power to ionize a gas.
- ALTERNATE CONES** - When two equal cones are arranged on parallel shafts, with their bases facing in reverse directions, they are said to be alternate, and their mutual function is the production of shifting a belt. See: cone pulley.

ALTERNATING CURRENT - An electric current, the direction of which reverses at regular intervals; common alternating frequency is at 60 cycle per sec. (abbr. A.C.)

ALTERNATING CURRENT - A system of current flow wherein the instantaneous values of current and voltage are fluctuating sinusoidally with time from positive to negative. A periodic electric conduction current which reverses its direction at regularly recurring intervals.

ALTERNATING CURRENT MOTOR - An alternating current device which operates to convert electrical energy into mechanical energy.

ALTERNATING CURRENT MOTORS - Classification: There are many types of A.C. motors for various applications and for use with various kinds of alternating circuits. A.C. motors may be generally classed as: 1. Synchronous; A. Plain, B. Super-synchronous. 2. Asynchronous motors; A. Induction motors, B. Squirrel cage, single and double. Internal resistance - external resistance - external resistance (slip ring) - split or single phase - poly-phase.

ALTERNATING CURRENT SYSTEMS - The various systems may be classed as follows: 1. With respect to the arrangement of the circuit, as A. Series, B. Parallel, C. Series-parallel, D. Paralled-series. 2. With respect to transformation as A. Non-transformer, B. Transformer. 3. With respect to the mode of transmitting the energy, as A. Constant voltage, B. Constant current. 4. With respect to the kind of current, as A. Single phase (two wire, three wire), B. Monocyclic, C. Two phase (three wire, four wire, five wire), D. Three phase (three wire, four wire, six wire, star connection, delta star connection), E. Multi-phase (of more than three phases). 5. With respect to transmission and distribution, as A. frequency changing, B. Phases changing, C. Converter, and D. Rectifier.

ALTERNATING CURRENT WINDINGS - The windings for alternators and A.C. motors. Most A.C. windings are of the open circuit type, forming a continuous circuit through the wire of the coils of each phase of the winding with two free ends. Such a winding does not close upon itself. Alternator windings may be described in terms of the number of slots per phase per pole, i.e., if the armature of a 20 pole three phase machine has 300 slots, it has 15 slots per pole or 5 slots per phase per pole, and will be described as a five slot winding.

ALTERNATING ELECTROSTATIC FIELD - An electrostatic field that contains both alternating voltage and alternating current fields.

ALTERNATOR - 1. An A.C. machine which may be employed either as a synchronous motor, or as a generator. One which can either transform mechanical energy to electrical energy, or vice versa. 2. Winding arrangement in a generator to convert D.C. to A.C.

ALTIMETER - An instrument which is used for measuring altitudes (such as an aneroid barometer) as in aviation; it may also be used for measuring ground surface elevation as in surveying or geology. Most altimeters operation is based upon the barometric pressure at the point of measurement.

ALUMINA OR SILICA GEL - A type of colloidal silica having a very porous nature, thereby giving it tremendous absorbing capacity. For example, it can be used to absorb moisture, and then if heated to drive off the moisture it can be re-used many times.

ALUMINUM GRAIN TRIER - A device used for obtaining grain samples from storage bins, railroad cars, etc. so constructed that the sample can be taken and removed at any desired depth without being mixed with grain from other depths.

ALUMINUM PAINT - A paint composed of aluminum metal pigment suspended

in linseed oil or other suitable paint which is commonly used as a finish paint for metal or as a primer for wood.

AMBIENT TEMPERATURE - The temperature of a surrounding; the ambient temperature is the room air temperature, as related to the temperature of an engine in the room.

AMERICAN CHEESE KNIVES - Knives with various multiple cutting edges which are used in factory production of cheese. See: Curd mill; curd knives; cheese knife.

AMERICAN LUMBER STANDARDS - Standards that embody provisions for softwood lumber dealing with recognized classifications, nomenclature, basic grades, seasoning standards, sizes, uniform workings, workings, description, measurement, tally, grading, etc.

AMERICAN SHINGLE - A rectangular cement-asbestos shingle usually 8 in. x 16 in. and 3/16 in., 1/4 in., asbestos-cement shingle.

AMERICAN SOCIETY FOR TESTING MATERIALS (A.S.T.M.) - An organization established for the promotion of knowledge of the materials of engineering and the standardization of specifications and the methods of testing.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS - A professional organization for the advancement of the theory and practice of engineering in agriculture, enhancing the status of the engineer in agricultural engineering work and increasing the usefulness of the organized engineering profession as a whole. Founded in 1907, with headquarters at St. Joseph, Michigan.

AMMETER - A meter used to measure electric current in amperes.

AMMONIA - A compound gas composed of 1 part nitrogen to 3 parts hydrogen by volume, or 14 parts nitrogen to 3 parts hydrogen by weight. A chemical which is often used in refrigeration plants as a refrigerant. A material composition (NH₄) which is often used in refrigeration plants as the refrigerant. It may be in either liquid or vapor state depending upon the temperature and pressure. Widely used as a soil fertilizer. See: Aqua ammonia.

AMMONIA COMPRESSOR - A pump in which ammonia vapor is compressed. It is necessary to construct these compressors with a minimum of clearance between the end of the piston and the end of the cylinder so as to expel all the ammonia possible at each discharge stroke. Any left behind would expand during the suction stroke, and destroy the efficiency of the apparatus.

AMMONIA ICE MACHINE - A refrigerating apparatus for the production of artificial ice, either by the absorption or compression processes, which uses ammonia as the refrigerating medium.

AMORTISSERU WINDING - An auxiliary winding on the revolving-field structure of a synchronous motor or generator. Used for starting and to minimize oscillations of the speed around the average constant synchronous speed.

AMPERAGE - The rate of flow of an electric current measured in amperes.

AMPERE - A unit of rate of electric flow. One ampere is specified as the constant current that will deposit silver from an electrolyte at the rate of 0.001118 gram/sec. The practical unit of electric current; it is the current produced by the pressure of one volt in a circuit having a resistance of one ohm. An ampere is that quantity of electricity which will deposit .005084 grain of copper per sec. It is one-tenth the c.g.s. electric-magnetic unit of current strength. This is, one ampere = .1 abampere. According to Ohm's law: $I = E \div R$, that is, amperes = volts \div ohms.

AMPERE HOUR - A current of one ampere flowing for one hour - sometimes used in rating storage batteries or the quantity of

- electricity that flows past a given section of a conductor when a current of one ampere is maintained for one hour.
- AMPERE HOUR METER** - An instrument used to measure a quantity of electrical energy in ampere hours, one ampere hour being the quantity of electricity that flows past a given cross section of a conductor when a current of one ampere is maintained for one hour.
- AMPERE METER** - An instrument used to measure electric current in amperes. Also called ammeter.
- AMPERE TURNS** - An expression of the magnetomotive force (m.m.f.) of a circuit in terms of the product of amperes and turns. For example, 10 amperes flowing around a link 10 times sets up 100 ampere turns of m.m.f.
- AMPLIFIER** - A device that utilizes energy from a secondary source to produce a larger replica of an original or controlled variation; i.e. voltage, power.
- AMPLITUDE** - The maximum displacement from the mean of a rhythmically fluctuating quantity i.e. alternating current a particle in simple harmonic motion, etc.
- ANALOG (MAPS)** - A map which shows weather conditions for a previous period of time. It is indexed and filed for reference.
- ANALYZER** - In refrigeration, a part of the absorption apparatus; sometimes forming the upper portion of a generator, but generally a separate vessel. In either case, it contains many cast iron trays or baffles to separate out suspended watery particles from the ammonia gas and return them to the rich liquor. This action is assisted by the rich liquor from the absorber, which flows over these trays on its passage to the generator, washing the aqueous particles from the gas and enriching the latter, and having its own temperature raised before it reaches the boiling liquor.
- ANCHORAGE** - A device for anchoring down any part subjected to uplift
- such as the end of an anchor arm of a centilever bridge.
- ANCHOR BOLT** - A round, steel bolt embedded in concrete or masonry to hold down machinery, castings, shoes, spans, engine beds, etc.
- ANCHOR-ICE** - Ice that forms on the bed of a stream. Anchor ice freezes on rocks and other objects in the bed or beneath the water surface in the form of long needles. This ice usually forms at night during very cold weather and may be released during the day if the sun strikes the object for a few minutes.
- ANCHOR PLATE** - A piece of heavy sheet metal or wood embedded in or fastened to something solid and used to anchor or support two adjoining members.
- ANEMOMETER** - An instrument which is used to measure the speed of wind. Also called wind gage. The Dines anemometer measures pressure which is translated to velocity. The common cup type anemometer usually records the miles of wind past the instrument rather than the velocity, however, when miles of wind are recorded versus time the average velocity can be computed.
- ANEMOSCOPE** - Any device which is used to indicate and/or record wind direction. Also a device to foretell changes in the weather.
- ANGLE BAR** - In building, an upright bar at the angle where two faces of a bay window meet. See: Angle iron.
- ANGLE BAR CYLINDER** - A type of combine cylinder which employs angle shaped bars on its periphery. See: Rasp bar and spike tooth cylinder.
- ANGLE-BED DIGGER** - A mechanical device for digging potatoes on which the elevating mechanism for separating the potatoes from the loose soil is in two planes at an angle to each other. See: Level-bed digger.
- ANGLE BLADE SCRAPER** - An earth-moving device in which a blade is mounted at an acute angle from the

- direction of travel. The blades are usually adjustable in three planes, vertical pitch, horizontal angle and side tilt.
- ANGLE IRON** - A rolled iron or steel shape, the cross section of which forms an angle. Usually a right angle.
- ANGLE JOINT** - A type of connection for steel framing members which will transmit either tension or compression. It is used to join members whose axes are not col-linear.
- ANGLE OF HITCH** - The angle between the line of pull and the line of depth.
- ANGLE OF INCIDENCE** - The angle between the incoming ray and the normal to the surface.
- ANGLE OF LAG** - The angle between the two vectors representing the waves of alternating voltage and current at any given instant. When the voltage passes through its zero value in a given direction before the current does, the current is said to lag the voltage.
- ANGLE OF LEAD** - The angle between the two vectors representing the waves of alternating voltage and current at any given instant. When the voltage passes through its zero value in a given direction before the current does, it is said to lead the current.
- ANGLE OF PULL** - The included angle between the line of travel and a flexible connecting link (such as a chain) attached between the source of power and the load; for example, between the tractor and the pull-type plow.
- ANGLE OF REPOSE** - Degree of slope at which a given material will slide or not.
- ANGLE PLY OR CONVENTIONAL PLY** - Tire construction in which the cords of body plies of the tire running from bead to bead cross and make 38 to 45° with the center line of the tire.
- ANGLE THE HARROW** - To change the angle between the gangs of a disc harrow.
- ANGLING ADJUSTMENT** - A device on a gang disk plow to vary the angles of the gang. Any device by which the angle of operation may be adjusted.
- ANGULAR ACCELERATION** - The time rate of change of angular velocity. It is equal to the initial velocity minus the final velocity divided by the time. See: Angular velocity.
- ANGULAR STRAIN** - A torsional strain.
- ANGULAR VELOCITY** - The angle turned through per unit of time expressed in degrees, revolutions or radians per sec.
- ANHYDROUS** - A term applied to a material which has no water in it. For example, anhydrous ammonia has no water in it and when water is added its properties change and it becomes an entirely different product. Destitute of water, especially water of crystallization, as anhydrous salts.
- ANHYDROUS AMMONIA** - Ammonia freed from any water which it might contain; as, the dry gas leaving the analyzer of an absorption refrigerating apparatus.
- ANIMAL OILS** - Lubricating oils for machinery obtained from animal tissues. Principal of these oils being sperm oil from whales and seals. Animals give an oil that does not dry and gum.
- ANIMAL POWER** - The power of horses, oxen, etc., as distinguished from motor or engine power or manpower, etc.
- ANION** - In an electrolyzed solution, the negatively charged particle, or ion, which travels to the anode and is there discharged, evolved, or deposited. By extension, any negative ion.
- ANNEALING** - Originally a term implying heating to some elevated temperature, holding, and slow cooling to put the metal in a soft condition. At present, the term has several meanings as defined below. See: Annealing (following cold work).
- ANNEALING (FOLLOWING COLD WORK)** - The heating of cold worked metal to a temperature above its re-

- crystallization temperature, holding and cooling as desired. This treatment has for its purpose the softening of strain hardened metal and the restoration of ductility and formability.
- ANNUAL PRECIPITATION** - The total amount of water, usually expressed in in. of depth which is deposited on the earth in one year by rain, snow, hail, sleet, or other forms of precipitation; condensation of dew and frost is generally not considered as precipitation. More commonly called annual rainfall.
- ANNUAL SNOWFALL** - The total amount of snow to fall in one year, which is usually expressed in ins. of snow depth in the United States. For conversion to its approximate water equivalent, the ins. of depth is divided by 10. (In some countries, for example, Australia, the ratio used is 12:1. However, the ratio can vary from 5 to 50:1 depending on many factors).
- ANTI-CORROSIVES** - Materials used in engines which resist corrosion. The materials usually contain active sulphur, phosphorous, or nitrogen.
- ANTI-FLIES** - A fence-like device which is placed on the eaves of coops, hen houses, etc., to prevent domestic birds from flying to the roof.
- ANTI-FLOCCULENT** - A material which when added to a liquid solution or suspension, will prevent sediment or other secondary material from separating out into small clumps or flakes.
- ANTI-FREEZE MATERIAL** - Substance added to water in a cooling system which should prevent freezing at the lowest temperature encountered, not attack materials in the cooling system, be chemically stable under engine operation conditions, have a high specific heat and heat conductivity, have a low co-efficient of expansion to reduce overflow losses, and be non-toxic and non-inflammable.
- ANTI-FRICTION BEARING** - A class of bearings having balls or rollers between the supporting part of the bearing and the shaft thus reducing friction.
- ANTI-KNOCK FUEL** - A fuel used in internal combustion engines containing an additive which prevents detonation and allows a controlled burning of the fuel.
- ANTI-KNOCK VALUE** - A rating given to fuels according to their ability to burn rather than explode when used in internal combustion engines. Usually called octane rating. 100 octane rating means it has high anti-knock value.
- ANTI-OXIDANT** - An agent, introduced into food products to prevent oxidative rancidity, which often produces an unpleasant taste. Also applied to other materials such as rubber, for example; to lengthen the life of the material, which is normally shortened due to slow oxidation when exposed to air.
- ANTI-SEEP COLLARS (SOIL AND WATER)** - A collar or wall often placed around a drainage tube or line to prevent water seepage along the outside of the tube. See: Diagram p. 216 Yearbook of Agriculture for 1955.
- ANVIL** - A block of iron sometimes faced with steel on which metal is hammered for shaping.
- ANVIL BLOCK** - A heavy cast iron or steel block forming the anvil of a steam or power hammer.
- APPARENT AIR FLOW** - The calculated or measured flow of air in cfm through a given unobstructed cross-section, before or after it passes through a product for drying or aeration.
- APPARENT DENSITY (OF SOIL)** - The mass per unit volume of oven dry soil, pore space included. When expressed in grams per centimeter, it is equal numerically to apparent specific gravity.
- APPARENT SPECIFIC GRAVITY (OF SOIL)** - The ratio of the oven dry weight of a given volume of soil, in its natural structure, pore space included, to the weight of an equal volume of water at a

- temperature of 4° C. Also called volume weight or bulk specific gravity.
- APPARENT VELOCITY, FEET PER MINUTE (V_a)** - A fictitious velocity unit used to describe the relative rate of air flow travel through a cross section of grain or hay. It assumes no grain present, and is determined by dividing the quantity of air flow in cfm by the cross sectional area.
- APPLE GRATER** - A device consisting of revolving knives fastened on a drum which grates apples, berries, grapes into very small particles preparatory to pressing the fruit juice.
- APPLE NUGGETS** - Made by quickly cooking dehydrated apples and then dehydrating in vacuum dryers. This method puffs the material until it is quite light and porous.
- APPLIANCE** - A piece of equipment, usually electrically operated, for performing a light task - for example, an electric toaster.
- APPLICATION LEVEL** - The height of aircraft above the ground or crop measured from the lower-most part of the airplane.
- APPROACH CHANNEL** - The channel or basin above the structure, control, or point of measurement usually to provide desirable flow conditions approaching a control or measuring point such as a basin to provide very low velocities of flow as the liquid reaches a weir or a uniform channel to provide steady flow in an area where velocity measurements are to be made.
- APPROPRIATIVE RIGHT** - A doctrine of right to water, according to which rights are based on date of appropriation of water and the right to water is limited to beneficial use. May also be called prior appropriation; prescriptive, condemnation, and appropriate right; all are appropriate rights in that they give the right to divert a given amount of water although the first two are not generally recognized as such.
- APRON** - A device to protect a stream or river bed against scour; a shield. A strong non-erosive, usually horizontal surface on which the kinetic energy of a jet or stream of water is dissipated and the velocity of flow reduced to a safe value for downstream conditions. Bottom part of inside trim on windows. A floor or lining of concrete, timber, etc., to protect a surface from erosion, such as the pavement below chutes or shipways, or at the toes of dams. A device sometimes of canvas, of rubber-like material, or of metal links which is made into a continuous belt for conveying materials such as straw, silage, manure.
- APRON CONVEYOR** - A type of conveyor, consisting of a plane traveling belt composed of link sections for transport horizontally or on a slight gradient.
- APPROVED MATERIALS, FITTINGS, ETC.** - Usually means that device or material is approved by the Under-writers Laboratories, an organization sponsored by insurance companies and others, to eliminate use of unsafe equipment.
- AQUA AMMONIA** - A solution of ammonia in water; it is a cleaning agent also used as a neutralizer for acids. It is formed in one stage of operation of absorption type refrigeration machines. Also used for fertilizer.
- AQUATIC RIGHTS** - Rights of individuals to the use of bodies of water, such as rivers and lakes, for navigation, recreation, fishing, and water supply. See: Appropriative right.
- AQUEDUCTS** - A channel constructed to convey water.
- AQUIFER** - Water bearing formation through which water moves more readily in comparison with its movement through formation of lower permeability. A stratum of permeable material which will yield gravity ground water in

- appreciable quantities.
- ARBOR BOLT** - See: Gang bolt.
- ARBOR PRESS** - An appliance used for forcing arbors or mandrels into or out of work by the aid of a screw press of hydraulic means.
- ARC** - A part of a curve; flow of current across a narrow gap in an electric circuit.
- ARCADE** - A type of structural framework that is formed by using a series of arches.
- ARCH** - Any bowl-like curve, structure, or object, usually having the convex side upward, generally spanning an opening and producing horizontal as well as vertical reactions. A type of structural frame found in farm buildings layed out in parabolic shape or semi-circular shape. A device used in the logging industry to help ease the skidding of logs by lifting one end.
- ARCH CENTER** - A temporary structure for supporting an arch shile in the process of construction.
- ARCHED DAM** - A curved dam, convex up stream, that depends on the arch for its stability. The load is transferred by the arch to the canyon walls, or other abutments.
- ARCHIMEDEAN DRILL** - A hand drill for light work, whose stock is formed into a multiple spiral or quick pitch over which a nut or spool slides easily. The act of sliding the nut up and down the stock makes the latter and consequently the drill, rotate first one way and then the other, pressure being applied by a knob or ball at the opposite end of the stock.
- ARCHIMEDEAN SCREW** - An early form of pump; consists of a hollow screw, or a spiral pipe, around an inclined axis; the lower end is submerged in the water and the upper end discharges.
- ARC WELDER** - A machine used for fusion welding or heating deriving its heat from an electric arc.
- AREA CURVES** - 1. A graph of the cross-sectional area of a stream at a gaging station or other section. 2. A graph of the surface area of a reservoir plotted against water-surface elevations. 3. A graph of the areas of any structure.
- AREA OF INFLUENCE** - The area under which a drop in water level occurs as a result of pumping from ground water storage.
- ARID** - A term applied to an area that generally receives little rainfall hence is a barren or sparsely vegetated area. Water usually must be applied artificially to crops. An arid climate is usually associated with desert conditions.
- ARID CLIMATE** - A dry climate such as a desert and semi-desert region where usually only sparse vegetation of desert plants prevails. Precipitation may vary considerably according to temperature conditions, with limit for cool regions of 10 ins. or less and for tropical regions of as much as 15 to 20 ins.
- ARITHMETIC MEAN** - The best value obtainable from a series of observations. Obtained by dividing the sum of the individual readings by the total number of observations.
- ARROW HEAD POINTS** - A type of cultivator shovel usually narrow with a flared point. See: Shovel.
- ARSENIC (As)** - An element which occurs as a solid steel gray color and metallic luster. The free element is not considered poisonous, although many of its compounds are very deadly. It is an ingredient of insecticides and pesticides.
- ARTESIAN AQUIFER** - A formation of permeable material which will yield an appreciable quantity of water and in which the water is under pressure. See: Artesian pressure.
- ARTESIAN PRESSURE** - The pressure or head of a source of water in an aquifer which is confined by relative impervious material. When such a source of water is

- tapped by a well, the water level in the casing will rise above the bottom of the confining material. This pressure may or may not produce a flowing well. See: Aquifer.
- ARTESIAN RESERVOIR** - A formation or aquifer in which the water is under artesian pressure.
- ARTESIAN WELL** - 1. A well in which the water is under hydrostatic pressure. 2. When a tightly cased well penetrates an aquifer overlaid by a confining bed, and the water rises in the well above the level of the bottom of the confining bed, the well is artesian. 3. When this pressure is sufficiently great to force the water above the surface, the well is a flowing well, but the term artesian is also applied to non-flowing wells. See: Aquifer.
- ARTIFICIAL DRYER** - A device which is used to reduce the moisture content of products so that the harvest can be safely stored.
- ARTIFICIAL NUCLEATION** - The supplying of artificial nuclei or particles to clouds thought to be lacking natural nuclei; also called cloud seeding.
- ARTIFICIAL REFRIGERATION** - Use of refrigerating machinery. It is accomplished principally by the compression or the absorption system. In the compression system a gas pump or compressor is connected to the vapor line, then draws the vapor from the evaporator and forces it into a condenser, where the vapor is cooled by water or air, and it condenses back into a liquid which can be used over again to absorb heat from a room or substance.
- A.S.A.E.** - American Society of Agricultural Engineers. Also used to designate standards established by the organization.
- ASBESTOS-CEMENT** - A type of material made by combining asbestos fibers with cement and water, resulting in a tough hard board. Usually manufactured in thin sheets for construction purposes.
- ASBESTOS FIBER** - A fibrous variety of ferromagnesium silicate, the fibers being usually so fine as to be flexible and easily separated by the finger. It is found in Italy, Canada, Cape Colony, United States, and elsewhere. Asbestos can be spun into yarn (which may be plaited to form piston rod packings, etc.). It is usually used in products where fire resistance is required.
- ASEPTIC** - The state of being clean and sterile, having no bacteria present.
- ASEPTIC CANNING** - A system of canning in which a sterile product is placed in a sterile container and sealed without bacterial contamination.
- ASH HOPPER** - A wedge-shaped, wooden box, with an opening in the bottom which was used by pioneer farmers in the forested region of the United States for leaching wood ashes and obtaining lye. A barrel with a hole bored near the bottom and tilted on a platform was also used for this purpose. Also called lye hopper.
- ASHLAR** - A method of laying brick, concrete block or cut stone in a wall to produce an ashlar pattern.
- ASPHALT** - A brown to black bituminous substance, solid when cold and liquid when warm, soluble in gasoline.
- ASPHALTIC CONCRETE** - A concrete made by adding proportionate amounts of asphalt to the concrete mixture.
- ASPHALT-IMPREGNATED FELT** - A roofing and waterproofing material consisting of saturated asbestos or rag felt, cemented together with asphalt or tar pitch.
- ASPHALT-IMPREGNATED MEMBRANE** - A waterproofing material composed of a felt base saturated with asphalt; used primarily to waterproof masonry walls.
- ASPHALT JOINT SEALER** - An asphaltic mastic used to seal joints in masonry construction, i.e. the joint between a masonry wall and a concrete floor.
- ASPHALT PAPER** - A type of paper made by impregnating rag or paper

- felt with asphalt. Used in building.
- ASPHALT SHINGLES** - A manufactured roofing material, composed of an asphalt saturated fiber base covered with a layer of mineral granules.
- ASPHALT TILE** - A type of floor covering, composed of a thermoplastic binder of asphaltic or resinous type, asbestos or cotton fibers, and inert materials as fillers or pigments.
- ASPIRATING** - A method of cleaning grain by drawing air through the grain by connection to the intake of a fan.
- ASPIRATOR** - A device resembling an ejector, in which water passes through a nozzle, whose outlines conform to the vena contracta. This device induces a suction current in a connection pipe and exhausts the air thus creating a high vacuum.
- ASSIST FEED MECHANISM** - The seed metering device on a semi-automatic potato planter which enables the operator to assure that it functions properly.
- A.S.T.M.** - The American Society for Testing Materials. An organization which has prepared standards for materials such as drain tile, pipe, etc.
- ASTRAGAL** - A small molding of circular section. A molding, attached to one of a pair of swinging doors, against which the other door strikes.
- ATMOMETER** - Any instrument or device which is used to measure the evaporation rate of water into the atmosphere.
- ATMOSPHERE** - The whole mass of air surrounding the earth. The air in any locality; as a moist atmosphere. The pressure of the air at sea level (about 14.7 lb. per sq.in.) is used as a standard unit.
- ATMOSPHERIC CIRCULATION** - Natural circulation of air due to unequal temperatures and/or unequal pressures but without the use of mechanical power.
- ATMOSPHERIC CONCENTRATOR** - A drum-like device for reducing the water content of food products which consists of a cylinder within a cylinder with a space between the two for steam. Fans within the inner cylinder maintain a slight vacuum and force out vapor from the evaporator. It operates at essentially atmospheric pressure.
- ATMOSPHERIC CONDENSATION** - When moisture laden air is uplifted and cooled sufficiently small droplets of water are formed as in a cloud or a fog. The condensation takes place on dust particles.
- ATMOSPHERIC CONDENSER** - As used by refrigerating engineers; an evaporative condenser for removing heat from the refrigerant, cooled by water spray and natural air currents.
- ATMOSPHERIC CONDITIONS** - Usually refers to temperature, relative humidity, motion, cloudiness, barometric pressure and suspended matter such as dust, smoke, odors, etc.
- ATMOSPHERIC DRUM DRYER** - A dehydrator for liquid food products consisting of a large, steam-heated drum which is coated with the food product as it slowly revolves. The water content is rapidly evaporated and close-fitting knives scrape the dehydrated material off the drum.
- ATMOSPHERIC INDUCTION ENGINES** - Any internal combustion engine using air at atmospheric pressure as compared to an engine equipped with a supercharging device on the air intake.
- ATMOSPHERIC PRESSURE** - Pressure caused by the weight of the air; a measure of the weight of a column of air of unit cross-sectional area above any given point, hence, varies with elevation. At sea level, 1 atmosphere of pressure equals 14.7 p.s.i., 130 ins. of mercury, 76cm of mercury or 34 ft. of water.
- ATOMIC HYDROGEN WELDING** - A welding process in which an arc is maintained

- between two tungsten electrodes while a stream of hydrogen is passed through the arc and around the electrodes.
- ATOMIZE** - To separate a jet of any liquid into a finely divided spray. Effected either by hydrostatic pressure or by a blast of compressed air or steam in conjunction with specially shaped nozzles.
- ATOMIZER** - Any device for reducing a liquid to minute particles, or to a mist or spray.
- ATOMIZING BURNER** - A heating unit in which the fuel oil is divided into fine particles and mixed with air prior to being burned.
- ATTEMPERATORS** - Piping in a liquid through which a refrigerant is passed to lower the temperature of the liquid, used in fermenting tanks of breweries. Also called attemperator coils.
- ATTERBERG LIMITS** - The moisture content extremes of soils between which plastic flow is exhibited and the difference between the moisture contents. See: Plasticity number, lower plastic limit. Also called atterberg constants.
- ATTIC** - That part of a classic structure that is built over the cornice level. Also the space immediately under the roof of a house. The space between the ceiling joists and the roof of the house.
- ATTIC VENTILATOR** - Usually openings in gables or ventilators in the roof. Also, mechanical devices to force ventilation under a roof by use of power-driven fans.
- ATTRITION MILL** - A mill which grinds by the method of friction or rubbing action to reduce the size of particles. Used in feed and flour mills.
- A-TYPE FRAME** - A type of building framework resembling the capital letter A; usually built by using two common rafters which extend from the peak to the floor of the building.
- AUGER CONVEYOR** - A materials handling device used for horizontal or vertical movement of free flowing materials. The material is moved by a rotating screw, usually within a trough or cylindrical tube.
- AUGER FERTILIZER DISTRIBUTOR** - A device used for application of dry commercial fertilizers which utilizes an adjustable speed auger as a metering mechanism.
- AUGER-HOLE METHOD** - In a test for soil permeability, an auger-hole is bored into the ground below the water surface. The water is pumped from the hole, and as the hole refills, the rate at which the water rises is observed, and the permeability is found from this rate.
- AUSTEMPERING** - Heat treatment in which steel is quenched from the austenitic region in a salt bath at a temperature in the range of 400 to 1000° F., followed by holding at constant temperature for a time sufficient to transform the austenite to a dark etching acicular structure, Bainite. Since the structures developed in the upper part of the range are not well defined and vary with the steel, the upper limit for temperature, 1000° F. should be taken as approximate.
- AUSTENITE** - A solution of carbon or of iron carbide in gamma iron. The maximum solubility of carbon in gamma iron is 2.00%
- AUTOCLAVE** - May be referred to in the food industry as a retort. A pressure vessel or a container for cooking, sterilizing, etc. Heated with steam under pressure.
- AUTOIGNITER** - A small magneto-generator or dynamo for electric ignition of gasoline and petroleum engines, the armature of which is geared to the flywheel, thereby supplying a continuous electric current as the engine revolves.
- AUTOLYSIS** - The process of self-digestion, occurring in vegetable and animal tissues particularly after they have ceased to be a normal part of the organism to which they belong, as in fruit after picking and meat after.

- slaughter.
- AUTOMATIC CONTROLS** - Any set of switches, valves, etc. which are operated without manual assistance when certain pre-set conditions are reached.
- AUTOMATIC DRAFT CONTROL** - A mechanism usually hydraulically actuated in which the control level position represents a given implement draft. Variations in draft cause the implement to be automatically raised or lowered to restore the pre-selected draft.
- AUTOMATIC FLAP GATE** - A type of check valve. A device located on the end of the discharge pump or main line which prevents back-flow.
- AUTOMATIC-PICKUP HAY BALER** - A hay baler with a pickup cylinder that delivers the hay directly to a floating feed cross auger.
- AUTOMATIC-PICKUP SELF-TYING HAY BALER** - A hay baler in which the pickup cylinder spring teeth pass the hay to an auger or other cross-feed device which in turn passes it to the feeding arms, which feed the hay into the baler chamber. The bale is then tied by an automatic knotter and ejected from the bale chamber.
- AUTOMATIC POSITION CONTROL** - A type of hydraulic control system in which there is a definite relation between the position of the implement and the position of the control lever, thus allowing the hydraulic cylinder to move an implement automatically to a pre-selected position or depth as determined by the control lever.
- AUTOMATIC POTATO PLANTER** - A device used in planting potatoes consisting of a picker wheel to which are attached from three to twelve picker arms. These arms pass through the picking chamber containing the seed. The seed is picked up and dropped down a seed spout which guides it into the ground.
- AUTOMATIC SAMPLER** - A device which removes a representative portion of a falling stream of grain without attention from an operator. Also catches a portion of water flowing by, as in a stream.
- AUTOMATIC SHUT-OFF** - A control mechanism which automatically shuts off a device such as an engine, burner, ventilator, pump, etc. in response to a signal from a sensing device.
- AUTO TRANSFORMER** - A type of transformer which has only one winding to serve as both primary and secondary windings; to step the voltage down, less than all of the winding is used as the secondary and to step the voltage up, less than all of the winding is used as the primary.
- AUXILIARY AIR-VALVE CARBURETOR** - A compensating-type carburetor making use of a supplementary air valve or duct that either bypasses the fuel jets and adds more air to the mixing chamber or increases the amount of air to the main stream.
- AUXILIARY-ENGINE ROTARY PLOW** - A rotary plow employing an internal combustion engine as a power unit to operate the mechanism. The engine is mounted on the machine which is not usually self-propelled.
- AUXILIARY FLOOD DITCH** - A ditch used to remove surplus surface or runoff water. Also called auxiliary ditch. A reserve channel that comes into operation when the capacity of the primary flood channel or pipeline is exceeded.
- AUXILIARY GASOLINE ENGINE** - A gasoline-burning engine serving to supplement or take the place of another power source; as an engine on a machine to supplement a ground drive mechanism or another engine. Sometimes the starting engine for a large diesel.
- AVAILABLE CAPACITY (AC)** - The total quantity of water held in the soil that is available for plant use, as determined by the difference between field capacity and the ultimate wilting point. It may be expressed in percentage of the dry weight of the soil or depth in ins. per ft. depth of soil. See:

- Available moisture.
- AVAILABLE HEAT** - The sensible heat energy per unit quantity of air which can be used for evaporating water from a product as the air is brought in contact with that product. In drying grain, the quantity of heat in air that, with proper exposure, can be utilized in evaporating water from grain. It is the sensible heat before such exposure minus the sensible heat after exposure, expressed in Btu per cu.ft.
- AVAILABLE MOISTURE** - The amount of water in the soil that can be absorbed by the roots of plants. Technically, the difference in the weight of moisture held in a soil at field capacity and that held at permanent wilting. It may be expressed in ins. of water per unit depth of soil. See: Available capacity. Does not include hygroscopic moisture.
- AVAILABLE PRESSURE** - The static pressure available for the operation of hydraulic equipment such as the pressure to operate an irrigation sprinkler.
- A.W.G.** - Abbreviation for American Wire Gage; also known as the Brown & Sharpe wire gage. A standard gage for measuring the thickness of all non ferrous sheet and plate metal.
- AXIAL-FLOW** - The movement of water along the impeller shaft of a pump; in turbine and propeller pumps the water being pumped is lifted by mixed flow or propeller blades on the impeller and caused to move along the pump shaft.
- AXIAL FLOW PUMP** - A pump designed for axial flow of water, usually a propeller or mixed flow turbine pump. These pumps generally used for high volume flow at low lifts. See: Axial flow.
- AXIAL LOADS** - A load or force which is applied to a shaft in the direction of the axis, or to a column or beam in a longitudinal direction.
- AXIS** - A central, principal line about which a figure or body may rotate, from which distance can be measured or to which positions can be referred. A central guiding line used in the preparation of architectural drawings.
- AXIS OF ROTATION** - A real or an imaginary straight line about which an object revolves.
- AXLE GREASE** - A substance used for lubrication of wheels and axles. Some of the ingredients that are used in making axle grease are: tallow, palm oil, spermaceti, and plumbago. A special preparation used for the lubrication of axles. Numerous mixtures are employed into which tallow, palm oil, spermaceti, plumbago, in various proportions enter.
- AXLE HOUSING** - The enclosing structure around an axle which provides lubrication and support for bearings and protection from dirt and damage. An enclosing structure which performs several duties, such as carrying and protecting from dirt - sometimes acting as support for bearings, etc.
- AXLE STEEL** - The steel that is used for making an axle. Mild steel is commonly used. For high strength requirements, alloys such as nickel, nickel-chromium, or chrome-vanadium steels are used.
- AXLE TREE** - A non-rotating transverse member connecting opposite wheels of a vehicle upon which the wheels revolve. A bar or beam of wood or iron, connecting the opposite wheels of a carriage on the ends of which the wheels revolve.
- AXLE WAD** - A washer of porous material, such as wood or paper mache, placed in the back part of an axle box, to protect the axle from entry of dust and air. It is divided across the middle with bevelled edges.
- AZIMUTH (OF A LINE OR A DIRECTION)** - The direction of a line as given by the angle between the meridian and the line measured in a clockwise direction from the south point or north point of the meridian.

B

- BABBITT** - An alloy used for bearings consisting of tin, antimony, copper, and lead in varying amounts. These metals mixed in proper proportions have such characteristics as hardness, toughness, resistance to corrosion, scoring and holding up under loads and heat.
- BABBITT BEARING** - A type of bearing consisting of a sleeve of babbitt metal poured into the bearing housing.
- BACK BAND** - The outside member of a window or door casing.
- BACK CURTAIN** - A piece of canvas which is suspended above the rear part of the platform of a grain binder to prevent the wind from interfering with the grain falling on the platform canvas. Also called wind shield.
- BACK-DRAFT** - A reverse flow of air in "stack" or "flue" ventilation systems.
- BACKFILL** - Any material used to fill an excavation such as around footings or foundations of buildings. See: Backup material.
- BACKFILLER** - A machine which is used to move excavated soil into the trench.
- BACKFIRE** - 1. An explosion in the exhaust pipe or muffler of an internal combustion engine. Usually caused by incomplete combustion in the cylinder. 2. In oxyacetylene welding equipment, the loud snapping or pop caused when the flame goes out suddenly. Usually caused by some interference in tip of the welding equipment. See: Flashback.
- BACKFIRE TEST** - One of seven tests specified by the Society of Automotive Engineers to evaluate air cleaners.
- BACK FURROW** - The resulting ridge of soil turned up when a furrow slice is lapped over the first furrow slice when starting the plowing operation.
- BACKHAND WELDING** - An oxyacetylene welding technique in which the welding progresses from left to right (right handed person), and the welding flame is directed backward at the completed weld. The welding rod is held between the completed weld and the flame. See: Forehand welding.
- BACKHOUSE** - See: Privy.
- BACK-LASH** - The distance or movement through which a part or series of parts must travel before any action takes place. It may be due to the tolerances or wear within the parts.
- BACK-PACK PUMP** - A small water container which is constructed of metal or canvas with a hand pump attached. It is fitted with back-pack straps and is used mainly in fire fighting.
- BACK PRESSURE** - A force in the opposite direction of the normal force such as the down draft in a natural ventilation system or the atmospheric pressure opposing the exhaust of any engine.
- BACKSIGHT** - 1. Transit traverse: A sight on a previously occupied instrument station. 2. Leveling: The reading on a rod that is held on a point of known elevation, and which is to be used for computing the height of the instrument.
- BACK-SIPHONAGE** - Water sucked out of vessels due to a low pressure in the supply pipe.
- BACK-TO-BACK SETUP** - A technique of accelerated testing of farm tractors. A test tractor is loaded by a tractor load machine through direct tire to tire contact. The external forces on the test tractor are similar to those found in the field, i.e. forces at the axles are forward and forces at the drawbar are backward.
- BACKUP MATERIAL** - Any type of material used to fill in behind or give a backing to a facing material.
- BACKWARD CURVED CENTRIFUGAL FAN** - A type of centrifugal fan consisting of curved blades mounted

- on the outer periphery with the leading edge of the blade on the inner edge of the outer periphery. See: Forward curved fan.
- BACKWASHING** - In well drilling, the forcing of water by air pressure down the pipe and through the screen to wash away the fine sand, silt, and clay of the water bearing formation which surrounds the screen.
- BACK WATER CURVE** - A particular form of the surface curve of a stream of water which is concave upward. It is caused by an obstruction in the channel, such as an overflow dam; the depth is greater at all points than Belanger's critical depth or the normal depth; the term is also used in a generic sense to denote all water surface curves. See: Surface curve. Generally the velocities diminish as it approaches the dam.
- BACK WATER GATE** - A device for preventing the back flow of sewage or water
- BACTERICIDAL** - Capable of killing bacteria.
- BACTERICIDE** - An agent for killing bacteria.
- BACTERIOLOGIC EXAMINATION** - An examination performed to determine whether or not the substance is contaminated or the degree of contamination.
- BAFFLE** - A device used to regulate, check, deflect or guide the flow of gases, liquids or solids.
- BAFFLED DRYER** - A dryer in which heated air is directed through grain by baffles.
- BAFFLE-PIERS** - Obstructions set in the path of high velocity water, such as piers on the apron of an overflow dam, to dissipate energy and prevent scour.
- BAGASSE** - The residue of sugar cane or sugar beets after the juice has been extracted. It is used for fuel, livestock feed and can be made into a fiber board for construction purposes.
- BAG FILTER** - A conical bag which is made of heavy cloth or felt and is used to filter fruit juices, milk, etc. Also called bag strainer.
- BAGGER** - A hollow tube shaped like an inverted capital Y through which grain, etc., is moved into bags for packaging. Its Y shape permits the removal of one bag while the other is filling.
- BAGGER ELEVATOR** - A tube or long open metal chute inside which is a mechanism used to carry potatoes, litter, grain, etc., from a level to a place where material is loaded or sacked.
- BAGGING** - 1. Cotton, jute, or other cloth material which is used in covering a bale of cotton. 2. Any cloth which is used for making bags.
- BAGGING SCALE** - A scale which is used to weigh sacks and their contents in connection with a bagger.
- BAG HOLDER** - A device for holding an empty sack upright, while it is being filled with grain or the like.
- BAGS** - Sack-like containers used for holding non-liquid products.
- BAG SEWER** - A person or machine that sews the top of a bag together after it has been filled with produce.
- BAG TRIER** - A device used to obtain samples of products from bags without disturbing the original closure or harming the bag in any way.
- BAG-TYPE STRAINER** - A cloth bag which is used to strain extraneous materials from honey, etc. See: Bag filter.
- BAIL** - The swinging semi-circular cross handle of a bucket or any stirrup-shaped piece used for the support or carrying of the object to which it is attached.
- BAILING PRESS** - Obsolete term for hay baler. See: Hay baler.
- BAINITE** - Product of the isothermal transformation of austenite in the range of 400-1000° F.
- BAIT SPREADER** - A device which consists of a large, rotating disc onto which poisoned bait is

- dispensed from a hopper. The disc distributes the bait seven to ten yds. from the spreader.
- BAKELITE** - Trade name for material composed chiefly of a phenol compound; chemical name, oxybenzyl-methyl-englycol anhydride. It has excellent electrical insulating qualities.
- BALANCED BEAM** - Beam dimensions and area of steel are in such relation that under full load the maximum fiber stress in both steel and concrete corresponds with their respective allowable unit stresses.
- BALANCED CIRCUIT** - 1. An electric circuit so adjusted with respect to neighboring circuits as to escape the influence of mutual induction. 2. A three wire circuit having the same load on each side of the neutral wire, as a three wire lighting circuit on an automobile.
- BALANCED PULLEY** - One in which the parts are equally weighted, both for running and for standing balance. All rapidly revolving pulleys required to be balanced.
- BALANCED REACTION COIL** - A choking coil in connection with an alternating current transformer which maintains a uniform current in the secondary circuit under changing loads.
- BALANCED RELAY** - A relay having its armature passive when equal currents traverse both coils in opposite directions around the core.
- BALANCED THREE PHASE CIRCUITS** - A system in which all phases have voltages and currents that are equal; they have 120 electrical degrees between each of the three voltages and between each of the three currents.
- BALANCE FRAME** - The frame of a walking wheel cultivator which is so designed (the wheels off-set in the front) that the tongue remains horizontal when the gangs are raised. As a result, very little weight hangs on the horses' necks.
- BALANCE WEIGHT** - 1. A weight slid over the end of a lever and attached thereto by a set screw, its use being to counterbalance a moving part. The function of the weight is not always that of counterbalancing merely, but also in addition the lifting of the working part - the lever, drill, brake, chisel, or whatever it may happen to be, out of or away from its place without the intervention of the workman or attendant. 2. Applied generally to any weight used as a counterpoise such as, a crank, or on the reversing gear. 3. Also the small weights put into a balance box.
- BALANCING A TRAVERSE** - Adjusting the observed measurements to conform to the geometrical requirements of the traverse. Distributing the angular error of a closure so that the initial and final azimuths are in agreement.
- BALANCING METHOD** - A means used to find the approximate location of the center of gravity of track type tractors or other materials.
- BALE BREAKER** - A machine which is used to disentangle, spread and fluff up the cotton fibers after the cotton has been removed from the bale and before the cotton is spun into thread.
- BALE BUSTER** - A self-powered machine used to break up and shake out tightly baled hay or straw before being fed.
- BALED** - A product that has been compressed into a large bundle, tied with heavy string or wire and sometimes protected by a wrapping.
- BALE DENSITY** - The weight per unit volume of hay or any other product which can be baled.
- BALED HAY** - Hay which has been compressed in large bundles, tied with heavy string or wire and sometimes covered with a protective covering.
- BALE LOADER** - An elevator which is attached to a truck or tractor for the purpose of lifting bales of hay or straw from the ground to the bed of the truck or wagon.
- BALE PRESS** - A machine used to

- compress cotton after ginning into bales for shipping.
- BALER** - See: Hay baler.
- BALING CHAMBER** - The compartment of a hay baler in which the hay is compressed into a bale.
- BALING TWINE** - A heavy fiber twine used for tying bales made by automatic balers.
- BALING WIRE** - Soft iron wire, made to specifications established by the A.S.A.E., used for tying bales.
- BALK** - A narrow ridge of land left unworked between gangs of a disc harrow or other tillage implement.
- BALL AND SOCKET JOINT** - A joint in which a ball or spherical object is placed within a socket recessed to fit it, thus permitting free motion in any direction within certain limits. A ball and socket mounting is usually applied to shafting supports to make them self-adjusting.
- BALLAST** - 1. An electrical current limiting device. 2. Weight added to a tractor or machine for increased traction or stability.
- BALL BEARING** - A bearing whose journal works on balls, which roll easily in their grooves or races. Friction upon a series of points is thus substituted for that upon a surface thus eliminating a considerable amount of the total friction. See: Roller bearings.
- BALL CHECK VALVE** - A type of check valve which uses a ball and a seat, each being ground to the same radius and resulting in a tight fit regardless of the position in which the ball seats. See: Check valve.
- BALL CUTTER** - A spherical cutting tool; a cutter with a rounded edge.
- BALLOON FRAME** - A type of framing for building in which all vertical structural elements of the bearing walls and partitions consist of single pieces extending from the top of the foundation sill to the roof plate and to which all floor joists are fastened.
- BALLOON HOOD** - A light, wooden frame which is covered with heavy roofing paper, etc., so that it is air-tight. It is placed over stacks of trays of sliced pears, peaches, or apricots to be sulfured by burning sulfur fumes before being placed in the sun for drying.
- BALLOON TIRE** - A pneumatic tire consisting of a casing and an inner tube. The inner tube is inflated with a large volume of air at relatively low pressure.
- BALL PEIN HAMMER** - A type of hand hammer in which one head is in the shape of a ball, thus rendering the tool serviceable for riveting.
- BALL RETURN SPRING** - The spring used to return a ball to a neutral or closed position in rotating valves or ball check valves.
- BALUSTERS** - Upright members of a hand rail or balustrade. May be used for support or for decoration.
- BALUSTRADE** - A handrail supported by balusters. Usually used in connection with stairs.
- BAMBOO RAKE** - A light rake with teeth made of bamboo pegs. It is used for raking leaves, cleaning beds, etc.
- BAND** - 1. A thin strap of metal or other material secured around the circumference of a thing either as ornament, fastening, or to serve some mechanical purpose. 2. The binding twine on a bundle of grain.
- BAND BRAKE** - A type of brake in which a band passes around the rotating member in such a manner that it may be tightened so as to stop rotation or hold it stationary once it has been stopped. See: Shoe brake, disc brake.
- BAND CUTTER** - 1. An attachment on the feeder of a threshing machine which cuts the bands on the bundle before delivering the grain to the cylinder. 2. A person who cuts the bands by hand on a thresher feeding table.
- BAND CUTTER KNIVES** - The cutting tool of the band cutter. They are curved knives attached to a

- rotating shaft. See: Band cutter.
- BAND MILL** - 1. A sawmill which is equipped with a band head saw.
2. A machine on which band saws are mounted.
- B & S** - Abbreviation for Brown & Sharpe wire gage.
- BANDS** - Radiant energy that has been separated by use of a filter which transmits only energy of certain wavelengths; by use of a prism which disperses the energy into bands; or by the use of a diffraction grating.
- BAND SAW** - An endless band of steel with saw teeth upon one edge, passing over and driven by two wheels.
- BAND WHEEL** - A pulley over which a belt runs or upon which a band saw is mounted.
- BANK BARN** - A barn built on the side of a hill so that entrance to second story, or loft, may be had from the ground. See: Basement barn.
- BANK FULL** - A term used in irrigation to describe the condition of a ditch which is completely filled with water but not overflowing.
- BANKING UP** - In blacksmithing, the beating down of green coal around the central portions of a smith's fire, or around a piece of forging laid therein.
- BANK OF TRANSFORMERS** - The series of transformers required in the electrical system design to provide the voltage needed.
- BANK PROTECTOR** - Any device or material used to stabilize the sides of a river or ditch.
- BANKS OF A STREAM** - See: Spoil banks, ditch banks.
- BANQUETTE** - An earthen terrace which is added to the base of a high levee away from the water to prevent seepage and sloughing of the levee.
- BAR** - Any piece of wood, metal or solid material long in proportion to its cross section; also a barrier; an accumulation of silt, sand, gravel or a combination thereof which is deposited in streams and forms an obstruction therein.
- BARB BOLT** - In machinery, one having jagged edges to prevent retraction after driving.
- BARBED WIRE** - A wire made by twisting two or more strands of wire to form a cable. Wire barbs are attached to the wires at regular intervals. Older barbed wire was made by twisting barbs on a single strand of wire.
- BARBWIRE FENCE** - See: Barbed wire.
- BAR HANGER** - In house wiring, a device for supporting outlet boxes. The hanger is attached to joists.
- BARLEY FORK** - A large long handled fork which has a guard at the handle end of the tines and is used to pick up loose short stemmed straw for transporting.
- BARLEY HUMMELER** - An instrument consisting of parallel iron plates which was once used in Scotland for hummeling barley; that is, threshing to separate the grain from the straw.
- BARLEY REEL** - A seed separating machine which consists of a rotating, corrugated, woven screen.
- BARN** - A farm building which is used for storage of hay, grain, etc., for the housing of domestic animals, or for the storage of farm implements.
- BARN CLEANER** - A power operated conveyor type of mechanical or chain device which runs in the manure gutter for removal of manure and litter.
- BARN CURED** - See: Barn drying.
- BARN DRYING** - The removal of moisture from hay and other forages within the barn using forced air which is usually unheated. Also called barn curing, mow curing, or finishing hay.
- BARN HAY DRIER** - A device used for drying hay in the barn using forced air, which is usually unheated, and a duct system for distribution of this air.
- BARN RAISING** - The constructing of a barn. Often this implies a

- gathering of friends and neighbors to assist in the construction at which time much food and drink is served for a pleasurable occasion.
- BARN SASH** - A type of window commonly used in farm buildings, of such a size that it can be easily installed between wall studs usually four or six panes.
- BARN SEWAGE** - Wash water from stables, containing considerable quantities of animal wastes, straw and other solids.
- BARNYARD** - The enclosed ground around a barn in which animals are allowed to exercise.
- BAROMETER, ANEROID TYPE** - An instrument for measuring the pressure of the atmosphere. Consisting of an exhausted chamber whose ends are corrugated diaphragms. Atmospheric pressure on the diaphragms deflects them. The deflection is transmitted to a pointer which gives the reading, equivalent to that which would be given by a mercury barometer in ins. or mm of mercury. It is less accurate than a mercury barometer.
- BAROMETRIC COLUMN** - The column of liquid supported in an evacuated tube by the pressure of the atmosphere.
- BAROMETRIC PRESSURE** - The amount of pressure of the atmosphere as measured by a barometer. It is measured in at., cm., or ins. of mercury, and sometimes ins. or ft. of water. One atmosphere is a pressure equivalent to that exerted by exactly 76 cm of mercury at 32° F. and under standard gravity of 32.174 ft/sec².
- BARRACK** - A structure consisting of a roof mounted on four posts which is used for the protection of hay. A simple plain housing unit to provide inexpensive lodging for humans.
- BARRAGE** - A dam used to divert or increase depth of a stream.
- BARREL** - 1. A nearly cylindrical vessel, usually slightly bulging around the middle, and generally made of wooden staves held together by hoops. 2. A measure of quantity applied both to liquids and to solids, varying in different places and for different materials. The standard U. S. wine barrel holds 31 gal., a flour barrel 196 lbs., and an apple barrel 2 3/4 bushels, etc.
- BARREL PUMP** - A simple type of sprayer which develops 200 to 300 lbs. per sq.in. of pressure (usually operated by a hand lever) on a drum of 15 to 45 gal. capacity. It is often transported on a hand cart or sled.
- BARREL SPRAYER** - See: Barrel pump.
- BARREL TYPE HEAT EXCHANGER** - A compact type of heater which is used in the dairy industry in which the milk passes through pipes surrounded with steam within a barrel shaped container. It is usually rated at about 1,000 lbs. of milk per hr. per eight sq.ft. of heating surface.
- BARRIER** - An obstruction which limits the free movement of animals, water, or the migration of plants; a mechanical device to keep insects away from plants or animals; a barrier which limits root growth.
- BARRIER-LAYER CELL** - A photovoltaic cell that generates its own electrical output, requiring no external source of voltage. The selenium barrier-layer cell is used principally for light meters and the operation of relays to control other electric equipment.
- BAR ROLLER** - A device which is used for crushing clods and compacting soil. It consists of a heavy metal tube or tubes which are rolled over a field being pulled by a tractor or team. See: Cultivator, corrugated roller, planker, subsurface packers, and treader.
- BARS** - Solid round, square or rectangular shaped pieces of metal used in all types of construction. Used extensively in the construction of farm equipment.
- BAR SPADE** - A spade having a cutting blade welded across three parallel bars (similar to a gardenfork) for trenching in wet,

- sticky soil.
- BAR TILTING ADJUSTMENT** - An adjustment on the cutter bar of a mower which changes the angle of the cutter bar in relation to the ground surface over which it passes.
- BASCULE** - A moving span that moves up and down about an axis that may be either fixed or movable. A type of bridge.
- BASCULE PAN** - The evaporating pan which was formerly used in the manufacture of sugar from sugar cane. Also called tile pan.
- BASE** - The lower member of a column or a building. The metallic shell assembly by which a lamp is attached to the supporting socket and connected to the electric circuit. The bottom of anything, considered as its support or the part of a thing on which it stands or rests, as the base of a column. A board placed against the wall around a room next to the floor to finish properly between floor and plaster.
- BASE BOARD** - A strip of wood, steel or plastic, usually having a moulded upper edge. Used around a room as a finish to the lower part of the walls where the wall joins the floor.
- BASE CIRCLE** - The circular section of a cam.
- BASE FLOW** - That portion of the stream discharge which is derived from groundwater.
- BASE LINE** - 1. Any imaginary line on the earth's surface running due east and west, from which township lines are established; a definitely located arbitrary line for reference control purposes. 2. A line adopted as a fundamental line in a survey from which other lines are run. Used in triangulation work.
- BASE METAL** - The metal of the part to be cut or welded as opposed to that which is added by the welding rod.
- BASEMENT BARN** - 1. A barn, very popular in the northern and eastern United States, which is built by excavating into the side of a hill so that the top of the first story is level with the land or top of the hill on one or more sides. 2. A barn, the first story of which has walls of stone, brick, tile or the like. Also called English type barn. In some instances, the barn is built above ground and soil pushed up against the wall.
- BASEMENT STORAGE** - A space below ground surface for the storage of articles.
- BASE PIN** - The male section of the plug-in, in electron tubes.
- BASE PLATE** - 1. The foundation plate of heavy machinery, as of a steam engine; bedplate. 2. The steel or cast iron plate on which a column rests.
- BASIN** - An enclosure which is made by throwing earth up to form a ridge or low levee on all sides to hold water for irrigation, as around a tree.
- BASIN ATTACHMENT** - Damming attachment for lister to make short basins to hold water.
- BASIN IRRIGATION** - A method of irrigation by flooding, where the water is applied to plots that are approximately level and are surrounded by a retarding border or low levee. Used extensively in orchards where a basin may include only one tree.
- BASIN LISTER** - A lister which has attachments to form small basins for rainfall retention by automatically depositing an earth dam in the furrow every six to ten ft.
- BASKET** - 1. A container usually made of thin strips of wood, reeds, canes, or other flexible materials in which commodities are picked, handled, packed, shipped, or sold.
- BASKET PRESS** - A press which is used generally for extracting juice from grapes. It consists of a cylinder made of heavily reinforced strips in which the crushed fruit is placed and within which the fruit is pressed.

- BASTARD - 1. In sugar refining, an inferior soft brown sugar which is obtained from the syrups that have already had several boilings. 2. A large size of mold in which sugar is drained. 3. Pine wood whose grain and quality differ very much from that of yellow pine. 4. A type of file for rapidly removing metal.
- BASTARD SAWN - Designating hardwood lumber in which the annual rings make angles 30° to 60° with the surface of the piece. See: Quarter sawed.
- BASTARD TRENCHING - A laborious system of bringing subsoil to the surface in gardens in which 2 two-ft. ditches are dug. The earth from the first is placed aside and the earth from the second is placed in it. Next, a layer of manure is placed in the bottom of the ditch along with a layer of earth from a third trench and so on.
- BASTARD WHEEL - 1. A bevel wheel in which the bevel closely approaches a right angle, or a spur wheel. 2. One accommodated to an existing wheel, though not a duplicate.
- BATCH - 1. The quantity as a unit which is produced in one operation, as a batch of bread, batch of concrete. 2. A quantity of a harvested crop or any other material which is put into a bin or container on a repetitive basis specifically for treatment, such as drying. The container may be utilized for storage of material after drying in contrast to continuous operation. The quantity of anything produced at one operation.
- BATCH BIN - A structure used for drying small batches.
- BATCH DRYER - A device which dries only a fixed quantity of material at one time as compared to a continuous dryer. See: Continuous flow dryer.
- BATCH DRYING CHAMBER - The container in a dryer in which the grain is held while heated air is forced through it.
- BATCH FREEZER - A commercial ice cream freezer which makes only a fixed quantity of ice cream at one time, as contrasted to the continuous freezer. Consists of a refrigerator drum or cylinder mounted on a base with a direct motor drive, which operates a dasher having scrapers that remove the frozen cream from the refrigerated surface and whip air into the ice cream. Generally there is a mix tank and hopper for adding fruits, nuts and flavors.
- BATCH MIXER - A device which usually consists of a large cylinder, hand or power driven, inside of which and fastened to the walls are fins. It is used to mix seeds, foods, feeds, etc.
- BATCH PEELER - A machine which is used to peel a fixed quantity of fruit or vegetable at one time, as contrasted to a continuous peeler.
- BATTEN - 1. A narrow strip of wood or metal which is used to cover joints of sheathing or other material. 2. A strip of wood or a narrow board which is used to fasten other boards.
- BATTER - To strike with repeated blows; an incline from the vertical (said of a wall having a face receding as it rises); to incline a face or line in masonry or any other construction. An inclined wall which recedes as it rises. A mixture of sand, lime, etc., for mortar. Inward slope of exterior face of a wall, usually making a reduction in thickness as the wall ascends. Embankment walls are usually battered.
- BATTER BOARD - A stake arrangement used to support strings which preserve the original outline of a building during construction.
- BATTER SIDE - The face of a batter that is inclined. See: Batter.
- BATTERY - 1. A series of cages usually three or four, one on top of another, which is used for the purpose of caging,

- raising, or fattening poultry, rabbits etc. 2. Also called nursery and hot house. 3. A range of forcing houses. A number of primary or secondary cells, grouped together for generating and electric current. A term commonly, though incorrectly, applied to a single cell for producing electricity.
- BATTERY GAGE** - A simple galvanometer for rough testing of electric batteries.
- BATTERY IGNITION SYSTEM** - An electric spark type ignition system using a battery as a source of current for the primary circuit.
- BATTERY METER** - A small instrument about the same size and shape as a watch for testing the voltage and amperage of batteries. As usually constructed, its range will cover two cells of a primary or one cell of a storage battery.
- BATTERY MOTOR** - A motor which may be operated by the voltage generated in an electric battery.
- BATTERY OF WELLS** - Two or more wells that are connected to a common pump section manifold. It is used to obtain a greater flow of water than is available from a single well.
- BATTERY TESTER** - A device used to check the voltage or amperage a battery can deliver which would indicate its condition. Also called battery meter, battery gage and hydrometer.
- BATTING** - Cotton, wool and flax fiber which is prepared in sheets; wadding; cotton wool.
- BATTLEDECK FLOOR** - A steel floor system for bridges and buildings, devised and developed by the A.I.S.C., which consists of steel plates and beams welded together so as to develop the whole as a T-beam section with continuity in all directions.
- BATTLESHIP LINOLEUM** - The heavier grades of linoleum usually 3/16 to 1/4 in. thick. Linoleum which is 1/4 in. thick.
- BAY** - One of the intervals or spaces into which a building plan is divided by columns, piers, or division walls. A special compartment in a barn for storage or for a special use, as a horse bay. The portion of a trestle between two columns; the English term for a panel of a truss. In building construction, it is the spaces between trusses. See: Bent.
- BEACH EROSION CONTROL** - The application of various mechanical and vegetative measures which are designed to stabilize permanently coastal and inland sand-dune or low-sand areas.
- BEADING MACHINE** - A sheet metal working tool used for making depressions, stiffening and ornamenting sheet metal.
- BEAKER** - A cylindrical glass vessel usually having a lip for pouring. Commonly used for holding liquids in a laboratory.
- BEAM** - 1. A large, long piece of timber or other material used for horizontal support in a building. 2. That part of a plow to which the plow bottom is attached and to which the team or tractor is hitched. 3. The balance bar on a scale. 4. A ray of light - more or less approaching a cylindrical shape as emitted from a lens, parabolic reflector, or other form of projection equipment.
- BEAM AND POST FRAME** - A system of construction in which the weight is carried on beams fastened to a series of posts. In this system, the weight is concentrated at points rather than on continuous footings.
- BEAM SPREAD** - The angular divergence of a beam of electromagnetic energy measured in degrees.
- BEAN PICKER** - A device that separates dirt, trash, dark and broken beans from the good beans.
- BEAN PLANTERS** - See: Planter.
- BEARING** - 1. The point of support on a post, beam, wall or other structural member. 2. Support of a rotating shaft. 3. Horizontal angle between a survey line

- and a given reference of direction.
- BEARING FRICTION** - Resistance to relative motion between a journal and its bearing.
- BEARING PLATE** - A plate placed between the supporting and supported members of a structure to distribute the load.
- BEARING POINT** - The point of support for a load or the point at which concentrated pressure is applied.
- BEARING PRESSURE** - 1. In mechanics, the action of force of bearing or resting; as the pressure of a beam on a wall. 2. The pressure of a revolving shaft upon its bearing; usually in lbs. per sq. in. of projected area.
- BEARING SPOOL** - A component of a disc harrow which serves as a disc spacer and journal for the gang.
- BEARING SURFACE** - The area upon which a load rests.
- BEATER** - Any mechanical device that pounds, stirs, loosens, as a revolving blade mechanism in a threshing machine directing the straw to or from the cylinder or as found at the rear of manure spreaders.
- BED** - A part of a surface which supports, as a foundation. Also the flat part of a truck or wagon rack.
- BEDDING** - A surface drainage system in which a field is plowed into a series of low crowns or ridges separated by parallel dead furrows that drain into a collection ditch.
- BED LOAD** - The quantity of silt, sand, gravel or other detritus rolled along the bed of a stream, often expressed as weight or volume per time.
- BEDROCK** - The solid rock which lies under loose detrital masses, such as sand or gravel.
- BEECH** - A species of tree, the wood of which is used in construction usually for flooring or interior trim. A soft wood.
- BEEF-CATTLE SHELTERS** - A more or less temporary structure used to protect beef cows from the sun, or wind, rain, snow, etc. May be erected either vertically as a fence, or horizontally as a roof.
- BEEHIVE** - A box or receptacle for housing a colony of bees. Usually has a series of frames in which honey is deposited.
- BEEBLOCKER** - A machine which is used to chop out beet seedlings in the row leaving one or more plants in blocks at intervals of every 10 to 14 ins.
- BEEB HARVESTER** - Any machine which is used for harvesting beets mechanically. See: Beet lifter.
- BEEB LIFTER** - A device, tractor or animal drawn, which consists primarily of two prongs that pass through the soil and straddle the row to partly lift sugar beets out of the ground. Also called beet puller, beet harvester.
- BELL AND SPIGOT JOINTS** - A system for joining tile and cast iron soil pipe to give a water tight joint. Each joint consists of an enlarged end called the bell or hub which will receive a pipe or tile of the same diameter to make the joint. The joint is sealed with lead or mastic compound.
- BELL CRANK** - A triangular frame pivoting on the apex of one angle, used to convert horizontal reciprocal motion into vertical, or vice versa. The bell crank often consists simply of two levers at right angles, keyed on the same shaft.
- BELLOWS** - An instrument which produces a current of air. In a simple form, it consists of two boards, between which a flexible air-chest is alternately expanded and contracted, drawing in air through a non-return valve on its extension stroke, and expelling it through a nozzle into a fire to increase heat, etc.
- BELLOWS DUSTER** - A portable duster which consists of a bellow, a discharge chamber, and a pipe. The bellows force the pesticide out in puffs rather than in a continuous stream. Also called puff duster. A hand operated

- duster which uses air as vehicle air supplied by a bellows.
- BELL RINGING TRANSFORMER** - A small transformer which is designed to furnish proper voltage and current, usually 8 to 16 volts, for electric bells.
- BELLY** - The outward or downward curve of a timber.
- BELT** - One of the elements of belt and pulley type power transmission. It is an endless band of leather, canvas or rubber-impregnated canvas of various thicknesses and widths. See: V-belt.
- BELT CLAMP** - A device consisting of a stretching frame, the two ends of which are coupled by screwed bars; used for pulling the two ends of a belt together with the proper tension, when lacing or jointing the ends.
- BELT CONVEYOR** - 1. An endless belt, provided with pockets or buckets, which is used to transport loose materials, such as grain, gravel, sand, etc. 2. An appliance for transporting materials such as grain, ore, etc., consisting of a traveling endless belt of cotton or India rubber belting, provided with pockets or buckets to receive the material conveyed. 3. An appliance for transporting materials such as grains, etc., consisting of a traveling endless belt provided with pockets or buckets that receive and convey the material to the top or desired location along the conveyor. See: Conveyor.
- BELT DISTRIBUTOR** - A system of conveying seed cotton within a gin on 8 to 12 in. belts which have 4 in. spikes fixed at regular intervals.
- BELTDRESSING** - A material applied to flat belts to prevent slipping on the pulleys. It usually consists of cod-liver and Neat's foot oil with tallow and wool-grease.
- BELT DRIVE** - 1. A method of transmitting power; the use of V-belts or flat belts to transmit power.
2. A method of power transmission largely used where room is available for adequate length of belt. Pulleys must be properly aligned. Do not tighten belt any more than necessary to prevent slipping. Vertical belt drive should be avoided. Have reasonable distance between pulley centers.
- BELT DYNAMOMETERS** - See: Brake dynamometers.
- BELT HORSEPOWER** - 1. The power of an engine as measured at the belt pulley. 2. Belt horsepower =
$$\frac{V \times P}{33,000}$$
 where V = velocity in ft. per min. of the belt and P = pull of the belt in lbs.
- BELT LACING** - A material (usually leather) used to fasten two ends of a belt together. Metal laces are used on belts transmitting small amounts of power.
- BELT POWER** - The maximum sustained power, measured at the dynamometer after belt transmission, with the controls set as specified by the tractor manufacturer for pulley work. Accessories such as the hydraulic lift pump shall only be disconnected if this can be done by the driver in normal practice. If this is not possible, they shall remain connected and run without load.
- BELT PULLEY** - 1. A circular device on which a belt runs - for the transmission of power. 2. One of the means of delivering tractor power to or onto other implements. It consists of a pulley mounted usually on the right side or the rear of a tractor and intended for the transmission of power through a belt.
- BELT SEPARATOR** - A machine which is used to separate round from non-round seeds by means of a sloping endless belt. As the belt travels upward the round seeds roll down while the unround seeds are carried up and over the top.
- BELT SHIFTER** - A device for placing a belt on a pulley while the latter is in motion. It consists of

- a cone and shield revolving on a stem, which yields easily to the pull of the belt. A staff or handle of any convenient length, fastened to a socket, may be used for this purpose.
- BELT TESTS** - Tests designed to measure power, fuel efficiency, govern control and horsepower ratings of engines transmitting their power through a belt. Results of these tests are used to establish calculated belt horsepower ratings.
- BELT TYPE SEED METERING DEVICE** - A device which utilizes a belt to effect metering of seeds in a planter. The belt commonly has holes or depressions along its face which convey seeds from a hopper to the discharge chute and thereby meter the quantity of seed by their size and spacing.
- BENCH** - A strong and heavy table at which mechanics and others work. The platform in a greenhouse in or on which plants are grown. A heavy, strong table for supporting hand work on small parts, as for a mechanic. Any ledge of rock which is shaped like a step or terrace. See: Bench terrace.
- BENCH CARPENTER** - A skilled workman who fabricates wooden parts of sub assemblies in accordance with blueprints and drawings. May act as assembler of prefabricated parts or assemble sub units into finished products.
- BENCH IRRIGATION** - A method of irrigation by flooding adapted to fairly uniform, moderate slopes with deep soils. Border strips are laid out across the slope on a controlled grade. Operation is the same as border strip irrigation when strips are on grade. If strips are short and level, it is like basin irrigation.
- BENCHMARK** - A relatively permanent point of known or assumed elevation.
- BENCH SHEAR** - A large pair of scissors 2 to 4 ft. long, one handle of which may be fastened to the bench. It is used for cutting 22 to 16 gauge sheet metal.
- BENCH TERRACE** - A step-like embankment of earth with a flat top and a steep or vertical downhill face. Construction is along the contour of sloping land to control runoff and erosion. See: Bench terracing.
- BENCH TERRACING** - The development of level or nearly level benches across the slope with steep risers between. The risers are usually protected with vegetation, loose rock, or masonry.
- BEND** - To take a curved shape rather than a straight shape.
- BENDING LOAD** - A load on a beam or structure which would produce bending.
- BENDING MOMENT** - The moment that produces or tends to produce bending in a beam or other member of a structure. It is measured by the algebraic sum of the products of all the forces by their respective lever arms.
- BENDING STRESS** - The stress produced in a member by a bending moment, consisting of a combination of tension, compression shear.
- BENT** - A storage area between two crosswise supporting parts, frames or trusses in a barn or shed. Usually measured as the lineal length from one support to another. The stem of a coarse grain. A tendency in or toward a certain direction as a "bent towards farming".
- BENTONITE** - An expanding clay incorporated with the soil and used in sealing ponds, irrigation ditches and reservoirs where satisfactory construction materials of low permeability are unavailable.
- BERM** - 1. The distance from the top of the bank of a drainage ditch to the edge of the spoil bank. 2. The shoulder of a highway. 3. A horizontal strip of shelf built into an embankment to break the continuity of an otherwise long slope.
- BERMUDA GRASS CUTTER BAR** - A cutter bar for a mowing machine which has twice as many guards in the

- same length as a regular bar and which has ledger plates on each guard. The knife passes through two guards on each stroke. It is used in cutting closely matted grass.
- BERMUDA GRASS ERADICATOR** - A synonym for spring tooth harrow.
See: Spring tooth harrow.
- BERRY HOOK** - A two to three ft. metal rod with a sharpened blade which is shaped like a hook and which is used for pruning low-growing vines.
- BEVELED SICKLE WHEEL** - A grinding wheel beveled so that the adjacent sides of two sickle sections can be sharpened at the same time.
- BEVEL GEAR** - A type of gear used where power has to turn a corner. Two gears will have their shafts at an angle to each other.
- BEVEL SIDING** - Siding which is manufactured, tapered or beveled so that its upper edge is thinner than its lower. It is fastened to the wall with the upper board overlapping the board directly below to shed water.
- B HORIZON** - In a soil profile, the horizon of alluviation which represents translocation and concentration of soil water. A zone of structural development underlying the A horizon.
- BIBCOCK** - A faucet with its spout bent to discharge in a down position.
- BIG VALLEY SWEEP** - One of many designs of cultivator shovels.
See: Sweep.
- BILL** - A part of the knotter assembly found on grain binders and automatic tie hay balers.
- BILL HOOK** - 1. A metal hook resembling a bird's neck, used to grasp string in a twine knotter, which is a part of the knotter head on a machine for tying string; for example, a binder.
2. A tool for cutting and pruning.
- BILL OF MATERIALS** - A list of the various portions of material for a construction, either proposed or completed, giving dimensions and weights or other quantitative measurements.
- BIN** - 1. A box, crib, or enclosure which is used for storage, particularly the storage of grains, machinery parts, etc. 2. A small room or box partitioned off in a granary or barn. It may or may not have sloping sides or bottom with or without carrying chutes. Hopper bin. Grain bin.
- BINDER** - 1. In moulding cementing materials such as wheat flour, glue resin, and linseed oil, used to unite the cores more firmly. 2. A harvesting machine for cutting grain and tying it into bundles which is being rapidly replaced by the combine. Also called reaper, binder. 3. Any material or organism which is used to cement or stabilize loose soil or aggregates.
- BINDER GUARDS** - See: Guards.
- BINDER REEL** - See: Reel.
- BINDER TWINE** - A coarse string or cord usually made of sisal or hemp which is used in harvesting machinery. Also called fussell. Used in grain binders, corn binders, and automatic pick up hay balers for tying bundles and bales.
- BIN DRIER** - A large receptacle for drying grains or other materials, usually fitted with either hot or cold air circulating means.
- BINDWEED SWEEP** - One of many designs of cultivator shovels. See: Sweep.
- BIO-AERATION** - A modification of the activated-sludge process in which the sewage and sludge are agitated and aerated by mechanical means, such as paddle wheels, turbines, or ejectors.
- BIOCATALYST** - A substance which activates or stimulates a biochemical reaction; as insulin, a co-enzyme, a vitamin, or a hormone.
- BIOCHEMICAL ACTION** - A chemical action which results from the growth or metabolism of living organisms.
- BIRD'S EYE** - A small, central spot with the wood fibers arranged around it in the form of an

- elipse so as to give the appearance of an eye.
- BISCAYNE AQUIFER** - The permeable limestone and sand ground water reservoir of the Miami, Florida area. It is about 100 ft. thick and underlaid by relatively impermeable marl. The aquifer ranks with clean well washed gravel in its ability to transmit water.
- BITCH CHAIN** - A short chain having a hook and ring which is used for fastening a gin pole to a sled or car for loading logs.
- BITUMINOUS ROOFING** - Roofing that is composed of a bituminous saturated felt base and covered with mineral granules. See: Asphalt shingles.
- BLACK BODY** - A theoretical substance that absorbs all the radiation of any wave length falling upon it.
- BLACK-BULB THERMOMETER** - A thermometer used to determine the intensity of solar radiation. To prevent loss of heat by reflection the bulb is blackened and to prevent loss of heat by convection it is enclosed in a vacuum. Also called black-globe-thermometer.
- BLACKLAND MOLDBOARD** - A moldboard shaped to scour and pulverize heavy blackland soils such as found in Texas.
- BLACKLAND PLOW (BOTTOM)** - A moldboard and share which is designed to penetrate and scour in sticky, black soils.
- BLACK LOCUST** - A decay resistant hardwood tree especially good for fence posts.
- BLACK RED HEAT** - In blacksmithing, that temperature of wrought iron or steel in which the red color is just visible by daylight. It roughly corresponds to about 1,000° F.
- BLADE** - 1. A cutting tool as the blade of an adze or the blade of a bulldozer. 2. The movable contact member of an electric switch.
- BLADE INTERFERENCE** - In fans a situation where the RPM of the blade of the fan is such that it interferes with the incoming air, resulting in air not entering the space as rapidly as it is removed.
- BLADE TYPE GRADER** - A machine used for grading or shallow excavating of soil or other material, which utilizes a blade to cut and move the material. It may be suspended from a tractor or may have its own wheels, in which case it may be towed or be self-propelled.
- BLANCHING** - The process of heating vegetables in water before canning to clean the product and inactivate enzymes. It may or may not aid in retention of the green color of the vegetables, depending upon the vegetable and temperature.
- BLANEY-CRIDDLE FORMULA** - A formula developed by H. F. Blaney and W. D. Criddle for calculating the consumptive use of water by crops. It is based on climatic factors and a monthly empirical co-efficient.
- BLANK BOLTS** - Rough forged bolts previous to threading.
- BLEND** - To prepare by mingling different varieties and grades; mixing of different ingredients.
- BLINDING** - Placing 6 to 24 ins. of loose, mellow topsoil in the trench immediately after laying the tile to prevent the tile from being moved out of alignment, to prevent breakage during the backfilling operation, and to provide a permeable soil envelope in contact with the tile.
- BLIND INLET** - A porous backfill section over a tile line which is constructed with selected porous materials to prevent sediment from entering the line. Recommended for drainage of small depressional areas where surface water collects.
- BLIND-NAILED ROOFING** - A method of applying roofing such that the nails are not exposed to the weather. They are so located that the nail heads are covered by the next layer of material.
- BLOCK** - 1. A piece of wood, two or more ins. thick, the size of the end of a bale of hay which is used in the baler as a divider between two bales of hay. 2. A pulley

- which is used to increase the pulling or hoisting power. 3. A grooved pulley or sheave encased in a frame or shell, constituting the block proper, which is provided with a hood, eye or strap for attaching it to an object.
- BLOCK AND TACKLE** - A simple machine, consisting of a rope and blocks with 1 or more pulleys to gain a mechanical advantage in lifting or moving a load. See: Block.
- BLOCKED** - A row crop that has been planted in a continuous series and subsequently thinned to one or two plants in groups a few ins. apart. Thinning may be done by hand or machine.
- BLOCKING** - A wooden block or other device used as a support or to limit movement.
- BLOCKING HOE** - A hoe with a straight shank in which the blade is in direct line with the handle, used for thinning.
- BLOWBY** - In internal combustion engines, the escape of gases around the valves and piston. Noticeable in worn engines.
- BLOWER** - 1. A device for producing a current of air or gas to increase the draft of a furnace, ventilate a building or shaft, clean grain, etc. 2. Usually a rotating fan set in a housing.
- BLOWER DUSTER** - A machine used to apply dust, insecticides, herbicides, etc., using air as a vehicle.
- BLOWER PIPE** - A pipe or tube that carries silage, seed, hay, etc., under air pressure.
- BLOWER-SPRAYER** - A powered spraying machine in which the spray material is atomized into an air stream produced by a centrifugal blower or axial flow fan. The air stream is the carrier for applying the spray material to trees or other vegetable growth. Also called a "speed sprayer".
- BLOWER-TYPE DIFFUSER** - See: Cold diffuser.
- BLOW-OFF** - A controlled outlet in a pipe line used to discharge water, steam or detritus.
- BLOW-OFF VALVE** - A safety valve or a type of relief valve. See: Relief valve.
- BLOW-OUT** - The flow of water from a draintile to the surface as the result of excess pressure in the tile, or the hole left by such flow.
- BLOWPIPE** - Mixing chamber and tip of oxyacetylene welding equipment.
- BLUEGRASS SEED STRIPPER** - A revolving cylinder set with spikes which are used to harvest Kentucky bluegrass seed.
- BLUEPRINTING** - A method of photo-printing by using paper sensitized with ferro-prussiate of potash.
- BLUE STAIN** - A bluish or grayish discoloration of the sapwood caused by the growth of certain mold-like fungi on the surface and in the interior of the piece; made possible by the same conditions that favor the growth of other fungi.
- BLUESTEM** - 1. A grass. 2. A fungus or virus which causes stunting, curling of the leaflet, and reduction of vigor in blackberries.
- BOARD** - 1. Lumber less than two ins. thick and more than eight ins. wide. 2. Lumber one and one half ins. thick, six or more ins. wide and eight or more ft. long. (British) 3. Lumber of all widths of one-in. stock. Widths of less than six ins. are sometimes called strips. 4. The plank floor on which sheep are sheared. (New Zealand)
- BOARD FENCE** - A wooden plank or board fence.
- BOARD FOOT** - A lumber measurement; a board one ft. long, one ft. wide, and one in. thick, or the equivalent, based on the original cut before planing and surfacing. Also called super foot. (Australia)
- BOARD MEASURE** - A unit of measurement of the volume of logs or lumber which is stated in board ft. Lumber measure. Formerly 144 sq.ins. now passes for a ft. when the boards are one in. or

- less in thickness.
- BOARD MILL** - A saw mill that makes a specialty of one and two in. lumber, as compared to a timber mill that makes a specialty of thicker material.
- BOARDS** - Lumber less than 2 ins. thick and 2 or more ins. wide. See: Lumber.
- BOBSLED** - A horsedrawn vehicle used in areas where snow covers the roads for part of the winter. It consists of two sets of short runners coupled together. The front set is attached to the tongue by which it can be steered.
- BOERNER SAMPLER** - An instrument to divide a sample of grain into two even, representative parts.
- BOGS** - Wetland, filled with decaying vegetable material that commonly will not support heavy objects.
- BOIL** - A run of wet material, usually quicksand, on the bottom of an excavation, under the sheeting of an excavation, or under the cutting edge of a caisson, caused by greater water pressure on the outside than on the inside. An ordinary spring is a boil carrying water only.
- BOILER** - An enclosed vessel in which water is heated for the purpose of developing steam under pressure.
- BOILER HORSE POWER** - The evaporation of 30 lbs. of water from an initial temperature of 100° F. to dry steam at 70 lbs. gage pressure, which (as accepted by the A.S.M.E. Power Plant Code Committee) is equivalent to 34.5 lbs. of water evaporated per hr. from a feed water temperature of 212° into dry steam at the same temperature. (United States Standard)
- BOILING CHAMBER** - That part of a vacuum pan which is used in evaporation or condensation of liquids, such as tree sap or milk.
- BOLOMETER** - An instrument of great sensitiveness for measuring minute quantities of heat energy by the changes of electrical resistance produced in a metallic conductor by variations of temperature.
- BOLSTER** - A cross member of a wagon or truck rack on which the bed, rack, or load rests.
- BOLT** - A fastening device consisting of a rod with a head on one end and screw threads on the other for the purpose of holding two or more parts together; part of a door lock which engages the catch mounted in the door jamb. A sliding catch used to lock doors.
- BOLTER** - A device for sifting flour which separates the coarse elements from the finer ones.
- BOLTING** - The process of separating or sorting different size particles in feed grinding.
- BOLTING CLOTH** - A sieve cloth which is used for sifting flour, etc., usually composed of silk.
- BOMBARDED** - To subject to the impingements of small particles, such as Beta or Gamma particles.
- BOND** - 1. In a stone wall the bonding stone reaches across to bind together the stones facing either side of the wall. 2. The adhesion of concrete and its metal reinforcement.
- BOND STONE** - One of a series of large stones built in across a wall at intervals to bind the stones on the face of the wall to those on the other side.
- BOND STRESS** - The stress developed at the bond of two materials such as reinforcing steel and concrete.
- BONE DRY** - A term used to indicate that the product contains no free moisture.
- BONNET** - A cover, raised in the middle; a hood or metallic cover to place over motors; a roof or protection over the top of a cage.
- BOOM** - 1. A rather long beam projecting from a supporting mast which is used for hoisting or stacking hay or other products. 2. A long pipe on a sprayer to which the nozzles are attached. 3. The beam or spar which projects from the log-loading machine and supports the logs during loading. 4. An obstruction arranged to direct floating logs in a certain direction.
- BOOM SPRAYER** - A type of sprayer

- consisting of a boom to which several nozzles are attached to permit the sprayer to cover a wide area.
- BOOSTER PUMPS** - Pumps used to provide additional pressure for areas that lie at elevations above the principle area to be irrigated. A pump in a line that adds pressure to compensate for losses.
- BOOT** - 1. The hollow metal casting into which the lower end of the seed tube is inserted on a planter or a drill and through which the seed passes as it is planted. 2. The box in which the lower pulley or sprocket runs in a grain elevator.
- BORDER** - An earth ridge built to hold irrigation water within prescribed limits in a field.
- BORDER DITCH IRRIGATION** - A method of irrigation by flooding where parallel ditches 25 to 200 ft. apart are run down the slope of the field. Water is then diverted at intervals, to the land between the ditches.
- BORDER STRIP IRRIGATION** - A method of irrigation by flooding between parallel controlling ridges or borders. The strips of land between adjacent borders should have no cross-slope, but may have a grade in the direction of irrigation of from 0.1 to 5.0 ft. or more per 100.
- BORE** - 1. An interior cylindrical surface. 2. The interior diameter of a cylinder. 3. To make or enlarge a hole. 4. A wave of water having a nearly vertical front, such as a tidal wave, advancing up stream as a result of high tides in certain estuaries; a similar wave advancing down stream as the result of a "cloud-burst", or the sudden release of a large volume of water from a reservoir. 5. To sink a well by piercing a hole through the earth with a bit or auger.
- BORED WELL** - 1. A well dug with tractor powered augers or hand tools in regions where the soil down to a water-bearing stratum is free from stones. 2. A well which is sunk by means of auger-buckets.
- BORER** - An instrument or an insect which produces a hole in material, i.e., a drill used in boring the interior diameter of a cylinder; raspberry cane borer, corn stalk borer.
- BORROW PIT** - A location where fill material may be, or has been, excavated. Also called bar pit; bar ditch.
- BOSS COWS** - Cows which due to their temperament tend to act as bosses in the herd. They interrupt feeding by moving up and down the feeders or cause trouble by butting other animals.
- BOTTLE CAPPER** - A device which crimps, inserts or fastens caps firmly to filled bottles.
- BOTTLE CARRIER** - A compartmental basket, rigidly constructed of heavy wire, which is used for carrying milk bottles; also cases.
- BOTTLE FILLER** - A mechanical device which is used for placing fluids or semi-solids in bottles.
- BOTTLE WASHER** - A mechanical device which washes and sterilizes bottles.
- BOTTLING MACHINE** - See: Bottle filler.
- BOTTLING PLANT** - A manufacturing plant where fluid or semi-solid products are placed in bottles for sale, as in a dairy.
- BOTTOM** - 1. The unit of a plow which consists of the moldboard, share, landside, and frog. 2. The base of a milk bottle or other container.
- BOTTOM BAR** - The lower, wooden bar of a frame for a comb in a beehive, as contrasted to the top bar or end bar.
- BOTTOM BOARD** - 1. The floor of a beehive on which the hive body rests. 2. The lower, wooden bar of a frame for a comb in a beehive, as contrasted to the top bar or end bar.
- BOTTOM CONTRACTION** - The reduction in the area of overflowing water caused by the crest of the weir

- contracting the nappe.
- BOTTOM GATHER** - The setting of the front or sleeved wheels of a vehicle, particularly a wagon so that the lower part of the rims are closer together than the upper part. This term has been replaced in current usage by "camber", which in automobile front-wheel alignment means that the wheels are tilted outward from the vertical so that the distance between the tires at the ground is less than when measured at the level of the top of the tires.
- BOTTOM HEAT** - Heat which is applied in hotbeds and greenhouses beneath the greenhouse bench to induce growth of greenhouse plants.
- BOTTOM LAND** - Land that was formerly river bottom now used for cropping.
- BOTTOM LATERALS** - Laterals attached to the main near the outlet. See: Lateral.
- BOTTOM RIDGE** - Circular or square ridge at the bottom of a bottle which serves to protect the bottle against undue shock.
- BOTULISM** - A type of food poisoning caused by the toxin of *Bacillus Botulinus* (*Clostridium Botulinum*).
- BOUNDARY SURVEY** - A survey which is performed to determine and locate legal boundaries.
- BOURDON TUBE** - A tube, bent in the form of an arc, used for sensing and measuring pressure. It is elliptical in cross section, open only at one end to the gas, steam, etc., whose pressure is to be registered.
- BOUYOCOS BLOCK** - A soil moisture measuring device consisting of a grid or a pair of spaced electrical conductors embedded in a plaster cast. Electrical resistance varies with moisture content of the soil.
- BOW** - 1. A contrivance of elastic wood which was used before the invention of the cotton gin to remove rubbish from lint cotton and downy fleece. 2. The deviation from a straight line of a board; the line being drawn from one end to the other of a piece of wood. 3. The curved parts at the top of the handle of a pair of sheep shears which serve as a spring to force the blade apart (New Zealand). 4. That distortion of a board in which the face is convex or concave longitudinally. See: Warp.
- BOWL** - A vat or tank in which wool is scoured. A basin for holding liquids.
- BOWL REFLECTOR** - A reflector having the general contour of a fairly deep bowl.
- BOW SAW** - A narrow frame saw, held in tension by the leverage afforded by the twisting of a cord. These saws are used for cutting curves, but the band saws have mostly superseded them in workshops.
- BOX** - 1. A wooden, cardboard, or metal container for storing and shipping produce. 2. The bed and sides of a wagon. 3. A device which divides water in an irrigation system into two or more ditches. 4. Steel box or container, used for the porcelain and metal part of a switch, outlet, or to support a fixture.
- BOXED CORE** - A column consisting of a main center timber faced with single boards on four sides to build it up into a larger column or to add strength.
- BOX DRIER** - A device for drying eggs or milk. Heated air is forced horizontally through a chamber, the liquid being sprayed into the upper portion of the hot air stream. As the velocity of the air decreases away from the sprayer the dry egg powder falls to the bottom of the chamber.
- BOX DUMPER** - A mechanical apparatus used for emptying box-type containers.
- BOXED CORNICE** - A detail of roof construction where the rafter ends are boxed in to protect the joint between the roof and the side wall from the weather, also, prevents air flow into the building at this joint.
- BOXED FRUIT** - Fruit properly placed in a box, making it ready for

- storage or marketing.
- BOXED HEART** - The term used when the center core of the log (pith) falls completely within the four faces of the timber cut from it.
- BOX NUT** - A nut made with a dome shaped, closed end, used for the protection of or improvement of the appearance of the bolt end.
- BOX STALL** - A small room, or large stall, in which an animal can be confined without being tied.
- BOX THE HEART** - To cut boards from the sides of the log so that the center or heartwood is left as one piece of timber.
- BOX VISE** - A type of bench vise, in which there is a leg supporting it from the floor. It is used for heavy work.
- BOX WRENCH** - A wrench (made in one piece with the handle) used on hexagon or square heads and nuts. The wrench entirely surrounds the nut.
- BPM** - Bushels per minute.
- BRACE** - 1. Generally a strut supporting or fixing in position another member; a tie used for such a purpose; a small tool used for boring, which holds the bit. A brace and bit are used together to drill a hole, usually in wood. 2. The rod connected to the beam, which reinforces the landside of a plow. 3. Any device which is designed to strengthen or support, such as a cornerpost brace, etc. 4. A crank shaped tool for holding and rotating drills. 5. A prop to prevent two timbers from coming together. In a modern plank frame construction a brace may also be a tie.
- BRACED RAFTER** - A type of construction where each pair of rafters is braced to be self supporting.
- BRACING** - 1. Any means taken to strengthen a building against a tendency to lean or to collapse as the result of high winds or the effects of time. Usually the bracing is at an angle to the other members in the structure. 2. The installation of supports so as to provide mechanical assistance to weak crotches and split limbs of trees, fencing, etc.
- BRACING FRAME** - A frame of steel or timber built in a manner to resist distortion of a structure.
- BRACKET** - A knee, or knee brace, connecting a post or batter brace to an overhead strut. A member fastened to a wall to support a shelf or other article.
- BRACKISH** - Saline water found in inland areas which may produce harmful effects on soil and plants and be undesirable for domestic use.
- BRAKE** - 1. An irrigation check. 2. To bend metal part to the proper radius and angle on a brake machine. 3. A device used to stop the relative motion between moving parts by converting kinetic energy to heat energy. 4. A mechanism by which a vehicle may be quickly decelerated.
- BRAKE DIFFERENTIAL STEERING** - A steering system used on track type tractors in which the speed of one track is reduced by applying a brake thus automatically speeding up the other tract and causing the tractor to turn.
- BRAKE DRUM** - The cylindrical part of a braking system which comes in contact with the brake shoe, band, or disc. It absorbs and helps to dissipate the heat energy formed during the braking process.
- BRAKE DYNAMOMETER** - An absorption type dynamometer for measuring the power output of an engine in which a braking system is used to convert kinetic energy to heat energy.
- BRAKE HORSEPOWER** - (Bhp) is the power delivered by the engine
- crankshaft, in ft. $\frac{\text{lbs. per min.}}{33,000}$
- BRAKE SHOE** - That portion or segment of a drum type brake which is forced against the drum to absorb the kinetic energy of a system.
- BRAN** - The broken coat of the seed of wheat, rye, or other cereal grains, separated from the flour

- or meal by sifting or bolting.
- BRAN BUGS** - Insects of the non-boring type which damage grain. They include the saw-tooth grain beetle and the rusted flour beetle.
- BRANCH CIRCUIT** - That portion of a wiring system extending beyond the final overload protective device of the wiring system.
- BRANCH DUCTS** - The secondary air flow channels leaving the main air duct in a drying system, ventilating system, heating system, etc.
- BRANCHES (JUNCTION PIECES)** - Special forms of vitrified tile and cast iron pipe for making connections to a sewer. They are called Tee, Y, Double-Y, etc., from their shapes.
- BRANDING IRON** - That device usually consisting of an iron rod with a metal stamp of unique, recognized design which is used to burn a mark on an animal for purposes of identification.
- BRAN DUSTER** - A device which is used for sifting flour from bran after bolting.
- BRAZING** - A general term for all joining processes which use a metal alloy; bronze, silver, solder, etc., at a temperature lower than is required to melt the base metal but above 800° F. It is not a fusion type joining process. See: Bronze welding.
- BREAKAWAY-(TYPE) HITCH** - A hitch incorporating a device which will release, or "breakaway", so as to permit separation of an implement from its source of pull, when the resistance to movement of the implement exceeds a certain predetermined value. Spring loaded couplings are commonly used in the hitches of drawn plows and deep tillage tools.
- BREAK DOWN TORQUE** - The maximum torque an electric motor will develop with full voltage without a sudden drop in speed.
- BREAKER** - A metal device attached to the end of a hose or pipe which is used to decrease the force of water flowing out of the tube so that plants may be watered without injury. A plow having a long, low moldboard which is used for turning sod land.
- BREAKER BAR** - A boom of tubing with a series of drilled holes in the tube in place of nozzles which is used on an airplane for spraying. See: Boom.
- BREAKER BOTTOM** - A type of plow bottom designed to work in heavy sod such as prairie sod land. The moldboard has a long gradual twist which turns the furrow slice completely upside down. Also called sod bottom.
- BREAKER ROLL** - A part of a feed grinder which breaks the ears of corn, crushes the cob and feeds the mixture to the grinding plates.
- BREAKER STRIP OR SHOCK PAD** - Plies of material under the tread area of a tire that do not tie into the tire beads or add appreciably to the circumferential strength of the tire. Cords used in these plies make angles of approximately 45° with the center line of the tire.
- BREAK IN GRADE** - The point at which the grade of a tile line, ditch, etc., is changed to another grade.
- BREAKING ROOM** - A room in a processing plant where eggs are broken out of the shell for food manufacturing, freezing or dehydrating.
- BREAKING STRESS** - The stress developed in a member at the point of rupture.
- BREAK PIN** - A connecting device such as a hardwood pin which breaks under excessive loads so as to prevent damage to an overloaded mechanism. Also called shear pin.
- BREAK PIN TRIP** - A type of trip using a wooden peg or soft metal pin so situated that it will shear under excessive loads. See: Trip, friction trip, spring trip.
- BREAST** - 1. A fore part of a moldboard on a plow, more commonly called the shin. 2. A part of the cotton gin which consists of a frame containing the huller ribs, the picker rollers and the roll box. 3. That portion of the bulk milk tank which joins the inside

- lining proper to the outer vertical wall. The breast is considered to be a milk contact surface and therefore is a part of the inside lining.
- BREAST BOARD** - See: Moldboard, breast chain.
- BREAST CHAIN** - 1. A chain which fastens the collar of a horse to the neck yoke. Also called breast strap. 2. A chain, strap, board, etc., which is used to hold and maintain the balance of a horse during transportation. Primarily it is used for protection during sudden starts and stops or shocks to the hauling vehicle. Also called breast board, tail board.
- BREAST PLOW** - An old, man-powered implement which consisted of a metal cutting piece attached to a pole or handle. At the opposite end there was a crosspiece which fitted across the man's chest.
- BREATHERS** - Small diameter risers extending from a tile drain to the ground surface, to prevent the development of a vacuum in the line. See: Crankcase breather.
- BREECHES TYPE DUSTER** - A type of duster fitted to an airplane in which the lower part of the hopper is W-shaped so that the dust drops into two sets of smaller hoppers.
- BREEDING CHUTE** - A structure, a little wider than the width of an average mare or cow which is usually constructed of wood and in which the female is confined at the time of mating. See: Hog ringing crate, breeding crate.
- BREEDING CRATE** - A wooden, boxlike device which is used to facilitate the mating of swine when there is a disparity in the size between the male and the female.
- BREEDING HOUSE** - Any poultry house which is used for breeding purposes. In pedigree breeding, the house is usually divided into breeding pens, about 6 x 10 ft. in size, with a single male and about a dozen females in each pen; in flock mating, a much larger pen, or the entire house, is used with several males and many females.
- BREEDING PEN** - See: Breeding house.
- BREEDING RACK** - See: Breeding chute.
- BREEDING SHED** - A barn or similar structure which is used for the breeding of mares, or other animals.
- BREEZEWAY** - A covered passage open at the sides between two buildings.
- BRICK** - A rectangular block of clay, moulded to regular sizes, and burnt to give it hardness and durability.
- BRIDGE** - 1. A structure that spans a body of water, a valley, or a road and affords passage for pedestrians or vehicles of all kinds, or any combination thereof. 2. An arrangement of resistance combined with a battery and galvanometer devised by Christie, but wrongly credited to Wheatstone. It is used for the measurement of electric resistance. It consists essentially of two "proportional arms" of such values that one arm has one, ten, one hundred or one thousand times the resistance of the other arm. A third arm is divided into tenths units, tens, hundreds and thousands of ohms. The unknown resistance to be measured is the fourth arm.
- BRIDGEMAN FORMULA** - An empirical formula used to determine E A D distillation curve from ASTM distillation curve.
$$TEAD = \frac{2 TASTM}{3} + 1.92\sqrt{S} \log (2-2R) - 43 \log \frac{1}{FR}$$
- + 77.7. TEAD = equilibrium - air distillation temperature ° C. absolute. TASTM = ASTM distillation temperature ° C. absolute. R = fraction evaporated on either distillation. S = slope of the ASTM distillations curve C/R. F equals fuel-air ratio in EAD by weight.
- BRIDGING** - 1. A piece of wood placed between and attached to two beams, or other pieces, in order to prevent them from tipping thus

- losing their ability to support a load; also the spanning of any opening. 2. Small wood or metal members that are inserted in a diagonal position between the floor joists acting both as tension and compression members for the purpose of bracing the joists and spreading the action of the effect of loads. 3. Binding of materials in a hopper preventing free gravity flow.
- BRIGHTNESS** - The luminous intensity of any surface in a given direction per unit of projected area of the surface as viewed in that direction.
- BRINE** - A salt solution such as calcium chloride in water. Any strong saline solution.
- BRINELL HARDNESS NUMBER** - A number indicating the hardness of a metal as determined by the depth and diameter of an impression left by a hardened steel ball to which a known load has been applied.
- BRINE-PIPE SYSTEM** - A system employed in the refrigeration of cold-storage rooms in which cold brine is circulated in pipes.
- BRINE-SPRAY SYSTEM** - A refrigeration system which uses a brine spray over the refrigerant coils in combination with a counter-current air flow to the coils. The cold air is distributed to the cold-storage rooms.
- BRITISH THERMAL UNITS** - A unit of heat. The amount of energy required to raise the temperature of one lb. of water from 58.5° F. to 59.5° F.
- BROACHING** - A method of removing metal to the desired size and shape by one pass of a long cutting tool with a series of successively larger cutting edges. Internal broaching of keyways, splines, etc., is most common although external broaching is also used.
- BROADAX (e)** - A wide-bladed ax which is used to rough square logs or to make incisions in trees for turpentine.
- BROADBASE TERRACE** - A broad surface water channel with or without down-slope earth embankment constructed across the land slope usually on a slight grade to carry surface runoff water of a non-erosive velocity to a point of outlet.
- BROADCAST** - The oldest and simplest method of sowing seed by scattering on the ground. A method whereby seeds are distributed uniformly over the entire area.
- BROADCAST DISTRIBUTOR** - A type of fertilizer distributor which spreads fertilizer or seed by scattering it over a large area on the surface.
- BROADCAST SEEDER** - A device used to scatter seed uniformly on the top of the ground over an area. See: Knapsack seeder, end gate seeder.
- BROAD-CRESTED WEIR** - 1. An overflow structure on which the nappe is supported for an appreciable length. 2. A weir with a significant dimension in the direction of the stream. 3. A weir approximately rectangular in cross-section unless modified; it is assumed to have vertical faces, a level crest and sharp edged corners.
- BROAD HOE** - A hoe with a very broad blade and long handle which was used in hoeing corn. It was more commonly used during the early period of settlement of the United States.
- BROILER PLANT** - A place where broilers are raised in large quantities.
- BRONZE WELDING** - A brazing process in which bronze is used as a filler metal and is done at a temperature of about 1600° F. See: Brazing.
- BROODER** - A building, room or device in which artificial heat is used and where baby chicks, or other fowl, or baby animals may be raised without a mother. Also called brooder house.
- BROODER HOUSE** - A house or building which can be artificially heated and in which young chicks can be raised without a hen. See: Brooder.
- BROODER STOVE** - A stove or small furnace which is used for furnishing heat in a brooder or brooder

- house.
- BROODY COOP** - A small coop (usually with a wire bottom) in which broody hens are confined to cure them of broodiness. The coop is also used for isolating injured birds or others temporarily from the flock.
- BROOM** - A sweeping device made from broom corn brush or other fibers.
- BROOM GUN** - A device which is used for spraying consisting of a spray rod three to five ft. long with a shut off valve at the place of attachment to the hose and a group of three to eight nozzles at the tip of the rod. It is used to produce a fog-like discharge which will not cause mechanical injury to foliage. Also called fog driven gun.
- BROOMING** - The act of putting a rough finish on concrete with a stiff broom or brush. A broomed finish is used for barnyards, alleyways, etc., where a non-skid surface is desired.
- BROWN STAIN** - A rich brown to deep chocolate-brown discoloration of the sapwood of some pines caused by a fungus that acts similarly to the blue-stain fungus.
- BRUSH** - 1. A revolving cylinder just back of the gin saws in a cotton gin which contains, on its outer surface, numerous rows of bristles for the purpose of removing cotton lint from the saws. 2. The device composed of a handle of wood or plastic with set in bristles which are used in brushing the coat of an animal which is often used with a curry comb.
- BRUSH BREAKER** - A large moldboard plow which is used for breaking land covered with brush.
- BRUSH CUT OFF** - Part of the seed dropping mechanism of a planter which removes surplus seed from the cells of the seed plate. See: Cut-off pawl, seed cut-off.
- BRUSH DRAG (BRUSH HARROW)** - A harrow which consists of short, rough branches attached to a log which is usually homemade and temporary.
- BRUSH HOOK** - 1. A heavy sickle knife attached to a long axe handle which is used to cut brush and bushes. Also called bill. 2. A short, thick blade used on a brush scythe for cutting brush.
- BRUSH PLOW** - See: Brush breaker.
- BRUSH SHREDDER** - A machine which is used for shredding or cutting up pruning brush in the orchard or along city street. Sometimes it is used for other, similar purposes.
- BRUSH STALK CUTTERS** - Power driven, a machine used to cut or shred crop residue or brush (size reduction) consists of rigidly mounted radial knives on high speed cutterheads, others have free swinging hammers or flails. Rolling stalk cutters: Reel type arrangement with blades parallel to the axis, the reel being rotated by contact with the ground as it is pulled along.
- BRUSH WASHER** - Cleaning or washing surface by the action produced by a brush.
- BTU** - See: British thermal unit.
- BUCKBOARD** - A four-wheeled, horse drawn vehicle having a long elastic board which bears the seat.
- BUCK BRACE** - A cross frame.
- BUCKET** - 1. A metal or wooden pail for carrying water or other liquids. 2. A receptacle on an elevator for the lifting of loose material; as grain. 3. A scoop used in excavating or dredging. 4. One of the compartments formed on the circumference of a water wheel, into which the water falls causing the wheel to revolve.
- BUCKET AUGER** - A type of auger used for bored wells and the helix of which is enclosed so as to form a semi-closed container. The enclosure aids in the removal of the soil as the auger is withdrawn from the hole.
- BUCKET CONVEYORS** - A conveyor used to move granular materials from one elevation to a higher elevation using buckets located at intervals on the conveyor chain as receptacles.

- BUCKET ELEVATOR** - A device consisting of a belt or chains traveling over wheels or sprockets on which are fastened buckets for the purpose of conveying materials, such as grains from a lower level to a higher level.
- BUCKET PUMPS** - A lift pump usually hand or windmill operated using a shallow well or cistern as a source. Small buckets attached to an endless chain are rotated over sprockets so that each bucket dips water from the source, carries it to the top, and empties it into the spout as it passes over the top sprocket.
- BUCKET SURVEYS** - Polls made by various agencies to supplement official rain gage data. The readings are obtained from buckets, cans, homemade gages, and other containers.
- BUCKET WHEEL** - A wheel having buckets attached to its rim, or to a rope or chain passing over it, as for raising water for irrigation, livestock, etc.
- BUCKING CHUTE** - 1. A short pole chute at a landing, in which multiple length logs are bucked before being loaded. 2. A chute in which bucking horses are saddled.
- BUCKLED** - Bent out of shape, distorted.
- BUCK RAKE** - A rake with long, straight, horizontal teeth that gather hay from windrow or cock and transport it to a stack or barn or bunch it in a pile in the field. Originally powered by horses but now powered by tractors or old trucks or auto chassis. Also called sweep rake, bull rake.
- BUCKSAW** - A saw with a narrow blade set in an H shaped or U shaped frame which is used for sawing poles or small logs by hand.
- BUDDING FUNGI** - Microorganisms which reproduce by the production of spores. These include molds and yeasts which are important in food storage. Molds induce chemical changes in media suited to their growth. Yeasts are used to pre-serve other foods because of their ability to ferment rapidly.
- BUFURCATION GATE** - A structure that divides the flow between two conduits.
- BUGGY PLOW** - Also called sulky plow. See: Plow.
- BUILDING PAPER** - Fibrous paper used to cover the sides of wooden buildings. It is placed between two thicknesses of boards. It weighs 15 to 30 lbs. per sq.; also used for miscellaneous purposes.
- BUILT-UP** - A type of construction where several thicknesses of lumber are fastened together to form a larger unit.
- BUILT-UP BEAM** - A beam made of a structural shape, such as plates and angles, riveted together.
- BUILT-UP POST FRAME** - A type of post frame used in barn construction in which the post is constructed from separate pieces of ordinary stock lumber. See: Hewed post system.
- BUILT-UP ROOFING** - Made by applying alternate layers of roofing felt and pitch or tar. A type of roofing used on nearly flat roofs. The number of layers depends on the life desired.
- BULB** - An incandescent electric lamp. The glass globe in which the filament of an incandescent electric lamp is placed.
- BULB GLASS THERMOMETER** - An instrument for measuring temperature consisting of a glass tube with an enlarged bulb on one end connected to a smaller diameter bore expansion cavity so that the expansion of the fluid (such as mercury) due to heat surrounding the bulb will cause a much magnified movement in the small bore section. A calibrated scale gives the temperature in degrees, as indicated by the height of fluid in the small bore section. The fluid is usually mercury or colored alcohol.
- BULGE** - An enlargement or change in a normal shape of an article. A bulge in the wall.
- BULK** - The main or major part. Implying magnitude, volume, greatness

- in reference to size or amount. A mass or aggregate of some product unpackaged for trade.
- BULK BOX DUMPER** - See: Bulk, box dumper.
- BULK COOLER** - A cooling tank or chamber to reduce the temperature of the material held in bulk quantities.
- BULK COOLING TANKS** - See: Bulk cooler.
- BULK DELIVERY** - The delivery or marketing of materials in bulk quantities or form.
- BULK EQUIPMENT** - Equipment used in holding, delivering or marketing materials in large or major quantities. Many single units of equipment taken together or referred to as a unit quantity.
- BULK FEED** - The process or act of delivering or feeding materials from a bulk form or quantity.
- BULK HANDLING** - Handling or processing of materials in large quantities or amounts in bulk. See: Bulk.
- BULKING DOWN** - The process of compressing barn cured tobacco into a more compact unit to be baled. The tobacco is piled on a dry floor or platform and then something like cotton sheeting is spread over it. Boards are placed on top of the sheeting and the tobacco is pressed down with 10 to 15 lbs. of weight into a mass 2 to 3 ft. high.
- BULK LOADING** - Placing materials in a container or conveying mechanism which holds large quantities.
- BULK MILK COOLER** - A sanitary container or vat, usually located in the farm milkhouse, which normally is used to cool and store milk or milk products at a low temperature, usually between 33 to 40° F.
- BULK MILK TANKER** - A vehicle, consisting of an engine, chassis, and milk transportation tank which is used to collect milk from the individual producer and deliver it to a point designated by the buyer. (tanker) (bulk truck) (farm pickup truck)
- BULK RECEIVING** - The act of delivering or receiving materials in large quantities or amounts.
- BULK STORED** - The holding or storing of materials in large quantities or amounts in bulk. See: Bulk.
- BULK TANK** - A large container capable of holding materials in large quantities.
- BULL CHAIN** - 1. A heavy chain used in logging to which short chains with hooks are attached for the purpose of dragging logs. 2. On horse drawn binders, a heavy, drive chain which transmits power from a sprocket on the bull wheel (main drive wheel).
- BULL DITCHER** - A very large, heavy middlebuster.
- BULL DONKEY** - A large donkey engine with a drum and cable which is used in logging for hauling or pulling logs.
- BULLDOZER** - A crawler tractor which is equipped with a blade mounted in front for use in moving earth, snow, gravel, etc. or for clearing underbrush.
- BULL GEAR** - 1. A large final drive gear in a power transmission gear train. 2. The large driving gear, either internal or external, found on the main drive wheel of ground driven machinery such as corn binders and grain binders.
- BULLOCK GEAR** - Mechanism for the utilization of animal power in the driving of well and other pumps, and for other similar light work. It consists of the long poles to which the cattle are attached, and which by their leverage drive a pair of bevel-wheels, and through these the machinery connected thereto. Also termed indiscriminately, cattle gear, and horse gear.
- BULL TONGUE** - 1. A single, shovel plow or cultivator tooth. 2. A narrow, cultivator shovel which throws the soil both ways.
- BULL TONGUE SHOVEL** - A type of cultivator shovel usually narrow and of heavy construction for deep cultivating. See: Shovel.
- BULL WHEEL** - 1. A large wheel which receives power from being drawn

- over the ground and transmits the power to another part of the machine by means of belt or chain, as in a single row planter, or horse drawn grain binder. 2. The main or largest wheel on any mechanism.
- BUMMER** - A dolly or small truck usually having two wheels and a short pole which is used for skidding logs. Also called drag car, self-loading skidder.
- BUMPER** - A large, iron casting which is placed on the outside of the last inside disc in a disc harrow gang to absorb the shock when the gangs bump together. A heavy bar on the front or rear of a motor vehicle so placed as to prevent damage to the vehicle from collisions.
- BUNCHING ATTACHMENT** - A device consisting of a number of finger-like bars which extend to the rear of the cutter bar on a mowing machine or harvester and having a special hood-like arrangement which is attached at each side and around the rear of the fingers. As the hay is cut the hood is allowed to remain down until the amount desired is accumulated, at which time, it is lifted by a foot lever allowing the bunch of hay to slide off the bars to the ground.
- BUNCHING MACHINE** - A device for tying asparagus or other vegetables in bunches for retail sale.
- BUNCHING RAKE** - See: Buck rake.
- BUNDLE CARRIER** - An attachment to a grain binder which carries bundles of harvested grain. When several bundles have accumulated, they are dumped onto the ground thus making shocking or loading easier.
- BUNDLE LOADER** - An attachment for a corn binder which elevates the bundles directly to a wagon or truck. Also called bundle elevator.
- BUNDLE TOPPER** - A device used as an attachment on the cutting head of a combine which cuts off just the grain heads when the bundle is held against it.
- BUNG** - A large plug or cork for stopping the hole in the side of a cask through which it is filled.
- BUNKER SILO** - A horizontal silo composed of two, vertical, side walls, 6 to 8 ft. high placed on top of the ground. Width between the walls varies from 16 to 50 ft. or more depending on the size of herd. The length varies from 50 to 100 ft. depending on the feeding season. Movable self-feeder sections may be started at either end so that the bunker silo becomes a self-feeder which it is sometimes called.
- BUNKHOUSE** - A house or shelter where cowhands or rangehands sleep. On small ranches eating facilities are sometimes included in the bunkhouse.
- BUOYANT FORCE** - The force due to water that tends to make particles in it float.
- BUR CLEANER** - A device consisting of a revolving, carpet-covered roller on which peas and other small vegetables are placed for the purpose of removing burs. The bristles stick to the carpet-covered roller from which they are later removed.
- BURIED MAIN** - In irrigation, the main line is covered with soil and made permanent where field boundaries are fixed and where crops require full season irrigation.
- BURLAP** - A coarse fibrous material made of jute, flax, hemp, or manila, used for many kinds of wrapping grain sacks etc., a base on which the other components of linoleum are pressed to make linoleum.
- BURNED STEEL** - Steel which has been overheated so that its nature as steel has been permanently changed due probably to the absorption of carbon and the formation of oxides.
- BURNER** - 1. A device consisting of a tank and a pump for applying pressure to a liquid fuel to which is connected a hose and a nozzle for the purpose of destroying plant life by fire. 2. A device for mixing air and fuel in the proper proportions for combustion with the flame adjacent to the burner.

- BURNING** - Oxidation which takes place so rapidly that sensible heat and/or light are released.
- BURNISH** - To make any surface smooth and bright by rubbing with something hard and smooth without scraping or removing any of the surface.
- BURR** - 1. A nut with a screw thread.
2. The rough projecting edge of a drilled hole in steel work.
- BURR GRINDERS** - A type of feed grinder which crushes the grain between two flat, roughened chilled iron plates called burrs. One plate is stationary; the other turns, drawing the grain in between and crushing it.
- BURR MILL** - A device used for size reduction consisting of two roughened steel plates, one of which rotates and one which is stationary. Material is fed between the plates and is reduced by crushing and shearing.
- BUSH** - A hollow cylinder or annulus of brass, which affords bearing surface for a shaft or spindle. The bush is usually forced into its seat, and is non-adjustable; for many applications it is preferable to split bearings. Also called bushing.
- BUSH AND BOG PLOW** - A heavy disc plow which is used to cut up vegetation and light brush. Also called brushland disc harrow.
- BUSHEL** - A dry measure which contains 32 qt.; 4 pk.
- BUSHEL BAG** - Any sack or bag which contains a bu. by dry measure.
- BUSHEL BASKET** - Any basket which contains a bu. measure, especially a circular basket woven of thin strips of wood and used to hold such things as apples, citrus fruit, potatoes, etc.
- BUSHEL WEIGHT** - The weight per unit volume the volume being that of a bu. Varies for different crops. Wheat is 60 lbs. per bu.
- BUSH HARROWING** - Harrowing plowed or seeded fields by dragging a bush or brush attached to chains. (An obsolete tillage practice.)
- BUSH** - See: Brush hook.
- BUSHING** - 1. The lining of a bearing. It may consist of bronze, babbitt, wood or any other wear resisting material. 2. A pipe fitting for the purpose of connecting a pipe with a fitting of larger size, being a hollow plug with internal and external threads to suit the different diameters.
- BUTT ADJUSTER** - A device on a grain binder which is used to even up the butts of grain and to assist the grain down the decks to the packers. It is usually either a vibrator or an endless belt.
- BUTT CHAINS** - Part of the row crop harvesting unit of a field chopper which helps to gather and guide the forage into the cutting unit.
- BUTTERFAT** - The fatty material or constituent of milk.
- BUTTERFLY VALVE** - A type of valve used inside an open tube consisting of a circular disc mounted on a diametric shaft so the tube can be blocked off to varying degrees.
- BUTTERMAKING** - The process of churning cream to separate butter fat from other constituents of cream.
- BUTTERMILK** - The liquid and solids remaining after separating fat from cream in making butter.
- BUTTER TRIER** - A device essentially a long, two-edged, curved blade knife inserted into butter in such a way that a sample can be withdrawn. See: Cheese trier, trier.
- BUTTERWORKER** - A machine which kneads butter after completion of the churning process. The kneading process distributes added salt throughout the butter.
- BUTT JOINT** - Where the end of one piece is joined to the end of another piece either by gluing or by attaching gusset plates to both sides.
- BUTTON** - The knot or obstruction found at uniform intervals on a check wire which trips the planting mechanism of a check row planter and allows the seed to be planted.
- BUTT PROP** - A pole having a U shaped iron fork attached to one end used to support a telegraph pole while

- being raised. Also called dead man.
- BUTTRESS - A structure or part of a structure built against or into a wall to strengthen it from lateral loads.
- BUTT WELD - A type of weld in which the two edges to be united are simply butted together, and welded along the seam thus formed. An electric resistance weld where two ends are forced together under pressure while current is passed through.
- BUZZARD WING SWEEP - A cultivator point having very wide wings which is used in cotton cultivation.
- BUZZ SAW - A large circular cross-cut saw used to cut cordwood. It is usually equipped with a sliding or swinging table on which the wood can be supported while sawing.
- BY-PRODUCTS - An additional product or material resulting from a separation process involving a main product.

- CABALERIA** - A unit of land measurement equal to 38.2 United States acres in Cuba, 111.82 acres in Costa Rica, 111.51 acres in Guatemala, 111.13 acres in Honduras, 103.75 acres in Mexico, 112.41 acres in Nicaragua, 194.1 acres in Puerto Rico, and 95.48 acres in Spain.
- CABINET** - An enclosure designed either for surface or flush mounting, and provided with a frame or trim on which sliding or swinging doors are hung. It is usually provided with shelves for storage.
- CABINET DRIER** - A dehydration cabinet consisting of a furnace room, heating pipes and cabinets in which trays of fruit are placed. Each cabinet holds about 12 trays, usually 3 ft. sq. in size.
- CABLE EXHAUST BOX** - A simple type of chamber for the heating of cans and their contents before sealing. It consists of a narrow, shallow, rectangular container through which passes a steel cable on which the cans are placed and which moves them through the box.
- CABLE OUT** - To remove brush by means of a chain or cable which is attached to two tractors, usually of the crawler type. The tractors move in the same direction parallel to each other, with the cable dragging the brush and underbrush out as the tractors move.
- CABLE STACKER** - A device for placing hay in a rack or stack, which consists of two sets of poles each of which are fastened together at the top and spread apart at the bottom so as to form a framework for the cable to be stretched over and between them. The cable then forms a track for a carrier by which the hay can be carried to any place across the top of the stack.
- CABLEWAY** - A course or track along which logs are transported in the forest by means of a cable suspended between two trees on which the lead line runs. The logs are lifted wholly or partially off the ground as they are dragged or carried.
- CABLING** - The supporting of tree branches by means of flexible cables in the crown of a tree. Between branches with a common crotch which might weaken are placed cables to provide additional support to leaders and branches. A term used in the wild hay region to denote placing a cable or rope around the base of a stack of hay and sliding it by tractor power onto a flat rack tilted toward the stack.
- CADASTRAL SURVEYS** - Surveys which relate to land boundaries and subdivisions, and are made to create or to define the limitations of titles, and to determine units suitable for transfer.
- CADELLE LAVA** - One of the principle insects which attack grains in storage. They hibernate in wood.
- "CAGE"** - That part of a cylinder type corn sheller which surrounds the cylinder. It is perforated at the bottom allowing the kernels to fall through but retaining the cobs for discharge at the cob outlet.
- CAGE** - An enclosure of fencing material, wood or metal, which is used for confining fowl or other animals.
- CAGE HOUSE** - A type of poultry house in which all of the fowl are housed in cages either individually or in small groups.
- CAJON** - A method of building construction in which the walls, roof, or floors are supported by structural frames and the intervening space filled with bricks, earth, concrete, or other materials.
- CALANDRIA** - A very common heating device which is used in vacuum evaporating of liquids. The liquid to be evaporated is circulated in pipes which are surrounded by live steam.
- CALCINATOR** - A device used for garbage and waste disposal

- consisting of a drier and a burner in combination. Heat is applied to the wet material until dehydrated after which it is burned. Non-combustible materials cannot be disposed of in this device.
- CALCIUM CHLORIDE** - Deliquescent chemical flakes used to settle dust to stabilize gravel surfaces, to lower the freezing point of water to prevent water in concrete from freezing and to aid ice control. CaCl_2 .
- CALF PEN** - That place in a barn or other building where calves are kept in an enclosed area.
- CALIBRATION** - The ascertainment of required settings on dispersal equipment necessary to give desired rates of application. The ascertainment of readings of an instrument or indicator in comparison to a correct standard.
- CALIBRATION CHART (FOR BULK MILK TANK)** - A chart prepared for each tank from information secured during the calibration process. Its purpose is to list a volumetric (gallon) equivalent for each graduation on the gage rod or surface gage (conversion chart) (gallone chart).
- CALIBRATION CURVE** - Plotting the graduation figures relating two variables progressively on a line. See: Calibration. May show actual capacity vs. theoretical or capacity of a tank vs. depth of fluid.
- CALIFORNIA STANDARD** - The weight of 70 lbs. per box of oranges.
- CALIFORNIA STANDARD FLAT** - A cantaloup crate measuring $4 \frac{1}{2} \times 13 \frac{1}{2} \times 22 \frac{1}{8}$ ins. which is used for packing for delivery to local markets. (This standard is not accepted in Colorado.)
- CALLUSING ROOM** - A room for the grafting of plants, in particular, grapes, in which the grafts are first dipped into warm water to a depth of just below the unions. After removal from the water and sprinkling with warm water, the grafts are placed in a well ventilated room where the temperature is held at 75° to 80° F. This hastens the callusing of the wounds.
- CALORIE** - In engineering, it is considered roughly to be the amount of heat needed to raise 1 gram of water 1° C. when the water is at any temperature between 0° C. and 100° C. 1 BTU = 252 calories.
- CALORIMETRIC HEAT CONTENT** - The theoretical heat content of a fuel; e.g., BTU per lb.
- CAM** - A device that produces intermittent motion; a wheel with a lobe or nose on one side. (The protruding section is called the nose; the flat section is called the heel.) Anything resting against the cam will be moved only when the nose comes around to it. Cams are widely used to give complicated and exactly timed movements such as in sewing machines and valves of internal combustion engines.
- CAMBER** - Angle of inclination from vertical of a wheel. The depth of the curve given to the surface of a wing of an airplane. The upward curvature of a member or truss above its nominal position.
- CAMBER ANGLE** - The angle between the vertical and a line drawn through a front auto wheel in its up and down direction.
- CAMBRIC TUBING** - An insulating tube. Also called spaghetti tubing. Used to insulate electric wires.
- CAM ENGINE** - A type of engine in which the pistons are reciprocated by means of a cam and roller mechanism.
- CAM FOLLOWER** - A part of an engine which rides on the contour surface of a cam and to which the motion is imparted by the cam.
- CAM FRICTION** - That friction existing between a cam and the cam follower.
- CAM GEAR** - A toothed wheel which drives a cam shaft.
- CAM GOVERNOR** - A controlling device which is used in connection with Otto-cycle gas-engines; a stepped or differential cam is used giving three or four grades of valve lift; the action of the governor balls

slides the roller on to one or another of these cams according to the centrifugal force of the balls.

CAM LOBE - The raised portion on the contour of a cam which operates the cam follower.

CAM PLATE - An eccentric rotating plate employed to produce reciprocating motion of an intermittent or irregular character.

CAM-SECTION - The shape or design of a part which communicates motion to a follower. In internal combustion engines the cam shapes and the adjustment of the following rocker arms determine the period during which the intake and exhaust valves are open.

CAMSHAFT - A shaft carrying cams or other eccentric elements which change rotary motion to the reciprocating motion. In an internal combustion engine, a camshaft provides the motion for opening and closing the intake and exhaust valves, operates the plunger of a fuel injection pump and similar linear functions.

CAMSHAFT SPEED - Speed at which camshaft rotates. In 4-cycle engines, camshaft speed is normally one-half crankshaft speed.

CAM WHEEL - A wheel with a projection or projections either on the periphery or face, adapted to give motion to another object against which it impinges, by sliding contact.

CAN - 1. A metal container used in the preservation, transportation and retail sale of preserved products. 2. A quantity of produce, as a can of tomatoes. 3. A container for the transportation of milk. 4. Verb meaning to preserve. 5. A vessel of small size made of sheet metal and used for various purposes. It may or may not have a spout for pouring out contents.

CANAL - An artificial channel which is used to carry water for irrigation or to remove water from areas covered with water. Respectively an irrigation canal and a

drainage canal. See: Ditch.

CANAL COMPANY - A company or corporation which digs and/or maintains canals for irrigation purposes, most often in the Western United States.

CANCELATION - A system or arrangement of the web members in a truss.

CANDLE - The unit of luminous intensity. One-sixteenth of the intensity of one sq.cm. of a black-body radiator at the temperature of solidification of platinum (2046° K)

CANDLEPOWER - Luminous intensity of a light source expressed in terms of a source selected as a standard. A spermaceti candle burning at the rate of 120 gr. per hr. has a regarded intensity of one international candlepower.

CANDLING - A process of examining an egg by means of transmitted light to observe characteristics associated with edible quality or hatchability, such as air cell size, yolk shadow position, presence of blood or meat spots and presence or lack of germ development.

CANE FIELD TREAD - A type of rubber tractor tire tread found on machinery used in sugar cane fields. It consists of extra high lugs to obtain traction under adverse field conditions.

CANE LOADER - A power-operated derrick like device equipped with a grapple fork and used to load bundles of sugar-cane stalks.

CANTILEVER ARM - A projecting arm of a beam or other member beyond the point of support.

CANTILEVER BEAM - A beam supported only at one end, which carries loads on the unsupported end.

CANTILEVER OUTLET - An outlet spillway designed to retard water flow to prevent excessive erosion on the receiving ditch.

CANTILEVER RETAINING WALL - A retaining wall depending for stability on not only its own weight but also on the weight of the material supported on the cantilevered base section. See: Cantilever arm.

CANVAS - The conveyor apron on a

- grain binder, combine or windrower.
- CANVAS-APRON UNLOADER** - Unloader consisting of a canvas spread over a flat surface which operates over rollers transporting material, such as grain from a combine header to the threshing cylinder or forage from a wagon.
- CANVAS BELTING** - A belt made up of layers of canvas stitched together along the edges and through the center.
- CANVAS HOSE IRRIGATION** - A Michigan method of irrigation in which a porous canvas hose is placed on the ground alongside each row. The hose is attached to a pipe in which water is flowing under pressure. Water seeps out of the canvas hose along its length and is absorbed by the soil.
- CAN WASHER** - A machine which consists of a conveyor and various hot water and steam jets for the purpose of draining, washing, sanitizing, rinsing and drying milk cans.
- CAPACITANCE METHOD** - A dielectric method of determining the moisture content of a product. The product is placed between the plates of a condenser and the capacitance is measured. The capacitance is an indirect measure of the moisture content.
- CAPACITOR** - See: Condenser.
- CAPACITOR MOTOR** - Type of electric motor widely used for fractional-horse-power in single-phase supply line but can be used for larger sizes also where single-phase current is available. Makes use of a condenser in the starting coil circuit in order to produce a rotating magnetic field for starting the motor. Single phase induction motors classified according to the method of starting, such as capacitor-start induction-run, capacitor-start capacitor-run and single-valve-capacitor.
- CAPACITOR-START INDUCTION-RUN** - (Motor) A high capacitance, intermittent-duty condenser is in series with the starting winding of this single phase induction motor. When the motor accelerates to a predetermined speed, a centrifugal switch disconnects the starting winding. The capacitor in the starting winding increases the phase angle between the starting and running winding, thereby approaching two-phase action and producing more starting torque than is produced in split-phase motors.
- CAPACITY CURVE** - A graph of the volume of a reservoir tank, etc., as a function of elevations. The capacity of a reservoir can be defined only by reference to some definite elevation.
- CAP BEARING** - A type of bearing consisting of two halves which are bolted together. Such a bearing can be adjusted by placing shims between the halves. 4/32
- CAPILLARITY** - The ability of water to rise in wettable soils.
- CAPILLARY ACTION** - The actual movement of soil capillary water from a point of higher potential to a point of lower potential.
- CAPILLARY FRINGE** - The subsurface zone immediately above a water-table and within the zone of aeration in which the moisture content is in excess of the field capacity.
- CAPILLARY MOISTURE** - Water held in the soil pores by force of surface tension as a continuous film around the soil particle.
- CAPILLARY MOVEMENT** - The movement of water in the soil due to the difference in potential between two points. See: Capillary action.
- CAPILLARY POTENTIAL** - $X(L^2T^{-2}$ or $FIM^{-1})$ - The energy required per unit mass to move water against the capillary field forces in the soil, from a free water surface, to any point in the soil.
- CAPILLARY WATER** - See: Capillary moisture.
- CAP JET** - A fuel-regulating orifice in a carburetor. Similar in action to the compensating nozzle. The cap jet receives its fuel from a supply which is vented to the air and the flow is thereby

- dependent only on the difference in fuel level.
- CAPON KNIFE** - A scalpel which is designed for and used in caponization.
- CAPPED STAND** - A device consisting of a large pipe, one end of which is set upright in the ground into which water flows under relatively low pressure. Around the sides of the pipe are holes for the release of the water into different small irrigation ditches. It is usually free from debris, of low cost and has a small leakage loss.
- CAPPER** - 1. A device which is used for removing the calyx from the strawberry. 2. A machine used to put caps on milk bottles.
- CAPPING MELTER** - A device which is used to melt the cappings on honey comb, when the combs are uncapped, and also after the excess honey has been drained from them.
- CAP RAIL** - The top rail of a fence.
- CAP SCREW** - American standard cap screws. Manufactured in six standard heads. Produced in finished form and used on machine tools and other machines where accuracy and appearance are important. Inferior to studs, therefore used on machines requiring few adjustments.
- CAP SEAT** - The inner ridge in the top of the neck of a milk bottle on which the cap or cardboard closure rests.
- CAP STEMMER** - A device consisting of two concentric truncated cones of heavy screen one of which revolves rapidly. Raisins are placed between them and revolved and rotated to remove the stems. A blast of air separates the raisins from the removed stems.
- CARBOLOY NOZZLE** - A pressure nozzle made of special alloy used in milk-dryers to reduce abrasion caused by solid particles of milk which require frequent nozzle replacement. Stellite or carboloy nozzles give longer service.
- CARBONATE HARDNESS** - A hardness of natural water which is called temporary because it can be removed by boiling, as in a teakettle.
- CARBONIZE** - 1. The deposit of carbon upon the points of the spark plugs and the various internal portions of the engine cylinder and exhaust passages. 2. The deposit of carbon on glass chimney of a fuel oil lamp. 3. To deposit carbon in metal with an excess carbon oxyacetylene flame.
- CARBON RESIDUE TEST** - A test to determine the amount of carbon residue left on evaporating a fuel or oil under specified conditions.
- CARBON STEELS** - Steels having no minimum specified content for aluminum, boron, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium or any other element added to obtain an alloying effect; when the specified minimum for copper does not exceed 0.40%; or when the maximum content specified for any of the following does not exceed the percentages noted: manganese 1.65; silicon 0.60; copper 1.60; carbon 1.70.
- CARBON TOOL STEEL** - A tool steel containing little or no alloying metals, with a carbon content of from 1.10 to 1.30% which is used for cutting operations where a hard, keen cutting edge is required at low cutting speeds, particularly when a high quality of finished surface is desired.
- CARBORUNDUM** - Silicon carbide--an abrasive material used widely in grinding wheels and other tool sharpening stones.
- CARBURETION** - The mixing of any fuel in the form of a mist or spray with air in proper proportions to form the fuel charge for a gasoline engine.
- CARBURETOR** - A fuel metering device on internal combustion engines the purpose of which is to vaporize the fuel, mix it with the correct proportion to air and supply the mixture to the engine in proper amounts.
- CARBURETOR FLOAT** - A device incorporated in a carburetor, which admits

- fuel into the float chamber at a rate corresponding to the demand of the engine, to control the fuel flow from the fuel tank to the carburetor bowl and to maintain a relatively constant fuel level by governing the action of the needle valve.
- CARBURETOR JET** - A small opening orifice used to meter the flow of gasoline in a carburetor.
- CARBURETOR NEEDLE VALVE** - An adjustable device consisting of a screw with a beveled needle point which fits into a beveled hole seat, to control the amount of fuel for the main fuel metering system of the carburetor and thus provide proper quality of fuel vapors entering the intake manifold.
- CARBURETOR STRAINER SCREEN** - A fine wire mesh screen which is incorporated in a carburetor at the union of the fuel feed line and the float needle valve, to prevent foreign substances from entering the carburetor bowl.
- CARBURIZED** - A surface treatment of steel resulting in a hardened surface due to the addition of carbon.
- CARBURIZED STEEL** - A low carbon steel used for plow shares to which surface carbon has been added in varying amounts and depths. The marking CARB is usually found on the share.
- CARBURIZING** - A case-hardening process whereby low carbon steel objects are immersed in a molten carburizing salt bath at 1500 to 1650° F. The outer layers absorb enough carbon so that subsequent heating and quenching followed by tempering produces hard surface layers. Pack carburizing and gas carburizing are other methods used to attain the same qualities.
- CARBURIZING FLAME** - One in which there is an excess of acetylene in the oxyacetylene welding flame.
- CARLOAD** - A unit of measurement i.e., the quantity which would fill a railroad car, an automobile, an elevator cage.
- "CAROLINA COTTON PLANTER"** - An early type of cotton planter consisting mainly of a furrow opener, a hopper with an adjustable opening and an agitating device to keep the seed flowing out of the hopper.
- CARRIAGE** - A frame on which a log is held while being sawed. A wheeled vehicle, usually horse drawn.
- CARRIAGE BOLT** - A bolt with a rounded or oval surfaced head having a square shoulder underneath extending out approximately ½ in. depending upon the size of the bolt. Commonly used to fasten wood.
- CARRIAGE JACK** - A lifting jack employed by coach builders, stablemen and others, to lift the wheel of a carriage from the ground, by jacking up the axle, thus permitting revolution of the wheel for washing, painting, etc.
- CARRIER** - A tray on which a fruit picker carries small containers to be filled with fruit.
- CARRY ALL** - A light-weight carriage, truck, wagon or the like for transporting objects or persons. A heavy excavating device used in the leveling of fields and the construction of canals and waterways.
- CARRY ALL SCRAPERS** - An earth moving vehicle which is self-loading and which not only can be used to scrape the land surface, but also has a means for transporting soil.
- CARRY OVER** - That part of a crop which is stored from one season to the next or from one marketing period to another.
- CARTRIDGE TYPE FUSE** - A long cylindrical type of electric fuse used in connection with spring clips with which it fits. Made in both the single-use type and that with renewable links.
- CASEHARDENED** - See: Casehardened steel.
- CASEHARDENED STEEL** - Steel which has been subjected to one of many treatments to harden the surface by the addition of carbon. The depth of case usually .005 to .010 in.
- CASE HARDENING** - 1. Treatment of

- iron or steel by dissolving carbon into the outer surface so it will withstand wear, leaving a soft center. 2. A condition of drying wood in which the surface becomes set in an expanded condition while the interior of the wood is in tension. If the interior tensile stresses exceed the strength of the wood, honeycombing results.
- CASEMENT** - A window sash hung by one vertical side to open inward or outward.
- CASING HEAD GAS** - Gas recovered from oil wells and from the still in the crude oil refining process. A highly volatile fuel. See: Liquefied petroleum.
- CASEIN GLUE** - Made from casein powder, obtained from milk, mixed with cold water.
- CASING** - 1. The pipe which is sunk into a well to prevent the walls from caving in and within which the pipe for pumping liquids is placed. 2. An enclosing framework for a door or window.
- CASING HEAD** - In well-boring, a heavy mass of iron screwed into the top of a string of casing to take the force of the blows produced by the driving hammer.
- CASING SHOE** - In well-drilling, a ring or ferrule of hard steel with a sharp edge which is screwed or welded onto the bottom of a string or casing to cut its way through the formation as the pipe is forced down. Also called drive shoe.
- CAST** - See: Casting.
- CASTER ANGLE** - In an automobile or tractor the inclination of the king pin is such that its axis intersects the ground at a point in advance of the point of tangency of the wheel with the ground, for the purpose of providing better steering.
- CASTER WHEEL** - A wheel so mounted as to pivot about an axis perpendicular to the axis of the wheel.
- CASTING** - Any machinery part which is formed by pouring molten metal into a mold and allowing it to cool.
- CAST INPLACE** - A method of construction usually using concrete which is placed in forms which have been constructed at the exact location the structure is desired.
- CAST IRON** - An alloy of iron and 2 to 4% carbon used in making intricately shaped machine parts. It is strong in compressive strength but relatively weak in tensile strength. Cast iron parts are made by pouring molten iron into molds which allow it to harden in the desired shape.
- CAST IRON PIPE** - Pipe made of cast iron. Usually joined with a bell and spigot joint or a bolted flange joint. Widely used for water or sewage.
- CAST IRON SHARES** - Plow shares made of cast iron as compared to steel shares.
- CAST IRON WHEEL WEIGHTS** - Designed for easy attachment to the wheel of a tractor. Usually cast in sections of 30 to 50 lbs. each to permit variation in weight on each wheel.
- CASTLE NUT** - A nut having slots radially across the top. A cotter pin can be inserted in the slot and through a hole in the bolt to lock the nut to the bolt.
- CAST PLOW** - A moldboard plow whose bottom is made of plain or chilled cast iron.
- CAST STEEL** - Refers to parts formed by pouring molten steel into a suitable mold. In this respect it is similar to cast iron but it has far different properties such as high strength, shock resistance ductility and toughness. Used mostly for gears.
- CATAMARAN** - A raft for supporting a windlass and a grappling hook to recover logs which have sunk in the river; boat with two hulls side-by-side.
- CATCHING COOP** - A small coop having a sliding gate at one end into which a limited number of chickens may be placed for treating, grading, culling or transporting from one pen to another.
- CATCHING CRATES** - See: Catching coop.

- CATCHING NET** - A net resembling a fishing dip net which is used for catching fowls.
- CATCHING PANEL** - A slatted device roughly four ft. by four ft. which is used to corral fowl in a pen for grading, culling, treating, etc.
- CATERPILLAR TRACKS** - A type of running gear consisting of a large endless chain with pads or cleats fastened to each individual link. These pads or cleats provide a firm continuous support over which the driving wheels can pass. See: Track laying tractor.
- CATTLE BOAT** - A ship designed for transportation of cattle.
- CATTLE CAR** - A railroad car which is designed for shipment of cattle and other farm livestock.
- CATTLE GUARD** - A device in a fence opening consisting of parallel stringers, rails, poles or pipes laid on a frame covering a pit. It is used to prevent cattle from crossing but to allow the passage of vehicles. It is commonly used in place of a gate in a fence or at a railroad crossing.
- CATTLE PASS** - A large culvert which is constructed under the road for cattle to pass from one pasture to another pasture without obstructing vehicular traffic.
- CATTLE RUN** - An alley or passageway for cattle.
- CATTLE SHEDS** - A type of shelter usually open on one side and used mainly for beef cattle.
- CATTLE WIRE** - See: Barbed wire.
- CAUSTIC RINSING** - The removal of caustic solutions (mineral acids, sodium hydroxide, phenol) by rinsing, generally with fresh water under pressure.
- CAVES ON** - A noseband of iron or other stiff material which is used in holding the head of a horse down or in restraining it. Also called caveson.
- CAVITATION** - A condition wherein a vacuum, to any degree, exists as a result of flowing fluid. For example, under certain conditions a vacuum is formed back of a propeller blade which is rotating in a fluid.
- CC** - An abbreviation for cubic centimeter, a unit of measurement of volume.
- CEILING HEIGHT** - The distance from the floor to the lower side of the ceiling joists. The ceiling height for farm buildings varies from 7 ft. 6 ins. to 10 ft. 0 ins. In colder regions a lower ceiling is generally used as it conserves heat.
- CEILING JOIST** - Heavy timber used to support the ceiling underneath and/or a floor load on top. See: Joist.
- CEILING TILE** - Rectangular pieces of insulating board or other material applied to ceiling surfaces for the insulation, appearance or acoustic properties which the material may have.
- CEILING-TYPE COIL** - A name given to refrigeration or cooling coils designating their location. Coils placed near the ceiling of a cold storage room.
- CELERY CRATE** - A slatted type of container which is especially designed for the shipment and handling of celery.
- CELERY HARVESTER** - A hand-pushed or tractor-pushed device with two or more "L"-shaped teeth which turn inward on either side of the row and which cut the roots of the celery preparatory to harvesting.
- CELERY HILLER** - A mechanical device which is used to throw soil up and around celery to blanch it as it grows in the row.
- CELL** - A general term for the minute units of wood structure. It includes fibers, vessel segments, and other elements of diverse structure and functions.
- CELLAR** - A storeroom beneath the surface of the ground, most often beneath a building, which is used for storage and safekeeping of produce and for human protection during storms. See: Cold cellar.
- CELL DROP** - A device in mechanical planters which consists of a horizontal rotating plate with cells

- on the outer edge. Seeds drop from the hopper into the cells, one to a cell, and from the cells the seeds drop into the spout or boot and finally into the earth. The device is used for planting seeds in a row at regular intervals. See: Corn planter plate.
- CELLULAR RADIATOR** - A type of radiator core construction resembling that of a honey comb and used in the cooling systems of internal combustion engines.
- CEMENT** - 1. Any substance, such as glue, paste, Portland cement, etc., which is used to cause separate things to adhere to each other. 2. To cause two or more things to adhere to each other by use of glue, paste, etc.
- CEMENT-ASBESTOS BOARD** - A manufactured sheet usually 1/8, 1/4, 3/16 or 3/8 in. thick and 4 ft. x 8 ft., 4 ft. x 10 ft. which is made by binding asbestos fibers with Portland Cement under pressure. It is used for interior or exterior wall finish, and when corrugated, as a roofing material or siding.
- CEMENT-ASBESTOS ROOFING** - A corrugated sheet of cement-asbestos board. Used as a weather protective layer on a roof.
- CEMENT-ASBESTOS SHEET** - See: Cement-asbestos board.
- CEMENT-ASBESTOS WALL COVERING** - See: Cement-asbestos board.
- CEMENTATION** - A uniting and hardening of substances, as a soil.
- CEMENTED** - 1. Designating two or more things which have been united by a cement. 2. Designating substances which have united and hardened.
- "C" ENAMEL** - An enamel used to line tinplate food containers developed initially for corn, but now used for other sulfur bearing food. The enamel traps the sulfur compounds released by the foods and prevents the formation of the innocuous, but unsightly, iron sulfide.
- CENTER BEARING** - 1. A term indicating that the dead-load support is near the axis of the pivot pier instead of near the periphery. Sometimes used in swing span bridges. 2. A term applied to the center main bearing on the crankshaft of an internal combustion engine.
- CENTER-DEPTH REGULATOR** - A device to maintain uniform penetration at the center as well as the ends of the gangs of a disc harrow.
- CENTER DIVIDER** - A guiding device found on two row harvesting equipment which passes between the two rows aligning them for entrance into the machine.
- CENTER FEED AISLES** - See: Center feed alley.
- CENTER FEED ALLEY** - An aisle or alley, 2 ft. to 6 ft. wide, which runs longitudinally through a barn between two rows of face-in stalls. It is designed for convenience of the workman in placing feed at each stall.
- CENTERING** - 1. The method of finding the center of a piece of material. 2. The false work upon which is built masonry arches, concrete slabs, etc.
- CENTER LINE** - A line which connects the center points of an object or building.
- CENTER LITTER ALLEY** - An aisle or alley, 5 ft. 6 ins. to 9 ft. wide, which runs longitudinally through a barn between two rows of face-out stalls. It is designed to aid the workman in placing bedding and removing litter, manure and milking in the dairy barn.
- CENTER MATCHED** - A type of joint found in lumber in which the tongue is in the center of one edge of the board and the groove is in the center of the opposite edge. See: Tongue and groove.
- CENTER OF DRAFT** - See: Center of resistance.
- CENTER OF GRAVITY** - That point in a body, thing, etc., at which the body can be poised or balanced in equilibrium.
- CENTER OF POWER** - See: Center of pull.
- CENTER OF PULL** - The true point of

- hitch or center of power. On a tractor this usually is the point at which the drawbar is attached and which is in the middle of the tractor, halfway between the wheels and slightly ahead of the wheels.
- CENTER OF RESISTANCE** - A point where the vertical, horizontal cross furrow, and longitudinal forces are considered to meet in a plow bottom (because of couples they do not actually meet). Also called center of load, center of draft.
- CENTER PUNCH** - A pointed tool which is used to mark center lines or centers for drilling work, etc. Its point is ground to a 60° angle as compared to the long thin point of a prick punch.
- CENTER SHOVEL** - The shovel mounted between the front and rear shovel of a cultivator gang. Such gangs usually have only three shovels: front, center and rear.
- CENTER-TRIP HAY SLING** - See: Hay sling.
- CENTER TUBE INLET AIR CLEANER** - A type of oil bath air cleaner in which the air passes down through a tube in the center of the cleaner into an oil bath then up through the filters to the clean air outlet.
- CENTER VENTILATOR** - The vertical duct for natural or forced ventilation. It is usually found in the center of round cribs used for ear corn storage.
- CENTER WINDROW** - A windrow attachment for a cutter bar which is so arranged that the windrow is made at the center of the cutter bar rather than at the end. It is used in harvesting peas for canning.
- CENTIGRADE** - A unit of temperature measurement in which the temperature scale is graduated into one hundred equal divisions. Each temperature division represents a uniform temperature interval within the range of the freezing point and boiling point of water at standard atmospheric conditions.
- CENTIGRADE SCALE** - A scale used in thermometry. It represents the temperature interval between the freezing point and boiling point of water (at 760 mm. barometric pressure) which is divided into one hundred equal parts or degrees. The present centigrade scale thermometer has 0° as the freezing point and 100° as the boiling point. The scale may extend below 0° and above 100°.
- CENTIGRADE THERMOMETER** - A thermometer on whose scale the interval between the freezing and boiling points of water is divided into 100 parts or degrees.
- CENTIGRAM** - 0.01 gram; 0.15432 grain.
- CENTIMETER** - 0.01 meter; 0.3937 in.
- CENTIPOISE** - 0.01 poise.
- CENTISTOKES** - 0.01 stoke.
- CENTRAL HEATING** - The use of one furnace or heating unit to heat one entire structure, as a hot air system, steam heat, etc. Heating an entire structure by means of a unit rather than by stoves, fireplaces, braziers, etc. Normally uses pipes to carry the hot air or water to where heat is needed.
- CENTRAL HOG HOUSE** - A structure for the community housing of hogs to provide for labor efficiency, sanitation and to provide shelter for all hogs under one roof.
- CENTRALLY MOUNTED TOOL** - Any tool mounted ahead of the drive wheels of a tractor.
- CENTRALIZED FARROWING** - A handling system in which sows are placed in individual pens, in a permanent building, during the time they are farrowing, as opposed to portable house farrowing.
- CENTRAL MOUNTED TRACTOR MOWER** - A type of tractor mower in which the cutter bar is mounted between the front and rear wheels of the tractor and to the right of the operator. Also called front mounted mower.
- CENTRIFUGAL** - Designating centrifugal force.
- CENTRIFUGAL BROADCASTER** - A seeder or fertilizer spreader which broadcasts material from a horizontally rotating distributing wheel(s) containing radial ribs.

- CENTRIFUGAL CLARIFIER - A centrifuge for removing impurities or sediment from a liquid, as a milk clarifier.
- CENTRIFUGAL COMPRESSOR - The compression of gases or vapor by centrifugal force from a rapidly rotating rotor.
- CENTRIFUGAL CREAM SEPARATOR - A machine used to separate the fat or cream from the rest of the milk. The milk is put in a rapidly rotating device which throws the cream to the inside of the bowl because of the difference in density between the cream and the milk serum.
- CENTRIFUGAL-DISCHARGE ELEVATOR - An elevator used for vertical movement of free-flowing materials such as small grains and pellets using a bucket-type receptacle. The buckets are uniformly spaced on a belt or chain. Material is picked up by direct loading into the buckets and by scooping from the boot at the foot of the elevator and is discharged by centrifugal force at the head.
- CENTRIFUGAL FAN - A fan which consists of a wheel rotated in a spiral housing. Air pressure is increased in the spiral housing as the wheel rotates. Air flows axially into the center of the wheel and is moved from the center to the periphery of the fan by the centrifugal force of the rotating wheel.
- CENTRIFUGAL FORCE - The force which acts upon a body revolving in a circular path, tending to force it farther from the center of the circle. $\frac{mv^2}{r}$, when m = the mass of the particle, v = the velocity and r = the radius.
- CENTRIFUGAL PUMP - A fluid moving device that utilizes the centrifugal force imparted to the fluid by a rapidly rotating impeller.
- CENTRIFUGAL SEPARATION - The separation of substances of different densities by means of centrifugal force, as the separation of fat from milk.
- CENTRIFUGAL SEPARATOR - See: Centrifugal cream separator.
- CENTRIFUGAL SWITCH - A switch often times employed to short out the auxiliary motor windings as soon as the motor is up to speed so that it will then operate at fixed speed as a plain induction motor of the squirrel-cage type. A switch which cuts out the auxiliary winding as motor approaches synchronous speed.
- CENTRIFUGE - A machine for separating by centrifugal force, as cream from milk.
- CENTRIPETAL FORCE - The net force acting on a rotating body and directed toward the center of rotation. It is equal to $\frac{mv^2}{r}$ when m = the mass of the body, v = the velocity and r = the radius.
- CENTROID - The center of mass or center of gravity; the point of application of the resultant of a system of stresses or forces.
- CERAMIC DISC - The sorption block used in a soil moisture meter. Made of 90% porous brick and 10% organic earth.
- CERAMIC OVEN - A type of dehydrator used in commercial fruit and vegetable dehydration which has walls of heavy masonry and fire brick. The produce is placed on trays or trucks on the floor and the heat is radiated from the walls, ceiling and floor. There is also a forced draft to circulate the air and improve drying. It is not extensively used.
- CESSPOOL - A pit for the reception and detention of sewage, having either tight or porous walls. The tight wall type must be cleaned periodically, while in the porous wall type the liquid drains away into the surrounding soil and only the solid matter must be removed.
- CETANE NUMBER - A number used to rate the ease and smoothness of burning of compression ignition engine fuels. A high number

- indicates a good ignition quality.
- CFM - The abbreviation for cubic feet per minute.
- CFM PER BUSHEL - A term which expresses the amount of air supplied per unit quantity of grain. It is obtained by dividing the cfm of air by the bin capacity in bu. where the capacity of the bin is determined on the basis of 1.25 cu.ft. for 1 bu. for small grains, and 2.50 cu.ft. for 1 bu. for clean husked ear corn.
- CFM PER CU.FT. (Q_c) - A term used for specifying air flow in cu.ft. per min. for each cu.ft. of crop. It is obtained by dividing the cfm of air by the total volume of product being dried or aerated, in cu.ft.
- CFM PER SQ.FT. (Q_a) - A term which expresses the apparent velocity of parallel flow of air through grain or other material. It is obtained by dividing the cfm of air by the area of the floor in sq.ft.
- CFM PER TON OR CFM PER CWT (Q_t or Q_{cwt}) - Used for specifying air flow through forages, bulk root crops, etc., where the total air flow in cfm is divided by tons (cwt) of products in storage. The capacity in tons (cwt) is determined on basis of volume occupied by crops at the moisture content normally stored.
- CFR ENGINE - A specially designed internal combustion engine used to test fuels for their tendency to knock. CFR is the abbreviation for Cooperative Fuel Research Committee, composed of representatives from the American Society of Automotive Engineers, the American Petroleum Institute and the U.S. Bureau of Standards.
- CHAFF - 1. The outer covering of grain; the glumes, husks, which are separated by threshing from the seed. 2. Finely segmented hay or straw. 3. The scales associated with the seeds in the heads of some of the composite plants. 4. That portion of a mixture or material which is light in weight but bulky.
- CHAFFER - The top screen of the cleaning mechanism of a combine or thresher. It has adjustable openings which give a rough separation of the chaff and smaller pieces of straw from the grain. Also called chaffer sieve.
- CHAFFER SIEVE - A component of the cleaning shoe of a combine consisting of a screen with fixed or, more often, adjustable openings. It is the first of a series of such screens and is designed to remove with the aid of an air-blast the light chaffy material as the grain passes through. See: Shoe sieve. 52/400.
- CHAIN - 1. A series of metal links forged or welded together which are used for fastening, hauling, etc. 2. A tape of chain-like measure used in land surveying which is 66 ft. long. 3. A belt-like device used to transmit power. See: Roller chain.
- CHAIN BELT - A belt consisting of links of metal used for power transmission. A type of drive chain for smooth high speed transmission of power. It consists of many small links assembled on the chain hinge pins resulting in a very solid but flexible chain. Also called silent drive chain.
- CHAIN CONVEYOR - A materials handling device consisting of an endless chain with attached cups, bars or blades operating between two or more sprockets. There are three types of chain conveyors: trolley, scraper, and apron.
- CHAIN GAGE - A device for determining the state or elevation of a water surface which consists of a tagged or indexed chain, tape, or other line attached to a weight lowered to touch the water surface whereupon the gage height is read on a graduated staff or opposite an index. Especially it is suited to bridges, wells and similar situations where the water is difficult to reach. The graduated staff is sometimes placed

- horizontally, the line running over a pulley. Also called tape gage.
- CHAIN HARROW** - A harrow which does not have a rigid frame. The original type consisted of a network of chain links which was used to roll up weeds on land worked with other harrows. Later models, sometimes called spiked flexible harrow had teeth formed by an extension of the link and were more generally useful. Some of the models had two sets of teeth. One set on one side was used on pasture, to break up and spread animal droppings. The entire harrow was turned over to engage the other set of teeth when used on cultivated land.
- CHAIN HOIST** - A mechanical device used to increase lifting power consisting of a hook attached to a chain or a set of pulleys, used for lifting heavy weights, such as milk cans, engines, etc.
- CHAIN HOOK** - A hook at the end of a log chain. May be grab hook so shaped that when placed over a link it will not slip or slip hook so shaped to permit the chain to slip easily through it.
- CHAINING** - 1. The wrapping of a chain around logs, lumber or other materials for the purpose of skidding or hauling. 2. Locking of a wagon or other wheel with a chain for braking purposes in descending steep slopes. 3. Measuring horizontal distances with a chain. Also called rough lock.
- CHAIN PUMP** - A pump consisting of an endless chain which passes over a wheel by which it is activated. Attached to the chain are a series of cups which lift the water and which drop the water into a spout as the cup passes over the wheel at the ground surface. It is for use in cisterns and shallow wells (not common).
- CHAINS** - A harness type of arrangement made of chain which fits on pneumatic tires and is used to improve traction.
- CHAIN SAW** - A portable, motor driven saw which consists of an arm on which an endless chain travels to whose links are attached saw teeth.
- CHAIN TIE** - 1. A section of light chain attached to a manger in a barn that branches into a "Y" to go around both sides of a cow's neck and fastens at the top. It serves to restrain the cow in a manner similar to a stanchion. 2. A light wrapping chain that goes over the top of a load of logs to secure it for transportation.
- CHAIN TIGHTENER** - A device used to take up slack in a drive chain. It may consist of a sprocket, wheel or hardwood block with tension being maintained by springs or by moving the tightener to a new position.
- CHAMBER** - A space enclosed by walls; a compartment. To detonate a small explosive charge; to create a cavity for placing a larger charge under a stone or stump.
- CHANGE-OVER** - The act of changing, altering, converting or substituting in full or in part.
- CHANNEL CUT-OFF** - A natural or artificial channel which shortens a meandering stream to increase the velocity, to shorten the channel length, and to decrease the length of levees.
- CHANNEL INFLOW** - Water which, at any instant, is flowing into the channel system from surface flow, subsurface flow, base flow and rainfall direct on the channel.
- CHANNEL STORAGE** - The volume of water in definite stream channels above a given measuring point or "outlet" at a given time during the progress of runoff.
- CHARGE** - 1. In a gasoline engine, the amount of gasoline and air which is taken into the cylinder during the suction stroke. 2. In a storage battery, the amount of current measured in ampere hr. which is absorbed by the battery in recharging. 3. In electrostatics, the amount of electricity measured in coulombs present upon a substance which has accumulated electric energy.

- CHARGING** - Sending a current through a storage battery to bring the plates into condition to cause a flow of current in the reverse direction against voltage lower than its own. To store energy in a battery.
- CHARLIER SHOE** - A narrow, light horseshoe without a toe-clip which is sometimes used on a horse put out to pasture for a period of time.
- CHAR-PITTING** - A method of removing stumps by burning in which a fire is built on the stump and the fire kept covered until the stump is consumed.
- CHART QUADRAT** - A small plot originally one meter square which is used for making a detailed, graphic record of vegetation.
- CHASSIS** - In automobile and truck construction, a rectangular framework of iron or steel which is directly supported on springs attached to the front and rear axles, forming the running gear.
- CHECK** - 1. In irrigation, a basin usually long and irregular which is bordered by two levees or ridges following adjacent contours and with short cross levees at either end. 2. In irrigation, an adjustable gate placed in a ditch or flume to regulate the flow of water or to divert it. 3. A separation lengthwise in the grain of the wood which extends across the annual rings. It often results from strains which occur in the wood during seasoning. Also called seasoning check. 4. A straight-line relationship between hills of corn when viewed perpendicular to direction of planting. 5. A crack which appears in soil as it dries after having been watered.
- CHECK BIT** - A small bit attached to the check rein on a bridle. The horse's head is held up by fastening the check rein to the backpad of the harness.
- CHECK BOARD** - A device of wood or metal hinged at the upper edge which is placed at the rear of a
- beater in a thresher or combine to prevent grain or straw from being thrown to the rear of the machine.
- CHECK DAM** - A small dam which is constructed in a gully or other watercourse to decrease the gradient and the velocity of flow, thus minimizing channel scour and promoting the deposition of eroded material.
- CHECK FORK** - A device on a check row planter which strikes the button on the check wire to open the valve in the planter so as to drop the seed. See: Checking head.
- CHECK HEAD** - See: Checking head.
- CHECK HOOK** - A hood or loop on the back pad of a harness over which the check rein is placed.
- CHECKING** - 1. Splitting of wood lengthwise across the annual rings. See: Check 3. 2. The cracking of drying soil. See: Check 5.
- CHECKING HEAD** - That part of a check row planter which engages the check wire and transmits the resulting movement to the planting assemble.
- CHECK IRRIGATION** - A method by which a field, divided into basin compartments or checks, is irrigated by flooding water into the checks.
- CHECK PLOT** - In field agricultural experimentation, a small area of land either untreated or given a standard treatment which is used as a standard for comparison or checking the results in plant growth of other plots differently treated.
- CHECK ROW** - A cultivated row in which seeds have been planted at regular intervals and so positioned that cultivation can be done lengthwise and crosswise of the rows.
- CHECK ROW PLANTER** - A machine which is equipped to permit the operator to drop hills of corn in checks or squares so that cultivation can be done lengthwise and crosswise of the rows.
- CHECK ROW WIRE** - See: Checkwire.
- CHECK ROW WIRE PLANTER** - See: Checkwire, check row planter.
- CHECK STRUCTURES** - See: Check 1.
- CHECK VALVE** - A type valve which

- will permit flow in only one direction.
- CHECKWIRE** - A wire in 80 rod lengths which has buttons fastened at regular intervals of 30 to 48 ins. At intervals of 5 or 6 rods separating links are provided so that the wire can be disconnected. It is stretched across the field and used to trip a lever at definite intervals for dropping of seed in check rows. See: Check row planter.
- CHEESE HOOP** - A cylinder in which the cheese curd is pressed in making cheese. See: Cheese press.
- CHEESE PRESS** - A machine which is used to extract the whey from curds in cheesemaking. There are two kinds: One in which a vacuum is created below the cheese hoop and the whey driven out by pressure of the atmosphere; the one in more common use, in which screws, toggle joints, or hydraulic pressure, etc., are used to apply pressure to the cheese.
- CHEESE TRIER** - A sharpened, curved blade which is inserted into cheese to remove a plug for examination.
- CHEESE VAT** - A large container in which curd is formed from milk and cut or broken for cheese making. Usually has rectangular shape and is steam jacketed.
- CHEMICAL BROWN STAIN** - A chemical discoloration of wood that sometimes occurs during the air drying or the kiln drying of several species, apparently caused by the oxidation of extractives.
- CHEMICAL TOILET** - A type of dry vault toilet in which the sewage is decomposed by the addition of caustic chemicals, such as quick lime.
- CHESSEL** - A cheese vat or mould. Usually made of thick oak staves bound with iron to withstand pressure and perforated with holes in the bottom and sides to drain the whey.
- CHEZY FORMULA** - A formula which expresses the relation between velocity of water, hydraulic radius, and friction slope; thus $V = C\sqrt{RS}$, in which V = velocity; R = hydraulic radius; S = $\frac{1}{2}$ slope of the energy gradient and C = a coefficient. See: Kutter's formula, Manning's formula.
- CHILLED CAST IRON** - A type of cast iron resulting when molten cast iron is poured into special molds where rapid cooling on the outside produces a very hard and close grained working surface.
- CHILLED SHARE** - A type of plow share resulting when the molten metal is poured into special molds where rapid cooling on the outside produces a very hard and close grained working surface.
- CHILLING** - 1. The lowering of the temperature of fresh produce to inhibit the growth of microorganisms and to preserve freshness. 2. Process used in manufacture of cast iron plow shares and moldboards to increase their resistance to abrasive.
- CHILL (ING) ROOM** - An insulated, refrigerated compartment, 32° F. or above, for the cooling of food products.
- CHIPS** - 1. Small angular fragments of stone which contain no dust. 2. Cow chips referring to dry manure used for fuel. 3. Wood chips made by ax or with power machines designed to break up wood for paper or to put on the soil for mulch.
- CHIP TEST** - A method of identifying metals based on the nature of a chip produced by a cold chisel.
- CHISEL** - 1. An implement used to break through and shatter compacted or otherwise impermeable soil layers. It consists of a series of rigidly mounted standards spaced 12 - 18 ins. apart and equipped with replaceable shovels. It will operate at depths below the plowing zone. It is a heavier machine than a field cultivator. 2. A hard steel rod with sharp wedge shaped blade designed to cut under the impulse of a blow.
- CHISEL CULTIVATOR** - See: Field

- cultivator.
- CHISELING** - Stirring or mixing at depths greater than normal tillage operations but without inversion of the various soil layers using a chisel cultivator or chisel plow.
- CHISEL PLOW** - A type of plow consisting of several beams which stir the soil without turning up the moist subsoil or turning under any crop residue which may be found on the surface.
- CHLORINATION** - Treatment with chlorine or bleaching powder for disinfection, retardation of decomposition or oxidation of organic matter. Often used on drinking water.
- CHOKER** - 1. In engine carburetion, to increase the ratio of gasoline to air in the fuel mixture, cut off some of the air supply, as when starting a cold engine. 2. The device used to accomplish the increased ratio of gasoline to air.
- CHOKER** - A rope with a noose by which a log is pulled.
- CHOKER THE PLOW** - A condition in which wet straw, weed, etc., collect under the beam and prevent proper action of the plow.
- CHOPPED HAY** - Grass and legume forage processed by cutting into lengths of $\frac{1}{2}$ to $1\frac{1}{2}$ for silage or 3 to 6 ins. for cured hay.
- CHOPPED ICE MACHINE** - A machine producing small flakes or ice chips for direct application in packing or other uses.
- CHOPPED SILAGE** - Forage crops cut to varying uniform lengths for the purpose of preserving it as silage.
- CHOPPER** - 1. A cordwood cutter. 2. A machine for cutting forage into small pieces. Also called forage harvester.
- CHOPPING BLOCK** - A supporting platform or block used when chopping food or wood.
- CHORD** - 1. Public land surveys. The straight line connecting two points of a great circle. 2. That portion of a truss the main function of which is to resist bending on the span.
- CHORE TIME** - That time of day when chore work is done. The amount of time it takes to do chore work. See: Chore work.
- CHORE WORK** - That work done each day or at regular intervals, usually done at a specific time each day. Like taking care of animals on the farm.
- CHROME PLATE** - A thin coating of chromium deposited on a metal surface by electroplating, which improves resistance to corrosion and improves the surface luster.
- CHROME PLATING** - Electroplating of chromium on metallic surfaces to improve the resistance to corrosion and to improve surface luster.
- CHURKA** - A first cotton gin which was used in India several centuries ago.
- CHURN BARREL** - A vessel in which cream is agitated until butter is formed.
- CHUTE** - 1. Partially or wholly enclosed passage or framework. 2. A narrow animal passage for branding, castration, spraying or delivering to a truck, etc. 3. A wholly enclosed passage through which grain, hay or the like is moved to a lower level. 4. A trough which is constructed of round timbers in which logs are slid up or down a grade. 5. A high-velocity conduit for conveying water to a lower level. 6. An inclined drop or fall.
- CHUTES** - Open or closed conduits used to transport water from one elevation to another.
- CIDER PRESS** - A press for extracting juice from fruits.
- CINCH BAND OR BELT** - Plies of cord material under the tread area of a tire having the cores nearly parallel to the center line of the tire. These cords do not tie into the tire beads but furnish circumferential strength for the tire.
- CINDER-BLOCK** - A concrete building block made of Portland cement and cinders, a light weight block.

- See: Cinder concrete.
- CINDER CONCRETE** - A light weight concrete made of Portland cement and cinders.
- CIPOLETTI WEIR** - A trapezoidal measuring weir in which each side of the notch has a slope of one horizontal to four vertical. It does not require a correction for end contractions (named after Cesare Cipoletti, an Italian engineer).
- CIRCUIT BREAKER** - A switch which is opened automatically when the current or the pressure exceeds or falls below a certain limit, or which can be tripped by hand. Has the same function as a fuse, but can be reset without having to replace or renew any part of it.
- CIRCULAR EXHAUST BOX** - A device for exhausting air from cans in a cannery in which the cans follow a circular or spiral path in going through the exhaust box.
- CIRCULAR LEVEL** - A device in which a bubble in a liquid is centered within a reference circle to level instruments, tanks, etc. (Bull's - eye level)
- CIRCULAR MIL** - The area of a circle one mil (.001 in.) diameter. The area of a wire in circular mils is equal to the sq. of the diameter in mils. Thus, a wire 2 mils in diameter (.002 in.) has a cross sectional area of $2 \times 2 = 4$ circular mils.
- CIRCULAR PITCH** - The distance in ins. measured along the pitch circle from a point on one tooth to the corresponding point on the adjacent tooth of a spur gear.
- CIRCULAR SAW** - 1. A thin, steel, round disc which has teeth cut on the edge. A similar shaped device is used in cotton gins for the removal of lint from cotton seed. 2. One or a series of such discs placed on an axle and used to cut wood, logs, etc.
- CIRCULATING BALL GEAR** - A type of steering gear in which steel balls provide the bearing surface for the worm gear as compared to the ordinary worm and sector gear type.
- CIRCULATING PUMPS** - Pumps used to distribute heat through a hot water heating system, ventilation system, etc.
- CISTERN** - 1. An artificial reservoir or receptacle for holding water or other liquids. 2. A common farm container for soft water which is frequently built underground.
- CISTERN FILTER** - A filtering material intervening between the supply and discharge of a cistern.
- CLAD WIRE** - An electric wire coated with an insulating or protecting material.
- CLAIMING PEN** - A pen or small enclosure within a pen in which a ewe and her newborn lamb can be placed until the ewe accepts the lamb as her own.
- CLAM SHELL** - An earth moving device used as an attachment for a power shovel equipped with a boom. Particularly useful for digging deep holes. It consists of two halves which can be opened and closed from the power shovel thus engaging or releasing a quantity of soil.
- CLAPBOARD** - A narrow board used for siding which is thicker at one edge; it is put on the vertical outside walls of buildings to weatherproof the building.
- CLARIFIER** - A machine similar to a centrifugal separator, which removes sediment from a fluid. An apparatus used in the removal of sediment or foreign material from a fluid either through sedimentation, filtration or centrifugal force. See: Clarify.
- CLARIFY** - To remove undesirable, solid substances from a liquid, such as milk or fruit juice by filtration or by centrifugal filtration.
- CLAW BAR** - A hand bar with a bent, claw-shaped point for drawing spikes from railway ties or sleepers.
- CLAW WEEDER** - A short handled implement with claw-like metal projections from one end which is used for hand weeding flower beds, gardens, etc.
- CLAY** - Heavy, compact, cohesive soil,

- stiff and smooth to the touch when wet, hard when dry. Clay can be drained only by slow degrees and it is subject to slow, continuous movement (compression) under load.
- CLAY PAN** - Dense sub-soil horizon high in clay content having a sharply defined upper boundary, and formed by downward movement of clay or by synthesis of clay in place during soil formation. Soil permeability is usually low in clay pans but bulk density may not be appreciably different than in the horizons below. See: Alkali clay pan.
- CLAY PIPE** - Pipe made of shale and fire clay, unglazed, glazed, or glazed and vitrified, with or without one end bellshaped, used for field drains, edge drains, etc.
- CLAY TILE** - A draintile made from clay, originating from Scotland patterns, used to drain excessive ground water. (obsolete)
- CLEANER FEEDER** - A device in a cotton gin which connects the elevating and distributing system with the gin. It is another device for beating dirt, dust, and trash out of the seed cotton.
- CLEANING FAN** - Any fan used for the purpose of removing chaff, leaves, etc. May be found on corn pickers, corn shellers, combines, etc. See: Fanning mill.
- CLEANING ROLLERS** - Devices found on fruit and vegetable grading equipment which polishes, cleans and removes trash as the product passes through the machine.
- CLEANING SHOE** - 1. A metal strip or curved plate for removing sticky soil or mud from a wheel or disc before excessive accumulation. 2. A part of the threshing machine consisting of the cleaning mechanism.
- CLEAN TILLAGE** - A process of intensive cultivation to prevent growth of all vegetation except the particular crop desired. Also called clean culture, clean cultivation.
- CLEAN TILLED** - Refers to cropland planted to row crops that are cultivated regularly.
- CLEARANCE VOLUME** - The compression space above the piston in an internal combustion engine when the piston is on upper dead center.
- CLEAR CUTTING** - Cutting all trees down to prepare land for cultivation.
- CLEAR HEADWAY** - The vertical height from the top surface of a floor to the lowest surface of the roof or next floor above. The height of the highest vehicle that could pass through a particular bridge. The distance from the water surface or ground to the lowest elevation of a super structure.
- CLEAR-SPAN ROOF CONSTRUCTION** - A system of roof construction without interior posts, whereby the roof load is supported by a truss or self-supporting rafters resting on the walls.
- CLEAT** - 1. A device having two arms around which turns can be taken with a rope to hold tightly and yet can be easily released. 2. A strip of wood or iron fastened to a brace and to the joint in a braced rafter to keep the joint from warping or bowing out.
- CLEAT WIRING** - A method of supporting wiring on porcelain insulators or cleats. By the use of cleats both wires of a circuit are held at the correct distance apart.
- CLEVIS** - A U-shaped piece of iron whose ends have holes through which a pin or pole is placed. It is used as a coupling device or hitch.
- CLICK** - A lock which allows movement in only one direction.
- CLIMATE** - The average weather conditions over a relatively large area and long period of time as affected by altitude, bodies of water, mountain barriers, ocean currents, latitude and prevailing winds.
- CLIMATIC FACTORS** - Factors that affect the climate in different locations, such as bodies of water, mountain barriers, ocean currents, latitude and prevailing winds.
- CLINCH(ES)** - That part of a nail

- which extends out of the material and is bent over to keep it from being pulled out, as in horse-shoeing, box manufacturing, etc.
- CLINCHING TONG** - The tongs or pliers which are used to bend the end of the horse shoe nail that extends through the hoof of the horse. See: Clinches.
- CLINKER** - The incombustible fused material formed in the burning of coal.
- CLIP ANGLES** - A metal clip that connects angle or tee irons to rolled beams without bolting or drilling either member.
- CLIPPED CEILING** - See: Suspended ceiling.
- CLIP PLOT** - A small area of land used to determine the weight of forage produced under different intensities of grazing or to measure potential forage yield on different sites.
- CLIP PULLEY** - A type of pulley used in connection with wire rope haulage. The rim is composed of a number of hinged clips with V-edges, instead of the usual rigid sides. The strain of the rope tends to pull the clips towards each other, thus securing a better grip with the load.
- CLOD CRUSHER** - An implement which is used as a roller to break up clods after plowing, in which numerous circular cast-iron sections about 30 ins. in diameter are threaded upon a round axle. See: Land roller, float 3.
- CLOD SMASHER** - A shed-like device made of wood which is used to transport heavy or awkward loads. See: Stone boat.
- CLOSED CONDUIT** - Conduits laid to grade beneath the surface to remove excess water from wet land. The joints are sealed to form a closed line on steep slopes or areas where tree roots may penetrate and clog the line.
- CLOSED END HARROW** - Designating a harrow which has guard rails attached to the ends of the bars to which the teeth are fixed.
- CLOSED TIRE WHEEL** - A type of wheel which is used on some corn planters in which the tread of the tire is solid. See: Open center wheel, double wheel.
- CLOSE-GROWING** - Referring to a cover of grasses used to stabilize a ditchbank and berm.
- CLOSE-GROWING CROPS** - Drilled or broadcast; not row crops.
- CLOTH-COVERED COLDFRAME** - A cold-frame covered with cloth instead of glass which is used for growing seedling tobacco plants and most vegetable crops that are to be transplanted. It provides protection from wind, evaporation, intense light, low temperature and insects.
- CLOTH-COVERED HOUSE** - See: Cloth house.
- CLOTH HOUSE** - A light weight structure resembling a greenhouse being covered with light cloth instead of glass, which is used for growing certain crops under protected conditions.
- CLOUDBURST** - Rain storms of high intensity that usually are short and localized and occur mostly in the summer.
- CLOUD CHAMBER** - A container supersaturated with water vapor, used in the study of gaseous ions, which cause a precipitation of the moisture.
- CLOUD SEEDING** - 1. Dry ice or water seeded in clouds by airplanes to promote rainfall. (obsolete) 2. When silver iodide crystals are released from ground generators, crystals drift away and presumably are sucked into the updrafts of storm clouds eventually causing precipitation.
- CLOVE** - A weight unit of eight lbs. of wool, cheese, etc. (England) The dried flower bud of a tropical tree of the myrtle family.
- CLOVER HULLER** - A type of threshing machine used primarily in threshing small seeded legumes. It is more efficient in hulling and threshing such seeds than an ordinary threshing machine.
- CLUMPING** - 1. The gathering together of a number of things of

- the same kind. 2. The grouping together of two or more fat globules in a tight arrangement.
- CLUSTERING** - 1. The gathering together of a number of things of the same kind. 2. The grouping together of two or more fat globules in a loose arrangement in milk products.
- CLUTCH** - A device used to gradually engage or disengage the power from various working parts of machinery.
- CLUTCH LEVER** - A lever which actuates a clutch, engaging or disengaging as desired.
- CLUTCH RELEASE** - A protective device found on some tractors which automatically disengages the clutch when the tractor is overloaded or the drawn implement, such as a plow, strikes an object.
- CLUTCH SPRING** - A spring arranged either to engage or disengage a clutch; in the former case, the clutch lever must be locked to keep the clutch disengaged.
- CLUTCH STEERING** - A type of steering system used on track laying tractors in which each individual drive wheel has a clutch. By disengaging a clutch all the power will be applied to the opposite drive wheel thus turning the tractor.
- COAGULANT** - An agent which causes a marked increase in viscosity or the formation of a more compact or dense mass, usually by chemical action.
- COARSE AGGREGATE** - Particles retained on a $\frac{1}{2}$ in. screen; they may consist of gravel or crushed stone.
- COARSE-GRAINED WOOD** - Any wood having wide annual rings in which there is considerable difference between the size of the summer and winter rings.
- COAXIAL POWER GEAR** - A type of power steering device in which the hydraulic control valve is closely associated with the steering gear while the power cylinder is removed from it.
- COB SHAKER** - A part of a corn sheller which separates the shelled corn from the cobs.
- COB STACKER** - A part of a corn sheller, an open channel inside of which runs an endless belt with attached lugs, which elevates corn cobs after shelling to a truck bed or stack. A part of a corn sheller consisting of a small elevator or blower which moves the corn cobs to a truck bed or stack.
- COCK** - 1. A small conically shaped pile of hay, manure, etc. 2. A device for regulating the flow of fluids through a pipe which usually consists of a shell of iron or brass bored out to receive a tapered conical plug having a hole or port in it. The passage of fluids is controlled by rotation of the plug.
- COCKLE** - 1. A kiln in which hops are dried. 2. A weed that grows among grain crops.
- COEFFICIENT OF DISCHARGE** - 1. A coefficient by which the theoretical discharge of water through orifices, weirs and other hydraulic structures is multiplied to obtain the actual discharges. Coefficients of discharge are obtained by experiments on structures similar to those under study. 2. The ratio between the actual flow of water through a pipe or orifice and the theoretical flow.
- COEFFICIENT OF EXPANSION** - The ratio between the increase in volume which a substance undergoes when its temperature is raised 1° C., and its original volume. Thus, in the centigrade scale the coefficient of expansion of air per degree is $0.003665 = 1/273$; that is, the pressure being constant, the volume of a perfect gas increases $1/273$ of its volume at 0° C. for every increase in temperature of 1° C. In Fahrenheit units it increases $1/491.2 = 0.002036$ of its volume at 32 for every increase of 1.
- COEFFICIENT OF FLUCTUATION** - The ratio of average rpm to the difference between maximum and

minimum rpm.

COEFFICIENT OF FRICTION - A dimensionless number which expresses the resistance to movement of one solid object along the surface of another solid object at a constant velocity. It is equal to the pulling force divided by the weight of the solid object.

COEFFICIENT OF HEAT CONDUCTIVITY - A number expressing the amount of heat in Btu transmitted per unit of time under certain standard conditions.

COEFFICIENT OF PERMEABILITY - The rate of movement of water through saturated soil (hydraulic conductivity) measured in ins. per unit time.

COEFFICIENT OF REFLECTION - The ratio of the total light reflected by a surface to the total light falling upon it, expressed as a percentage.

COEFFICIENT OF ROLLING RESISTANCE - The ratio of the rolling resistance force to the transaxial load on the wheel.

COEFFICIENT OF ROUGHNESS - A factor in the Kutter, Manning, Bazin and other formulas expressing the character of a channel as affecting the friction slope of water flowing therein.

COEFFICIENT OF STATIC FRICTION - The ratio of force required to move the object to the force normal to the surface over which the object is moving. It depends on the material and the roughness of the surface but over a wide range is independent of the area of contact.

COEFFICIENT OF THERMAL CAPACITY - The amount of heat it takes to change the unit weight of a material 1° in temperature.

COEFFICIENT OF TRACTION - A dimensionless number equal to the tractive force of a soil-engaging driving member of a vehicle divided by the vertical (normal) load on the member.

COFFEE HULLER - A machine which is used to remove the husk or sac which covers the coffee berry.

It consists of an arrangement of serrated surfaces on a belt, between which the envelope of the coffee berry is torn and loosened from the grain. Subsequent rubbing, brushing, dusting and winnowing complete the process of hulling the grain.

COFFERDAM - Temporary structure built to exclude earth and water from an excavation so that work may be done under dry conditions.

COG - A tooth in a gear wheel; more especially an inserted or mortise tooth.

COHESION - The force that holds the individual particles of a substance together.

COHESIVE STRENGTH - That property of matter which denotes the ability of adjacent particles to resist separation.

COIL - A spiral arrangement of such materials as wire, rope, tubing, etc., so as to place a large linear quantity within small area or volume. Also the name of a unit which contains any such assembly.

COIL-TYPE HEAT EXCHANGER - A type of heat exchanger, which consists of a tank with a series of coils through which the circulating heating or cooling medium is pumped.

COLD CATHODE - A cathode that does not have a filament heater which heats by radiation.

COLD CELLAR - An underground space or room which is used for the storage of vegetables, fruits, etc., through the winter. The temperature should remain about 38 to 40°.

COLD CHISEL - A tool of high carbon steel tapering to one end which terminates in a beveled edge and is used to cut cold metal. The cutting end is hardened and tempered since it must be harder than the material to be cut.

COLD CUTTER - A heavy chisel used for cutting cold material. It has a thick blade compared to the hot chisel and an eye into which a handle is fitted so it can be held while struck with a heavy

- hammer.
- COLD DIFFUSER** - A device to give fan-forced air movement over cooling coils to maintain a cold room or refrigerated room. Also called blower-type cooling unit.
- COLD ENGINE** - Any engine not up to normal operating temperature.
- COLD FRAME** - A shallow bottomless box set upon the ground with a removable glazed top which is used to protect, to propagate, to harden off or to grow plants. No heating device except the heat of the sun is used in it. See: Cloth-covered coldframe.
- COLD-HOLD TANK** - A milk storage tank in which milk is held at low temperatures by means of a double-walled reinforced steel jacket surrounding the milk. A refrigerant is forced through this wall to cool the milk. Also called cold-wall type milk tank.
- COLD JUNCTION** - A term commonly used to refer to the reference junction of a thermocouple circuit. The reference junction is maintained at a known temperature which may be either below or above the temperature of the measuring junction of the thermocouple circuit.
- COLD MILK FILTER** - A device for removing sediment from milk and cream in which a pump forces the milk through a series of paper filters. The milk is at 40° F. or less.
- COLD PACK CHEESE** - A cheese which is made by grinding very fine and mixing together without heating the same or different varieties of cheese to which may be added vinegar, or lactic, citric, acetic or phosphoric acid; water, salt, color and spices. The pH should not be below 4.5. It is then packed in air-tight containers. Also called club cheese; comminuted cheese, potted cheese.
- COLD-PACK PROCESS** - 1. A method of canning in which the material to be canned (vegetables, fruits, etc.) is scalded in hot water or sirup and placed immediately in hot jars or cans. Hot sirup or water is then poured into the can so that it is completely full after which the cover is placed on the container. The containers are next sterilized or pressure cooked. The method is used by processors and by housewives in home preservation. 2. The preservation of fruits by storage in bulk (usually barrels) containers at freezing temperatures. Formerly it was much used commercially.
- COLDPIT** - A deep pit with a sash cover which is used for storing bulbs and hardy plants during the winter.
- COLD SPARK PLUG** - A spark plug having a relatively short insulator around the central core or firing end, to transfer heat more rapidly to the engine's cooling system. A cold plug is used under heavy duty operating conditions to avoid over heating and pre-ignition.
- COLD-ROLLED STEEL** - A condition or form of steel in which it has been subjected to a rolling process while cold. The hardness of the steel will depend on the amount of cold working it has been subjected to. See: Hot rolled steel.
- COLD ROOM** - A storage room which has heavily insulated walls, floor, and ceiling and which may or may not have a refrigerating mechanism to maintain low temperatures. It is used for storage of perishable and semi-perishable products. See: Storage.
- COLD SOAP** - A semi-boiled soap in which the glycerine remains in the finished soap as in contrast with its separation as a by-product in boiled soap or hard types of soap.
- COLD STERILIZATION** - The process of destroying microorganisms or the germ cells without heating the product noticeably during the sterilization process. Radiation (gamma and beta rays) is the most

- common method of cold sterilization.
- COLD STORAGE EGGS** - Eggs which have been held in storage at a temperature of 45° F. or less for 30 days or longer. Also called refrigerator eggs.
- COLD TEST** - A test for viability of seeds in which the seeds are placed on wet soil, sand, cloth or a blotter in a constant temperature as low as 40° F. for three days or longer. The test tray is then removed and placed in temperature conducive to rapid germination of the seed. The percentage of germination is then recorded for the benefit of the user of the seed.
- COLD-WALL TANK** - See: Cold-hold tank.
- COLLAR BEAM** - A horizontal framing member connecting pairs of opposite roof rafters at or near the ridge.
- COLLINS DYNAMOMETER** - A device used to measure the tractive pull of horses. It permits the movement of the vehicle to which the horses are hitched only when the tractive pull = the weight set on the machine. A distance of 27 1/2 ft. is most frequently used in pulling contests in order to simplify horsepower calculations.
- COLLOID** - 1. A sub-microscopic substance that when held in suspension or seemingly other liquid diffuses not at all or very slowly through a membrane and shows other special properties as lack of pronounced effect on the freezing point or vapor pressure of the solvent. Colloids are often gelatinous typical examples being albumin, gelatin starch. 2. Any substance in a state of fine subdivision or dispersion with particles ranging from 10^{-5} to 10^{-7} cm. in diameter, as colloidal gold, lead, sulphur and soil. May be flocculated by other chemicals.
- COLLUVIAL DEPOSITS** - Deposits of flocculated colloids that commonly form near the base of rather steep sloping lands that have been cultivated without conservation controls. The typical form is long, narrow, and sinuous and the origin is primarily sheet erosion. Damages are due mostly to the changes in texture and fertility of the soil that affect productivity.
- COLMATAGE** - The practice of spreading silt or mud sediments over poor land for reclamation or improvement. The practice is said to have originated in Italy.
- COLONY HOG HOUSE** - A small movable structure used to house one or two sows and litters when the pigs are large enough to be cold resistant. Also widely used as a farrowing house with the addition of electric brooders. It affords protection from the weather, adequate ventilation and light, and good sanitation when located on clean soil.
- COLOR INDICATORS** - Chemical indicators used to test salinity and alkaline content of soil.
- COLORMETRIC INDICATOR** - A hygrometric method of measuring the moisture content of a product. A mixture of ferric ammonium sulphate and potassium ferrocyanide is used in a carrier of sodium chloride; in the dry state the mixture is blue but in the presence of water turns red.
- COLOR TEMPERATURE** - A measurement of light intensity that is sometimes used to describe light sources. The color temperature of a source of light is the temperature at which a black body must be to give a color matching that of the source in question.
- COULTER** - A special attachment for a plow which helps cut the furrow slice. Its purpose is to allow the plow bottom to move through the soil more easily by cutting surface residue and roots. See: Notched coulter, rolling coulter.
- COLUMNAR CLEAVAGE** - Cleavage planes that run vertically which permits the construction of a steep ditch-bank.

- COLUMN DRIERS** - A type of continuous gravity-flow drier in which grain is fed into a hopper at the top of the bin. It then moves down through a perforated-wall column which is generally a maximum of 18 ins. thick. As it flows down this column, heated air is forced through the column at right angles to the grain flow. Usually cool air is forced through the bottom part of the column to cool the grain before it goes into storage. The dried grain is drawn off at the bottom by a continuously operating auger.
- COMBINATION CARRIER** - A heavy duty frame mounted on a tractor, or on separate wheels to which various tillage implements may be attached. It is similar to a tool bar but much heavier. See: Tool bar.
- COMBINATION FEED GRINDER MILL** - A grain and roughage processing machine having a cutter head for chopping roughage before it passes to the grinder which may be either of the burr or hammer type. Grain can be ground with the chopped material by adding it to the grinder through another feed opening.
- COMBINATION HAMMER MILL AND ROUGHAGE CUTTER** - See: Combination feed grinder mill.
- COMBINATION PLIER** - A type of plier adjustable for size of opening by means of a slip joint; having the outer grip scored and the inner grip notched for grasping round objects.
- COMBINATION ROLLING COULTER AND JOINTER** - A type of coultter on whose yoke a jointer is mounted. The coultter cuts through the surface trash and the jointer turns it under with its small furrow slice.
- COMBINATION SQUARE** - A square containing bevel protractor, level and center head in addition to a movable square head. See: Square.
- COMBINATION STACKER** - See: Combination sweep rake and stacker.
- COMBINATION SWEEP RAKE AND STACKER** - A device for placing hay in a stack which performs both the job of picking up the hay from the field as well as placing it in the stack.
- COMBINATION T-SHAPE AND SPROCKET-WHEEL PULVERIZER** - A type of soil pulverizing and firming device made up of rings shaped like an inverted T which cuts into the soil and rings shaped like sprocket wheels which tend to stir the soil.
- COMBINE** - A machine which heads the standing grain, and threshes and cleans it while moving across the field. It is adapted to harvesting all the small grains, soybeans, grain sorghums, peanuts, rice, beans and many other crops. The two general types are the pull or tractor drawn and the self-propelled. In some areas the heads are cut and placed in windrows by a swather (windrower) and a combine with a pickup attachment which gathers the grain and threshes it at a later date. Five basic operations are performed; cutting or picking up windrow, threshing, separating and cleaning.
- COMBINED SEWER** - A sewer designed to receive both storm water and sewage.
- COMBINE HARVESTER** - See: Combine.
- COMBINED HARVESTER-THRESHER** - See: Combine.
- COMBINING** - The act or process of using a combine.
- COMB STRIPPER** - A cotton harvesting device which uses a comb-like arrangement to pull the entire cotton boll from the plant.
- COMBUSTION** - The process of combining chemically, oxygen of the air with carbon and hydrogen in a fuel. Heat is liberated in the process, resulting in a pressure increase. Either the heat, pressure increase or both can be used to do work.
- COMBUSTION GASES** - Exhaust gases given off from burning fuels.
- COMMERCIAL FARM** - A farm from which the greater part, or all, of the products are produced for direct market and use.
- COMMON STORAGE** - The storage of products in an air-cooled room, using

- ambient conditions for the control of storage. See: Cold room.
- COMMUNITY PEN** - A system in which the goat rancher places kids of about the same age together in a pen. The does are kept away from the kids during the day and are grazed. In the evening the does are segregated into individual pens with their kids.
- COMMUTATOR MOTOR** - A motor driven by alternating current, carrying a commutator upon its armature.
- COMMUTATOR SEGMENTS** - The divisions of a commutator to which the ends of the armature conductors are connected. Sometimes referred to as commutator bars.
- COMPACTION** - The result of exterior forces on the soil to closely unite its particles.
- COMPACTOR** - See: Clod crusher.
- COMPACT TYPE SURFACE COOLER** - A type of heat exchanger made up of a number of units. The heating or cooling medium is carried inside the tubes and the product to be heated or cooled falls by gravity over the outside of the tubes and is collected in a trough at the bottom of the unit.
- COMPASS SAW** - A short narrow saw, tapering toward the point, used for cutting sweeps and curves by hand. Sometimes termed a coping saw.
- COMPENSATED REPULSION MOTOR** - A type of A.C. commutator motor consisting of a simple or "straight" repulsion motor in which there are two independent sets of brushes, one set being short circuited while the other set is in series with the compensating winding. The two sets of brushes are known as the energy or main short circuiting brushes and the compensating brushes. This type of motor is characterized by high power factor at speeds above synchronism, but at low speeds its power factor is less than with the A.C. series motor, while at all speed points its torque per ampere is not as high.
- COMPENSATED SERIES MOTOR** - A type of universal motor that has a high starting torque and current.
- COMPENSATING JET** - A secondary fuel flow nozzle on a carburetor so constructed that the flow of fuel from the carburetor is dependent only on the change of fuel level in the carburetor bowl. The compensating jet is one means whereby nearly constant fuel-air ratios are maintained during varying engine loads and speeds.
- COMPENSATING JET CARBURETOR** - A carburetor equipped with a compensating jet. The compensating jet is one means whereby nearly constant fuel-air ratios are applied to an engine during varying loads and speeds.
- COMPENSATING NOZZLE** - Also compensating jet. One type of device for regulating the fuel-air ratio supplied by a carburetor. The flow of fuel through the compensating nozzle is limited only by the size of the installed orifice since the flow is due only to the difference in fuel level causing the flow.
- COMPONENT** - One of the parts into which forces or stresses may be resolved or divided. The part or parts which make up the whole.
- COMPOUND** - Composed of two or more elements or parts; produced by the union of several ingredients, parts or things.
- COMPOUND-WOUND** - A type of direct current motor wound in such a way that it combines the advantages of the series and shunt-wound motors to give excellent starting characteristics together with good speed regulation. The field or stator winding is in two sections, one which is connected in series and the other in parallel with the armature, found in compound of generators and motors.
- COMPRESS** - 1. A hydraulic press which is used to reduce a bale of cotton to about 1/3 its original size for ease in handling and shipping. 2. The business or building in which such a press is located.
- COMPRESSED AIR** - Atmospheric air

- compressed by mechanical means into a state of increased density.
- COMPRESSED AIR SPRAYER** - A sprayer consisting of a tank to which is attached an air pump. Herbicides, insecticides, etc., are placed in solution in the tank and air is compressed by a pump so that the spray material is forced out through nozzles under pressure. See: Power sprayer, barrel pump, knapsack sprayer.
- COMPRESSED DEHYDRATED FOODS** - To increase density of dehydrated foods certain types are compressed. There is an increase in lbs. per cu.ft. of as much as 8 times for some foods such as cabbage.
- COMPRESSIBILITY OF LIQUIDS** - The change of volume, or resistance to change of volume of liquids when subjected to pressure. At normal pressure ranges, column changes, and hence, changes in unit weight, are so slight they are usually ignored in solving engineering problems.
- COMPRESSING** - The act of putting pressure on a substance to alter its size or increase density.
- COMPRESSING CHAMBER** - The chamber of a baler in which the hay is compressed into bales.
- COMPRESSION** - A force which crushes or tries to crush the particles of a material.
- COMPRESSION FLANGE** - The wide portion at the top or bottom of a structural steel member which is in compression due to a bending moment applied to the member.
- COMPRESSION-IGNITION** - Ignition as a result of heat by compression.
- COMPRESSION-IGNITION ENGINE** - A type of engine in which the fuel is injected into the cylinder and the air-fuel mixture ignited by heat of compression. This type of engine is called a Diesel.
- COMPRESSION KNOCK** - During normal combustion in a spark-ignition engine the air-fuel mixture starts burning at the spark plug and burns steadily across the cylinder with a gradual rise in cylinder pressure. However, when the explosive mixture reaches a certain pressure and thereby a critical temperature the entire air-fuel mass ignites and burns instantly causing a very rapid rise in pressure with a resultant "knock". Also called detonation.
- COMPRESSION MEMBER** - A structural member which has a compressive force on it.
- COMPRESSION RATIO** - A term used in internal combustion engines which is equal to the sum of the cylinder volume and the clearance volume divided by the clearance volume.
- COMPRESSION REFRIGERATION SYSTEM** - In refrigeration, a system which employs a volatile agent having a low boiling point, such as ammonia, carbon dioxide, methyl ether, sulphurous acid, etc. The volatile agent is drawn into the compressor. The compressor forces the agent into a condenser or liquifier, where it meets cooled surfaces, parts with its latent heat, and becomes liquid under pressure. It is then released through the regulating or expansion valve, into the expansion pipes (coils of piping or the like within an insulated space or refrigerator). There the liquid encounters a low pressure and volatilizes into gas, absorbing the heat necessary for the transformation from the surrounding air or liquid, chilling or freezing the latter by the abstraction of the heat. The expanded gas is exhausted by the suction stroke of the compressor and the process is repeated continuously.
- COMPRESSION SPRING** - A wire type open coiled helical spring that resists compression forces.
- COMPRESSION STROKE** - One of the movements of an internal combustion engine piston in which it moves up within the cylinder placing the air in a diesel engine and the fuel and air mixture in an engine with a carburetor under pressure previous to its ignition.
- COMPRESSIVE STRENGTH** - The strength to withstand a compression force

- acting on it, as opposed to tensile strength. When referring to concrete, means the compressive strength of the concrete 28 days after being poured.
- COMPRESSOR** - That part of a refrigeration system in which the vapor from the evaporator is compressed and delivered to the condenser. A machine for compressing air or other gases, notably carbon dioxide or ammonia in connection with refrigeration. It consists essentially of a single or multiple pump, within whose cylinders compression is affected by the return stroke of the piston after it has drawn in the gas on the previous stroke in the other direction.
- COMPRESSOR, AIR** - A machine by which air is compressed into a receiver for subsequent use as high pressure air or for power.
- COMPRESSOR SPRING** - See: Compression spring.
- CONCAVE(S)** - A concave shaped part co-acting with the cylinder of the threshing machine or combine. The threshing and much of the separation of the grain from the straw takes place as the material passes between the revolving cylinder and the stationary concaves.
- CONCAVE BEATER** - A beater located behind the concaves and cylinder of a threshing machine or combine. Its function is to help strip the threshed material from the cylinder and direct the grain and straw onto the straw rack. Also called cylinder beater.
- CONCAVE TEETH** - Steel finger-like projections from the surface of a concave which are so spaced that corresponding cylinder teeth may pass between them. The clearance between the two sets of teeth is adjustable and there may be two, four or six rows of teeth depending on threshing conditions.
- CONCENTRATED LOAD** - A load or weight applied at one point on a beam, column, or other supporting device.
- CONCENTRATED MILK** - Whole milk from which water has been removed to increase the percent of solids of milk. See: Evaporated milk, condensed milk.
- CONCENTRATES** - 1. Juices or liquids from which part of the moisture has been removed leaving only the solids or the solids and part of the liquid. 2. Any feed stuff for domestic animals high in nutrients, e.g. corn, wheat, cottonseed oil meal, etc.
- CONCENTRATION** - The actual content expressed as an amount or percent of an active ingredient in an inert carrier or diluent.
- CONCENTRATION AREA** - 1. An area of land on which the overutilization of browse indicates an overpopulation of grazing wild animals. 2. Any area where livestock or products are concentrated prior to shipping, etc.
- CONCENTRATION BY FREEZING** - A method of concentration by slush freezing and centrifugal removal of ice crystals.
- CONCENTRATION YARD** - A livestock-buying station which is located in the livestock producing area.
- CONCENTRATOR** - Any device used for the evaporation of liquids by which the liquid is heated and concentrated by the evaporation of water. For example, the sorghum pan or iron kettle for the concentration of syrup. See: Evaporator.
- CONCRETE** - A mixture composed of cement, sand, water and an aggregate such as broken stone, which after mixing has the property of hardening into a solid stone-like substance.
- CONCRETE BLOCK** - A type of building block used in wall or foundation construction, made of concrete. See: Concrete.
- CONCRETE FORMS** - Moulds for concrete construction, usually made of metal or timber units, put together so they can be easily taken apart after the concrete has set.
- CONCRETE FRAME** - An assembly of reinforced concrete beams, girders and columns.
- CONCRETE FROST** - That type of frost

- in the soil which is so filled with ice as to be virtually a solid block.
- CONCRETE FROST STRUCTURE** - Extremely dense structure in frozen soil; usually it is associated with soil which has been frozen to a great depth.
- CONCRETE PIPE** - Modified bell and spigot pipe made of concrete, plain or reinforced with steel.
- CONCRETE ROLLER** - A type of clod crusher made of a cylinder of concrete mounted on an axle and which is used for crushing clods, firming soil, etc.
- CONCRETE SILO** - A vertical circular structure constructed of concrete blocks, staves or solid concrete walls. Used for the ensiling and storage of forage crops.
- CONCRETE SLAB** - Mass concrete laid horizontally directly on the ground, on hard core fillings or laid on supporting beams or columns to form floors.
- CONDENSED ICE CREAM MIX** - A mix used in the manufacture of ice cream which consists of 70 to 80% total solids and is in this form preserved by sugar.
- CONDENSED MILK** - Milk which has had part of the moisture removed. Sugar is sometimes added for better preservation effects. See: Evaporated milk.
- CONDENSER** - 1. That part of a refrigeration unit in which the refrigerant changes from a vapor to a liquid. The condenser may be air-cooled, water-cooled or a combination of the two, known as air-water cooled. 2. A device to accumulate electrical energy consisting of two or more conducting surfaces separated by various dielectrics as air, paper, mica, etc. 3. A part of a cotton gin; a device consisting of a roller covered with wire screening and a smaller roller. The lint is blown against the screen-covered roller where it is packed into bats by the smaller roller.
- CONDENSER PLATES** - See: Dielectric heating.
- CONDENSER VENTILATION** - See: Condenser.
- CONDENSERY** - A milk plant in which milk is condensed by the removal of part of the water.
- CONDENSING PAN** - A device for the condensing of liquids consisting of a retort in which the contents to be condensed can be heated under a vacuum.
- CONDITION** - The state in which a material exists. To control or limit the conditions of environment. To prepare a material for certain processes.
- CONDITIONING** - Using processes which change the physical properties or state of harvested crops to maintain or improve market quality or storability.
- CONDUCTANCE** - The amount of heat (B.t.u.) transmitted from surface to surface through an area of 1 sq.ft. of a material or combination of materials in 1 hr., when temperature difference is 1° F. between the 2 surfaces. See: Conductances.
- CONDUCTANCES** - Experimental coefficients that express heat flow through a material due to convection, radiation and conductance. Expressed in units of $Btu/Ft^2/(Hr)^\circ F$.
- CONDUCTION** - It is a process of heat transfer within a material medium, in which thermal energy is passed from molecule to neighboring molecule in the course of a purely thermal motion.
- CONDUCTIVITY** - Relative ability of different materials to carry electric current based on pure copper as a conducting standard. A measure of the ability of a material to transmit heat by conduction. See: Conduction.
- CONDUCTOR PIPE** - Down spout. Usually a 3 in. pipe made of galvanized iron, copper, aluminum or other suitable materials to conduct rain water from the roof to the sewer or to the ground surface or other system of disposal.
- CONDUIT** - 1. Any channel which is intended for the conveyance of water, whether open or closed; any

- container for flowing water. 2. A pipe, usually metal, in which electrical wiring is installed.
- CONE CLUTCH** - A type of clutch no longer in common use on farm tractors. It consists of the frustrum of a cone keyed to a driven shaft so that it can be pushed into an opposite engaging surface rigidly attached to a driving shaft. See: Clutch.
- CONE GRATE** - The protective cover of an inlet riser which is slatted to prevent the entrance of foreign matter.
- CONEHEAD** - An object or figure which tapers uniformly from a point to a circular base.
- CONE OF DEPRESSION** - An inverted bell-shaped depression in the water table as a result of pumping. The water table surface which is formed as a result of pumping.
- CONFINED WATER** - Underground water which is trapped in geologic structures much in the manner as petroleum is trapped. The water is usually highly mineralized and once drawn out is not renewable since such water is not a part of the general hydrologic circulatory system.
- CONGEALING TANK SYSTEM** - System is used where it is desirable to store up refrigeration for meeting large demands of short duration. Consists of brine in the storage which is allowed partially to freeze onto the coils. This permits storage of a large refrigeration capacity with a smaller tank than with the regular storage system because of the low heat level of the frozen and chilled brine. It is not so popular as it needs more critical adjustment and care.
- CONICAL VALVE** - A form of lift valve whose sides are cone-shaped in section. It fits on an annular seating and has no wings. It sometimes takes the place of the common lift valve with parallel wings.
- CONNATE WATER** - Water trapped in sediments at time of deposition.
- If tapped by wells, it may be highly mineralized and of a briny nature.
- CONNECTED LOAD** - The total wattage of electrical equipment connected to a circuit, even though equipment may not be operating.
- CONNECTING ROD** - A part which links a piston and a crankshaft transmitting the linear motion of the piston into rotational motion of the crankshaft.
- CONNECTING ROD BEARINGS** - The bearing at end of an engine connecting rod which attaches to the crankshaft throw.
- CONNECTOR** - Any device for fastening two or more members together. They must be bolts, nails, screws, glue, etc.
- CONSERVATION DISTRICT** - A legal subdivision of a state, embracing the drainage basin of a river, which is established primarily for control of river floods. The governing body may have the right of eminent domain, including the power to levy taxes and to regulate the use of surface waters within the drainage basin.
- CONSERVATION POOL** - The storage space in a reservoir which cannot be drained below the outlet of a dam. The unuseable space is often allocated to silt storage, fish, waterfowl, recreation, etc.
- CONSERVATORY** - A glass structure constructed for the accommodation of flowering plants for display as contrasted to a structure for propagation which may or may not be attached to a house.
- CONSISTENCY** - The degree of cohesion of particles, expressed by such terms as "firm", "hard", "friable", "sticky", "soft".
- CONSTANT-ENTROPY** - See: Adiabatic.
- CONSTANT-LEVEL METHOD** - 1. A method of watering plants in a greenhouse in which a V-shaped channel (or a flat bottom covered by a half tile) is filled with pea gravel. On top of the gravel is placed a layer of sand and on top of that soil. The water table is held constant usually in the sand layer by use of

- a float valve. 2. A method used to water hogs; all the waterers for the individual pens are maintained at the same level.
- CONSTANT RATE PERIOD** - A period of time in which a given process occurs at a constant rate.
- CONSTANT RUNNING POWER TAKE OFF** - A type of power take off having its own clutch which allows it to continue to operate when forward motion of the tractor is stopped. Also called live power take off, independent power take off.
- CONSTANTS** - Factors which do not change in quantity, quality or properties.
- CONSTANT STROKE PUMP** - A type of pump used in diesel engines which has a constant stroke, the quantity of fuel needed to maintain the speed of the engine being controlled by governor mechanism which controls the suction valve, by-passing part of the fuel back to the storage tank; or the control may be by hand.
- CONSTANT VOLUME CYCLE** - A cycle that nearly represents the conditions in a diesel engine cylinder during very light loads. Heat is added and rejected at constant volume.
- CONSTRUCTION DRAWINGS** - Drawings which give in detail the whole plan of the proposed construction. May include stress sheet, design drawing, shop drawing and specification.
- CONSTRUCTION ESTIMATE** - An estimate of the total amount of material and labor needed for a project. Includes the various kinds and amounts of component materials; usually includes an estimated total cost.
- CONSUMPTIVE USE** - The sum of the volume of water used by the vegetative growth of a given area in transpiration or building of plant tissue plus that evaporated from adjacent soil, snow or intercepted precipitation on the area in any specified time.
- CONTACT POTENTIAL** - The extent of the ability of different metals to emit electrons between them.
- CONTAMINATED WATER** - Water unfit for a given use because of contact with or the presence of injurious substances.
- CONTAMINATING** - The process of polluting or making impure.
- CONTINUOUS-ACTION ATOMIZER** - A type of hand spray consisting of a pump and a chamber in which the spray liquid is poured. The pump builds up enough pressure after a few strokes to force out a continuous stream of spray.
- CONTINUOUS AGITATING COOKER** - A device for processing fruits and vegetables in cans in which the cans enter a small port-hole at one end of the sterilizer and travel along a spiral inside. While the cans are traveling through the processor, they are rolled continuously and the contents are thoroughly agitated. The device is much superior to the non-agitating cooker.
- CONTINUOUS AGITATING PRESSURE STERILIZER** - A device for sterilizing fruits, vegetables and evaporated milk under pressure and heat in which the can enters the sterilizer, and as it travels through it is agitated. It differs from the continuous agitating cooker in that the cans enter and leave the sterilizer through vestibules permitting the maintenance of pressure within the device.
- CONTINUOUS APRON** - Any type of continuous belt used to convey material from one point to another. A riddle. In a potato harvester, the apron is made of a series of bars so spaced as to separate the potatoes from the vines and dirt.
- CONTINUOUS BEAM** - A beam that rests on three or more supports.
- CONTINUOUS BOTTLE FILLER AND CAPPER** - A machine used in the modern dairy which consists of an endless belt on which milk bottles travel so that as they move along they are filled and capped.
- CONTINUOUS BUCKET ELEVATOR** - An elevator with a continuous series of buckets attached to a belt or chain. The front of each bucket

- is shaped so as to act as a deflector or chute for the material being discharged from the succeeding bucket as it passes over the head wheel. A feeding leg is necessary to introduce the material two or three buckets above the center of the foot wheel. Continuous buckets are not designed for scoop loading. Suited for heavy gritty materials such as sand, coal and ores.
- CONTINUOUS BUTTER MAKER** - A machine which is so designed that milk and/or cream may be poured in continuously at one end of the butter maker and butter will come out continuously at the other end.
- CONTINUOUS BUTTER MAKING** - A process of churning butter in which milk or cream is continuously added at the initial stage of the process, and butter is continuously removed at the latter stage.
- CONTINUOUS DELIVERY** - The continuous delivery of water to an irrigation farm throughout the season.
- CONTINUOUS DRYING** - Drying carried out with a continuous movement of harvested crop and continuous flow of air.
- CONTINUOUS DUTY** - A requirement of service that demands operation at a substantially constant load for an indefinitely long time. Usually refers to horsepower rating of an engine.
- CONTINUOUS FLOW DRYER** - A process or mechanism which operates continuously in the drying operation.
- CONTINUOUS FLOW DRYER, HORIZONTAL BELT** - See: Continuous flow dryer, vertical chamber.
- CONTINUOUS FLOW DRYER, VERTICAL CHAMBER** - To cause a continuous flow of materials over or through a drying mechanism or process, with the mechanism or process in a vertical position.
- CONTINUOUS FLOW IRRIGATION** - A system by which each person using irrigation receives his allotted quantity of water at a continuous rate. (obsolete)
- CONTINUOUS FRAME** - A member of a structure continuous over two or more supporting members.
- CONTINUOUS FREEZER** - A machine used in ice cream plants in which the mix is introduced continuously into the freezer and frozen ice cream continuously flows out at the other end. Air is added in metered amount, and a refrigerated cylinder chills and freezes the ice cream mix as it passes thru the machine.
- CONTINUOUS GRAIN DRYING** - Drying which is carried out with a continuous flow of grain and air in contrast to batch operation.
- CONTINUOUS HOUSES** - Two or more greenhouses in a greenhouse range which have a common gutter to drain the roofs and a partition dividing the houses under the gutter. See: Ridge and furrow houses, uneven span house.
- CONTINUOUS ICE CREAM FREEZER** - See: Continuous freezer.
- CONTINUOUS IRRIGATION** - Applying water to the soil for a long period of time, as used in frost protection, water is applied continuously as long as the frost hazard exists.
- CONTINUOUS LAYERING** - A method of propagation of plants by rooting the branches of wood plants while the branches are still attached to the parent plant. The whole shoot is bent down flat in a shallow trench which runs radially from the plant. Soil is placed over most of the branch and the end of the branch is permitted to come up out of the soil. This method is used for a few shrubs and vines, the buds of which will grow readily even though covered with soil. The common snowball European viburnum is often propagated this way.
- CONTINUOUS MANGER** - A type of manger which consists of a long trough into which the feed is placed. Partitions may be used to divide the manger into separate areas for each animal.
- CONTINUOUS NON-AGITATING OPEN COOKER** - A type of cooker for processing canned fruits and vegetables which

- consists of a long tank containing water through which the cans are conveyed. It is infrequently used.
- CONTINUOUS PASTEURIZER** - A pasteurizer which allows a continuous flow of milk, juices, etc., to enter and a continuous stream of pasteurized milk, etc., to be delivered to the bottle or can filler.
- CONTINUOUS PRESS** - A type of fruit press into which fruit enters at one end of the machine and the residue pulp is discharged continuously at the opposite end of the press. The juice escapes through openings in the walls of the press.
- CONTINUOUS STAVE-PIPE** - A pipe of wooden staves held together by encircling bands; the assembly is made in the field.
- CONTOUR** - A line which shows the location of points of the same elevation above a datum. A series of such contours serves to delineate the relief or topography of the land.
- CONTOUR BASINS** - Basins which are made by levees or borders following contours, with occasional cross levees. Also called contour checks.
- CONTOUR BORDER IRRIGATION** - The application of water to a very gently sloping field which has been divided into strips by earth ridges on the contours. The ridges, or levees, confine the water until the irrigation of a particular strip is completed. Also called contour checks.
- CONTOUR CHECKS** - A series of irrigation basins which are formed by small levees or ridges on contour lines.
- CONTOUR CULTIVATION** - Cultivating across the slope as nearly as reasonably possible on the contour to prevent excessive water erosion and runoff.
- CONTOUR FARMING** - A method of farming which entails soil preparation, planting and cultivating of crops, including operations for row crops, vineyards and small grain along guide lines that are nearly level or conform to acceptable grades.
- CONTOUR FENCE** - A fence following an approximate contour or elevation, but may be composed of a number of curved and straight sections.
- CONTOUR FURROW** - 1. A furrow plowed along a contour. 2. A level furrow which is made in a field or pasture to prevent runoff and soil loss.
- CONTOURING** - The practice of working land and planting crops across the slope on the approximate contour to reduce runoff. The contour is approximately level.
- CONTOUR INTERVAL** - The difference in elevation, or vertical distance between contours.
- CONTOUR IRRIGATION** - Furrows are laid across the slope on a pre-selected grade. (non-erosive) Water is applied to the land in limited quantities to reduce the erosion to negligible amounts.
- CONTOUR LEVEE** - A small continuous dike built across the slope on a contour for confining the areas of land so that they will retain water.
- CONTOUR LINE** - A line which is staked out in the field through points of equal elevation on a land surface or drawn on a map to show the location of points of the same elevation above a datum.
- CONTOURLINER** - A level device mounted on a tractor which enables the tractor operator to drive along a contour line without a preliminary survey.
- CONTOUR MAP** - A map which shows the lines of equal elevation of the topography.
- CONTOUR ROW** - 1. A row, all points of which have the same elevation within a given tolerance. 2. A row which runs at right angles to the line of slope, and is at the same level throughout, regardless of the irregularities of the landscape.
- CONTOUR STRIP CROPPING** - The production of crops in long variable

- width strips which are placed crosswise of the line of slope approximately on the contour.
- CONTOUR TILLAGE** - A system of performing the cultural practices of farming so that the various operations are performed on the contour within a given tolerance.
- CONTRACTED WEIR** - A measuring notch which has sides designed to produce a contraction in the cross-sectional width of the overflowing water.
- CONTRACTION** - The extent to which the cross-sectional area of a jet or nappe is decreased after passing an orifice, weir or notch.
- CONTRACTION JOINT** - A separation in a concrete slab filled with a poured filler, placed longitudinally or transversely to permit contraction and expansion without forming an irregular crack; not a true joint, a dummy joint.
- CONTRACTORS** - People who perform work such as installation of tile drains, ditch digging, excavating ditches and ponds, etc., at a certain cost per unit.
- CONTROL** - 1. An instrument that contains a sensing or measuring device that has linkage to transmit the response of the sensing device to that part which, when manipulated, causes a specific change in the variable sensed.
2. A section or a reach of a conduit in which conditions exist that make the water level above it a fairly stable index of discharge. A control may be partial or complete. A complete control is independent of downstream conditions and is effective at all stages. An overflow dam, a ledge of rock crossing a channel, a boulder-covered reach and an indurated bed are examples. Controls may be either natural or artificial.
- CONTROL FLUME** - An open conduit or artificial channel which is arranged for measuring the flow of water, generally including a constricted section wherein Belanger's critical depth exists. See: Parshall flume, Venturi flume.
- CONTROL GRID** - An open structure in an electron tube through which electrons can pass from the cathode to the anode. It controls the potential at some location between the cathode and plate. Usually maintained at a negative potential.
- CONTROLLED ATMOSPHERE** - Controlling the composition of a surrounding media. Generally pertaining to controlling the percentage of moisture, nitrogen, oxygen, carbon dioxide, etc. to a desired composition. A type of storage where the oxygen level is reduced and the carbon dioxide level increased from the normal storage levels to increase the storage level of a product. A method of preservation.
- CONTROLLED BURNING** - Planned burning held within desired bounds and under conditions of wind, humidity and fuel moisture that will hold burning intensity to the minimum necessary to accomplish the objective.
- CONTROLLED DRAINAGE** - A system in which the water table is controlled by a system of structures in drainage canals and additional irrigation water is not normally applied. See: Subirrigation.
- CONTROLLING DIMENSION** - That dimension which controls the amount of load a member can support. Usually the smallest cross section of the member.
- CONVECTION** - Movement or mass motion of gases or liquids due to temperature difference.
- CONVECTIONAL** - A type of storm or thunderstorm when, because of uneven heating, the air over a locality becomes warmer than the surrounding air. The warmer air becomes light and therefore rises, cooling as it rises; if sufficient moisture is present and the cooling process proceeds sufficiently, precipitation is formed.
- CONVECTIVE** - An air cell that forms during a storm in which warm air currents are rising and cooling.
- CONVENIENCE OUTLET** - A permanently

- installed electrical plug-in receptacle, including the box in which it is housed.
- CONVERSION** - A short conduit for uniting two other conduits having different hydraulic elements; a transition.
- CONVERSION EFFICIENCY** - The efficiency of converting one form of energy to another. When converting electric energy to radiant energy or heat, the efficiency is 100%.
- CONVEYANCE LOSS** - The loss of water from a conduit which is due to leakage, seepage and evaporation. It may be expressed in any unit of flow, percentage of flow in the conduit or average depth over wetted area per unit of time.
- CONVEYANCE STRUCTURE** - A structure usually necessary in open irrigation ditches to deliver water at the desired elevation on each field.
- CONVEYOR** - Any device used for the movement of materials in any direction.
- CONVEYOR ELEVATOR** - A type of elevator using a belt or chain as a means of transporting the material from one elevation to another.
- CONVEYOR TYPE DEHYDRATOR** - A mechanism which removes moisture from a material in a progressive process while it is moving on a conveyor carriage.
- CONVEYOR, UNLOADER TYPE** - An unloader box or hopper for grain and/or chopped forage, usually mounted on 2 or 4 wheel trailers or trucks, equipped with drag-link or auger type conveyors to convey material from unloader to bin, feed bunk, etc.
- COOKROOM** - The room which is set aside for the pressure cookers and the pressure cooking of canned fruits, vegetables, meats, etc., in a cannery.
- COOLANT** - Any medium having high heat transfer properties used to remove heat from internal combustion engines for example.
- COOLER** - Any of several devices which consist of a chest with a cooling device or refrigerant for reducing the temperature of certain farm products, such as milk.
- COOLER SHRINKAGE** - A loss in net weight of an animal's carcass, during storage in a cooler, which usually amounts to 2.5% of the total weight of the carcass.
- COOL HOUSE** - A house of a range of greenhouses which is maintained at a day temperature of about 55° to 60° and a night temperature of about 50° to 55°. Also called cool greenhouse. See: Warm house.
- COOLING COILS** - Used in air conditioning and refrigeration systems. They are pipes filled with a cooling liquid or gas over which air is passed to cool a room. May also be used to cool liquids.
- COOLING LIQUID** - See: Coolant.
- COOLING RACK** - A rack having several parallel, horizontal iron bars on which dressed poultry is hung to cool.
- COOLING STAGE** - The time required to cool a product mass in storage to a safe storage temperature.
- COOLING SYSTEM** - Any method of artificial cooling; for example, in an automobile the cooling system consists of the radiator, water pipes, circulating pump and fan.
- COOLING TOWER** - A unit used to cool the water or other liquids usually by counter current liquid air flow. Types of cooling towers; the natural-draft type and the forced-draft type.
- COOLING ZONE** - That portion of the product mass in a storage where the product temperature is falling during aeration.
- COOPERAGE**- 1. The barrels, kegs, etc., produced by a cooper. 2. The lining of boxcars to prevent leakage of bulk products.
- COPE** - To cut out or shape to fit any material.
- COPING** - Stones or bricks laid on top of a wall to provide a finished surface that will shed water.
- COPPER-CONSTANTAN** - Basic materials to make a thermocouple. Constantan

- is a metal alloy containing nickel and copper.
- COPPER LOSS** - The lost energy in an electric machine due to the electrical resistance of the copper wire in the armature and field.
- COPPER WIRE** - A strand of copper metal formed by drawing copper through dies.
- CORBEL** - To build outward by projecting successive courses of masonry or wood beyond those below.
- CORD** - The unit for measure of wood for fuel. 128 cu.ft.
- CORDUROY ROAD** - A road or path made by laying saplings or small poles close together and crosswise of the road, used primarily as a technique for crossing swampy or wet areas. Also a condition of roads in which corrugations have formed due to traffic, giving a wash board effect.
- CORE** - A brick or stone filling between relieving arches and lintels. Inside a stone-cased column. Filling in a thick wall. A sand filler used to form open spaces in metal casting.
- CORE VALVE** - A plug valve which has a rotary turning motion in a hollow conical seat, occupying about the same relative position to its seat as the core of a faucet does to the casing itself.
- CORE WALL** - A wall of masonry, sheet piling or puddled clay built inside an earth dam or embankment, the purpose of which is to reduce percolation.
- CORINTHIAN** - The third order of Greek architecture. The distinctive feature is the column capital, composed of two tiers of acanthus leaves surmounted by volutes supporting the angles of the abacus.
- CORKBOARD** - A rigid type material made from granulated cork heated and pressed together in different thickness. Is used for insulation, sound deadening, etc.
- CORK-COMPOSITION** - A type of flooring material made from cork which is pressed and heated to form a thick, homogeneous surface, provides a resilient, warm and noiseless floor.
- CORN BINDER** - A machine for harvesting rows of corn or sorghum. The machine cuts the standing stalks, gathers them into bundles and ties them with twine prior to ensiling or shocking.
- CORNCOBS** - Vegetative material used in blinding tile. Is the natural core of an ear of corn, to which the kernels are attached.
- CORN CRACKER** - A mill which is used to grind corn kernels coarsely.
- CORN CRIB** - A building which is designed especially for storage of ear corn. The roof is watertight, but the sides usually are slatted for ventilation. A temporary storage, with or without roof, made of woven wire or slatfencing, either circular or rectangular in shape. See: Single crib, double crib.
- CORN CUTTER** - See: Stalk cutter.
- CORN ENAMEL** - An enamel used in metal cans in which sweetcorn is packed. The enamel contains a small amount of zinc oxide to prevent blackening or discoloration of the can. Also called C-enamel.
- CORNER** - 1. In land measurement and surveying, a point where boundary lines meet. 2. The junction point of two fence lines.
- CORNER BEAD** - A strip of formed galvanized iron placed on corners of interior walls before plastering to aid in forming a straight edge and to reinforce them. A piece of three-quarters-round or angular wood finish placed over a plastered corner to protect it from breaking off. A small moulding usually scotia fillet of quadrant, in the inner angle of intersecting surfaces.
- CORNER BRACE** - A brace or reinforcement to keep a corner fence post erect so that the tension of the fence does not pull it out of line.
- CORNER POST** - The fencepost at the apex of an angle which bears the

- strain of the fence wire from two directions.
- CORNER STUDS** - Occur at the intersection of two walls at right angles to each other and form the corner framing of a building.
- CORN GRADER** - A machine which is used to separate various sizes and shapes of kernels for the seed trade. The size and shape of seed should conform to the size of the holes in the corn planter plate. See: Cell drop.
- CORN HARVESTER** - See: Corn binder, corn picker, picker-sheller.
- CORN HILL** - The spot in a cornfield or row of corn in which one or more stalks of corn are growing.
- CORNHUSKER** - A power driven machine which snaps ear corn from the stalks, elevates the ears onto a series of rollers, which working in pairs, strip the husks from the ears, after which they are delivered to the wagon or carried.
- CORNHUSKING** - The removal of the corn husks from the ears of corn, by a husker in the field or from snapped corn.
- CORNICE** - A horizontal, decorative element projecting from the face of a wall. Sometimes placed over windows or doors but usually placed at or near the level of the eaves at the lower end of the roof rafters.
- CORN MILL** - A machine which is used to grind corn on the cob for feed. A roller mill for grinding corn.
- CORN PICKER** - A corn harvester being a single or double row machine which is equipped with snapping rolls to remove ears of corn from the standing stalk. The machine does not sever the stalks from the ground. It may be one of several different types; the snapper which does not remove the husk, the picker husker which after picking corn, husks and shells it. There is also the picker-shredder which shreds the stalks after the ears have been picked.
- CORN PLANTER** - Any of several different mechanical devices used to plant corn which is designated according to the manner in which the corn seed is dropped; for example, the check-row planter, lister planter.
- CORN PLANTER PLATE** - A metal plate in the bottom of the seed hopper on a corn planter which has around the circumference, a series of notches of a size to hold one of several grains of corn depending upon the method of planting the corn. This plate rotates carrying the kernels over a hole so that they drop down into the seed tube and are planted at regular intervals. See: Cell drop.
- CORN SHELLER** - A machine which removes corn kernels from the cob.
- CORN SHREDDER** - A farm implement which husks the ears and tears the dried corn stalk into bits for feeding. See: Corn picker.
- CORN SNAPPER** - A corn picker which detaches the ears of corn from the stalk but does not remove the husk. See: Corn picker.
- CORNSLED** - A crude, wooden sled provided with cutting knives on one or both sides which was sometimes used in harvesting corn before the advent of the corn binder.
- CORONA** - 1. In electrical engineering it is the discharge of electricity which appears on the surface of a conductor when the potential gradient exceeds a certain value. 2. A kind of upper saddle blanket for pack animals.
- CORRECTED BELT HORSEPOWER** - The horsepower developed under standard conditions of 60° F. and 29.92 in. Hg.
- CORRECTED HORSEPOWER** - Obtained by correcting observed horsepower to standard conditions of sea-level pressure (29.92 ins. mercury) and 60° F. temperature.
- CORRECTION STRIP** - In strip cropping to reduce soil erosion, a strip of irregular width so placed between contour plantings of cultivated crops as to permit the cultivated strips to be of uniform widths.
- CORRODE** - A slow or gradual eating away or erosion of metals. Due to chemical action.

- CORROSION** - The mechanical or chemical detachment or wearing away of material caused by agents foreign to the affected material usually due to chemical action.
- CORROSION INHIBITOR** - An additive used in cooling systems to prevent the formation of rust by forming a very thin film over all interior surfaces of the system. Also, used as an additive in engine lubricating oils.
- CORROSION RETARDERS** - Compounds which retard corrosion or ion transfer. Those compounds placed on a surface which reduce oxidation; e.g. sodium chromate is the best of the known corrosion retarders for calcium chloride brines since chromates inhibit corrosion by brines.
- CORRUGATED METAL** - A sheet of steel or other metals in folds or furrows of regular size and spacing in order to give greater strength and rigidity.
- CORRUGATED ROLLER** - A clod crusher consisting of vee-shaped wheel sections which consequently leave a vee-pattern on the surface of the soil. See: Clod crusher.
- CORRUGATION IRRIGATION** - Application of water in small furrows running across a slope of land from the head ditch. The furrow guides the water, but some overtopping may occur. Adapted to close-growing crops in sloping and rolling land.
- COSMIC** - Something vast and systematic that is harmonious and orderly as opposed to chaotic. Pertaining to the universe as a whole and not to the earth alone.
- COSMIC RAYS** - Rays of extremely high frequency produced beyond the earth's atmosphere by transmutations of atoms continually taking place in outer space. Some scientists suggest they are rapidly moving charged particles and others believe they are waves with frequencies thousands of times greater than x-rays and wave lengths shorter than any produced in the laboratory.
- COST ACCOUNT** - A system of accounting in which records are kept of all cash and non-cash costs chargeable to a crop or livestock enterprise, including such records of labor, power and machinery use, buildings use, feed fed, interest charges, etc., and cash and non-cash returns for the purpose of preparing an account to show costs of production, returns and net profit or loss on the enterprise. Cost accounts are of two types; enterprise cost accounts which take into consideration a single crop or livestock enterprise and complete cost accounts which constitute a double-entry system of accounting for similar records detailed on all respects of a farm business.
- COST AND TIME STUDY DATA** - The data obtained from comparing or relating the cost of an operation to the time necessary to complete the operation.
- COTTER** - A beveled piece of wood or steel, used as a wedge for fastening; also a split steel key, used for the same purpose.
- COTTON BALE** - A compressed package of cotton fibers.
- COTTON BELT** - That section of the United States in which cotton is the principal or an important crop: Florida, South Carolina, Georgia, Alabama, Arkansas, Texas, Louisiana, Missouri, Tennessee, North Carolina, Mississippi, Oklahoma, New Mexico, Arizona, California.
- COTTON BREEDER** - A scientist whose principal activity is concerned with the improvement of good strains of cotton varieties.
- COTTON FIBER** - The soft white fibrous material attached to the cotton plant seed.
- COTTON GIN** - 1. A machine or device which is used to separate the cotton seed from the cotton lint. 2. A building where the lint cotton is compressed into bales. Also called gin, ginhouse.
- COTTON HARVESTER** - Any mechanical device used in the harvesting of

- cotton. See: Cotton picker, cotton stripper.
- COTTON MILL** - Any mill which manufactures cotton thread or cloth.
- COTTON PICKER** - A machine used for mechanically harvesting cotton, which removes only the mature seed cotton. The basic principle on which it operates is a revolving spindle which penetrates the cotton plant and winds the seed cotton from the open boll and carries it to a dropping zone in the machine.
- COTTON PLANTATION** - A large acreage owned by an individual or a corporation most of the land of which is devoted to the growing of cotton.
- COTTON PLANTER** - A device for planting cotton seeds in a row.
- COTTON PLATE** - A part of the metering device within the planting mechanism of a row crop planter having openings designed to fit the cotton seed.
- COTTON PIPE** - A tube roughly one ft. in diameter which conducts seed cotton from a truck or wagon into the cotton gin by vacuum.
- COTTON PRESS** - A press in which cotton is baled for transportation and storage. There are various forms of cotton presses, known as the screw, toggle, beater, revolving, hydraulic, portable, double acting windlass, rack and pinion, repressing, and rolling pressure presses.
- COTTON SLED** - A machine having a V-shaped throat which when pulled along the rows of cotton, pulls off the bolls and directs them into a container. It was an early cotton harvesting machine.
- COTTON STRIPPER** - A machine used for harvesting cotton mechanically which removes all bolls whether open or closed from plant. Early types of strippers were simply inclined fingers which gave a combining action. Present day machines consist of a roller and stripping bar, or two rollers driven so that their adjacent surfaces move upward.
- COULEE** - A topographic feature with several local connotations: it may be a waterway bordered by natural levees; a small creek or run; a sharply cut narrow valley carrying only storm water; the equivalent of gulch; a steep walled, abandoned, glacial stream valley; or dry canyons as in the scablands of the Columbia plateau region of the northwestern United States.
- COULOMB** - A measure of electric current, that passes through a conductor in a given time. One coulomb is the quantity of electricity transferred by one ampere in one sec.
- COULTER** - An attachment to a plow which cuts a vertical slit through the soil ahead of the point of the plow bottom. Its purpose is to cut and divide the surface trash and help produce a vertical furrow wall. See: Scalloped-edged rolling coulter.
- COUNTERBALANCE** - A weight placed opposite a crank arm to balance the revolving weights and a certain proportion of the reciprocating weights.
- COUNTERSHAFT** - A shaft receiving its power from a main driveshaft and transmitting it to some working part.
- COUNTERBRACE** - A web member of a truss which transmits stress in the opposite direction (in relation to span length) to that transmitted by the main web diagonal.
- COUNTER FREEZER** - A small ice cream freezer in which ice cream may be frozen for serving in the semi-frozen state or to be hardened and stored. It is compact enough to be installed in drug stores, confectioneries, etc.
- COUNTY DRAIN** - A constructed drainage system consisting of an open ditch, a closed conduit, or a combination of open and closed conduits that provide a drainage outlet for agricultural and/or urban areas. It is organized and administered according to the laws of the individual state. See: Judicial ditch.

- COUPLE - 1. Two equal and parallel forces acting in opposite directions and tending to produce rotation. 2. To attach, to hitch, as to couple a trailer to a tractor.
- COUPLER - Any device which is used to join or connect two or more other devices. See: Bolt.
- COUPLING POLE - The shaft which connects the rear axle to the front bolster of a wagon. Also called reach.
- COVE MOULDING - A moulding cut with a hollow circle, used in corners such as between the ceiling and the wall.
- COVERAGE - The amount and uniformity of material deposited on the insects, foliage, soil or other surface as required.
- COVER BOARDS - Boards placed on top of a pile of lumber during drying for protection of the pile. These are usually of low-grade lumber.
- COVER CAP - A metal or paper cover which fits over the pouring lip of the milk bottle to protect the lip from contamination. This is in addition to the regular cover. Also called hood cap.
- COVER CROP - A crop which is grown primarily for the purpose of adding organic matter to soil, and/or soil protection against erosion usually between periods of regular crop production. Effective for control of erosion during winter.
- COVER CROPPING - The establishment of close growing crops, usually between cropping seasons to protect the soil against wind and water erosion and/or to improve the soil by addition of organic matter.
- COVERED WAGON - A wagon drawn by horses, oxen or mules, the bed of which is protected by a canvas or tarpaulin spread over hoops fastened to the sides of the wagon. It was used primarily as a means of weather protection for the products being carried, although on the westward trek across the United States by the pioneer emigrants, it served also as living quarters.
- Variation: Connestoga wagon.
- COVERING DEVICE - A device used on seeding equipment such as drag chains, drag bars, scraper blades, press wheels, etc., which helps place moist soil in contact with the seeds.
- COVERING SHOVEL - Cultivator shovels used when planting cotton in beds, which are so located and adjusted that they throw soil over the planted row. See: Shovel.
- COVERING WIRE - An attachment to a moldboard plow which consists of a piece of wire so arranged as to help cover trash and vegetation by the furrow slice.
- COVER PLATES - The structural members used to cover the exposed edges of built up columns. They actually form part of and add strength to the column.
- COW ALLEY - The area within a milking room or stable which is used for the entrance and exit of cows.
- COW BARN - A barn designed for the housing of dairy cows which is usually equipped with stanchions, manger, gutters and other features. See: Dairy barn.
- COWL - A curved, flaring top fitted to a ventilation pipe with a vane which controls the direction of its opening in relation to the wind. A pressure cowl faces the wind; a suction cowl faces in a down wind direction.
- COW-MONTH - A unit of measurement of the feed or forage acreage which is necessary to maintain a mature cow for 30 days.
- COWPEA HULLER - A special device for removing the cowpea seed from the hulls or pods. Also called cowpea hulling machine.
- COWYARD - See: Barnyard.
- CPS - Cycles per second. Term used in rural electrification.
- CRAB - A short shaft or axle which is mounted in a frame having squared ends to receive hand cranks and which is used to wind up a rope and thereby raise a load.
- CRACKING - A process in which the complex hydrocarbons composing petroleum or other similar oils,

- are broken up by heat and, usually, pressure, into lighter hydrocarbons of simpler molecular formulae.
- CRADLE** - 1. A framework consisting of several long, slender wooden fingers about 2½ ft. long which is attached by a frame to a scythe to gather the grain into a swath and to protect it from shattering as it is cut. 2. A large, smooth area which is leveled out for large trees to be felled on to prevent breakage. 3. Any framework of 10 to 12 rigid sticks which is so tied to an animal's neck as to prevent it from turning its head sideways, and which is used to prevent self-sucking, tearing off bandages, etc. 4. A footing or support structure shaped to fit the conduit it supports.
- CRADLE DYNAMOMETER** - When a shaft is subjected to a twisting movement, an angular twist is produced which is proportional to the moment. The cradle dynamometer is an instrument or device mounted in concentric (ball) bearings so that the stator is free to turn. The twist (torque) can then be measured by suitable scales. See: Dynamometer.
- CRAMMING MACHINE** - A device for force feeding of poultry which consists of a tripod and a tank to hold the ration. The feed flows into a pipe connected to the tank and is forced into the throat of the bird by a foot-operated or machine-operated plunger. It is used chiefly in France for fattening geese to increase the size of the liver.
- CRANBERRY BARREL** - A standardized container which is used for marketing cranberries and which contains 5,826 cu.ins.
- CRANBERRY SCOOP** - A device which has teeth arranged like a comb for the purpose of raking cranberries off bushes and catching them in a box behind the teeth. See: Wisconsin rake.
- CRANK** - An arm perpendicular to a shaft used for the conversion of horizontal motion to rotational motion. Also used as a verb indicating the act of cranking.
- CRANK ANGLE** - The angle formed between a reference point and the position of a crank on a crankshaft at any given time during one complete revolution.
- CRANK ARM LENGTH** - The radius of the circle inscribed by the crank arms.
- CRANKCASE** - The case surrounding the crankshaft and certain other moving parts of the engine, protecting them against dust, dirt, and mechanical damage, and acting as a part of the framing in supporting the cylinder walls. Also frequently serves as a reservoir for oil used in lubricating the engine.
- CRANKCASE BREATHER** - An opening in the crankcase of an internal combustion engine providing for ventilation of the crankcase and to equalize the pressure on the inside and outside of the crankcase. It is usually equipped with a small air cleaner to prevent dust from entering.
- CRANKCASE OIL FILTER** - A device used in the lubrication system of internal combustion engines for the removal of contaminants from the lubricating oil.
- CRANK DEAD CENTER** - The position of the crank shaft and piston is at the end of the intake and power strokes.
- CRANK DUSTER** - A small duster for spreading poison dust for insect or disease control, in which the dust is forced out of a container by a hand-cranked mechanism.
- CRANKING** - The act of rotating an internal combustion engine either manually or with an auxiliary motor for the purpose of starting the engine.
- CRANK PIN** - The cylindrical stud or pin at the extremity of a crank, and parallel with it, which affords attachment for the link or connecting rod by which the crank shaft is turned. The portion of an internal combustion engine

- crankshaft forming the bearing journal for the connecting rod.
- CRANKSHAFT** - A shaft consisting of one or more cranks which convert reciprocating motion into rotational motion, such as the crankshaft of an engine. See: Crank.
- CRAWLER TRACTOR** - A type of tractor propelled over the ground by means of endless track running around a drive wheel and several idler wheels. Also called a track-layer tractor.
- CRAWLER-TYPE CANE WAGON** - A type of wagon with endless tracks in place of wheels transporting heavy loads in soft ground which is used in distributing seed cane in the Florida Everglades region.
- CREAM COOLER** - A device used to remove heat from cream. Usually cooled by water or artificial refrigeration.
- CREAMERY BUTTER** - That butter which is produced in a factory or creamery as contrasted with home-churned or farm-made butter.
- CREAM LAYER** - The upper portion of non-homogenized milk in a container which is richer in milk fat than the remainder.
- CREAM LINE** - Usually considered to be the line of demarcation between the layer of cream and the skim milk, in a bottle of milk. See: Cream layer.
- CREAM PLUG** - A defect of bottled milk and/or cream in which a mass of concentrated, semi-solid, partially churned cream forms in the top of the container and restricts the flow therefrom.
- CREAM RIPENING** - The culturing of certain microorganisms to impart characteristic flavors in cream which is to be churned.
- CREAM SCREW** - An orifice type set screw on a cream separator bowl which controls the outward flow of the cream, the ratio of cream to skim milk and the fat content in the cream and skim milk.
- CREAM SEPARATOR** - A machine consisting of a series of revolving discs in a bowl which is used for separating cream from milk by centrifugal force.
- CREAM TEST BOTTLE** - A long neck, calibrated bottle which is used for determining the fat content of cream.
- CREEP FEEDER** - A type of pen or enclosure into which young animals may pass and feed without competition from older or larger animals.
- CREEP FEED (ING)** - A method of feeding young livestock in which an enclosure surrounds feed especially suited to the young. The opening into the enclosure is large enough for the young animal to enter, but too small to admit a mature animal. See: Creep feeder.
- CREOSOTE** - An oily fluid manufactured by the destructive distillation of bituminous coal during the process of making commercial gas. Creosote is a very effective wood preservative.
- CREST** - 1. The top of a dam, dike, spillway, weir. 2. The peak or high water mark of a flood.
- CRIB** - 1. A bin for corn or grain. 2. A retainer for a bank of earth. 3. A manger for cattle or horse feeding.
- CRIB DAM** - A barrier which is made of timber forming bays or cells filled with stone or other suitable material for streambank protection.
- CRIB-WALL** - A type of wall construction for grain bins in which 2 in. lumber is laid flat, one on top of the other, and spiked together. An open or slatted type of wall which is generally used to provide ventilation in ear corn storage cribs.
- CRICKET** - A small roof structure of either single or double slope which is placed in a horizontal valley to create effective drainage.
- CRIPPLE** - A platform or scaffold used as a means of building construction. Same as a jack.
- CRITICAL COOLING RATE** - The rate in degrees per sec. at which, or above which, a steel must be cooled in order to develop martensite.

- The critical cooling rate varies with the steel. For most steels the rate is so high that the steel must be cooled by quenching in water or oil.
- CRITICAL DENSITY** - The density at which the soil is not stable enough to make a good embankment. Additional compaction in some soils passes critical density and increases the shear strength and settlement of the embankment.
- CRITICAL DEPTH** - 1. The depth of water in a channel which corresponds to one of the recognized critical velocities; ordinarily, Belanger's critical depth, the depth at which a given flow would attain its minimum energy with respect to the bottom of the channel. 2. The depth at which in a given channel a given quantity of water flows with minimum energy.
- CRITICAL FLOW** - A condition of flow for which the mean velocity is at one of the critical values; ordinarily flow at Belanger's critical depth and velocity. Another important usage is in reference to Reynolds' critical velocities such as the point at which the flow changes from stream line or non-turbulent flow. See: Critical velocity, supercritical flow.
- CRITICAL MOISTURE CONTENT** - The minimum moisture content of the grain that will sustain a rate of flow of free water from the interior to the surface of the grain which is equal to the maximum rate of removal of water vapor from the grain under drying conditions; occurs between the constant rate and falling rate periods.
- CRITICAL SECTION** - Placed in a board or timber where the net cross-section is least. It is the point where failure of the piece is likely to occur.
- CRITICAL SIZE (OF SAND)** - The maximum grain size that will be transported by a given velocity of water.
- CRITICAL VELOCITY** - 1. Reynolds' critical velocity is that at which the flow changes from laminar to turbulent, and where friction ceases to be proportional to the first power of the velocity and becomes proportional to a higher power - practically the square. 2. Kennedy's critical velocity is that in open channels which will neither deposit nor pick up silt. 3. Belanger's critical velocity is that condition in open channels for which the velocity head equals one-half the mean. See: Critical depth.
- CROP BOOM** - A pipe connected to the fluid outlet of a crop or field sprayer to which the nozzles are attached, so as to discharge the spray material for distribution over an area covered by the boom.
- CROP CLEARANCE** - The available working distance between any part of a field machine or power unit and the crop it is being used on.
- CROP DRYING** - The process of removing moisture from crops.
- CROPLAND** - That land that is suitable to raise crops in rotation continuously.
- CROP LOSSES** - The loss of crop produce through disease, weather conditions, etc.
- CROP MANAGEMENT** - Managing a crop in such a way so as to increase the fertility of the land and prevent soil erosion.
- CROPPING PLAN** - The scheme of growing different crops in a planned, recurring succession on the same land, in contrast to a one crop system or a haphazard change of crops. See: Rotation.
- CROP RESIDUE MANAGEMENT** - The operation and management of crop land to conserve stubble, stalks and crop residue on the surface to prevent wind and water erosion; to conserve moisture, decrease evaporation and insure future crop production.
- CROP RESIDUE** - That part of the crop that is left in the field after harvest to work back into the soil.
- CROP ROTATION** - A sequence of crops growing in recurring succession

- on the same area of land, which provides for the growing of different crops rather than continuous culture of one crop, and for the growing of these different crops in systematic order rather than in haphazard fashion. See: Cropping plan.
- CROPPING STATION** - A place for an operation in plant dressing of poultry, in which large numbers of birds are cleaned, which consists of cleansing the crop of feed by massage, and thus forcing the feed out of the mouth or out of an incision in the neck of the bird.
- CROP WITH** - To grow one crop after another, as in rotation.
- CROP YEAR** - 1. The interval from the planting to the harvest of a crop. 2. The time of harvest of 1 yr. to the time of harvest of the following yr.
- CROP YIELD** - The amount of harvest per acre, or other land measure, for a particular crop. Usually per yr.
- CROP YIELD INDEX** - An index which is a percentage figure showing relation of combined yield of crops on a farm to the combined average yield of the same crops for the region. The total production of each crop is divided by the average yield per acre for the same crop for that region. The quotients are added and divided by the total of acres of the same crops of the farm. The result is multiplied by 100 and stated as a percentage.
- CROSS-ALLEY** - An alley in a barn which runs from side to side, as contrasted to the main alley which usually runs lengthwise of the barn.
- CROSS BEAM** - A girder which runs transverse to the center line of a structure.
- CROSS BRACE** - Either of two diagonal braces that cross over each other. A member holding opposite walls of a structure together against lateral forces.
- CROSS BREAK** - A break in a piece of lumber across the grain which results from unequal shrinkage or from mechanical stress.
- CROSS-BRIDGING** - Thin pieces of timber or small metal members inserted in a diagonal position between floor joists, for the purpose of stiffening the floor.
- CROSS CHECK** - The condition resulting from the use of a check row planter in which the plant spacing is equal in all directions and forms perfect rectangles.
- CROSS CONVEYOR** - Any type of conveyor which moves material crosswise or laterally to the original direction of movement or line of travel of the machine in which it is used. In a pickup baler, the cross conveyor carries hay laterally from the pickup mechanism to the baling mechanism.
- CROSS-CULTIVATION** - The working of a field, orchard, etc., in which the field is cultivated in one direction followed by cultivation at right angles to the first.
- CROSS-DRAINAGE DITCHES** - A system of ditches used in draining water away from a road.
- CROSS GRAIN** - A condition in wood when the fiber or grain does not run parallel to the principal axis of the piece.
- CROSS-GRAINING** - In plywood, the system of running the grain in adjacent plies at right angles to each other. This restricts dimensional change of the plywood. See: Plywood.
- CROSS SECTION** - 1. A vertical section of the surface of the ground, or of underlying strata, or both, taken at right angles to the center line or across a stream. 2. A horizontal grid system laid out on the ground for determining contours, quantities of earth work, etc., by means of elevations of the grid points. 3. A section made by a secant plane perpendicular to the axis of the member, structure, or any construction.
- CROSS-SECTIONAL AREA** - The area of a plane that cuts through an object perpendicular to the

- longitudinal axis.
- CROSS-SLOPE BENCH** - A bench terrace running along or near the contour which has a steep drop on the downhill side with the space between terraces being nearly flat. See: Bench terrace.
- CROSSED BELT** - One employed to drive a pulley in the opposite direction to its driver. It is usually twisted $\frac{1}{2}$ turn from one end of the belt to the other.
- CROSS-FENCED** - Of, or pertaining to, a farm or ranch which is enclosed by a fence and which has field or pastures fenced off within the outer fence.
- CROSS GRAIN** - A general term describing any departure of wood cells or fibers from a direction parallel to the axis of the piece. This includes spiral, diagonal, wavy, dip, curly and interlocking grain.
- CROSS GUTTER** - A short channel in the barn floor running perpendicular to the main gutter, that is usually used in connection with mechanical gutter cleaners.
- CROSS HAUL** - A method of loading logs on a vehicle in which one end of a line is made fast to the vehicle and passed over the bed and around the log to be loaded. Power is applied to the line, and the log is rolled onto the vehicle.
- CROSS PIECE** - A piece framed cross-wise in a structure.
- CROSS PLOWING** - A method of blocking cotton, beets and other drilled crops using sweeps mounted on a cultivator, set flat and run at right angles across the rows.
- CROSSPLY** - In plywood, adjacent plies are laid with the grain running in opposite directions; thus, adjacent plies are known as crossplys.
- CROSS-SHAFT** - A shaft extending through machine for the purpose of transmitting power from one side to the other.
- CROTCH** - A small sled which is made from the fork of a tree and is used to skid logs. Also called alligator, crazy dray, go-devil, travois, lizard.
- CROWDING PEN** - A pen which is used for sorting or handling animals; a corral.
- CROW FOOT WIRE FENCE** - A wire fence, having diamond-shaped mesh, which restrains large and small animals and which is difficult for trespassers to climb over.
- CROWN** - 1. A crimp-on closure for glass bottles (and some beer cans) that is used to seal pop bottles and beer bottles. 2. The upper surface of a furrow slice; the width of the top of a levee; the neck of a sweep or cultivator point which is used to fasten the sweep to the cultivator shank; the top of a hill; the higher, center portion of a road.
- CROWN CAP** - The most common and least expensive closure for bottles with small necks and openings, which consists of an outer metal disc with a cork disc fitting on the inner side. The cork rests against the top of the bottle and the metal edge, which is corrugated, forces the seal. The cap is crimped to the bottle by a capping machine.
- CROWNED COVER PLATE** - An arched piece sitting in the bottom of the seed hopper of a corn planter, which is so shaped as to cause the kernels to slide to the outer edge of the hopper where they drop into the cell drop.
- CROWNED PULLEY** - A belt pulley with a working face of variable diameters, such that the maximum diameter lies in a plane about which the belt operates symmetrically. The largest diameter is at the center of the force of the pulley.
- CROWN MOLDING** - A standard item of wood mill work used to fit into a right angle between two plane surfaces.
- CROWN PIECE** - A short piece of timber acting as a ridge plate on top of a wall to support a structure.
- CROWN RADIUS OR TREAD RADIUS** - The radius of curvature of the face of

- the lugs measured at right angles to plane of the center line of the tire with the tire mounted on its recommended rim and inflated to recommended pressure.
- CRUDE OIL** - See: Crude petroleum.
- CRUDE PETROLEUM** - Unrefined oil as it comes from the earth. It usually contains impurities such as sulphur compounds, dirt and water.
- CRUMBER** - A device which is a part of a machine for digging trenches for tile. It follows immediately behind the digger unit and serves to clean out and smooth the indentation into which the tile is placed.
- CRUSHER** - A device or machine in which material is compressed, bruised, pulverized, squeezed, extracted, shattered or otherwise reduced in size by passing between two or more working elements. Crushers of various types are used to extract oil and juices from various commodities, to bruise, squeeze, crush or break newly mown legumes, etc.
- CRUSHER BOARDS** - Boards attached to the runners on a sled lister cultivator, extending at right angles to the cultivator, which are used to smooth the soil.
- CRUSHING AND PRESSING** - The process whereby juices or saps are separated by pressure from the less valuable fiber or pulp.
- CRUSHING STRENGTH** - The strength of tile that helps determine the maximum depth it can safely be laid. The ability of tile to resist exterior forces without cracking.
- CRYOLAC NUMBER** - An index related to the theoretical freezing point of milk calculated from the value lactose and chloride content. Varies from 393 to 435 with a mean of 413.
- CRYSCOPE** - An instrument which is used to determine the freezing point of milk.
- CUADRA** - A unit of land measurement which in Argentina equals 4.17 acres; in Chile 3.88 acres; in Paraguay 1.85 acres; in Uruguay 1.82 acres; in Brazil 0.92 acres and in Puerto Rico 0.971 acres.
- CUBAGE** - The number of cu.ft. of volume in a building often used for estimating total construction cost.
- CUBIC FOOT PER SECOND** - The standard unit of measurement of flow in irrigation, which is 1 cu.ft. of water flowing past a given point in 1 sec.
- CUBING MACHINE** - A device which macerates meat to make it tender.
- CULLING CHUTE** - A chute through which animals are passed single file so that they can be judged prior to removal of animals for sale.
- CULTI-CUTTER** - An implement with heavy spade-like blades which is used for cultivating the sod cover maintained in orchards.
- CULTIPACKER** - A machine used to brush clods and firm or pack the soil utilizing one or more rollers made up of Vee-shaped wheel sections or those having sprocket-like teeth on their periphery, so as to present a corrugated or jagged working surface to the soil.
- CULTIVATING SHOVEL** - See: Shovel 2.
- CULTIVATION** - 1. The planting, tending, harvesting and improving of plants. 2. Tillage of the soil to promote the growth of a crop after the preparation of the seedbed and after the plant has germinated and appeared above the ground. 3. Loosening the soil and removing seeds from among desirable plants.
- CULTIVATOR** - A farm machine used to till the upper portion of the soil, primarily used to destroy weeds or form a moisture retaining mulch. It consists of a frame work to which are attached the soil working elements, such as shovels, teeth, disks, blades, knives, etc. See: Field Cultivator.
- CULTIVATOR SHIELD** - See: Shield 1.
- CULTIVATOR SHOVEL** - See: Shovel 2.
- CULTIVATOR SWEEP** - See: Sweep.
- CULTIVATOR TEETH** - A general classification for all types of shovels and sweeps used on cultivating

- equipment.
- CULTURAL PRACTICE** - A practice that deals with the working of the soil in the growing of crops.
- CULTURE BUTTER** - Butter manufactured from cream to which a culture of desirable bacteria has been added.
- CULTURED BUTTERMILK** - The product obtained by souring pasteurized skimmed or partially skimmed milk, which contains not less than 8.5% of milk solids not fat, by means of a suitable culture of lactic bacteria.
- CULTURED CREAM** - A heavy, smooth, viscous creamy product which results from the ripening of pasteurized sweet cream by the use of a lactic culture.
- CULTURED SOUR CREAM** - See: Cultured cream.
- CULTURE JAR** - A container in which milk is heated or sterilized and prepared for the growth and development of commercial cultures.
- CULVERT** - A conduit to convey water through an embankment. A distinction between a highway culvert and a bridge is that the top of a culvert does not form a part of a roadway surface.
- CUP** - 1. The receptacle which is attached to a tree to collect rosin in turpentine orcharding. 2. A notch made by two downward cuts of an ax in a tree which is used for killing a tree with herbicide. 3. A curve which occurs across the face of a piece of board. 4. Mechanical objects resembling a drinking cup: in lubrication, a vessel or small funnel for receiving oil, etc., and conveying it to a machinery part, an oil cup; in grain elevators, a bucket or receptacle with more or less curved outline.
- CUP DRILL** - A grain drill with vertical seed-metering wheels with cups on the edges which lift up through a seed pool and throw approximately one seed per cup over into the seed tube. Most popular in England.
- CUP FLATS** - A carton for shipping eggs which has individual cells or cups for each egg to prevent damage in transit.
- CUPPING** - In turpentine orcharding, the attaching of a cup to a tree to collect the rosin.
- CUPPING AX** - A concave bitted ax which is used in turpentine orcharding for slabbing the face and seating the apron.
- CUP PROTECTOR** - In turpentine, a device of wire or cloth which covers the cup to keep the cup and gutter free from trash and chips.
- CUP TYPE METER** - A type of current meter that measures water discharge. The rotation of the meter is due to the difference in pressure by the moving water on opposite sides of the cups.
- CURD** - A soft solid formed by the addition of an acid to milk; it consists of casein and the fats, while the sugar, salts, etc., are contained in the liquid or whey; curds are made into cheese. Any soft solid of similar appearance to the curdled milk is given the same name, as in soap making.
- CURD KNIVES** - A taut, piano-wire tool which is used in cutting coagulated or curdled milk in cheese making. See: American cheese knives, curd mill.
- CURD MILL** - A machine having a multiple series of knives which is used for cutting curd in Cheddar cheese making. See: American cheese knives.
- CURD SCOOP** - A shovel type piece of equipment for picking up the drained curd and piling it onto the sides of the cheese vat which is used for stirring during cooking.
- CURD TENSION** - A measure, expressed in grams, of the pressure which is necessary to cut the curd of milk. The hardness of milk curd.
- CURE** - To prepare for keeping or use; to preserve, as by drying, salting, etc.; as, to cure fish.
- CURING** - A form of conditioning which is applied to certain crops, meats, etc., such as tobacco, sweet potatoes, to prepare for

- storage or use.
- CURLY GRAIN** - A wavy or irregular pattern of the fibers, as in wood.
- CURRENT METER** - A device used for measuring the velocity of flow of water in irrigation streams, ditches and rivers.
- CURRENT REGULATORS** - See: Voltage regulator.
- CURRYCOMB** - A comb with rows of metallic teeth which is used in dressing the coats of horses and cattle.
- CURVED-BLADE IMPELLER** - A pump impeller which combines the screw and centrifugal principles for building up pressure head.
- CURVED KNIFE-TOOTH HARROW** - See: Acme harrow.
- CURVED RUNNER OPENER** - A fixed type of furrow opener used on seeding equipment which has the front end curved up so as to slice its way through the soil. Useful only in well prepared, trash free seed bed.
- CUSEC** - A cu.ft. of water per sec. (India and Australia).
- CUSHION HITCH** - A coupling device utilizing springs, hydraulic mechanisms or combinations of these to stop a tractor when the drawn equipment strikes an obstacle. It may include a declutching device to stop the tractive effort of the tractor.
- CUSTOM DRYING** - A practice of drying products for people other than the owner.
- CUT ACID** - A soldering flux consisting of hydrochloric acid and two parts of water "killed" with all the zinc it will dissolve. It is used as flux for soldering tin, copper, brass, zinc or babbitt.
- CUT-AND-FILL** - A process of building canals by excavating part of the excavated material for the adjacent embankments. In a balanced cut-and-fill the excavated material is precisely enough for the embankments, with an allowance for settlement.
- CUT-AWAY COULTER** - A rolling plow coultter with a scalloped perimeter for better cutting the surface and trash so the furrow slice can be lifted cleanly by the plow share. See: Coulter.
- CUT-AWAY DISK** - A disk with a scalloped edge which cuts through surface vegetation and penetrates hard ground better than a smooth disk. Also called spading disk.
- CUT-AWAY VIEW** - A type of drawing in which a cutting plane is passed through an object removing the nearest part and revealing interior parts or elements which would ordinarily be concealed.
- CUT GEARS** - A term applied to gears whose teeth have been formed by a machine, as distinguished from those whose teeth have been moulded or cast. The former, being mechanically accurate, require less clearance, and therefore, run with less noise.
- CUT-IN BRACE** - Short pieces of material the same size as the studs, cut at 45° at the end fitted between the studs to form continuous diagonal bracing.
- CUTOFF** - 1. An artificial channel for a stream which is constructed to straighten a channel or to reduce the possibility of flooding. 2. A natural channel which is made when a stream cuts through the neck of an oxbow meander. 3. A wall, collar or the like, which is constructed to reduce the seepage of water along otherwise smooth surfaces or through porous strata.
- CUT-OFF COVER** - The portion of the seed hopper of a corn planter over the seed tube which houses the knock-over pawl and the cut-off pawl, admitting only seeds in the cell and dropping them down the tube.
- CUTOFF DRAINAGE SYSTEM** - A tile drainage system normally placed near the upper edge of a wet area to intercept water before it gets down the slope.
- CUT-OFF PAWL** - A part of a horizontal plate corn planter hopper which rides on the rotating seed plate over the seed cells and acting

under spring pressure, pushes back extra seed kernels which are not in the cell. At the same time it presses the kernel firmly into the seed cell so it will pass under the cover. As the plate revolves further the seed cell passes over the seed tube where a knockout pawl, also under spring pressure, comes in contact with the kernel knocking it down into the seed tube.

CUTOFF TRENCH - An excavation in the base of a dam or other structure which is filled with relatively impervious material to reduce percolation.

CUTOFF WALL - A wall or diaphragm, which is made of concrete, steel, wood or earth, through the center of a fill to reduce seepage.

CUT-OFF RELAY - An electrical device that consists of an electromagnet which attracts a movable contact arm when the generator voltage is higher than the battery voltage. Its points are open when the generator voltage is less than the battery voltage, thus preventing the battery from discharging through the generator.

CUT SAMPLE - A sample of ginned cotton which is taken from the press box before any pressure has been applied to make a bale.

CUTTER - A machine or person who cuts or chops. A machine which chops forage or other plant material preparatory to feeding, storing or placing in a silo.

CUTTER BAR - The cutting mechanism on a mowing machine, binder or combine consisting of a cutter bar proper which carries the guards and their shear plates and the reciprocating knife or sickle which passes through the guards.

CUTTER BAR LOSSES - Grain losses occurring at the gathering and cutting mechanism of any grain harvesting equipment.

CUTTERHEAD - The device on a silage harvester which chops the forage into suitable lengths for silage. Also called cutter.

CUTTING BENCH - A bench, usually in a greenhouse, containing a medium, such as sand, peat moss or vermiculite, in which cuttings are rooted. Also called cutting table.

CUTTING BLOCK - A large block of wood standing, so that the grain of the wood is vertical, which is used in butchering and in cutting meat.

CUTTING BOARD - A board or table on which something is placed to be cut, such as bulk honey comb.

CUTTING BOX - 1. A device which is used to chop hay and straw. 2. An open-ended, rectangular box without a top, similar to a miter box, which is used to cut foundations to the proper size for combs in bee hives.

CUTTING CHUTE - A chute or narrow passageway into which animals are driven to remove certain ones from the main herd.

CUTTING HEAD - The part of any machine used for harvesting crops which gathers and removes for further processing, the grain or entire stalk. It usually consists of a reciprocating knife and gathering device.

CUTTING TABLE - 1. A table on which a carcass is placed to be cut. 2. See: Cutting bench.

CYANIDE HARDENING - A method of case hardening of steel using potassium cyanide as a source of carbon.

CYCLE EFFICIENCY - The ratio of the heat out to the heat in. In the ideal Otto cycle the heats in and out are added and rejected at constant volumes.

CYCLONE - 1. A device for reducing tomatoes to pulp. Also called pulper. 2. A storm formed by the interaction of cold polar air masses and warm tropical air masses. The storms generally move from west to east and have a warm air section on the south side of the revolving low-pressure system.

CYCLONE SEPARATOR - A device used in processing for collecting a solid product from a stream of air. The air and product enter tangentially at the top of the machine

- and descend with a circular motion. The product is separated by centrifugal force during the descent and the clean air ascends in a tight vortex at the middle of the machine and is released.
- CYCLONIC** - Atmospheric waves formed along the polar front by the interaction of the cold polar air masses and the warm tropical air masses with the warm-air section on the south side of the revolving low-pressure system.
- CYLINDER** - A part of a combine, etc., a rapidly rotating cylinder whose projecting teeth thresh the grain from the heads as the straw passes between the cylinder and the stationary teeth or bars of the concaves.
- CYLINDER AREA WIPED** - An area equal to $3.1416 \times \text{bore} \times \text{stroke} \times \text{number of cylinders}$, in sq.ins.
- CYLINDER BEATER** - A rotating cylinder mounted to the rear of the threshing cylinder of a combine. It tends to strip the threshed material from the cylinder, aiding separating and directing the straw and seed onto the straw carrier.
- CYLINDER BLOCK** - The main frame of an internal combustion engine or pump containing the cylinders. The pistons move back and forth in the cylinder bore.
- CYLINDER BORE** - Any circular opening in which a piston moves. It is designated in size according to the diameter of the opening.
- CYLINDER CARRIER HAY LOADER** - A type of hay loader using one or two cylinders, which pick up the hay, and a chain conveyor for elevating it to the wagon. See: Hay loader.
- CYLINDER CLEANER** - A seed cleaning device consisting of a series of revolving cylinders with pockets on their inside walls utilizing differences in seed widths. The desired seeds are caught in pockets of suitable size, carried upward and dropped into a collecting trough.
- CYLINDER CLEANER AND GRADER** - A device with an indented cylinder which cleans and grades seed according to size, and which separates the unwanted seeds.
- CYLINDER DISK PLOW** - See: One-way disk plow.
- CYLINDER HAY LOADER** - A device which picks up and elevates mown hay onto a truck or wagon as it moves across the field. It includes a cylinder to which are attached flexible fingers for picking up the hay off the ground and placing it on an elevator. Also called windrow loader, endless apron, elevator belt, web, drum, hay loader.
- CYLINDER HEAD** - A term applied to the cylinder covers on combustion chamber end of cylinder of an internal combustion engine or a pump.
- CYLINDER OIL** - A mineral oil, of adequate viscosity at high temperatures and very high flash point, used to lubricate the cylinders and valves of an internal combustion engine.
- CYLINDER PRESSURE INDICATOR** - A device for measuring and recording the combustion pressures in the cylinders of an internal combustion engine.
- CYLINDER RAKE BAR LOADER** - A type of hay loader combining features of both the rake bar and cylinder type loader. Also called push bar loader, cylinder rake loader, push loader.
- CYLINDER-REEL RAKE** - A type of side delivery rake in which the teeth rotate in planes perpendicular to the axis of the reel, maintaining parallel positions throughout the circle.
- CYLINDER SCORING** - A scratch in the cylinder walls of an engine usually caused by a loose wrist-pin, broken piston rings, broken valve or foreign material.
- CYLINDER SHELLER** - A device for shelling corn consists of a cage of longitudinal bars forming a cylinder. Ears of corn are broken and shelled against the bars as they are fed through by the auger.
- CYLINDER TEETH** - The teeth attached to a spike-tooth type cylinder in a

grain thresher or combine. See:
Cylinder.

CYLINDER TYPE CUTTER HEAD - A chopping device used on forage harvesters having helically shaped knives mounted around the outside of a cylindrical reel. The knives may be designed to act as impellers or a separate fan may be used. Also called helical knife type cutter head.

CYLINDER TYPE SIDE-DELIVERY RAKE - A hay rake having an upward rotating cylinder consisting of three or four rake bars carrying spring rake teeth. The cylinder is angled about 45° with the direction of travel and rolls the hay sideways into a windrow as the rake moves across the field.

CYLINDER-TYPE SORTERS - See: Cylinder cleaner.

CYPRESS - A tree which grows in the swampy areas of the gulf states. The lumber is moderately hard and strong and especially resistant to decay.

D

- DAIRY BARN - Any barn in which dairy cows are housed, milked, and fed; especially designed for the housing, care and handling of the dairy herd.
- DAIRY CHEESE PRESS - A device in which cheese is placed and put under pressure to compact or knit it. (The removal of whey in the dairy cheese press is merely incidental to the compaction process since most of the whey has been removed before pressing.)
- DAIRY PLANT - A manufacturing plant where milk is received, pasteurized, bottled and distributed for sale. It may also be used for the manufacture of milk products.
- DAIRY SCALE - A scale used to weigh milk and its products which is usually so devised as to show net and gross weight respectively.
- DAM - 1. An artificial structure which obstructs a stream of water for the purpose of water storage, for conservation, recreation, water power, flood control, irrigation, etc. A dam may be used for one or more of these purposes. See: Reservoir. 2. A barrier to confine or raise water for storage or diversion to create a hydraulic head.
- DAMMING ATTACHMENT - See: Basin lister.
- DAMMING LISTER - A lister equipped with an attachment to form dams in the listed furrows. The resulting basins catch rainfall thus preventing erosion and water loss, and also are an aid in checking wind erosion. Also called basin lister.
- DAMPENING VALVE - A restriction, which may be variable or fixed in a hydraulic or pneumatic line and which diminishes the magnitude of the fluctuations which may appear, as for example, in the movement of a needle on a Bourdon pressure gage during rapid pressure changes.
- DAMPING - The evening out of fluctuations to a steady single value.
- DAM SITE - A site which would make a suitable location, such as a stream, for the construction of a dam.
- D. & M. - In building specifications means dressed and matched. Planed and grooved or tongue and groove.
- DARCY'S LAW - The flow of water through a column of soil is proportional to the difference in pressure at the ends of the column and inversely proportional to the length of the column.
- DASHBOARD - A wood or other screen which is so placed on the front of a buggy or other horsedrawn vehicle as to protect the passengers from mire, etc., thrown up by the horses' feet.
- DASH CHURN - An earthen or wooden, generally cylindrical container in which cream is churned into butter. The dasher, a wooden handle on whose bottom end are attached two wooden pieces forming a cross, is worked up and down in the crock to make the butter "come".
- DASHER - A device containing agitating paddles and affixed blades which when rotated, agitate the freezing mix and scrape the frozen ice cream from the ice cream cylinder wall and incorporate the air evenly.
- DASH POT - A device, usually consisting of a loosely fitting piston and cylinder or with controlled leakage past the piston, and used for dampening oscillations or reducing the speed at which elements of machines change positions.
- DATUM - 1. Any level surface which is taken as a surface of reference from which to measure elevations. In surveying, sea level is the basic reference. 2. A figure indicating a fact, as the number, quantity or weight of an item which is used principally in the plural, data.
- DAYLIGHT LAMP - An artificial light source that produces light that

- approaches daylight quality.
- DEAD** - Slang for describing a circuit or wire that is not electrified.
- DEAD FURROW** - A trench left in the field that is slightly wider than twice the width of a plow bottom; usually occurs when the plowing is done by "lands".
- DEAD LOAD** - The weight of the parts of the structure. It is constant in amount and always acts vertically.
- DEAD MAN** - 1. In rigging, a post buried in a horizontal plane in the ground to which are fastened guys; or for furnishing any fastening or anchoring. 2. An uncemented pier of brick work put up to hold a leveling line.
- DEBEAKER** - A foot-operated device with an electrically heated blade which is used to burn off a part of the upper beak of chickens or turkeys to prevent picking, cannibalism and egg eating.
- DEBRIS** - Any material, including floating trash, suspended sediment or bed load, moved by a flowing stream; detritus.
- DEBRIS CONE** - A fan-shaped deposit of soil, sand, gravel and boulders built up to a point where a mountain stream meets a valley or otherwise where such deposits occur. See: Alluvial cone.
- DEBRIS DAM** - A barrier which is built across a stream channel to store debris, such as sand, silt, driftwood, etc.
- DEBROGLIE'S PREDICTION** - The electron is an energy front or packet that oscillates at a definite frequency, but has no tangible existence as a particle. Electrons could be diffracted as light waves are diffracted when they pass through fine slits.
- DECARE** - A unit of measurement which is the area equivalent of 10 ares, 1000 sq.m., or 0.2471 acres.
- DECAY** - 1. Disintegration of wood substance through the action of wood-destroying fungi. 2. To pass gradually from a sound, prosperous or perfect state, to one of imperfection, weakness or dissolution.
- DECISTERE** - A unit of measurement which equals 0.1 of a cu.m. of 3.53 cu.ft. or 0.1 of a stere.
- DECOMPOSITION** - The state of being separated; separation into constituent parts; analysis; release from previous combinations; the decay or dissolution consequent on the removal or alteration of some of the ingredients of a compound.
- DEEP BED DRIER** - Any drying unit used to dry grain in a layer 2 ft. or more deep.
- DEEP BIN** - A bin that is deep in relation to its width; if filled with grain the lateral pressures on opposite sides of the bin react with each other and affect the force relations in the design of the bin.
- DEEP FURROW OPENER** - See: Lister.
- DEEP LAYER DRYING** - The drying of grain in a bed more than 2 ft. deep.
- DEEP PERCOLATION LOSS** - Water that percolates downward through the soil beyond the reach of plant roots as a result of inefficient irrigation practice.
- DEEP PLOWING** - An operation intended to mix soil below the depth of normal tillage with the normally tilled layer or to cover undesirable soil surface layers of subsurface soil. This is an inversion and mixing operation most frequently performed at 12 to 24 in. depths but in extreme cases may be performed at depths up to 6 ft. Special disc or moldboard plows are used.
- DEEP TILLAGE MOLDBOARD PLOW** - A plow with high clearance beams and bottoms designed to plow up to 12-14 ins. deep instead of the usual 8-10 ins.
- DEEP WELL** - Any well whose water level when pumping is below the practical suction lift of 25 ft. (under sea-level conditions). See: Shallow well.
- DEEP-WELL TURBINE PUMPS** - Pumps used in irrigation wells that start

- without priming and in which the pump impellers are located in the bottom of the well.
- DEFICIENCY** - The amounts by which a series of quantities fall short of a given demand; in other words, the deficiency of a natural stream flow to meet a given irrigation demand determines the storage required, the additional supply necessary, or the limitation of the irrigable area.
- DEFINITE-PURPOSE MOTOR** - Any motor designed, listed and offered in standard ratings with standard operating characteristics or mechanical construction for use under service conditions other than usual or for use of a particular type of application.
- DEFORMED BARS** - Steel reinforcing bars with closely spaced shoulders, lugs or projections so they will engage the surrounding mortar or concrete and create a strong bond. (Also wire mesh that has welded intersections not farther apart than 12 ins. in the direction of the principal reinforcement and with cross wires not smaller than No. 10.)
- DEFROSTING** - The removal of frost or ice from refrigerating coils. This may be done by any one of three methods: shut off the refrigeration system and open the doors; pump a hot refrigerant into the coils from the compressor discharge line or chip the ice off with a hammer and dull chisel or scrape the coils with a bar or metal brush.
- DEGRADATIONAL** - A type of channel where incision or down-cutting is predominant.
- DEGREE-DAY-DRYING ($^{\circ}D$)** - The average temperature drop of the drying air across the drying front over a 24 hr. period of continuous air flow. 1° -day-1 lb. of air per min. equals approximately 346 Btu.
- DEGREE OF CURVE** - The number of degrees at the center of a circle subtended by a chord of 100 ft.
- DEGREE OF FIXITY** - A method of determining the "unsupported length of a column" for design purposes. There are three end conditions: ends unrestrained and having no moment at the ends (pin end); fixed at the bottom, pin end at the top, and having a point of inflection in its elastic line at 1/3 the length of the column from the fixed end; and fixed at both ends and having points of inflection in the elastic line 1/4 the length of the column from each end.
- DEGREES API** - A gravity scale developed by the American Petroleum Institute for determining the relative weights of petroleum products.
- DEGREES OF SUPERHEAT** - The difference between the dry bulb temperature and dew point. Steam whose temperature is higher than that of saturated steam at the same pressure is said to be superheated. The degree of superheat is the difference in temperature between saturated and superheat steam at the same pressure.
- DEHYDRATION** - Removal of the free moisture from a product, but it may apply to any product dried below its equilibrium moisture content.
- DEHYDRATOR** - In refrigeration, a vessel in which ammonia gas is passed through trays containing quick lime to remove any final traces of aqueous vapor. A device for dehydration.
- DEHYDROFREEZING** - Preservation of food products by partial dehydration followed by freezing.
- DE-ICERS** - Heaters used to prevent ice formation in livestock drinking tanks, etc. Most are electrically operated and designed to float.
- DELAYED ACTION FUSE** - A type of fuse which incorporates a calibrated link of fusible material, usually zinc as a part of the electric circuit. A prolonged current, regardless of the cause, greater than the ampere rating of the fuse, or an extreme overload, will

- melt the fusible link and interrupt the circuit.
- DELINTE**R - A device, usually in a cotton oil mill, which removes the linters from the cotton seed.
- DELIVERY BOX** - A structure for the control and measurement of water delivered to a farm unit.
- DELIVERY GRADIENT** - The ratio of the energy content of water at the point of delivery to the horizontal distance travelled by the water before infiltration takes place.
- DELIVERY RATE (WATERSHED SEDIMENT)** - The ratio of sediment yield to gross erosion in a watershed or drainage basin.
- DELTA** - A broad, flat, alluvial deposit along the sides or at the mouth of any river.
- DELTA IRON** - Body centered cubic iron stable from 2550 to 2795° F. At 2550° F. gamma iron changes back to a body centered cubic form which remains unchanged through the interval 2550 to 2795° F. Iron melts at 2795. At present the two body centered forms, Alpha and Delta, are considered to be identical. As iron is heated the allotropic changes are: Alpha.....Gamma.....Delta. The changes are reversible and occur in the opposite direction when iron is cooled.
- DEMAND FACTOR** - In any system or part of a system, the total connected kilowatt load divided into the maximum kilowatt demand and expressed as a percent.
- DEMAND RATE** - An electric power cost rate which increases as the kilowatt demand of an electric customer increases.
- DEMINERALIZER** - A substance used to remove salt from salt water.
- DEMONSTRATION AREA** - An area of land on which test plots or trials of various practices are placed to demonstrate either good or bad agricultural procedures.
- DENATURED** - Deprived of natural qualities i.e. to render unfit for eating, but it may still be used for other purposes. To alter original structure (protein) as by heat, acid or alkali.
- DENTATED SILL** - A notched sill at the end of an apron which is used to check the force of flowing water and thus reduce erosion below the apron.
- DENTIL** - A projecting rectangular block, as beneath a cornice.
- DEPARTURE** - 1. The difference between any single observation and the normal annual precipitation. 2. The length of the projection of a traverse course on a line perpendicular to the meridian.
- DEPHLEGMATOR** - A device for purifying liquids by fractional distillation.
- DEPLETION CURVE** - Line representing, for a given point in a stream, the discharge at any instant during periods of emptying out from storage, either surface or subsurface.
- DEPOSIT** - Material which is laid down at any specified position within a treated swath or area.
- DEPOSIT PATTERN** - See: Distribution pattern.
- DEPOSIT RATE** - Amount of material per unit area deposited at specified positions within the treated swath. A term usually used when the material is applied with spraying or dusting equipment.
- DEPTH** - The downward distance from the surface or top. The term generally carries the idea of verticality but such is not always the case; for instance the depth of any beam inclined to the horizontal is measured in a direction perpendicular to its length and, therefore, on a line inclined to the vertical.
- DEPTH FACTOR** - When drying with air, it refers to a depth of grain such that if all the theoretical heat available for drying could be used, it would all dry to equilibrium in a period of time equal to the time required for fully exposed grain to dry half-way to equilibrium. Also applied to cooling.
- DEPTH GAGE** - Any device used to regulate the position of a machine relative to the surface on which it

- is working. Also called depth wheel.
- DEPTH-INTEGRATING, SUSPENDED-LOAD SAMPLER** - A device for finding the sediment content of a stream. A milk bottle is placed in the sampler, and the sampler is submerged in the streamflow by means of a cable. Vanes keep the sample pointed upstream. The sample is taken into the bottle through a nozzle projecting in front of the samples.
- DEPTH OF PLOWING** - The average depth that is influenced by the power available, the size of plow, soil type, rainfall, kind of crop grown, cost and benefits measured in increased yields and income.
- DEPTH REGULATOR** - Any device on a disk harrow or plow which regulates or varies the depth of cut.
- DEPRESSION OF WET BULB** - See: Wet bulb depression.
- DEPRESSION STORAGE** - The volume of water which is required to fill depressions, large or small, to their overflow levels.
- DERRICK STACKER** - A device for stacking hay which consists of a revolving center mast or pole attached to a boom. A rope or cable passes through pulleys attached to a large fork or sling.
- DESICCATOR** - A closed container with a good drying agent in it used to preserve samples in an atmosphere of low constant humidity.
- DESIGN AREA** - A specific land area which the supplier or designer and the purchaser mutually understand is to be irrigated by a sprinkler system.
- DESIGN CODES** - Standard information listing design data for common building materials, including allowable stresses, safe loads, etc.
- DESIGN DRAWING** - A drawing which includes plans, section, elevations and structural details.
- DESILTING BASINS** - Basins that are constructed to impound water so that the sediment will settle to the bottom.
- DESORPTION ISOTHERM** - An equilibrium moisture content curve in which moisture contents of a product are plotted on the ordinate against the relative humidity on the abscissa at which the moisture content of a product would not change if exposed to air at that relative humidity characteristically an S-shaped curve. Obtained by removing moisture by lowering humidity surrounding product.
- DETACHABLE-LINK CHAIN** - A type of power transmission chain used mainly on agricultural equipment for moderate loads at speeds up to 500 f.p.m. It can be easily connected or disconnected at any point.
- DETACHABLE POINTS** - Points of different width and shapes which may be used on spring-tooth harrows and cultivators for particular uses. They can be removed and usually reversed for further wear.
- DETACHABLE SHIN** - A replaceable shin of a moldboard plow where wear is excessive and replacement is frequently needed.
- DETASSELING MACHINE** - A device on which workers ride along the rows in a field while detasseling corn.
- DETENTION DAM** - See: Dam.
- DETENTION STORAGE (Da)** - The water moving over the land as overland flow during the runoff process - expressed in ins. of depth.
- DETRITUS TANK** - A chamber in a sewage disposal system which removes grit from the sewage by rapid sedimentation in the tank. Floating solids are removed here by skimming them off. Also called grit chamber.
- DEVELOPED WATER** - Underground water which, after discovery, is brought to the surface and used for some purpose, as for irrigation.
- DEW** - The atmospheric moisture which condenses, usually at night, in or on plants, soil and other surfaces. Dew is produced when plants or the soil surface are cooled to a temperature below the dewpoint of air. The amount of water contributed by dew, though small, is potentially significant in the

- growth of plants especially in semiarid or arid regions.
- DEWATERING - 1. The process of water moving out of an aquifer through gravitational flow. 2. Removing gravitational water from an area by pumping it out usually as an aid to construction.
- DEW POINT - The temperature at which, under field conditions, condensation begins to collect on surfaces.
- DEW-POINT TEMPERATURE - The temperature at which condensation of water vapor begins if air containing water vapor is cooled.
- D-HANDLE - The short handle in a spade, shovel, fork, etc., which has a hand grip on the end shaped like the letter D.
- DIAGONAL BRACING MEMBERS - Bracing installed at an angle, usually 45° , to the structural frame of a building or frame work. This completes a triangle and thus makes the framing more rigid.
- DIAGONAL GRAIN - The result of sawing at an angle rather than parallel to the axis of the tree. (Annual rings at an angle with the axis of a cut piece.)
- DIAMETRAL PITCH - A designation for gears defined as the ratio of the number of teeth in the gear to the diameter of the pitch circle measured in ins.
- DIAMOND DRAG - A drag consisting of heavy wire screening slightly corrugated which is used in the preparation of a seed bed.
- DIAMOND POINT - A name given to a hand or machine tool for metal when the surface of the cutting plane is formed like a diamond. Diamond point chisels are used for grooving or furrowing; lathe and other machine tools with this point are employed for roughing cuts on wrought iron and mild steel.
- DIAPHRAGM-TYPE PUMP - A positive displacement type pump which uses a flexible diaphragm and a valve system for the movement of fluids at low flow rates and low pressures. (5-6 g.p.m. and up to 80 psi. Often used for pumping water containing sewage.)
- DIAPHRAGM VALVE - A pressure actuated valve with a thin metal divider backed by a spring. When the pressure becomes great enough the spring is forced back and the mechanism is actuated. It is designed to give accurate control.
- DIBBER - See: Dibble.
- DIBBLE - A small, hand tool which is used to make holes in the soil for planting bulbs, seeds or plants. The handle is usually of wood and the point of steel or brass. Also called dibbler. See: Trowel, planting bar, spud. To transplant with a dibble.
- DIBBLE BOARD - A pointed implement used to make holes in the ground for plants or seeds.
- DIBBLER - A transplanting device which consists of a frame to which two wheels are attached. On the rim of each wheel are attached spikes regularly spaced so that as the vehicle moves across a field holes are made in the soil for transplanting.
- DIELECTRIC - A non-conducting material, so called because the lines of force of an electrostatic field will pass through it, thereby making it the seat of the strain.
- DIELECTRIC CONSTANT - The dielectric constant, $K = \frac{Q_1 Q_2}{r^2 F}$, where Q_1 and Q_2 are charges, r is distance between charges and F the force in dynes of the electric field. The factor that causes an increase in capacitance.
- DIELECTRIC HEATING - Heating a product by placing it in a strong high frequency electrostatic field. The effect is principally caused by a high voltage with a low current. The material to be heated is placed between the plate of a condenser which is connected to a high-frequency generator or oscillator. The plates are alternately charged, positively and negatively,

- causing a changing stress on the molecules of the material being heated. The rapid moving electric field generates heat by molecular friction in the material. This type of heating is used to heat materials of low thermal conductivities.
- DIELECTRIC TYPE MOISTURE METER** - An instrument calibrated to measure moisture contents of products using the principle that the capacitance of an electrical condenser varies with the moisture content of a material placed between its plates.
- DIESEL CYCLE** - The series of events which take place within the cylinder of an internal combustion engine as follows: intake of air; compression of air to ignition temperature of injected fuel; power due to injection and burning of fuel; and exhaust. This may occur as a two-stroke cycle or a four-stroke cycle. Named after its inventor, Dr. Rudolph Diesel.
- DIESEL ENGINE** - A high compression internal combustion engine which operates on the principle of the diesel cycle.
- DIESEL OIL** - A petroleum fuel prepared primarily for use as a fuel for diesel engines. It may also be used for other purposes, such as a carrier for herbicides, insect extermination, etc., for which purpose no control of combustion characteristics is maintained.
- DIFFERENTIAL BRAKES** - Brakes used in connection with differential steering.
- DIFFERENTIAL CAM** - An arrangement of cams of different contours, placed together in the valve mechanism of gas engines, etc. These cams are slid backwards or forwards upon a shaft by the governor, coming into contact with the roller in turn and thus varying the fuel admission to suit the load.
- DIFFERENTIAL CYLINDER** - A cylinder placed in the head of a force pump (shallow-well) which helps discharge the water, takes the place of a stuffing box, and serves as a trap tube for the air chamber.
- DIFFERENTIAL GEAR** - An arrangement of gears in an epicyclic train that connects two shafts or axles located on a common centerline, divides the driving force between them according to a predetermined ratio, and permits one shaft to rotate faster than the other.
- DIFFERENTIALLY WOUND MOTOR** - A motor with a compound wound field in which the series and shunt coils oppose each other.
- DIFFERENTIAL PULLEY** - A drive arrangement utilizing pulleys or sheaves of different diameters sometimes in an epicyclic arrangement, to provide a mechanical advantage by utilizing high input speed with low torque or force to deliver a higher output torque or force at lower speed. The differential chain block hoist is a common application.
- DIFFERENTIAL STEERING** - A steering system used on track laying tractors in which a braking device can be applied to either side of the final drive resulting in a speed up of the opposite track through a differential connection.
- DIFFERENTIAL THERMOPILE** - A thermopile having opposite faces exposed to different sources of heat so that the two heat intensities may be compared.
- DIFFUSED RUNOFF** - Simultaneous runoff of rainfall which is distributed over the whole area of a slope, in contrast to runoff concentrated in a single channel.
- DIFFUSE-POROUS WOODS** - Hardwoods in which the pores are practically uniform in size and occur generally throughout the annual rings. Most of the growth takes place rapidly during the spring seasons with some smaller pores toward outer border of the rings.
- DIFFUSER** - In illumination, any device which scatters light rays in order to give a diffused light.
- DIFFUSER VANES** - Rib-like projections on the inside of a pump to direct

- the water flow.
- DIGGER** - Any device which is used for the removal of root crops from the soil or device which may be used to dig holes for placing posts or poles in construction work.
- DIKE** - 1. A ridge of earth which is thrown up to impound water, as in irrigation; or to divert water, as in soil erosion. 2. An embankment or levee which is constructed to prevent inundation of low land, as on the seacoast or in the flood-plain of a river valley. Also called dyke. See: Levee.
- DILUTION** - A method of disposing of sewage or effluent by discharging into a stream or other body of water.
- DIMENSIONAL CHANGES** - Changes in the dimensions of a material due to a change in temperature, water content or pressure.
- DIMENSIONAL COORDINATION** - One of the components of modular design, it involves the coordination of the dimensions of the numerous parts of a building with the building plans to decrease wastage of materials and labor due to cutting and fitting.
- DIMENSION FRAMING** - Framing constructed of dimension lumber only. See: Dimension (framing) lumber.
- DIMENSION (FRAMING) LUMBER** - Yard lumber 2 ins. up to but not including 5 ins. thick and 2 or more ins. wide. Usually comes in standard lengths starting with 6 ft. and increasing in 2 ft. increments.
- DIMMER** - 1. A resistance inserted in a lighting circuit for shunting or by-passing a variable portion of the current, thus "dimming" the lights in the circuit. 2. A variable resistance connected in series with incandescent lamps to reduce the brightness or the light output to a desired value.
- DIPPED GRAIN** - A type of cross grain in which there is a dip in the grain. See: Cross grain.
- DIRECT CONNECTED PLOW** - See: Integral mounted plow.
- DIRECT CONTACT--SINGLE** - A food freezing method in which packaged or unpackaged food is placed on one side of a metal plate. A refrigerant is applied to the other side of the metal plate. The food may be kept under some compression while being frozen.
- DIRECT COUPLED MACHINE** - 1. As distinguished from direct connected the term means that the driver and machine are each a complete unit connected by some device such as friction clutch, jaw clutch or shaft coupling. 2. A machine having the shaft of its armature coupled directly to the shaft which drives it.
- DIRECT CURRENT MOTOR** - An electric motor which can direct current as its energy source.
- DIRECT-EXPANSION** - A refrigeration system in which the heat is transferred directly to the evaporating or primary refrigerant of a compression refrigerated system. It is the opposite of indirect refrigeration which utilizes a secondary refrigerant (brine, water, alcohol, glycol, etc.) to carry the heat from the product to the primary or evaporative refrigerant.
- DIRECT-EXPANSION BATCH FREEZER** - An ice cream freezer which makes ice cream in batches, as contrasted to the continuous freezer, and which uses a freezing jacket into which the liquid refrigerant is expanded directly to accomplish the cooling.
- DIRECT-EXPANSION SURFACE COOLERS** - Surface cooling units in which the cooling medium refrigerant is expanded directly within the tubes. This type of cooler is contrasted with those using a refrigerated liquid, such as water or brine, as the cooling medium.
- DIRECT-FIRED** - See: Direct heater.
- DIRECT-FIRED KETTLE** - A device for concentration of juice, sap, etc., to a sirupy consistency which consists of a cast-iron kettle placed over a fire. Sirup so produced is often caramelized. It may be used in maple sirup or

- sorghum sirup, etc., production.
- DIRECT-FOOT CONTROL** - A method in which the operator uses his foot to control the gang of horse drawn cultivators so they will follow the row.
- DIRECT HEATER** - A classification of heater for heated air drying systems. With the direct heater the products of combustion are forced through the product with the drying air.
- DIRECT INJECTION COMBUSTION CHAMBERS (DIESEL)** - An open combustion chamber where the entire combustion space is directly above the piston crown. The combustion space may be in a cavity hollowed out of the piston. Fuel is distributed through a multihole nozzle so as to facilitate rapid mixing with the air.
- DIRECT METHOD** - A method whereby the value desired is actually measured e.g. obtaining the moisture in a material by weighing or measuring and relating it to the dry matter or the original amount of material. Opposite of indirect methods e.g. moisture measurement by an electrical resistance or capacitance moisture meter.
- DIRECT-READING** - Any instrument which has been calibrated to read in the units of measurement desired, without further calculations.
- DIRECT STEAM INJECTION** - A heating method for liquids in which steam is injected directly into the fluid to be heated.
- DISCHARGE BAY** - An open-ended concrete basin into which water is discharged. It is used principally in pump drainage of low areas, such as in muck and peat or mineral soils, where an outlet of sufficient depth is not available.
- DISCHARGE CURVE** - A rating curve showing the relation between stage and discharge of a stream.
- DISCHARGE HOSE (PIPE)** - That hose or pipe which is attached to the discharge side of the pump, or to a forced system, through which the water moves away from the pump or tank toward the nozzles or outlets.
- DISCHARGE PRESSURE** - The head or pressure at the discharge nozzle or discharge point of a pump.
- DISCONNECTING ENGINE** - A double engine, usually of the compound type, in which the cylinders can either be used in combination or each separately from the other.
- DISCONTINUOUS PASTEURIZER - BATCH PASTEURIZER** - A pasteurizer which pasteurizes one batch of canned produce, juice, milk, etc. at a time. See: Continuous pasteurizer.
- DISK BRAKE** - A type of brake using circular plates which are pressed together to absorb the kinetic energy of any moving object in contrast to a band or shoe-type brake.
- DISK COVERER** - Two disks which are attached to a lister planter immediately behind the seed spout for covering the planted seed with soil. A type of covering device employed on seeders consisting of one or two disks set to throw soil over the planted seed.
- DISK CULTIVATOR** - A type of cultivator which uses gangs of three or four disks rather than shovels or sweeps to work the soil. They may be adjusted to throw the soil into or away from the row.
- DISK EXHAUST BOX** - A device used in canning to heat the can and its contents before sealing which consists of a metal box in which are several disks revolving so as to force cans through the heated chamber.
- DISK FAN** - A type of axial flow fan having a propeller type fan with an enlarged hub or center and short blades. In addition, stationary straight vanes are located on the discharge sides of the fan to prevent rotation or swirling of the air. Also called vane axial fan.
- DISK GANG** - A section of a disk harrow consisting of a number of disks spaced by spools and held together by a long, heavy bolt.

- DISK GO-DEVIL - See: Ridge buster.
- DISK HARROW - A type of harrow consisting of two opposed gangs of disk blades which may be set at various horizontal angles with the direction of travel and which both throw the dirt outward from the center of the tilled strip.
See: Tandem, offset disk harrow.
- DISK HILLER - An attachment for a cultivator which consists of a disk so set that it throws soil, laterally, usually used in pairs throwing in for "hilling-up". It is also frequently used in cotton cultivation for barring-off before chopping.
- DISK NOZZLE - A common nozzle, often used with garden hoses, that consists of a long, narrow chamber inside of which a lens-shaped disk is moved by an adjustable plunger. When the disk is placed outside of the orifice, a wide-angle spray is produced; when placed within the chamber, a narrow jet spray is produced; and when moved from one extreme position to the other, the spray varies from wide angle to jet.
- DISK OPENER - A type of furrow opener used on grain drills and planters which employs one or two disks instead of a "runner" or "knife" to cut through thrash and open a furrow for placement of seed.
- DISK PLOW - A plow with individually supported inclined disks mounted in a manner similar to bottoms of moldboard plows. A disk plow is usually used under conditions (hard, stump or stony ground) where a moldboard plow is ineffective.
- DISK SEPARATOR - See: Pocket type separators.
- DISK TILLER - See: Disk cultivator.
- DISK WEEDER - See: Disk cultivator.
- DISK WHEEL - A wheel having its central portion solid. The disk may be flat or it may be dished.
- DISPENSING HEIGHT - Height of outlets of spreaders or boom above the ground or crop being dusted or sprayed.
- DISPLACEMENT - GENERAL - 1. The difference between the initial position of a body and any later position. (Aerial Photography) 2. The horizontal displacement of the image of a ground point on a vertical aerial photograph due to the elevation of the point above or below the assumed ground plane. 3. In internal combustion engines the volume displaced by the piston as it moves from one end of the stroke to the other and is expressed in cu.ins.
- DISPLACER PISTON - An auxiliary piston in some gas engines whose function is the expelling of the residual gases or products of combustion from the cylinder. In other cases a flushing charge is used for the same object.
- DISPOSABLE TYPE SHARE - A type of plow share made by cutting special strip stock to the proper length and shape to serve as a plow share. Since they are inexpensive they can be thrown away rather than be resharpened.
- DISPOSAL TILE - Tile used to carry wastes from a septic tank and dispose of it to the surrounding soil.
- DISSIPATOR BLOCKS - Blocks of concrete used in the outlet of a dam to take some of the energy out of the water or cause a hydraulic jump.
- DISTRIBUTARIES - 1. The smaller conduits taking irrigation water out in laterals for delivery to farms. 2. Any system of secondary conduits.
- DISTRIBUTING STAND - Any device used in irrigation practice from which water is distributed into furrows and basins. Usually it is a part or a riser outlet from an underground pipe system. See: Capped stand, valve-controlled hydrant.
- DISTRIBUTION PATTERN - Graphic representation of deposit rates within the bounds of a single swath both in a traverse and longitudinal pattern. It is the term usually used with spray or dust application equipment.
- DISTRIBUTION SYSTEM - 1. The system

- of laterals, distributaries, and their appurtenances, conveying irrigation water from the main canals to the farm units. 2. Any system by which a primary water supply is distributed to consumers.
- DISTRIBUTOR** - 1. A device located in the secondary circuit of spark ignition system which fires the spark plugs at the desired interval and time, by correlating the high tension circuit to the individual plug wire at the proper time. 2. Any device which is used to move produce from one place and to scatter it in another. For example, a fertilizer distributor. A device, part of some bulk milk tanks, which is used to spread the milk over a cooling surface.
- DISTRIBUTOR PIPE** - A flexible pipe which is attached to the end of the blower pipe of a forage blower or ensilage chopper and used to distribute the material within the silo or bin.
- DITCH** - An artificial excavation, as a trench or channel, which is used in carrying water for irrigation or removing water in land drainage. (A ditch is usually considered to be smaller than a canal, but this is a loose distinction.)
- DITCH BANKS** - The retaining walls of a ditch usually put on a slope for stability and to prevent excessive erosion and slippage.
- DITCHER** - One who, or a machine which digs ditches.
- DITCH-GRADER** - A terracing tool usually a mounted angle blade made in various sizes which is used to construct terraces, grade dirt roads and cut ditches.
- DITCHING MACHINE** - A power-driven machine which may have a continuous belt chain or wheel to which buckets are attached to dig out the soil and deposit at the side of the trench. It is used for digging ditches, tile trenches and making excavations. See: Trenching machine.
- DITCHING SCOOP** - A shovel which is used for digging ditches. Usually has a greater than normal angle between handle and blade.
- DITCH INTERSECTION** - The point at which one ditch will flow into another, i.e., points where lateral ditches flow into main ditches.
- DITCH RIDER** - A person employed by an irrigation company or a governmental unit whose business it is to check on the condition of irrigation ditches, weirs, etc., and to adjust the measuring devices so that the correct amount of water is delivered to a farmer.
- DIVERGING OUT BELT GRADER** - A machine which grades fruits and vegetables according to size, by the method of dropping the product automatically from two diverging belts which carry the product to the point where they drop thru.
- DIVERSION** - 1. A channel constructed around the slope and given a slight gradient to cause water to flow to the desired outlet. 2. Construction used to divert runoff and cause water to flow in a controlled manner to some suitably protected outlet.
- DIVERSION CHANNEL** - A channel with a supporting levee on the lower side which is constructed across the land slope to intercept runoff and to minimize erosion, or to prevent excess runoff from flowing on lower lying areas. In some places a series of diversions are constructed across the slope, similar to terraces, but with greater horizontal and vertical spacing.
- DIVERSION DAM** - A barrier which is built to divert part or all the water from a stream into a different course; for example, into an irrigation ditch.
- DIVERSION DITCH** - A ditch which is constructed to divert a flow of water.
- DIVERSION DUTY OF WATER** - See: Gross duty of water.
- DIVERSION PONDS** - Ponds usually constructed near the stream at such a level that at least a portion of the stream flow can be diverted to the pond.

- DIVERSION TERRACE - 1. A terrace which is used to divert water above a terrace system. 2. A wide relatively shallow channel of low gradient with gentle side slopes and ample water capacity, which is constructed across the slope of a field to intercept and change the direction of flow and to reduce the velocity of the runoff. 3. An artificial ditch which is used to divert water from its natural course.
- DIVIDED-CENTER-MAIN - A duct system for hay drying in which the air is introduced to the middle of the main duct through a short delivery duct.
- DIVIDER - A metal or wooden device on hay or grain harvesting machinery which is attached to the end of the cutter bar away from the tractor and which precedes the cutter bar to help separate tangled crops. It also helps to prevent stems from becoming entangled in the reel shaft. A longitudinal board in the feeder of a threshing machine to keep the bundles separated and following each other in sequence order.
- DIVIDER BOARD - See: Divider.
- DIVIDER STICK - See: Divider.
- DIVISION BOX - A structure for dividing and diverting water into other channels.
- DOBE HOUSE - A house with walls of sun-dried mud cakes or crude bricks. The mud bricks are sometimes made with straw as a binder and cast in a frame or form and allowed to dry hard in the sun. This ancient art of making mud brick structures originated in the Middle East and was much used in the arid regions of Southwestern United States. See: Adobe.
- DOCKAGE SIEVE - A set of sieves usually found at an elevator into which a sample of grain is placed and shaken through to determine the amount of foreign matter (dockage) that the sample contains.
- DOFFING ROLLS - A part of the cotton which forms lint cotton into bats preparatory to baling.
- DOG - A device usually consisting of a steel hook and chain which is used in skidding logs. A sort of iron hook or bar with one or more sharp fangs which may be fastened into a piece of wood or other heavy article for the purpose of moving it. Any part of a machine acting as a claw or clutch, as an adjustable stop to change the direction of a machine tool. To fasten together, as with dog.
- DOG IRON - A short bar of iron forming a kind of clamp with its ends bent down at right angles and pointed so as to hold together the pieces into which they are driven. Often the term "dog iron" is used for "dog hook".
- DOLLY - 1. A rectangular platform supported by wheels or casters on which heavy loads may be moved, usually in a packing plant or warehouse. 2. A snap head; a tool with an indented head for holding the head of a rivet and absorbing impact while the other head is being driven.
- DOMESTIC WASTES - Sanitary sewage that includes everything that goes down the drains of a farmstead.
- DOMING - An obstruction to flow of granular material by arching or bridging over the discharge opening; associated with convergent flow in which it is necessary for the bulk material to lose its strength to become flowable.
- DOODLEBUG - A home-made tractor which is constructed from a used automobile.
- DOOR BUCK - The main upright framing members of a door opening to which the finished opening for the door is built.
- DOOR SWING - The projected area covered by a door between its wide open and closed position.
- DOSING CHAMBER - See: Dosing tank.
- DOSING SIPHON - An automatic system for discharging the contents of a dosing tank by removing the liquid with a "tube" and to a level lower than the tank floor;

liquid flows through the tube by reason of more weight of fluid in the longer leg.

DOSING TANK - A container which holds the effluent from a septic tank until full. The liquid is released in one batch at intervals to insure uniform spreading of the liquid thru the disposal field.

DOUBLE ACTING CYLINDER - Hydraulic cylinders which have actuating force in both directions.

DOUBLE-ACTING DEEP WELL PUMP - A pump which has a double-walled cylinder where there are two plunger valves and two check valves. This arrangement enables the discharge of water on both the upstrokes and downstrokes. It is used on small-diameter wells (3 ins. or less) from which large volumes of water must be pumped.

DOUBLE-ACTING TANK PUMP - A type of sprayer pump which forces an ejection on both the downward and upward strokes.

DOUBLE-ACTION DISK HARROW - See: Tandem disc harrow.

DOUBLE-BAIL PLOW - A frame plow usually horse-drawn which has two U-shaped iron pieces that attach the beam to the frame of the plow whose purpose is to allow the bottom or bottoms to be locked down for plowing or raised above the surface of the ground for turning or transport.

DOUBLE-BATTERY GIN - A cotton gin which has two sets of gin stands.

DOUBLE-BREAKING CART - A cart which usually consists of the rear wheels and axle of a large wagon and a platform-like seat extending out behind the wheels. Its tongue is often made from a log four to six ins. in diameter, and it is used to train horses and mules to work in teams.

DOUBLE BREAK SWITCH - One which breaks a circuit at two contacts along the same wire. Distinguish between double break and double pole switch.

DOUBLE BREAST - A part of certain cotton gins which is the boxed-in contrivance receiving the hulls, bolls, etc. Such gins are valuable for ginning bolly cotton or cotton which contains much trash.

DOUBLE CAPPING - The placing of a cap on a bottle and the covering of the opening with a separate protective cap which is usually crimped or fastened below the outside lip of the bottle. Used on milk bottles.

DOUBLE CRIB - Two parallel single corn cribs with a roofed-over drive way between them.

DOUBLE-CYLINDER LOADER - A type of hay loader which uses an extra cylinder revolving in the opposite direction to the main cylinder to aid in picking up the windrow.

DOUBLE-DISK HARROW - A disk harrow in which two single-disk harrows are arranged in tandem. The front gangs are set to throw the soil outward, while the rear gangs are set to throw the soil inward to leave the surface level. Also called double-action harrow, tandem harrow.

DOUBLE-DISK MARKER - A row marker attachment for a planter which consists of a long rod fastened to the planter at one end. On the other end are two disks so arranged as to make a small marking furrow in the soil. See: Double-folding marker.

DOUBLE DISK OPENER - A type of furrow opener using two disks. Seeding depth can be closely controlled when "depth bands" are used with a double disk opener. See: Disk opener.

DOUBLE DRAINED - Designating an area of land which is drained by both the laterals and a main tile.

DOUBLE DRAY - A type of tongueless, double logging sled which is used for short distance hauling.

DOUBLE-HARPOON FORK - A hayfork which has two, long, iron forks with barbs on the ends which, when forced to a desired depth in a load or pile of hay, may be sprung so as to grasp the hay for lifting. See: Single-harpoon hay fork.

DOUBLE HEADER - In house construction,

- two beams, instead of one, placed perpendicular to joists which support the framing for a chimney, stairway or other opening.
- DOUBLE KNIFE MOWER** - A mowing machine having a cutter bar equipped with two reciprocating knives, thus requiring a stroke equal to half of the knife section spacing. (Conventional type guards are usually unnecessary.)
- DOUBLE LANDING** - A stairway landing for a 180° turn consisting of a single horizontal surface.
- DOUBLE-MAIN SYSTEM** - A system of tile drain arrangement in which two main lines are laid parallel. It is used where the depression between two slopes is broad and flat and for rehabilitating a tile system where the main has been removed by gulying.
- DOUBLE PITCH ROLLER CHAIN** - A type of roller chain in which the side plates used to make up the chain are twice as long as the pitch of the sprocket teeth for which it is designed. See: Standard pitch roller chain.
- DOUBLE-POINTED SHOVEL** - A cultivator shovel that is sharpened at both ends so that it may be reversed when one end becomes dull. Also called reversible point.
- DOUBLE POLE CUTOUT** - A cutout which acts at once on both the positive and negative leads an an electrical circuit.
- DOUBLE RUN FEED** - A type of forced feed seed metering device used on grain drills which are used to seed a variety of large and small seeds. It consists of a feed wheel with a large opening on one side and a smaller opening on the other, one of which is covered while the other is in use.
- DOUBLE SHEAR** - A bolt or other pen member is in double shear when it has shear on two parallel cross sectional planes.
- DOUBLE SHOVEL** - A walking plow which has two beams for the attachment of two shovels.
- DOUBLE TANDEM STALLS** - A milking parlor arrangement in which there are at least two stalls, one behind the other, on each side of the operator's area or pit.
- DOUBLE THROW SWITCH** - One in which the blade can move on either side of the off position to a live contact.
- DOUBLETREE** - An arrangement of two bars connected to a third, used to hitch a team of horses to a wagon, implement, etc. for pulling same.
- DOUBLE-TURN PLOW** - Two turn plows which are attached side by side to open a furrow much the same as a lister.
- DOUBLE V-CRIMP** - A type of sheet metal roofing with two V-crimps on each edge to form a fit with the next piece which is lapped over the double v.
- DOUBLE WHEEL** - A planter press wheel consisting of two separate wheels tipped out at the top but close together at the bottom. The wheels serve to cover the seed and to firm the soil.
- DOUBLE-WINDOWED** - Two widths of a hay rake in one windrow, usually with one width from each side of the windrow.
- DOUBLE-WING** - Designating a plow which throws soil both to its left and right. See: Lister.
- DOUGH OR PASTE DRYING SYSTEM** - A method of drying milk in which the fluid milk is heated in a vacuum pan until most of the moisture is driven off. The partially dried milk is then put in a drying chamber, and the moisture is reduced to the point desired. See: "Carolina cotton planter."
- DOWN-DRAFT** - 1. A type of natural ventilation using natural air movement to force air through a drying product. A cowl is turned to face the wind and air goes down it through the ducts and out through the grain. Also called pressure ventilator. 2. A type of carburetor which draws air from above and passes it downward into the intake of the motor.
- DOWNSPOUT** - A spout or pipe leading downward to carry off rain water from a roof.

- DOWN SUCTION - Relief behind the share point, after secured by a downward bend, which helps the plow penetrate the soil to the proper depth as it moves forward. Also called vertical suction.
- DOWSING (WATER WITCHING) - Using a forked stick or wire to locate underground water for a well site.
- DOZER BLADE - A heavy steel blade usually mounted at the front of a wheel or track type tractor and used to push dirt rock, etc., for short distances.
- DRAFT - The horizontal component of pull of an implement parallel to the line of motion. Also called directional pull.
- DRAFT ANGLE - The vertical angle between the resultant pull on a tool by the power unit and its horizontal component.
- DRAFT GAGE - An instrument for measuring total pressure or static pressure of air in a duct. Also called manometer. See: Manometer.
- DRAFT HOLE - A hole in the center of an evenner, singletree or doubletree for the hitchpin.
- DRAFT TESTS - Carefully controlled and standardized tests used to determine the force necessary to move an implement.
- DRAG - A type of harrow, usually homemade, consisting of several pieces of 2 x 8 x 10 in. planks fastened together which is used in the preparation of the seed bed to crush clods, to level the soil and to form soil around the seeds. Also called float, planker, slicker.
- DRAG BAR - The transverse bar on a mower carrying the yoke to which is attached a cutter bar. The drag bar has a pivot connection to the frame, thus allowing the cutter bar to float up and down for following uneven ground.
- DRAG CHAIN - A series of short lengths of chain which are fastened to the seed tubes of small grain drills to cover the seed without packing the soil. An endless belt of chains which is used to move corn, etc., as from a loading platform to the silage cutter.
- DRAG GRADER - A device which consists of heavy wood timbers fastened together so as to form a parallelogram. It is used to smooth and level the surface of dirt roads, fills, etc.
- DRAG HARROW - See: Spike-tooth harrow.
- DRAG IN - To cover broadcast-sown seed with a drag or harrow.
- DRAG IRON - See: Rudder blade.
- DRAG-LINE EXCAVATOR - An excavating machine for use in digging large ditches and constructing levees which consists of a power unit, a boom from the upper end of which the bucket is suspended, a cable which pulls the bucket toward the machine. The whole device may be rotated on a turntable and is usually mounted on crawler treads.
- DRAG SCRAPER - A device for excavating in which the load is supported by the bottom of the scraper bowl behind the cutting edge. Also called slip scraper, slip, roll-over scraper.
- DRAGSTAFF - A pole attached loosely to the underside and at the rear of a horse-drawn vehicle to prevent the vehicle from moving backward, which is useful to prevent the wagon from rolling backward downhill.
- DRAIN - An artificial or natural channel which receives and carries off the gravitational water of a drainage area. The artificial drain is either an open ditch or an underground conduit, is designed to carry off excess or unwanted water from a land area. Ordinarily the drain does not carry sewage and is therefore distinguished from a sewer. To remove water from the surface of land or to remove excess water from the soil by ditching, tiling, or other procedures.
- DRAINAGE - 1. The removal of surplus ground or surface water by artificial means. 2. The manner in which the waters of an area are removed. 3. The area from which

- waters are drained; a drainage basin.
- DRAINAGE AREA** - 1. The area (sq.mi., acres, etc.) of a drainage basin. 2. A catchment area; drainage basin.
- DRAINAGE BASIN** - The area from which water is carried off by a drainage system; a watershed or catchment area.
- DRAINAGE DISTRICT** - An organization which operates under legal regulations for financing, constructing, operating and maintaining a drainage system.
- DRAINAGE DITCH** - An open channel which is used to carry off surplus ground and surface water.
- DRAINAGE ENGINEER** - An engineer whose specialty is drainage. He designs and supervises construction of drainage structures and systems.
- DRAINAGE FITTING** - A fitting used in tile drainage to change the direction of the pipe or provide a means for a junction with another pipe, i.e. lateral to main.
- DRAINAGE FURROW** - A furrow plowed to carry off excess surface water. See: Bedding.
- DRAINAGE MODULUS** - 1. The run-off of surplus surface and ground water from an area expressed in ins. of depth per 24 hr. Also called drainage coefficient. 2. In design, the flow capacity to be provided in ins. of depth to be removed in 24 hr.
- DRAINAGE SURVEY** - A survey which is performed to determine the need for, the requirements of, and collect profile and topographic data for the design for a system.
- DRAINAGE SYSTEM** - 1. An artificial network of furrows, ditches, tile drains or combinations of these that provides drainage for land. 2. A river and its tributaries which carry the run-off water from a watershed.
- DRAINAGE TERRACE** - A terrace constructed with a graded low velocity channel for run-off interception.
- DRAINAGE WATER** - 1. That water which the soil is unable to retain against the force of gravity. Also called gravitational water, free water, excess water. 2. Water flowing in a drain derived from the soil profile, surface or storm water.
- DRAINAGEWAY** - A man-made or natural channel thru which water flows for a specific area.
- DRAINING PEN** - A pen adjoining a dipping vat containing a sloping concrete floor on which animals which have just been dipped stand while the excess fluid drains off and back into the vat.
- DRAIN TILE** - Pipe of fired clay or concrete, in short lengths, which are usually laid with open joints to collect and remove soil profile gravitational water. Quality standards have been established by ASTM. Perforated wall tile is also used.
- DRAINTILE DESIGN CHART** - A chart used to determine the required size of tile and its discharge rate at a specified grade knowing the drainage coefficient, and number of acres to be drained.
- DRAIN WELL** - (Vertical drain) A well into which drainage water is directed, thus replacing the usual outlets of drainage ditches and natural streams. The well is excavated to a sufficient depth to reach a pervious substratum, such as sand and gravel, or a porous or cavernous limestone.
- DRAPER** - See: Canvas.
- DRAW** - A small natural stream tributary, drainage hollow, usually without a permanent stream in its bottom. (In local usage it is not always sharply differentiated from ravine, hollow, gulch, or coulee.)
- DRAWBAR** - That part of a coupling device which is fastened to the power unit such as a tractor and which transmits the pull of the power unit to the object to be drawn.
- DRAWBAR DYNAMOMETER** - An instrument used to determine the pulling effort of power units or obtain the draft of field implements.
- DRAWBAR HORSEPOWER (DBHP)** - It is

- the sustained power of a tractor that is available at the end of the drawbar, and is that power available to pull loads or draw machines. It is measured in ft. lb. per min. In relation to either a trailed or a mounted implement, is the power actually required to pull or move the implement at a uniform speed.
- DRAWBAR PULL (P)** - Net force at the drawbar in the direction of travel and parallel to the plane of the surface on which the traction device is operating.
- DRAWBAR SPRINGS** - Heavy springs used in conjunction with break pin drawbar coupling devices to reduce the shock and hence the frequency of break pin replacement.
- DRAWDOWN** - 1. The temporarily lowering of the watertable around a well during pumping. See: Cone of depression. 2. The decrease in cross sectional dimensions of a piece of metal after swaging or forging.
- DRAWDOWN TUBE** - A tube or outlet structure that slowly releases floodwaters temporarily stored behind a dam to prevent overflowing the outlet channel.
- DRAW HOE** - See: Garden hoe.
- DRAWING** - Term used synonymously with tempering of steel.
- DRAWING TEMPERATURE** - 1. The temperature at which ferrous or non-ferrous metals may be stretched, spread or shaped by passing through dies or by stamping successively, etc. 2. The temperature (which is variable) at which ice-cream, candy, etc., may be produced or drawn into units for distribution.
- DRAW WELL** - A well in which a bucket is used to lift the water to the ground surface.
- DRAY** - A small wagon which is used for light hauling. A single sled used in hauling logs in which one end of the log rides on the sled as the other drags on the ground.
- DREDGE** - Any of several different types of machines to excavate, deepen and clean out ditches and rivers.
- DRESSED** - The rough sawn surface of lumber has been planed off to make surface smooth.
- DRESSED SIZE LUMBER** - The actual dimensions of lumber after planing; usually 3/8 in. less than the nominal size for face widths of 2 to 6 ins., and 1/2 in. less than the nominal size for face widths and greater than 6 ins.
- DRESSING ROOM** - A room in a poultry plant in which birds are finished for market.
- DRESSING TOOL** - See: Sticking knife, hotel parer.
- DRIFT BARRIER** - An open structure built across a stream channel to catch driftwood. It may be of any form from a simple wire fence to a barrier of massive piers with heavy cables strung between them.
- DRILL** - An implement for planting seeds which forms a small furrow, deposits the seed in random spacing, covers the seed, and packs soil over it. A small furrow in which seeds are planted. A row of seeds which were planted by dribbling a small furrow. To sow seeds by means of a drill. To sow seeds by dribbling them in a small furrow. See: Plain drill, fertilizer drill, alfalfa drill, grain drill, lister planter, check-row planter.
- DRILL BARROW** - An early device intended to serve as a row planter which consisted of a barrel with holes on the circumference. It was filled with seed and rolled along a row, the seeds dropping out of holes as the barrel was rolled.
- DRILL CORN PLANTER** - A corn planter designed to place the kernels individually in the row, at relatively uniform space intervals.
- DRILLED WELL** - A well which is constructed by excavation, cable tools, boring, jetting or driving. See: Dug well, radial well, driven well, bored well.
- DRILL FURROW** - The small furrows left by the covering mechanism of the seed drill.
- DRILL PLANTER (SEEDER)** - See: Drill.

- D RING - A piece of metal shaped like the letter D or O which is fastened to a band or strap and used as a means of attachment to another part or device, especially with harness, etc.
- DRIP GUTTER - A small gutter in greenhouses at the point where the roof and walls meet to carry off water formed by condensation on the inside of the glass roof.
- DRIP HOLE - A hole at the bottom of a depression in a pipe or masonry wall to allow water to flow out.
- DRIP MOLD - A molding designed to prevent rain water from running down the face of a wall or to protect the bottom of a door or window from leakage.
- DRIP PAN - In machinery, a pan placed beneath a machine to catch excessive oils or other liquids.
- DRIP PIPE - A device used to draw off the water of condensation from systems of piping, steam cylinder, heaters, etc. Drain cocks are used for similar purposes.
- DRIVE - The means for giving motion to a machine part or machine, as a drive chain, a drive wheel.
- DRIVE CHAIN - A chain for heavy power transmission which is composed of uniform links working over suitable sprocket wheels. Also called link belting.
- DRIVE NOZZLE - A high-pressure nozzle used in spraying trees which is so designed that the jet breaks into a mist at the desired height.
- DRIVEN WELL - A well which is constructed by placing a well point and screen on iron pipe and pounding it into the ground until the point and screen are below the surface of the water table.
- DRIVER - 1. One who operates a vehicle, such as a wagon, truck, tractor, etc. 2. That which communicates motion to something else, especially a wheel that transmits power to another wheel.
- DRIVER COUPLING - A flange coupling connection, in which the bolts are headless and parallel, being fixed in one flange and more or less free in the other.
- DRIVE SHAFT - Any shaft used for the transmission of power.
- DRIVE WHEEL - The ground wheel of a machine, the rotation of which is used as a source of power for the operation of that machine.
- DRIVING AXLE - That axle of a self propelled vehicle through which the power is transmitted to the wheels.
- DRIVING GEAR - Any main gear through which power is directed to its final use.
- DRIVING HAMMER - 1. The hammer used to drive horseshoe nails into a horse's hoof. 2. A piece of pipe capped and weighted at one end which is used to drive steel posts into the ground. 3. A guided drop weight used to drive a post or piling into the ground.
- DRIVING RAIN - Heavy rainfall accompanied by a high wind.
- DRIZZLE - Uniform precipitation from stratiform clouds in the form of very small and numerous drops less than .5 mm in diameter which appear to float in the air. The precipitation may amount to as much as 0.04 ins. in an hr. Heavier than a mist, a drizzle is less intense than a shower.
- DROP - A volume of liquid that falls freely as one spherical mass.
- DROP CENTER RIM - The rim of a wheel adapted to receive a pneumatic rubber tire. The drop center facilitates slipping the tire over the outer flanges of the rim.
- DROP-INLETS - A tube type depth control structure with its inlet located at a specific elevation on the water side of a dam to conduct excess water to a point of outlet - commonly used as an outlet structure for farm ponds and flood control reservoirs.
- DROP-INLET SPILLWAY - A reservoir water level control structure commonly made up of three elements; namely an inlet consisting of an over-flow weir and vertical transition, a closed conduit and an outlet structure designed to

- dissipate kinetic energy.
- DROPLET** - A small spherical volume of fluid resulting from the secondary breakup of a drop or other fluid mass by action of a dispenser or air currents.
- DROPLET SIZE** - A measure of the size of a droplet such as diameter, weight or volume. It is usually expressed as the mass median diameter or the various droplet sizes actually dispensed.
- DROPPED CEILING** - A ceiling that has been lowered from an overhead floor or roof to form a plenum chamber or a space to run pipes or wires.
- DROPSIDING** - A horizontal type of wood siding shaped with a lap joint to shed water down the face of a building.
- DROP SPILLWAY** - A grade control structure which is used for dropping water in an open channel to a lower level and dissipating its kinetic energy.
- DROUGHT** - 1. A period of insufficient rainfall for normal plant growth which begins when the soil moisture is so depleted that vegetation roots cannot absorb enough water to replace that lost by transpiration. A drought can be arbitrarily defined on the basis of amount of precipitation during a certain period although such a measure has not uniform significance because of variable amounts of moisture retained in soils when the measurement begins. 2. A dry period. 3. A period when precipitation is not adequate to meet the needs of the human population. 4. In an arid area, a dry period of unusual length when there is an especial shortage of water for irrigation. Also called drouth.
- DRUM** - 1. A spool or reel for carrying coils of wire or rope. 2. A cylindrical container for oil, paint, etc.
- DRUM BRAKE** - See: Band brake.
- DRUM DRIER** - A type of dehydrator which consists of a revolving, heated drum on whose surface the materials are dried and scraped off after dehydration. The drum can be under atmospheric pressure or vacuum.
- DRUM GATE** - A movable barrier in the form of a sector of a circle hinged at the apex. The arc face effects a water seal with the edge of a recess into which the gate may be lowered. The gate is raised and held up by the pressure of water admitted to the recess from the forebay. It is lowered by closing the inlet port to the recess and draining the water from it.
- DRUM-TYPE HAY LOADER** - See: Cylinder hay loader.
- DRUM-TYPE HEAT EXCHANGER** - A heat exchanger for pasteurizing or for ice-cream freezing in which a drum is jacketed with steam or a refrigerant. The material to be treated is placed within the drum where scraper blades remove the heated or cooled material from the surface.
- DRY AIR** - Air exclusive of water vapor. This term is also used comparatively since in nature there is always some water vapor included in air.
- DRY BASIS** - A basis for representing moisture content of a product as parts of water per part of dry matter, which is equal to the weight of the dry matter and the answer multiplied by 100 to get the answer in percent. It may be more than 100%.
- DRY-BUILT** - See: Dry wall.
- DRY-BULB** - Part of a sling psychrometer. A dry bulb thermometer is designed to measure the temperature of the surrounding air without regard to its relative humidity.
- DRY-BULB TEMPERATURE** - The temperature of the air which is shown by any type of thermometer not affected by the water vapor content of the air.
- DRY CENTRIFUGAL AIR CLEANER** - Generally refers to a pre-cleaner placed in the inlet air stream of an internal combustion engine ahead of the final air cleaner. The flow of air through the pre-cleaner is such that centrifugal

- force acts on the heavier dust particles to separate them from the air, so that they may be collected in a suitable container or ejected outside.
- DRY-COIL BUNKER SYSTEM** - A method of distributing refrigeration in cold-storage rooms in which coils of pipes carrying a refrigerant are placed in a separate room. Air forced by a large fan is blown over the coils and distributed by ducts to the storage room.
- DRY COMPRESSION** - In refrigeration, when the ammonia is compressed without the addition of liquid ammonia, the superheat of compression being taken away by a water jacket.
- DRYER (DRIER)** - 1. Any device used to remove moisture from a product. It usually consists of a fan and duct system for forced air drying or a fan, duct system, and heating unit for a heated air drying system. 2. A trap attached to the suction pipe of an ammonia compressor. It usually contains freshly burnt unslaked lime which the ammonia gas can be passed over. The lime takes out any water the ammonia may carry. Also called a dehydrator.
- DRY ICE** - Solid carbon dioxide. It is used for refrigeration and it passes from a solid to a gas without a liquid phase.
- DRYING** - Removing moisture from a product so it is near equilibrium with normal atmospheric air or so the rate of deterioration from chemical and biological activity is slowed down.
- DRYING BED** - A prepared sand and gravel bed where sewage sludge is spread to dry after which it can be used as fertilizer.
- DRYING BIN** - A holding container for grain used in drying.
- DRYING CONSTANT** - A constant for different drying rates and is obtained as the slope of a straight line on semi-log paper, where the free moisture ratio on the ordinate is plotted against time on the abscissa.
- DRYING FRONT** - In a drying product, it is the advancing zone which includes all of the grain that has just reached an arbitrarily selected moisture content between the initial and final moisture content.
- DRYING OIL** - An oil which either naturally or after its boiling with oxide of lead, absorbs oxygen from the air and dries up rapidly. Drying oils are used as a basis for many paints and varnishes.
- DRYING POTENTIAL** - The vapor pressure difference between grain and the surrounding air is called "the drying potential" since the greater the vapor pressure difference, the faster the grain will dry.
- DRYING RATE** - The speed at which drying is taking place, usually a negative number. It is the slope of the drying curve at any instant of time.
- DRYING SYSTEMS** - The whole system used to dry products including the air ducts, fan, bin and heater, if heated air is used.
- DRYING ZONE** - The band or layer of product in a bin or mow in which most of the drying is occurring at any time.
- DRY KILN** - A structure in which lumber is seasoned by artificially heating or in which cones are dried and opened.
- DRY-LAND DIPPER DREDGE** - A power-driven dredge mounted on a platform which in turn is mounted on tracks. It consists of an open bucket with a cutting edge and a hinged-flap bottom, a boom and a dipper handle. It is used to excavate basements, drainage and irrigation canals. Commonly called "shovel".
- DRY MASONRY** - Stone work laid without mortar.
- DRY MATTER** - Material that contains an equivalent to that with no free water. (Bone-dry matter)
- DRY-MIX CONCRETE** - Concrete which is not saturated with water at the mixing stage. Having a low

- water-cement ratio and zero slump when the standard slump test is used. A patented material containing the necessary dry cement and aggregate to make concrete to which water is added.
- DRY PACK** - To fill a space with concrete by ramming in a damp concrete mixture, with suitable ramming or tamping equipment.
- DRY-PLATE CLUTCH** - Any type of clutch in which there is no lubricant used between the two friction surfaces.
- DRY-RENDERING** - The cooking of meat scraps, etc., in steam-jacketed tanks under a vacuum.
- DRY ROT** - A term applied to many types of decay of plants, fruit, vegetables and wood. This decay, when in an advanced stage, permits the wood to be easily crushed to a dry powder. This term is a misnomer for any decay since all fungi require moisture for growth.
- DRY SANDS** - Any kind of sand soil, especially in the humid regions, that is very dry because of free drainage and low moisture-holding capacity.
- DRY SATURATED STEAM** - One of the three forms of steam. The other two forms are wet steam and superheated steam. Dry saturated steam is steam formed when water is vaporized and contains no droplets of water or any degrees of superheat.
- DRY STEAM** - See: Dry saturated steam.
- DRY WALL** - A type of wall finish for houses which uses gypsum board, plywood or fiberboard as the interior wall finish instead of plaster. Joints between sheets must be taped or included in wall design.
- DUCK-FOOT CULTIVATOR** - Cultivator shovels which have a wing on each side for cutting through plant roots. Duck-foot cultivator is a generally used term for a field tiller with sweep-type shovels.
- DUCT SYSTEM** - A layout of passages for the purpose of conducting fluids or gases.
- DUGOUT POND** - An excavated reservoir which is used for storage or collection of ground water surface runoff. A source of irrigation water in some areas.
- DUG WELL** - A well which is excavated by men digging with picks and shovels to the water table or just below it.
- DUMP TRUCK** - A truck having a specially built bed which can be raised at the front end so that material on the truck will be unloaded by sliding off.
- DUMPY LEVEL** - An engineer's level having a short telescope rigidly fixed to the supporting bar and vertical axis.
- DUPLEX OUTLET** - A convenience outlet for two plug-in appliances.
- DURATION CURVE** - A graphical representation of the number of times given quantities are equalled or exceeded during a certain period of record. For example, if in a 10-yr. record of daily stream flow, the percentage of time the flow was above certain values (100, 200, 300 cu.ft. per sec., etc.) was plotted against the flow, the graph would constitute a duration curve for that stream and period. From it could then be read the percentage of time the flow was greater or less than any given value within the range that occurred during the period cited. The duration curve is the integral of the frequency curve.
- DUST** - 1. Particles of material in a fine, dry powdery state usually made up of a range of particle sizes within specified limits as determined by screening or other separating methods. 2. An insecticide-fungicide applied in dry form.
- DUSTER** - A mechanical device consisting of a blower, a dust reservoir, and a nozzle which is used in the application of an insecticidal or fungicidal dust so that the dust is emitted in a blast of air.
- DUSTER-CRANK** - A manually operated duster which comprises a hopper

- or container for the dust; an agitating device; a high velocity gear-driven fan driven by a hand-operated crank which develops a continuous current of air which carries the dust through the discharge equipment. Volume of dust discharged controlled by regulating device, and range of carry by speed of fan.
- DUSTER - KNAPSACK** - A manually operated duster designed to be carried on the operator's back, knapsack style. Comprises a hopper or container for the dust; an agitating device; a lever-actuated bellows which develops a current of air at each stroke which discharges the dust through the discharge equipment. Volume of dust discharged controlled by regulating device and range of carry by rapidity of actuating operating lever.
- DUSTER - KNAPSACK POWER** - An engine-powered duster designed to be carried on operator's back, knapsack style. Comprises a hopper or container for the dust; an agitating device; a high speed fan, driven by gasoline engine, which develops an air current which picks up the dust and discharges it continuously through the flexible discharge equipment. Provides complete portability and engine power instead of man power to operate.
- DUSTER-PLUNGER** - A small manually operated duster comprising a container for the dust material; a plunger pump which develops a current of air at each forward stroke which picks up dust from the dust container and discharges it through the discharge equipment. Volume of dust discharged and range of carry controlled by size of pump and speed of stroking.
- DUSTER - POWER** - A duster powered by a gasoline engine or PTO drive. Comprises a hopper or dust compartment; an agitating device; a high speed fan which may be engine or PTO driven and develops an air current which picks up the dust and discharges it continuously through the discharge equipment. Duster may be mounted on tractor, trailer, truck or other conveyance.
- DUSTER - TRACTION** - A duster mounted on a frame with wheelbarrow type handles and one or two wheels. Comprises a hopper or container for dust; an agitating device; a high speed gear-driven fan, driven by traction power from the ground wheel, which develops an air current which picks up the dust and discharges it through the discharge equipment. The unit may be propelled by man, horse or tractor. Provides greater dust capacity and wider area of coverage.
- DUSTING** - Applying a dry chemical dust to vegetation, for purpose of insect and pest control.
- DUST RESPIRATOR** - A mask to filter out poisonous substances which is worn when applying dangerous poisons, working in dusty area, etc.
- DUTCH LAP** - A type of asbestos-cement roofing in which the shingles are 16 x 16 ins., and 3/16 to 1/4 in. thick. They are laid with 1/4 to 1/3 side lap with the larger side lap preferred for better quality roofs. Also lapped over the preceding row of shingles.
- DUTY OF WATER** - The relation between the area of land served and the quantity of irrigation water used under different standards of practice which may vary from large use under crude practice to small use under good practice. It is the measure of the use of water and may be distinguished as head-gate or gross duty, lateral duty, duty at the farms, or net duty, and crop duty for different crops. It may be expressed in depth of water on the land, as the rate of flow per acre for a given time, as the area per unit flow for a given time. Strictly speaking, duty should be expressed in terms of the crops that a given duty will produce or the number of acres that a given flow will irrigate. A high duty corresponds to an economical use of water; a low

duty indicates small returns for the water used. Usage has broadened the meaning until it may mean exactly the opposite; that is, high duty signifying the use of abundant water, and vice versa. See: Consumptive use.

DYNAMITE - An explosive made of nitroglycerin, ammonium nitrate or other materials absorbed in a porous material, used to excavate stumps, stones, ditches, ponds, etc.

DYNAMOMETER - An instrument used for measuring work or power usually by a measurement of force, time and distance through which the force moved. See: Brake, draw bar, torsion dynamometers.

DYNE - A unit of force which equals that required to give a mass of 1 gm an acceleration of 1 cm/sec².

E

- EAGLE CLAW** - A cultivator gang with four shovels which are arranged in the shape of an eagle's claw.
- EARTH DAM** - A barrier composed of earth, or a combination of earth and rock in contrast to a dam made of concrete, masonry, etc.
- EARTH FILL** - 1. The soil used in a dam or other water controlling structure which is relatively impervious to the flow of water thru the soil mass. 2. Soil used to fill a depression in the land.
- EARTH LINING** - A thin covering of highly impervious soil placed in canals or other retention reservoirs to reduce seepage losses.
- EARTH-MOVING EQUIPMENT** - Equipment such as wheel scrapers, draglines, patrol graders, blades and bulldozers used in land grading and forming work.
- EARTH PRESSURES** - Lateral forces and vertical pressures on retaining walls or foundations exerted by earth piled against the wall.
- EARTHQUAKE LOADING** - A stress in buildings caused by an earthquake.
- EASEMENT** - The right of access or right of way through land which is usually attained by purchase for a specific purpose, such as for the construction and maintenance of a gas line, power line, oil line, telephone line, drainage ditch, irrigation canal or tile drain. A vested or acquired right to use land other than as a tenant, for a specific purpose, such right being held by someone other than the owner who holds title to the land.
- EAVE** - The lower edge of a roof, that part which projects beyond the wall of a building.
- EAVES TROUGH** - A shallow channel or conduit of wood or metal placed just below and along the eaves of a building to catch and carry off rainwater from the roof. Syn. gutter.
- ECCENTRIC LOADING** - A condition resulting when the principle loading of a structural member does not lie along the longitudinal axis. It induces uneven stresses over the cross section of the member due to a combination of tension or compression stresses and bending stress.
- EDDY-CHAMBER** - A chamber in a nozzle in which the liquid is whirled to improve atomization.
- EDDY-CURRENT DYNAMOMETER** - An absorption type dynamometer consisting of a rotor and a stator. The stator is equipped with coils for direct field excitation thus coupling it magnetically with the rotor. The stator is also mounted in trunnion bearings, thus permitting it to register torque on a scale.
- EDGE DISTANCE** - A detail of a connection joint design. It is the distance from the connector (timber connector, bolt, etc.) to the edge of the piece.
- EDGE-DROP SEED PLATE** - One of the types of seed plates used for planting corn which carries the corn kernel on its edge in the cell of the plate.
- EDGE-GRAINED** - A condition found in lumber resulting from the position of the log with respect to the saw. The growth rings form an angle of 45° to 90° with the surface of the board of timber considered. Syn. vertical grain.
- EFFECTIVE DEPOSIT RATE** - The mean deposit rate obtained center to center of adjoining swaths in agricultural aviation practices of pesticide application.
- EFFECTIVE LENGTH OF SLOPE** - That length of slope where there is no interception and water may build up to erosive flow.
- EFFECTIVE ROLLING CIRCUMFERENCE (FT.)** - The distance traveled in ft. per revolution by a traction device which is neither transmitting or receiving energy above and beyond that required to overcome rolling resistance.
- EFFECTIVE ROLLING RADIUS (INS.)** - Radius of a circle whose

circumference is equivalent to a given effective rolling circumference. Effective rolling circumference multiplied by 12, and divided by $2\sqrt{\pi}$, or 1.9098 multiplied by effective rolling circumference.

EFFECTIVE SIZE (HAZEN) (D_{10}) - The

grain size on a mechanical analysis curve corresponding to $W\% = 10$.

EFFECTIVE TEMPERATURE - A combination of room air temperature, air velocity and relative humidity, which will produce a comparable feeling of comfort in man or animals.

EFFLUENT - Sewage, partly or completely treated, flowing out of any sewage treatment device.

EJECTOR PUMP - A pump that consists of a centrifugal pump, which is located at the top of the well, and a hydraulic ejector near the water surface.

ELASTICITY - The property of recovering original shape and dimensions upon removal of a deforming force.

ELECTRICAL RESISTANCE MOISTURE METER

- A device used to determine the moisture content of grain by measuring the electrical resistances of a grain sample as it is fed between two steel rolls which act as electrodes. One of the rolls is motor driven. The resistance is calibrated so it can be read in moisture content.

ELECTRICAL RESISTANCE STRAIN GAGE -

A device for measuring strain consisting of a special material which has accurate electrical resistance, that is modified by any deformation of the material. The strain gage material is cemented to the member on which the deflection measurement is desired. A sensitive electronic measuring device converts the change in electrical resistance into an electrical reading.

ELECTRICAL RESISTANCE STRAIN GAGE

PRESSURE CELL - A pressure cell that can be used to measure pressures

in soil caused by tillage implements and traffic over surface of soil. The pressure cell is a stainless steel disc that acts as a diaphragm. A slight deflection of the diaphragm causes a strain in the metal which is measured by means of the strain gage, an electronic amplifier and recorder.

ELECTRIC DRILL - A drill having either a rotary motion provided by an electro-magnetic motor, or a percussion or reciprocating action provided by solenoids.

ELECTRIC FENCE CONTROLLER - A device to supply an interrupted or a continuous electric voltage to a wire, insulated at its supports, of such voltage and amperage that an animal contacting the charged wire and completing the electric circuit to the earth receives a deterring shock.

ELECTRIC OSMOSE (ELECTRO-OSMOSIS) -

The passage of an electrolyzed liquid into another liquid through an intervening porous partition. If a strong current be led into certain liquids, a porous partition being placed between the electrodes, the liquid is carried by the current through the porous partition until it is forced up to a higher level on one side than on the other. This electric action is most pronounced when the experiment is made with liquids which are poor conductors. The movement of the liquid takes place in the direction of the current.

ELECTRIC OUTLET (NEC) - A point on the wiring system at which current is taken to supply utilization equipment.

ELECTRIC POTENTIAL - This is the electric pressure potential between the terminals of a battery or a generator. Is usually measured in volts.

ELECTRIC PROBE - A device used to determine the temperature of different depths of material by probing to the desired depth where the sensing device will actuate indicating electric meter.

ELECTRIC RESISTANCE - That property

- of a material which resists current flow and which causes the conductor to change part of the electric energy into radiation (heat) when electric energy is transmitted thru it. It is measured in ohms.
- ELECTRIC RESISTANCE HEATER** - A heater that utilizes the electric resistance of a segment of a circuit to heat the material in the particular segment by using the properties of the material to convert electric energy to heat energy.
- ELECTRIC SHOCK** - The effect caused by the flow of electricity through the animal system. A sudden stimulation of the nerves as the convulsion and contraction of the muscles caused by an electric discharge through the system of man or animal.
- ELECTRIC STEAM BOILER** - A steam boiler heated by electricity to evaporate water under pressure.
- ELECTRIC TANK HEATER** - A device for heating liquids, consisting of an electric resistance coil which is introduced into the tank which holds the liquid.
- ELECTRODE** - Either terminal of an electrical energy source; especially either of the conductors by which current enters and leaves an electrolyte. An electrode may be a wire, plate or other conducting object.
- ELECTROMAGNET** - A coil of wire designed to act as a magnet as a result of carrying an electrical current. It is usually wound on a soft iron (high permeability) core.
- ELECTROMAGNETIC FIELD** - A condition around wires carrying an electric current, which causes the system to react as a magnet.
- ELECTROMAGNETIC INDUCTION** - The process of producing an emf in a conductor as a result of the cutting of magnetic lines of force by the conductor.
- ELECTROMAGNETIC RADIATION** - Disturbances in atoms caused by energy changes that produce the radiation of energy.
- ELECTROMOTIVE FORCE (emf)** - The electrical pressure in a system, e.g. the voltage of a battery or a generator.
- ELECTRON BEAM ACCELERATOR** - A device for accelerating electrons to high energy levels and directing them in a beam onto a specific target. Sometimes called a beta ray generator since it gives off beta rays.
- ELECTRON EMISSION** - The transmission of electrons by a surface of high potential to a surface of lower potential.
- ELECTRONIC OVEN** - An oven which obtains heat by molecular movement caused by alternating current in the radio frequency region.
- ELECTRONIC SYSTEMS** - Systems that operate equipment electrically through use of sensing devices which control the operation of the system.
- ELECTRON THEORY** - All matter is made up of atoms. The atom in turn is composed of still smaller particles called protons, neutrons and electrons. The electrons are negatively charged and move around the nucleus at a rapid speed. As the atoms in a substance move around they strike each other and electrons become detached from the nucleus. It is these detached particles or free electrons which some scientists suggest are electricity.
- ELECTROSTATIC FIELD** - See: Electromagnetic field.
- ELEVATING GRADER** - A power-driven, earth-moving device, consisting principally of a plow and a belt conveyor, which is used in the construction of terraces. As the plow turns the earth, the earth is dropped on the belt conveyor and carried to the other side of the machine where it is deposited at a higher level usually.
- ELEVATING SCRAPER** - An implement similar to the regular scraper except it uses chains, augers, etc., to load itself as it is towed.
- ELEVATOR** - One that raises or lifts anything; as an endless belt or

- chain conveyer with scoops or buckets for raising material; a cage or platform and its hoisting machinery in a building, mine, etc., for conveying persons or goods to or from different levels; or a building for elevating, storing, discharging and sometimes processing grain.
- ELEVATOR BUCKET** - A cup-like device attached to an endless chain or belt for the purpose of elevating granular type of material. Also called elevator cup. See: Bucket elevator.
- ELEVATOR CANVAS** - On a grain binder or combine, it is an endless canvas belt which transfers the cut grain from the cutter bar platform to the binding or threshing mechanisms.
- ELIMINATOR** - A type of moisture separator, in which suspended moisture is separated from air or other products by passing it through a vessel containing corrugated ribs and diaphragms, which collect the moisture and direct it to where it can be removed.
- ELKINGTON SYSTEM** - A system of drainage in which wells are dug at regular intervals to allow water from a lower stratum to raise to the level of the tile and thus drain away. First used by Joseph Elkington of Warwickshire, England, 1764.
- EMERGENT ELECTRON** - An electron whose energy depends on the frequency of the incident light. It is emitted from some materials at ordinary temperature when the impinging radiation is in the visible region.
- EMPTY-CELL PROCESS** - Any process for impregnating wood with preservatives or chemicals in which air is imprisoned in the wood under the pressure of the entering preservative and then expands, when the pressure is released, to drive out part of the injected preservative.
- EMULSION** - The dispersion of fine globules of a liquid in a liquid. For example, milk is an oil-in-water type emulsion.
- END GATE** - The rear end of the farm wagon box or bed or the rear end of a manure spreader. It is made in a number of different types so that it may be raised or easily removed or adjusted for different loading or unloading conditions. See: Tailboard.
- END-GATE SEEDER** - A device for broadcast sowing consisting of a hopper feeding device, and two rapidly revolving disks to scatter the seed. It is attached to the rear end of a wagon box or truck bed and is driven from the wagon wheel.
- END-GATE SPREADER** - A device fastened to the rear part of a wagon box or truck bed consisting of a hopper and two rapidly rotating disks which are used to spread granular materials.
- ENDLESS APRON LOADER** - A type of hay loader in which an endless apron carries the hay from the ground to a height for loading on the wagon.
- ENDLESS BELT** - A belt whose ends have been united so as to have neither beginning nor end, passing over two or more pulleys to convey materials or transmit power, as from a tractor to a cornsheller.
- ENDLESS CHAIN TRENCHING MACHINE** - A vertical or slant-boom trenching machine that has buckets on an endless chain to excavate a trench suitable for laying tile.
- END-MATCHED** - A descriptive term for lumber which has tongue and grooves on the ends so as to make tight joints and provide support between studs.
- END OF LUG CLEARANCE** - Distance from trailing side of a lug to the end of the lug that follows.
- END PLUG** - A cap which is used to shut off the flow of water from the end of an irrigation pipe. Also called end cap.
- END POST** - The supporting post at the end of a fence line; may be made of concrete, steel or wooden posts properly braced.
- ENDURANCE LIMIT** - The highest unit stress a material can stand without evidence of failure, when

- subjected to a large number of repeated loads.
- ENERGY** - The capacity for doing work. Two kinds - Potential and Kinetic. Measured in units of foot - pounds (ft.-lbs. or mks.)
- ENERGY GRADIENT** - 1. The slope of the energy line with reference to any plane. 2. (MLT^{-2} or F) The change in energy per unit length in the direction of flow or motion.
- ENERGY LINE** - A line joining the elevations of the energy heads of a stream. The energy line is above the hydraulic grade line a distance equivalent to the velocity heads at all sections along the stream.
- END-GATE ROD** - An iron rod which is used to brace the sides of a wagon box at the rear end, and threaded through parts of the end-gate.
- ENGINE EFFICIENCY** - 1. The ratio of the ideal fuel consumption per horsepower-hour to the actual fuel consumption per horsepower-hour. 2. The ratio of the thermal efficiency of the actual cycle to that of the ideal cycle (Otto, Joule, Diesel, etc.) on which the actual engine is operating.
- ENGINE FRICTION** - The total friction developed by an engine independently of that of any machinery which it has to drive.
- ENGINE, HIGH SPEED** - A relative term usually referring to engines that operate at speeds greater than 1000 rpm. Engines known as low-speed engines generally operate at 750 rpm or less.
- ENGINE LATHE** - A somewhat vague term, but as generally used signifies a lathe of moderate or large size, designed to perform the operations of engineer's work, and driven by the motive power derived from an engine.
- ENGINE POWER** - 1. The maximum sustained power at the rated speed with all accessories necessary for continuous operation. 2. In agricultural tractors is the sustained power delivered from the engine and measured on a dynamometer through a rotating power outlet on the tractor.
- ENGINE PRESSURE INDICATOR** - A device used to measure the pressures within the cylinders of internal combustion engines. It may be mechanical with the record of the pressures being traced on a chart or electrical with the pressures being indicated by the reaction of an oscillograph.
- ENGLISH BOND** - In masonry construction where alternate layers of blocks or bricks are laid with long axis of unit perpendicular to each other thus providing a tie with the back up wall every other layer.
- ENGLISH COB** - A method of earthen wall construction in which stiff mud is piled in thick layers directly in the wall without using forms.
- ENSILAGE BLOWER** - (Commonly called a "forage blower".) A machine used to transfer chopped forages or other materials from the wagon or truck unloading area to the storage area which is usually a silo. The material is transferred by a conveyer, such as an auger or endless belt, to a centrifugal fan or blower, which then throws and blows the material through a large pipe to the storage area. In such a machine, the blown material is thrown by centrifugal force radially outward along the blades of the fan.
- ENSILAGE CUTTER** - A machine which chops green crop materials into lengths suitable for storing in a silo. Also called silo filler, silage cutter.
- ENTRAINMENT** - Air or other material added to a major substance, i.e. air in concrete adds greatly to the durability of exposed concrete surfaces.
- ENTRANCE HEAD** - $h_e - h_v$ (L) - The head required to cause flow into conduit or other structure; it includes both entrance loss and velocity head.
- ENTRANCE LOSS** - h_e (L) - The head

- lost in eddies and friction at the inlet to a conduit or structure.
- ENTRANCE LOSS COEFFICIENT** - A number expressing the amount of change or effect, under certain entrance design conditions, of the flow of water through that entrance.
- ENTRANCE SWITCH** - A wiring device for interrupting all electrical power between the service wires and the building wiring.
- EP (EXTREME PRESSURE) LUBRICANTS** - Lubricants which have load carrying properties making them suitable for effective lubrication of power trains operating under severe load and speed conditions.
- EPHEMERAL STREAM** - One that flows only in direct response to precipitation. It receives no water from springs and no long-continued supply from melting snow or other surface source. Its stream channel is at all times above the water table. The term may be arbitrarily restricted to streams or stretches of streams that do not flow continuously during periods of as much as one month.
- EQUILIBRIUM MOISTURE CONTENT** - The moisture content at which grain or wood neither gains nor loses moisture when surrounded by air at a given relative humidity and temperature.
- EQUILIBRIUM MOISTURE CURVES** - A characteristically S-shaped or sigmoid isotherm is the result when moisture content of a product is plotted versus equilibrium relative humidity.
- EQUIVALENT DIAMETER** - The width of a square hole that will give the same area as a given round hole, the equivalent diameter of a rectangular duct is four times the hydraulic radius of a round hole, where the hydraulic radius is equal to the area divided by the circumference.
- EQUIVALENT WHEEL THRUST** - More commonly referred to as "Rim Pull" in the Construction Field where this term is used. It is the theoretical pull possible taken at the effective tire radius and at zero slip.
- ERODE** - 1. To wear away or carry away the surface of the earth, as water erodes a rock formation. 2. To wear away. See: Wind erosion.
- EROSIVE** - The action of external forces of wind, water, ice and gravity on the soil, which carries away some of the material.
- ETHANOL** - See: Ethyl alcohol.
- ETHYL ALCOHOL** - An anti-freeze which lowers the freezing point of water, and is inflammable. Also called Ethanol.
- ETHYLENE GLYCOL** - An anti-freeze material which lowers the freezing point and raises the boiling point of water and is not inflammable.
- EVAPORATED MILK** - Milk with one half or less of its original water content. The moisture is removed by evaporating and the milk contains no sugar. It contains a standardized amount of milk fat and milk solids, and is sterilized.
- EVAPORATING PANS** - An arrangement of shallow pans in series, for concentrating liquids, particularly in sugar manufacture, for evaporating water from cane juice or for evaporating water from maple syrup to make maple sugar.
- EVAPORATIVE CONDENSER** - Part of a refrigeration system used to condense the refrigerant from a vapor to a liquid. It does this by keeping the exterior of an ammonia condenser coil wet with water at all times and blowing air over this coil. As the water is evaporated it takes up about 1000 Btu/lb. of water and thus cools the ammonia so it condenses.
- EVAPORATIVE COOLER** - A method of cooling ventilating air by passing the air flow over beds of material saturated with water or over wet cloths. The evaporation of the water cools the air stream.
- EVAPORATOR** - The part of a refrigeration system in which the refrigerant is changed from a liquid to a vapor. The heat required to vaporize the liquid refrigerant is taken from the product being cooled.

- (expansion coil.)
- EVAPO-TRANSPIRATION** - Combined loss of water from soils by evaporation and plant transpiration.
- EVAPO-TRANSPIROMETER** - An instrument that consists of a large soil tank so constructed that plants can be grown in it under essentially field conditions and can be provided with water as needed. Every term in the hydrologic equation except evapo-transpiration is measured. Evapo-transpiration therefore can be determined as a difference.
- EVENER** - A bar of iron or wood which is used to divide the pull (place the center of pull) in the hitching of more than one draft animal, to a plow, wagon or farm implement.
- EVENER PIN** - Any hard steel pin either smooth or threaded with a head at one end, that is used to attach an evener to a tongue, clevis or other point of attachment at a farm implement. See: Wagon hammer.
- E-VITON** - A unit of erythemal flux equal to 10 microwatts of homogeneous radiation of wavelength 2967 Å.
- EXCESS ACETYLENE FLAME** - Oxyacetylene welding flame condition in which an excess of acetylene is used over the ratio required for complete combustion. (Reducing flame.)
- EXCESS WATER** - 1. Legally, surplus water of a stream; that which is not adjudicated, or that which is in excess of the needs of those who have prior rights to its use. 2. Any water, particularly rainfall, over and above that needed for plant growth which results in ponded water or runoff. See: Free water.
- EXHAUST BOX** - Usually a rectangular metal box 10-50 ft. in length, 3-20 ft. in width with a conveyor in the bottom. Steam is the usual heating medium. Filled, but unsealed cans are conveyed through the exhaust box. The product is heated to 170-190° F. which is high enough in temperature that a small vacuum will be formed after sealing and cooling.
- EXHAUST STACK** - A stack, on a portable heated air drying unit or boiler through which oil heater exhaust gases are discharged.
- EXPANDED METAL** - Malleable and ductile sheet metal that has been slit in alternate places and then pulled apart or expanded to form a grating surface or diamond-shaped mesh.
- EXPANDED METAL LATH** - Sheet metal cut through with numerous slits and the openings spread to form a metal network. Used as a base for plaster.
- EXPANDER TYPE FITTING** - See: Solderless type fitting.
- EXPANSTION COIL** - See: Evaporator.
- EXPANSION JOINT** - A special joint between two objects or materials designed to allow slippage or compensation for expansion with a temperature change, in order to reduce strains.
- EXPLOSION-PROOF** - This is an enclosing case which is designed and constructed to withstand an explosion of a specified gas or dust which may occur within it, and to prevent the ignition of the specified gas or dust surrounding the enclosure, by sparks, flashes or explosions of the specified gas or dust which may occur within the enclosure.
- EXPOSURE RATIO** - The total heat loss through a building's surfaces for a 1° F. temperature difference per Btu of sensible heat produced in the building. $x_f = \frac{AUau}{Q_s}$, where
- x_f = exposure ratio; AUau = average overall heat-transmission coefficient, (Btu/ft² hr °F); A = surface area through which heat flows, (ft²); Q_s = sensible heat available (Btu/hr.).

EXTERIOR GRADE PLYWOOD - Plywood that is capable of resisting moisture without delaminating. There are two types, water-proof and water-resistant. The water-proof grade will withstand extended exposure to severe moisture condition. The water-resistant grade must be painted to prevent separation of the plies when exposed to moisture.

EXTERNAL DRIP FEED - A type of lubricating system used on early machinery and tractors in which the lubricant was dripped into the bearing from an external reservoir.

EXTERNAL SPUR GEAR - A spur gear having its teeth on the outside of the rim of the gear.

EXHAUST - GAS ANALYZER - An instrument used to determine the air-fuel ratio being used in an internal combustion engine by analyzing the exhaust gases.

EXHAUST PIPE - Any system of piping used to conduct the exhaust gases of an internal combustion engine to a desired point. If a muffler is used, it is that piping which connects the exhaust manifold to the muffler.

EXHAUST STROKE - The return stroke of an internal combustion engine, immediately following the explosion stroke, during which the products of combustion are expelled from the cylinder.

EXHAUST VALVE - The valve in a gasoline engine cylinder which opens to allow the products of combustion to be expelled from the cylinder.

EXTENSION CORD - A combination of an electric cable, an electric outlet socket, and a plug used to provide a semi-portable electric outlet.

EXTENSION DOOR BOLT - A type of bolt used to secure one leaf of double doors when seven ft. high or over, replacing the common flush bolt. The extension bolt is worked from a thumb piece set in short plate on the edge of the door.

EXTERNAL GRINDER - 1. A worker who

grinds the external surface of cylindrical, or cone-shaped, objects on a machine equipped with a grinding wheel. Attaches suitable abrasive wheel, adjusts speed of machine and work; measures work from time to time to maintain accuracy. 2. Also, the special machine to accomplish this work.

EXTRACTOR - A machine used to remove the seed cotton from the burr of cotton harvested with a stripper type harvester.

F

- FACADE** - The front elevation of a structure.
- FACE BOARD** - A strip of material laid across the ends of the second story floor joists to seal that section.
- FACE BRICK** - Brick especially manufactured for use as a finishing or facing material; care is taken to make sure the brick will have good color and surface texture, regularity in shape and dimension and other qualities which contribute to a good appearance.
- FACED-IN** - Designating a method of arranging feeding alleys in a barn so that the animals stand in their stalls with their heads toward the center of the barn. See: Faced-out.
- FACED-OUT** - Designating a method of arranging feeding alleys in a barn so that the animals stand in their stalls with their heads toward the outside walls of the barn. See: Faced-in.
- FACTOR OF SAFETY** - The ratio between the load at which the member would fail and the load the member is designed to carry.
- FACTORY LUMBER** - A class of lumber used for millwork such as sash, cabinets and window casings. The other two classes are hard lumber and structural timber.
- FALLING RATE PERIOD** - A rate period of drying in which the product being dried affects the rate at which drying occurs. As the product gets closer to its equilibrium moisture content, it is more and more difficult to dry the moisture out of it.
- FALLOWING** - A method of accumulating and retaining moisture in the uncropped soil by working it only when necessary to remove weeds from an uncropped field.
- FALSE-ENDGATE UNLOADER** - A device consisting of an endgate which when loading remains at the front end of a truck or wagon box. It is then pulled to the rear of the box by some means, thereby unloading material, such as chopped forage, from the rear end of the wagon or truck box.
- FAN** - A mechanical device used to induce air movement by a revolving wheel with blades projecting from its shaft. Fans may be classified as axial or radial flow.
- FAN COOLING** - A term applied to any cooling process utilizing a fan to induce forced movement of air.
- FAN FLUID HORSEPOWER** - The work output of a fan. Fluid Horsepower =
$$\frac{(Cfm) (\Delta P_t)}{6350}$$
 Cfm = cu.ft. of air per min; ΔP_t = static pressure in ins. of water.
- FANNING MILL** - A type of seed cleaning machine using screens or sieves and an air blast, resulting in a separation based on size, shape and specific gravity.
- FAN TYPE NOZZLE** - A type of spray nozzle so constructed as to cause the liquid to emerge as a flat fan shaped sheet.
- FAN VENTILATION SYSTEM** - A ventilation system using a power driven fan to exhaust the air from a building.
- FARM DRAINAGE** - The removal, or exclusion, of excess water from farm land by open or closed drains and pumping plants.
- FARM DRIER** - See: Dryer (drier).
- FARM ELEVATOR** - A grain storage building in which is installed a permanent mechanical device for moving grains. Also a mechanical device for moving agricultural products.
- FARM IMPLEMENT** - Any mechanical tool used on a farm; for example, a plow, a tractor, etc.
- FARM IRRIGATION STRUCTURE** - 1. Any farm structure, such as a flume, siphon, suspension, culvert, debris basin, detention dam, sprinkler system, etc., which is necessary for the proper conveyance and application of irrigation

- water. These structures require special design, detailing staking and/or on-site assistance. 2. Any small farm irrigation structure, such as a turnout, check, drop or measuring device which is necessary for the proper conveyance and application of irrigation water. These structures will include those for which standard designs are available.
- FARM MAP** - An outline map of a farm showing roads, buildings, sites, lanes and field arrangements whose principal use is in farm planning and as a historical record of the tile lines, lime application, soil tests, etc.
- FARM MECHANICS** - The unspecialized, mechanical activities performed on the farm and in the home. Areas of activity are farm power and machinery, electrification, farm buildings and conveniences, rural electrification, preparing farm products for storage or use, and soil and water management.
- FARM MIXER** - A mechanical device consisting of a drum and paddles attached to a power unit which is used to mix feeds, etc.
- FARM POND** - A small reservoir of water on a farm which is usually formed by constructing a dam across a watercourse or by excavating.
- FARM POWER UNIT** - Any internal combustion engine used as a source of drawbar or rotative power on the farm. (May also be direct drive with no belts.)
- FARM RESERVOIRS** - Ponds or pits that provide stock, spray, domestic and recreational water irrigation.
- FARM SHOP** - 1. The building on a farm in which a farmer keeps tools, makes repairs, and constructs and maintains farm equipment. 2. A training program in agricultural high schools which train students in the maintenance of equipment and in the production of home-made equipment.
- FARMSTEAD** - That part of the farm which is occupied by the main set of buildings, including adjacent yards or corrals, garden and family orchard.
- FARM STRUCTURE** - Any building or other type of structure on a farm.
- FARM TRAILER** - A large, wagon-like box mounted on rubber-tired wheels which is used to haul produce, animals, etc.
- FARM TRUCK** - 1. That part of a wagon consisting of front and rear wheels, tongue and coupling pole (reach). 2. A gasoline engine powered truck which is used principally for hauling agriculture products and supplies.
- FARM-TYPE DITCHER** - An implement used to excavate temporary ditches on farms. It usually consists of a V-blade which is pulled behind a tractor to form the ditch.
- FARM WAGON** - A four-wheeled horse or tractor-drawn vehicle which is used to transport produce, fertilizer, seeds, etc. on the farm.
- FARM WASTE UTILIZATION** - The utilization of farm wastes, i.e. manure, corn cobs, flax straw, corn stalks, etc.
- FARMYARD** - That part of the farmstead that includes the area not occupied by the buildings.
- FARROWING HOUSE** - Any of several types of structures which are especially designed for a sow and her litter of pigs during the farrowing process.
- FARROWING PEN** - A small pen or enclosure, usually in a farm building, which is especially designed for a sow that is ready to farrow or has given birth to a litter of pigs.
- FASCIA** - A board fastened to the lower ends of the rafters or the side of the end rafters or look-outs to form the exterior surface of the eaves and cornice. Also called fascia.
- FAT-ACIDITY INDEX** - The amount of fat acidity present in grain. It is valuable in indicating incipient deterioration not apparent from grade factors.
- FAT-CORRECTED MILK** - Milk which has had excess fat removed or enough fat added to bring it to a standard

- butterfat content.
- FATIGUE OF MATERIALS** - Loss of strength as a result of a fluctuating stress occurring for a considerable period of time.
- FAUCET** - 1. A valve to fit an orifice in a barrel or other vessel to control the flow of the liquid. 2. A cock or tap for water or other liquids.
- FEATHER-EDGE** - 1. One edge of a board or surface which has been cut or planed to zero thickness. 2. A tool which is sharpened to a thin but uneven edge.
- FEED ALLEY** - An open lengthwise space in a barn along mangers used as an area passage way for putting feed into mangers.
- FEED CHAMBER** - The chamber in a baler, adjacent to the plunger, where hay accumulates momentarily while the plunger is in its compression cycle.
- FEED COLLECTOR** - A generally inverted, conical, metal receptacle into which material is blown after it passes through a hammer mill and from which the material passes into the bagger spout.
- FEED CUP** - The depression below the hopper in a grain seeding drill where the seed is metered to the seed tubes which conduct the seeds to the ground.
- FEEDER** - 1. Any device which carries material to or into a machine, as a feeder in a threshing machine or in a cotton gin. 2. Any of several types of appliances which is used for feeding sugar sirup to bees. 3. A hopper in which feed is placed for consumption by livestock. 4. A circuit extending from service panel or from a distribution panel to a branch circuit panel, from which point the final branch circuits are run to outlets and equipment.
- FEEDER CANVAS** - Any wide canvas belt fitted with slats and used to elevate materials, usually cut grain and straw, to the threshing or other processing mechanism.
- FEEDER CIRCUIT** - That portion of the electrical wiring system which is between the service switch and the final circuit fuses.
- FEED GATE** - A door or trap in the casing surrounding the conveyor in a grain elevator which is used for regulating the passage of grain to or from the various bins. Also for admitting seed to feed cups in a grain drill.
- FEEDGRINDER** - See: Hammer mill.
- FEEDING AREA** - An area of a barn, shed or open lot where livestock are fed any and all kinds of feed. This area may or may not include feed storages.
- FEEDING BATTERY** - A system of stationary equipment for the feeding of animals.
- FEEDING FLOOR** - The floor or ground surface of a feeding lot or building.
- FEEDING PEN** - An enclosure in which animals or fowl are fed.
- FEEDING RACK** - A slatted rack in which hay or forage is placed for direct animal consumption.
- FEED LOT** - A yard located outside the building devoted to feeding of farm animals, paved so it can be easily cleaned and not become muddy.
- FEED MIXER** - A device which is essentially an inverted cone of sheet metal, within which is an auger and paddle arrangement for mixing feed ingredients.
- FEED ROOM** - Room in a barn where feed supplies and grain are kept until fed.
- FEELER GAGE** - A shop tool for gaging or "feeling" the accuracy of workmanship between two abutting surfaces. Thin strips of hardened steel of known thickness are employed, and by mounting several blades of different thicknesses in a handle, like blades in a pocket knife, a great range of tests can be made by combining the blades.
- FELLY** - That part of the rim of a wheel, especially a wooden wagon wheel, in which the spokes are inserted and over which the iron tire is shrunk.
- FELT-BASE TILE** - A type of hard

- wear-resistant floor covering material with a backing of felt.
- F.E.M.A.** - Farm Equipment Manufacturers Association or standard thereof.
- FEMALE THREAD** - A thread which is cut inside a hole.
- FENCE INSULATOR** - An electrical insulator which is placed on a fence post or stake and to which the wire of an electric fence is attached.
- FENCE LINE** - 1. The wire of an electric fence which carries the electric current. 2. The dividing line between fields or farms on which a fence is usually built.
- FENCE LINE FEED BUNK** - A trough-like structure which is designed for feeding livestock along a fence. It is essentially a feed bunk in which the animals may feed by standing on the yard side. The feed may be distributed by dump trucks or feed carriers operated on the opposite side of the enclosed area.
- FENCE STRETCHER** - A mechanical device which can be fastened to a piece of wire or woven wire fence and is used to draw the fence wire taut before it is fastened to the posts.
- FENCE TESTER** - A device which is used to test the voltage produced on an electric fence.
- FENDER STICK** - A projecting rod used on the dividing devices of combines, corn pickers, mowers, etc., as a further aid to the separation of standing stalks or forage from that being cut.
- FERTILIZER ATTACHMENT** - A device that may be attached to agricultural machinery especially to a drill planter, or cultivator, to facilitate the distribution of fertilizer in or upon the soil at the time of planting. See: Fertilizer distributor, fertilizer drill, fertilizer spreader.
- FERTILIZER BOOT, SPLIT BAND** - A fertilizer placement device which allows placement of the fertilizer in bands on either side of the seed, usually above the seed level.
- FERTILIZER DISTRIBUTOR** - Any of several types of devices and implements which are used to spread fertilizer.
- FERTILIZER DRILL** - A seed drill which has a fertilizer attachment to place fertilizer in the soil during the process of drilling the seed. It may also be a machine which places fertilizer in the soil before seeding.
- FERTILIZER GRAIN DRILL** - See: Fertilizer drill.
- FERTILIZER SPOUT** - Any tube-like device used to conduct the fertilizer from the metering device to the placement device.
- FERTILIZER SPREADER** - A mechanical device which is used for broadcasting manure or commercial fertilizer wide-spread in the field.
- FIBER INSULATION BOARD** - A rigid insulation made from processed wood, sugar cane or other vegetable products. Usually made in large sheets of low density, combining strength with heat and sound in insulating properties. Widely used for sheathing, or a plaster base for inside surfaces.
- FIBER SORTER** - An apparatus within which cotton seed with combed lint will be sorted by length of lint and by a ratio of weight of lint to that of the seed.
- FIBRILLATING CURRENT** - Excessive electric current encountered with electric fencing which either stops an animal's breathing by paralyzing the chest muscles or stops the heart.
- FIELD CAPACITY, F.C.** - 1. The moisture percentage, on dry weight basis, of a soil after rapid drainage, following an application of water, has taken place. This moisture percentage is usually reached within 2 to 4 days after an ordinary irrigation. Field capacity differs from "specific retention" only in units of expression and its application. 2. The amount of water held by the soil after the surplus water has drained from a saturated soil;

- sometimes called the water holding capacity of soils.
- FIELD CHOPPER** - See: Forage harvester.
- FIELD CHOPPING** - The harvesting of forage, corn and other green crops, and straw by a machine which chops the material in the field and delivers it into a wagon or truck. Forage may be chopped directly as standing material or picked up from windrows.
- FIELD CULTIVATOR** - An implement which has several sweeps or shovels so mounted as to provide subsurface tillage. The standards which carry the sweeps are staggered to permit trash to flow around and between them.
- FIELD CURING** - Natural drying of hay in the fields where it is cut. Usually refers to drying the hay to 20% moisture content wet basis at which moisture content the hay will keep indefinitely.
- FIELD CUTTERS** - See: Forage harvester.
- FIELD DITCH** - One of the smaller ditches from larger irrigation canals which is used for carrying the irrigation water to individual fields.
- FIELD ELL** - A pipe joint which is curved 90° for main or lateral pipe lines to change the direction of the water in irrigation.
- FIELD ENSILAGE HARVESTER** - See: Forage harvester.
- FIELD FENCE** - The fence which surrounds a farm field.
- FIELD FORAGE CHOPPER** - See: Forage harvester.
- FIELD HARVESTER** - See: Forage harvester.
- FIELD IMPLEMENT** - Any type of machine designed for use in the field for the production of agricultural crops as compared to those used as stationary installations.
- FIELD IRRIGATION EFFICIENCY** - The percentage of irrigation water that is available for consumptive use by crops; measured at the field or plot.
- FIELD LEVEES** - Embankments along streams or on flood plains adjacent to a field designed to confine the canal flow to a definite width for protection of the field.
- FIELD PIT** - A pit which is dug in or near fields of potatoes or cabbages and in which these products are placed for storage, covered by soil or layers of soil and straw to protect them from the winter cold. See: Pit storage.
- FIELD PROVED** - Designating features of machines that have been proved by years of field tests.
- FIELDS** - Subdivisions of a farm which form areas on which specific crops are grown, or for pasture purposes.
- FIELD SPRAYER** - Any sprayer designed to handle many different types of materials for application to field crops.
- FIELD STORAGE** - The storage of produce in trenches and pits or by mounding on the surface of the ground and in above-ground horizontal silos. See: Pit storage.
- FIELD STRIP CROPPING** - A system of strip cropping in which a field is divided into parallel strips that run across the slope, not necessarily following contours to reduce soil erosion. See: Strip cropping.
- FIELD TEE** - A pipe junction for connecting three lengths of tubing which is used in irrigation where a branch of the main line or lateral line is taken off.
- FIFTH WHEEL** - A horizontal wheel-like bearing or pivot which partially supports and is supported by the front axle on a 4-wheeled vehicle, enabling it to be moved at an angle for turning corners. (By the arrangement of gearing with worm gears the fifth wheel can be made to serve as steering gear.)
- FILE** - A steel instrument, having its surface covered with sharp edged furrows or teeth, which is used for sharpening, abrading or smoothing other substances, as metals,

- wood or stone.
- FILE CARD** - A flat wire brush with fine sharp teeth used for removing the metallic particles from the grooves of the file.
- FILING** - The act of filing; as in cutting down or smoothing of metals, wood or stone with a file.
- FILL** - 1. Material usually soil, used to bring the existing ground level up to some new level. 2. Depth to which material is to be placed (filled) to bring the surface to the predetermined grade.
- FILLER** - 1. Any of various types of appliances for filling special receptacles, as bottlefiller, silofiller, ice-cream filler, etc. (or indicating by the names something as to the manner by which the filling is accomplished, such as gravity filler, vacuum filler, pneumatic elevating can filler, etc.) 2. A plate the sole function of which is to fill up space.
- FILLET** - The material in a sharp corner which has been added to give a rounded corner.
- FILLET WELD** - A weld of approximately triangular cross section as used in a lap joint, tee-joint or corner joint, to unite two surfaces approximately at right angles to each other, but filling in to eliminate the sharp corner.
- FILM BAG** - A carrier to hold a sample of grain until a moisture determination check of the sample. The film bag prevents moisture loss from the sample.
- FILM-STRENGTH** - A physical property of lubricating oils which results in the ability of an oil to support a given bearing load.
- FILTER BED** - A bed of sand and gravel with disposal tile on top and drain tile underneath. The liquid effluent filters downward through the sand and gravel which removes solids, leaving a clear liquid discharge through the underdrained tile.
- FILTER BOWL** - Part of a fuel filtering device consisting of a glass or metal receptacle into which the fuel flows before passing through the filter screen.
- FILTER DISK** - A disk-shaped pad through which a liquid is passed to filter it. In the dairy industry, this is usually a cotton pad. Also called filter disc, filter pad.
- FIN COULTER** - An irregular-shaped piece of steel which is bolted to the land face or gunnel of the plow share and extends upward to cut loose the furrow slice. It is used principally in sod land.
- FINE AGGREGATE** - That part of concrete that the cement binds together; particles will pass a 1/4 screen - may consist of sand, stone screenings or other inert materials. Free of organic material.
- FINES** - 1. Soil classification term applying to all particles smaller than sand. Fines (silt and clay) below No. 200 screen (.074 MM). 2. In hydraulic sluicing, the material that slowly settles to the bottom of a mass of water.
- FINE-TEXTURED SOILS** - 1. Soils in which 50% or more of the grains pass the No. 200 screen (.074 MM). 2. Soils which exhibit plasticity due to high silt and clay content.
- FINGER (S)** - Finger-like parts of machines that serve different functions according to the machine. In a grain combine, special parts that pick up the cut grain from the windrow and start it on its way to the threshing cylinder. In a fertilizer spreader, certain parts that agitate or feed the fertilizer in the box or hopper to the outlets. In mechanical pickers or roughing machines, the rubber tubes or strips which pull off most of the feathers from the fowl passing through the machine. See: Finger plate.
- FINGER FEED** - As applied to fertilizer distributors, it refers to a type of metering device which consists of a flat rotating disk having projections on its periphery which transfers fertilizer from the hopper to the delivery tube.

- It is commonly called a "star wheel" feed. (Combines often have retracting feeding fingers incorporated in the auger to transfer grain from the cutter bar platform to the elevating or threshing portions of the combine.
- FINGER PLATE** - Also called star feed, wizard feed. See: Finger feed.
- FINGER STRIPPER** - A type of cotton harvesting machine. It consists of teeth made of 1-in. angle-iron section about 20 ins. long and attached to a heavy bar in such a way that the teeth are about 3/4 of an in. apart. A revolving wheel with a rubber belt or metal fingers is located just above the teeth to scrape the cotton from the teeth.
- FINGER WHEEL RAKE** - A type of side delivery rake made up of a series of individually floating wheels set at an angle to the direction of forward motion. Each wheel has raking teeth on its periphery and rotates because of contact with the ground or it may be power driven.
- FINISHER** - 1. For the manufacture of tomato and other fruit and vegetable purees, the appliance which breaks up the various sized pieces of pulp by the action of rapidly revolving, heavy brushes so that the final product is homogeneous and will pass through a fine sieve. 2. For poultry, a battery of several cages within which broilers may be fed to the desired size and degree of fatness. Also called finishing battery.
- FINISHING HAY** - Drying hay in a barn or other storage from a moisture content of 35-40% (wet basis) down to a moisture content of about 20% (wet basis) which is safe for storing. Also called barn drying, barn curing, mow curing.
- FINISH LUMBER** - Lumber with the designation S4S4E used as a finishing material, usually clear lumber without knots or other defects; a high quality lumber with a good appearance.
- FINK TRUSS** - A type of truss in which there are four interior members of diagonals arranged in the shape of a W. The two short diagonals join the upper chords at their mid-points and the lower chord at its third points, the long diagonals join at one point with the two top chords at the ridge joint and fasten to the bottom chord at its third points.
- FINNED TYPE COIL** - Evaporator coils with thin strips of metal sticking out on them to aid in obtaining a faster rate of heat transfer to the surrounding medium or from the surrounding medium to the coils.
- FINNEGAN FREEZER** - An effective apparatus for freezing canned citrus juices. The canned juice slides through concentric pipes filled with alcohol (denatured or isopropyl) at about -28° F. The cans spin as they go through the pipes to prevent a "core" at the center of the can.
- FIRE BRICK** - Brick made of a wide variety of materials (clay, silica, flint, feldspar, aluminum silicate) which give it a high fusing point, especially suitable for furnace or fireplace linings.
- FIRE PLOW** - A heavy duty, usually specialized machine, either of the share or disk type, which is designed solely for abusive work in the woods and is used with either horses or tractors to construct fire breaks and fire lines.
- FIRE POT** - 1. The lower part of a stove or furnace in which the fire is made. 2. A portable furnace heated by coke or liquid fuel, used by plumbers for melting lead.
- FIRE TUBE BOILER** - A type of steam boiler where hot gases are forced through tubes to heat the surrounding water.
- FIRING ORDER** - The order in which the firing takes place within each of the cylinders of a multiple cylinder internal combustion engine. Numbering is started with the cylinder at the end opposite

- the fly wheel.
- FISCHER METHOD** - An indirect method of determining moisture content of a product by the use of a chemical. Anhydrous methyl alcohol is added to a finely ground product and penetrates the organic tissues to aid in rapidly removing the moisture.
- FISHTAIL OUTLET** - A nozzle which is shaped like a fishtail and which is used in spraying or dusting insecticides and fungicides causing the spray or dust to spread out in a band that covers the plants.
- FISH TAPE** - See: Snake.
- FITTINGS** - Coupling joints, valves, tees, etc., for pipes which are used for various purposes; that is, sprinkler irrigation system; dairy apparatus; high pressure fittings for lubrication of wheels or other moving parts.
- FIVE-TOOTH WEEDER** - An assembly of five cultivator teeth that can be attached to a garden cultivator which is used for weeding row crops.
- FIXED-HEAD, SPRINKLER** - A type of sprinkler fixed in position, having no moving parts and capable of dispersing water in a full part circle or square patterns.
- FIXITY FACTOR** - See: Degree of fixity.
- FIXTURE** - Holder for one or more electric lamps.
- FIXTURE WIRING** - The wiring which carries power in the lighting fixture.
- FLAIL** - A wooden handled implement of many designs at the end of which is fastened a free swinging metal or wooden piece called a swingle which is used to thresh the grain by hand from harvested plants by beating the seeds free from the straw. v. To thresh the grain from the stem by the use of the flail.
- FLAIL-TYPE FORAGE HARVESTER** - The flail-type cuts off and chops by means of swinging knives mounted on a rotating shaft and cutting upwardly in front. See: Forage harvester.
- FLAKE OR CHOPPED-ICE MACHINE** - Equipment which will produce small flakes or ice chips. The ice is usually formed and flaked or chopped in the machine and stored until use.
- FLAKING MILL** - A piece of machinery for rolling or pressing grain, such as corn into thin flakes.
- FLAME CONTROL** - A device that will automatically shut off the fuel supply to a burner in case of ignition failure. Used on farm drying systems as a safety feature.
- FLAME CUTTING** - An oxyacetylene process employing a special attachment with which steel is heated to its kindling temperature and oxygen, under pressure, is released from a jet to burn a narrow kerf into the metal.
- FLAME HARDENING** - A method of obtaining a hard surface on steel machine parts to resist wear, abrasion or local deformation while maintaining a tough shock resistant core. It involves progressive controlled local heating followed by a water cooling guard.
- FLAME WEEDING** - A system of using open flame to control weeds among row crop plants. It depends on the weeds being small and tender compared to the crop plants. Enough heat is applied to rupture the cell walls of the weeds but not enough to cause actual combustion. Also called flame cultivation.
- FLANGED PIPES** - Pipes provided either with integral or attached flanges for connecting them together by means of bolts.
- FLANGED UNION** - A method of connecting one length of pipe to another, by means of flanges, screwed or brazed on the end of either pipe, with gasket material between the flanges, the whole being held together by bolts.
- FLANGE PULLEY** - A belt pulley provided with flanges upon its circumference edges to retain the belt in place. This type of pulley is commonly used with V-belts,

but may be used with flat belts.

FLANGE WELD - A weld in which the two pieces to be joined are turned up or flanged to a height equal to the thickness of the sheet and fused by applying heat.

FLANK - That portion of a cam outline which is flat.

FLARE - 1. Widening a trough to increase its capacity by enlarging the cross section. 2. The expanded end of a tube.

FLARE BOARD - A slanting side board as on an open type motor truck.

FLARING INLET - A funnel-shaped entrance to facilitate flow into a conduit.

FLASHBACK - That which occurs when the flame in oxyacetylene welding disappears from the end of the top and the gases burn back inside the blowpipe or in the hose, usually with a shrill, hissing sound. This indicates that something is seriously wrong with the equipment or the manner of operating it.

FLASHBOARD - 1. A temporary barrier, usually of wood, which is placed along the crest of spillway dams to impound increased volumes of water. It can be constructed so that it will be carried away during floods and thus lower the water level in the reservoir. 2. A removal board in the weir of a water level control dam to increase or decrease the depth of upstream storage.

FLASH EVAPORATOR - Water at a particular pressure and temperature is released into a chamber of slightly lower pressure, where the liquid flashes into vapor and is subsequently condensed.

FLASH-FLOOD - A sudden overflow of a stream due to a rapid concentration of runoff commonly associated with high intensity storms of short duration.

FLASHING - Sheet metal, or some other water resistant material, used at points where the continuity of the surface is broken such as valleys, chimneys, etc., to prevent leaking of water into the structure.

FLASH POINT - The particular temperature at which a material gives off inflammable vapor in sufficient quantity to burn instantaneously at the approach of a flame or spark.

FLASH RUNOFF - See: Flash flood.

FLASH TEST - A test used to determine the temperature at which a fuel sample will give off inflammable vapors. See: Flash point.

FLASH WELDING - A resistance butt welding process wherein the welding heat is developed by the passage of current in the form of an arc across a short gap between the surfaces to be welded, these surfaces being kept slightly separated until they have flashed off to parallelism and have reached the desired temperature. The electrical circuit is then opened and the surfaces pressed together, causing fusion.

FLAT BELT - A thin, wide belt made up of leather or several piles of canvas impregnated with rubber. It is used for rotary power transmission involving relatively large power requirements.

FLAT CHISEL - A cold chisel having a relatively broad cutting edge, used in chipping flat surfaces.

FLAT-DROP SEED PLATE - A type of plate used in cell type seed metering devices which has openings around the periphery of the plate large enough to allow a single seed to lie flat.

FLAT FURROW PLOWING - Plowing in such a manner that the furrow slices are inverted and lie flat on the bottom of the adjacent furrow.

FLAT-GRAINED - The grain of the piece is parallel or nearly parallel with the surface of the piece.

FLAT POSITION WELDING - Welding a piece of metal, lying in a horizontal position, on the top side.

FLAT RUNNER POINT - The teeth of a hay-rake which are flattened near the tip so as to pass freely under the mown grass and rake cleanly.

FLAT-SPRAY NOZZLE - A nozzle which is designed to produce a spreading,

- flat spray.
- FLAVOR MIXING TANK** - A supplementary tank which is designed for adding flavoring to the ice cream mix in continuous type ice cream freezers.
- FLAX ROLL** - A special attachment for combines consisting of the combination of a rubber covered roll and a steel roll installed just ahead of the conventional cylinder when harvesting podded crops. The rubber roll turns faster than the steel roll thus providing a rubbing action to aid in threshing.
- FLAYMASTER** - A type of motorized knife which is used in the removal of the hide or skin from the beef carcass in slaughter-house operation.
- FLEAM** - The angle of rake between the cutting edge of a saw-tooth and the plane of the blade.
- FLEMISH BOND** - An arrangement of bricks which consists of alternate headers and stretchers in the same course; the header in one course is centrally placed over the stretcher in the course below. A quarter bond is made by putting a closer next to the quoin header. This type of bond is used mostly for facing work.
- FLEXIBLE CONDUIT** - A tube for wiring consisting of a continuous flexible steel tube composed of convex and concave metal, wound spirally upon each other in such a way as to interlock their concave surfaces.
- FLEXIBLE COUPLING** - A shaft coupling used to connect two shafts in which perfectly rigid alignment is impossible; the drive is commonly transmitted from one shaft to another through a resilient joint such as a steel spring, a rubber disk or bushings.
- FLEXIBLE HARROW** - A spike-tooth harrow with hinged links between the tooth bars which permit it to be rolled up on one steel bar for transport.
- FLEXIBLE-IMPELLER PUMP** - A type of pump used where pressures not exceeding 20-50 psi are needed. An impeller having flexible vanes is mounted off center in the pump housing. The result is a flattening of the vanes during part of the rotation cycle thus reducing the effective volume between the vanes at one point and causing a pumping action.
- FLEXIBLE SPROCKET-WHEEL PULVERIZER** - A type of pulverizer made of sprocket-like wheels fastened together so they will adjust to the contour of the land. This type crushes surface clods particularly well.
- FLICKER ROLL** - A roll, composed of coarse, circular saws which remove the extracted seeds from the seeder roll in commercial raisin seeding operations.
- FLIGHT** - A wood or metal slat mounted crosswise of the chain or belt of an elevator or conveyor.
- FLIGHT CONVEYOR** - A type of materials handling conveyor using slats fastened to the continuous belting or chain to aid in moving the material upwards.
- FLIGHTING** - Parts in motive contact with materials, as auger screw or chain paddles.
- FLITCH** - 1. The outsize piece of lumber sawed from a tree; it may have bark on one or both sides. 2. A piece of metal added to a girder to give strength at a weak point.
- FLOAT** - 1. A device used to smooth or level freshly poured concrete. 2. A valve: in the cream separator one that regulates the inflow of milk into the cream-separator bowl; or a similar contrivance for maintaining the desired level of water in a tank. 3. A drag or device for leveling soil. 4. An instrument which is used for filing animals' teeth, usually a horse's. v. To come to the top of the ground, as with a certain type of plow which automatically adjusts if the bottom strikes an obstruction.
- FLOAT CHAMBER** - In a carburetor, the fuel reservoir from which the jets are supplied, and in which the fuel level is kept constant by means of a float-controlled valve.

- FLOATING** - The process of smoothing the surface of freshly poured concrete with a float or a steel trowel. This works the fine particles to the surface and gives a smooth finish.
- FLOATING AXLE** - An axle on which the shaft is relieved of all loads or stresses except those required for turning the wheel.
- FLOATING DIPPER DREDGE** - A dredge mounted on a floating barge which uses a bucket type of dipper to dig and to deposit the excavated soil at one side of the ditch. It is suited for excavation of drainage ditches or canals in swampy, timbered regions.
- FLOAT-TYPE CARBURETOR** - Any carburetor using a float to regulate the fuel supply coming in according to the demands of the engine. Very early type carburetors did not use a float and were a simple mixing device.
- FLOCCULATED** - To aggregate into small masses due to reaction of soils or sediments. Term describing aggregation of matter in the colloidal state. A characteristic common of most clay soils.
- FLOOD** - 1. The overflow by water from natural cause or by human effort of fields, farms, cities, etc. 2. To run water upon a field to the depth of a few ins. for the purpose of irrigating, to supply sufficient moisture for the growth of the crop, as rice, cranberry, etc., or to protect the crop from threatened injury by frost. (This is probably the earliest and simplest method of irrigation, and one that was used in Egypt several thousand years ago.) 3. To overflow the natural banks so as to inundate the adjacent or more distant regions.
- FLOOD CONTROL** - Any of the various engineering practices that are used to prevent or reduce damage resulting from overflowing diversion canals, building levees and constructing dams to impound the water in retention basins.
- FLOOD-CONTROL RESERVOIRS** - Reservoirs usually placed in the upper part of the watershed for storing excess water and regulating the rate of outflow.
- FLOOD-CONTROL STRUCTURES** - Structures varying in size used to impound, restrict the rate of flow, or dissipate the energy of the water. See: Flood-control reservoirs.
- FLOOD CREST** - The maximum depth of water during a flood.
- FLOOD EASEMENT** - A type of easement secured to permit the flooding of land for flood control or other purposes.
- FLOODED COILS** - Evaporator coils which in operation are filled with a liquid refrigerant.
- FLOODED SYSTEM** - A type of direct expansion cooler in which the evaporating coils are kept full of liquid at all times by means of a float valve with an accumulator that keeps liquid from being drawn into the compressor of a refrigeration system.
- FLOODGATES** - 1. Release gates commonly used in flood control dams for the purpose of regulating the rate of outflow from the impounded reservoir to the stream channel below the dam. 2. Gates located above the salt-water line in a stream which controls the flow of water into the canal.
- FLOODING** - 1. The inundation of land by water in excess of that confined within the stream banks. 2. The running of water upon fields for irrigation, or for protection from frost damage. See: Flood.
- FLOOD PEAK** - The maximum momentary rate of flow occurring during a flood.
- FLOODPLAIN** - Land which overflows when stream flow exceeds channel capacity.
- FLOODPLAIN SCOUR** - The removal of unconsolidated terrace deposits by floods.
- FLOOD PREVENTION** - See: Flood control.
- FLOOD STAGE** - The stage of flooding

- in which the level of the water rises above the stream banks. Frequently an arbitrary level is established which, when the water level exceeds this stage, the stream or river is said to be at flood stage.
- FLOOD WALLS** - Retention walls built adjacent to a stream or river to prevent flood waters from overflowing the flood plain.
- FLOOD WATER** - The water that overflows the stream bank and spreads over the flood plain.
- FLOODWATER RETARDING STRUCTURE** - A structure placed in the stream channel which impounds water.
- FLOODWAY** - The area including the usually dry land, between the river bank and the levee or other natural elevations on either side of a stream. See: Floodplain.
- FLOOR BEAM** - A transverse beam or girder placed at the panel points of a span to support the stringers that carry the floor.
- FLOOR PLAN** - A drawing of one floor of a building showing the thickness of walls and partitions and where passages and doors are located; it may or may not show the location of furniture and other items. Shows all horizontal dimensions at the level to which the drawing refers.
- FLOOR SLAB** - A slab of concrete poured for use as a floor. Usually laid directly on the ground but may be reinforced and supported by beams or pillars.
- FLOOR STAND** - A shafting support, consisting of a frame or pedestal upon which is mounted a pillow block bearing; means are generally provided for vertical adjustment, either by means of screws or by wedge keys.
- FLOOR-TYPE MANGER** - A manger whose front edge is level with the floor. May be of the sweep-in type.
- FLOOR-TYPE MILKER** - A type of milking machine unit which rests on the floor during the mechanical milking process.
- FLOTATION** - A separation of materials of different specific gravities by mixing them with a liquid having an intermediate gravity. Some of the materials will float and others will sink, i.e. over-mature peas may be separated from green peas in this manner.
- FLOTATION VELOCITY** - Velocity of air needed to hold a particle in suspended equilibrium. Also, the terminal velocity of that product, e.g. the constant rate at which it would fall.
- FLOWAGE LINE** - A contour line around a reservoir, pond, lake or along a stream which corresponds to some definite water level (maximum, mean, low spillway, crest, etc.), and is generally used in connection with the acquisition of rights to flood lands for storage purposes.
- FLOW-CONTROL VALVES** - Valves used to regulate the pressure and discharge of individual irrigation sprinklers.
- FLOW METER** - An instrument designed to measure the rate of flow of liquids or gases.
- FLOW RATE** - Rate at which a material is transferred or conveyed past a given point, i.e. gal. or lbs. per unit time.
- FLUE-CURED TOBACCO BARN** - A specially constructed structure for curing "bright" or "flue-cured" tobacco. The barns are 16 to 25 ft.sq. and 16 to 25 ft. tall, and equipped with kilns and flues for heating and means for controlled ventilation.
- FLUE-TYPE BOILER** - A vessel used in generating steam in which the hot gases of combustion pass thru small metal tubes which are surrounded by water.
- FLUELESS TYPE** - A type of boiler which does not include small diameter flues in its construction; but rather uses a single large diameter passage for the hot gases of combustion.
- FLUID COUPLING** - A hydraulic mechanism for transmitting power. It is made up of two elements - an impeller and a runner, and utilizes the kinetic energy of a

- fluid, usually oil, as it circulates between the impeller and the runner. The output torque equals the input torque as distinguished from the torque converter which multiplies torque.
- FLUME** - An inclined, open conduit or troughlike structure for the conduction of water and/or objects floating in the water, as logs, sugar cane, fruit, etc.
- FLUSH** - To irrigate a field with just enough water to soften the crust. To wash a surface with a large volume of water applied for only a short time.
- FLUTED-FEED GRASS SEEDER** - A grass seeder with a metering device which consists of a shaft with grooves in it. The shaft rotates and carries the seed in the grooves to an outlet which funnels the seed to the ground.
- FLUTED NAIL** - A nail used in the anchorage of framed structures. It is made of high-carbon steel with flat, checkered and slightly countersunk heads and medium diamond or needle points which have vertical grooves up to the shank.
- FLUTED WHEEL FEED** - A force feed metering device used on crop planting machinery mainly for solid planting. It consists of flute cylinder which revolves in the seed box and carries out in the flutes a measured quantity of seed to the seed opening. The rate of seeding is adjusted by sliding the cylinder endways to expose more or less surface.
- FLYWHEEL-TYPE CUTTERHEAD** - A chopping device used on forage harvesters consisting of knives mounted in radial or nearly radial positions on one side of a steel plate flywheel. Impeller blades are mounted at the outer edge of the same wheel for elevating the chopped material. Also called radial knife cutter head. See: Forage harvester.
- FLYWHEEL-TYPE MAGNETO** - A magneto whose rotor is mounted on the crankshaft and serves as a fly wheel for the engine. It is used extensively in outboard motors and small engines.
- FOAMING CHARACTERISTIC** - The tendency of a liquid to form an aggregation of bubbles on its surface during agitation.
- FOBBING** - Foaming, especially in bottle-washing machines.
- FOG-DRIVE GUN** - A spray device which consists of a pipe three to five ft. in length with a group of three to five nozzles of the eddy-chamber type at its tip. The liquid is forced out at a high pressure of from 300 to 600 lbs. per sq.in., thus producing a fog-like discharge of minute particles.
- FOG NOZZLE** - A special nozzle in which streams of water strike each other and are broken up into a fine mist. It is useful for wetting the foliage of greenhouse plants and maintaining humidity in the green house. Also for fire fighting in areas of water shortage.
- FOOD ENGINEERING** - The application of engineering principles to preparation, production, processing and handling of foods.
- FOOD TECH** - Abbreviation for Food Technology. The application of science and technology to the processing of foods.
- FOOT** - The portion of a cultivator to which the sweep is attached; also called shank.
- FOOTBOARD** - A horizontal board running across the back of a drill or planter, used to stand on when putting fertilizer or grain in the machine. It is usually supported by brackets from the planter or drill. (obsolete)
- FOOTING** - The support which transfers the weight of the structure to the soil.
- FOOTLAMBERT** - A unit of brightness, equal to the uniform brightness of a perfectly diffusing surface emitting or reflecting light at the rate of one lumen per sq.ft. The average brightness of any reflective surface in footlamberts

- is the product of the illumination in footcandles by the reflection factor of the surface.
- FOOT LIFT** - A foot lever by which the operator of machinery can raise the machine to avoid obstructions, as distinguished from a hand lift or a power lifting mechanism.
- FOOT-TREADLE GRINDSTONE** - A grindstone so mounted that the operator sits on a seat attached to the frame and turns the stone by means of foot treadles.
- FOOT VALVE** - An upward opening valve placed at the lower end of a pipe to prevent the liquid escaping.
- FOOT WHEEL** - The bottom sprocket around which the chain with the attached buckets revolves on a bucket elevator.
- FORAGE BLOWER** - A device consisting of a feed hopper or conveyor which feeds chopped forage into an impeller-blower which blows the material into a site.
- FORAGE CHOPPER** - Also called field chopper. See: Forage harvester.
- FORAGE DRYER** - A type of equipment usually consisting of a large volume fan, with or without a source of heat, which is designed to quickly and effectively reduce the moisture content of freshly cut or partly cured forage material.
- FORAGE HARVESTER** - A harvesting machine, usually tractor drawn and powered, which is used for field chopping of corn, legumes and grass into suitable lengths for either silo or mow storage. Also called field forage chopper, field chopper, field ensilage harvester.
- FORCE** - Any action that changes or tends to change the state of rest or motion of a body. A force is completely specified by its magnitude, direction and point of application, and is usually expressed in lbs. per sq.in. (psi).
- FORCED-AIR DRYING** - Process of evaporating moisture from a product by forcing either natural or heated air through the product. For example, passing air through the product with a fan.
- FORCED VENTILATION** - A process of air circulation where the air is forced through the ventilating system by a fan, in contrast to a natural ventilating system.
- FORCE-FEED OILER** - A type of lubrication system used on early tractors with slow speed engines. It consisted of individual feed lines which ran to each bearing through tubes. The oil was supplied by a small pump.
- FORCE OUTPUT (TOTAL) OR PULL** - Total force developed by the traction device in the direction of travel and parallel to the plane of the surface in which it is operating (total force available for work).
- FORCE PUMP** - A pump which is employed to force water and other liquids above the range of atmospheric pressure; distinguished from lift pump in which the liquid is elevated to run from a spout. In a force pump the water is forced out by a piston or plunger working against a pressure corresponding to the head, or elevation (above the inlet valves) to which the water is pumped.
- FOREBAY** - 1. A reservoir or pond at the head of a penstock pump or pipe line. 2. The water immediately up stream of any structure.
- FORECARRIAGE** - A truck, consisting of an axle and one or two wheels, which is placed under the front and unsupported part of a vehicle or machine for support.
- FORECOOLER** - In refrigeration, a supplementary condenser which consists of a coil or series of coils through which the compressed refrigerant is made to pass before it enters the condenser proper. It is cooled by the overflow water of the condenser.
- FOREIGN MATERIAL** - Any extraneous matter present in a product or commodity, e.g. chaff and straw in processed grain are foreign materials.
- FOREPUNCH** - A kind of counterpunch which is used to make a place for

- the nailheads to be set into a horse shoe.
- FOREWARMER** - A special type of equipment which is used in pre-heating milk or cream before processing.
- FORGE WELDING** - The oldest form of welding. The parts to be joined are heated locally in a furnace to the plastic temperature range and then subjected to pressure by hammering or rolling either by hand or by machine.
- FORGE WORK** - In iron work, wrought or malleable iron work as distinguished from founder's cast work.
- FORGING** - n. A piece or mass of metal formed by hammering. v. The process by which iron or other metal is heated and hammered into shape, such as the forging of tools, machine parts, etc.
- FOREHAND WELDING** - Welding with the blowpipe flame pointing in the same direction that the weld progresses, that is, toward the unfinished seam. The opposite of backhand welding.
- FORKING AGITATOR** - A motor-driven agitator which serves to stir and cool the curd after cutting in cheese making.
- FORK LIFT** - A specially designed lifting device having usually two horizontally projecting arms which can be slipped under a load for raising and transporting, eliminating the manual labor. It may be attached to a tractor or specially designed truck and is usually hydraulically operated.
- FORK LIFT TRUCK** - A small truck or tractor-like vehicle to which has been attached a fork lift for use in the handling of pallets.
- FORK LOADER** - A hay loader which loads hay onto a wagon or truck bed from the ground without windrowing. It consists of rake-like attachments which gather hay and deliver it to an elevator.
- FORMLESS FLUME** - See: Missouri-type flume.
- FORM WORK** - Bending metal to a desired form by heating it and bending it through use of anvils, hammer, bench vices, etc.
- FORMING MACHINE** - A machine used to form sheet metal into cylindrical shapes. It consists of three steel rolls, two of which are connected with gears and the third which is adjustable to give the desired size of circle. Also called slip rolls, bending rolls.
- FORWARD CURVED FAN** - A type of centrifugal fan which is used in drying; they are constructed of curved blades on the outer periphery of a revolving wheel. There are usually between 20 to 64 curved blades so arranged that the leading edge of the blade is on the outer edge of the periphery. The best mechanical efficiency obtainable with this type of fan is about 80%.
- FOUL GAS** - Gas in a refrigeration process made up of air, decomposed ammonia and oil products.
- FOUNDRY PIG IRON** - Bars of cast-iron 2 to 3 ft. long and 3 to 4 ins. in diameter, as bought by an iron foundry.
- FOUR-ABREAST HITCH** - The hitching of four draft animals abreast rather than in tandem.
- FOUR-SQUARE SETUP** - A setup used for accelerated testing of transmission units of a tractor. A test tractor is loaded by a tractor load machine through direct tire to tire contact with a higher degree of acceleration because its loading is not dependent on the power source. See: "Back-to-back" setup.
- FOUR-STROKE CYCLE ENGINE** - An internal combustion engine in which the four events, intake, compression, power and exhaust, occur during two complete revolutions of the crankshaft, hence four strokes of the piston. Also incorrectly called four-cycle engine. Also called Otto cycle.
- FOUR-WAY VALVE** - A valve attached to the steering wheel of the rear tractor of a tandem tractor setup which controls the steering cylinders.
- FOUR-WHEEL TRAILER** - Any trailer which is supported by two axles

- and four wheels, as contrasted to a two-wheel or one-wheel trailer.
- FOWLER'S EQUATION** - An equation for estimating the dead load of a steel roof truss. $W = 0.4 SL + 0.045L^2$ Where W = the weight of one truss in lbs., S = the distance between adjacent trusses in ft., L = the total span of the truss in ft.
- FRACTIONAL HORSEPOWER MOTOR** - Electric motor of less than one horsepower rating.
- FRICTIONAL LOSS** - In an engine or machine, the energy dissipated in overcoming the friction or internal resistance of the mechanism.
- FRACTIONAL PITCH** - (Of a screw-thread cut in the lathe.) A pitch not an integral multiple or sub-multiple of the pitch of the lath-head screw.
- FRAMELESS SULKY PLOW** - A horse-drawn riding plow having no frame or tongue.
- FRAMELESS-TYPE TRACTOR** - A method of tractor construction which involves the use of two distinct castings one serving as the engine crank case, the other as the transmission housing, the two being bolted together to function as a frame.
- FREEBOARD (L)** - The vertical distance between the normal water level and the top of the sides of an open conduit, the crest of a dam, etc., to allow for wave action, floating debris, or any other condition or emergency, without topping the structure.
- FREE-BODY DIAGRAM** - A diagram of a portion of a body or the whole body showing all the known forces acting on the body; also shows the location or magnitude of unknown forces. From this, internal stresses in the member can be computed.
- FREE FLOW** - A condition of flow through or over a structure not affected by submergence.
- FREE FLOWING** - Dry materials of almost symmetrical shape held in place only by friction on each other and without cohesion e.g., sand, wheat.
- FREE MOISTURE** - The difference between the moisture content of a product at any time and its equilibrium moisture content.
- FREE PISTON-GAS TURBINE** - An internal combustion engine that does not have a crankshaft. Combustion takes place in a cylinder fitted with opposed pistons that are free to move along the axis of the cylinder. The pistons are limited in their outward travel by an air cushion. The combustion gases are piped to a gas turbine which develops the torque of the engine.
- FREE WATER** - Water in soil in excess of hygroscopic and capillary water; also termed "gravity water".
- FREE WEIR** - A weir that is not submerged, that is, in which the tail water is below the crest or the flow is unaffected by the elevation of the tail water.
- FREEZE-DRYING** - A method of removing moisture from a product by sublimation. A centrifuge may be used to remove the ice crystals.
- FREEZER** - 1. A refrigerated storage cabinet, room, locker, etc., in which food products may be frozen quickly and stored indefinitely without appreciable loss of flavor, color, odor, etc. 2. Any of many types of devices for the manufacture of ice cream or other products.
- FREEZER SPACE** - Storage space for food products which is maintained at a temperature below 29° F.
- FREEZING CYLINDER** - The part of an ice cream freezer where the ice cream mix is frozen. It consists of a cylinder with a hollow jacket surrounding it in which a refrigerant is present.
- FREEZING TUNNEL** - A room in a commercial food-products freezing concern in which the products are rapidly brought to a temperature of about 0° F. or lower; usually the product is on a moving carrier as it passes thru the tunnel.
- FRENCH DRAIN** - A blind tile inlet that is constructed by back-filling the tile trench with various

- gradations of material. The coarse material is placed immediately over the tile, and the size is gradually decreased toward the surface. The surface should be kept in permanent vegetation to prevent sealing.
- FRESNO SCRAPER** - 1. A horse-drawn, adjustable scraper designed for scraping down mounds and filling hollows where the distance of the haul is not great enough to require wheels to carry the load. It has a long, narrow, cylinder shaped scoop or bucket. 2. A tractor-drawn scraper of the rotary type for small scale cutting and filling.
- FRICITION CLUTCH** - Any clutch which depends on the resistance of two sliding surfaces for the transmission of power.
- FRICITION DRIVE** - A type of friction wheel used in place of spur gears for transmission of power. See: Friction gearing.
- FRICITION GEARING** - Any combination of elements used to transmit power or motion by frictional contact. Sometimes used in a restricted sense for friction wheels alone.
- FRICITION HEAD** - The head loss as the result of friction in a fluid due to its movement with respect to the walls of the conduit. Measured as its equivalent in ft. head, required to overcome its friction.
- FRICITION HORSEPOWER (fhp)** - The power required to run the engine at any given speed without production of useful work. It is usually measured with a suitable electric dynamometer which runs or "motors" the engine. It represents the friction and pumping losses of an engine.
- FRICITION LIGHTER** - A device for lighting a welding torch. In operation a small flint is rubbed across a friction surface to produce a spark.
- FRICITION LOSS** - The loss of energy due to the resistance of two surfaces as one moves relative to the other. Usually expressed per unit weight or per unit length. In pumps, loss in head or pressure caused by the resistance to the flow of water through pipe and fittings. In bearings it is due to resistance of the moving shaft and shows up as heat.
- FRICITION PULLEY** - A friction wheel in which the surface of the rim is in contact with the rim surface of another pulley; usually the driving pulley is faced with wood, the driven pulley being smooth iron. Such pulleys are often used in lumber working machinery.
- FRICITION SLOPE** - The friction head or loss per unit length of conduit. For most conditions of flow the friction slope coincides with the energy gradient, but where a distinction is made between energy losses due to bends, expansions, impacts, etc., a distinction must also be made between the friction slope and the energy gradient. Friction slope is equal to the bed or surface slope only for uniform flow in uniform channels.
- FRICITION TAPE** - Cotton type impregnated with a black, sticky, moisture-repellent compound. May also be made of plastic.
- FRICITION TRIP** - A type of cultivator shank attachment utilizing a pivot and clamping action, the clamping action being tight enough to hold normal loads, but to allow the shovel to swing back and pass over a rock or root without breaking. To reset, one clamp must be loosened, the shock swung forward in an arc and the clamp retightened.
- FRIEZE** - A board placed on edge underneath the roof tail acting as trim.
- FRINGE WATER** - Water in the zone immediately above the water table. It may consist solely of capillary water, or it may be combined with gravity water in transit to the water table.
- FROE** - A wedge-shaped cleaving tool which is used in making shingles or shakes by hand. See: Frow.
- FROG** - That part which holds the plow bottom parts together; an

- irregularly shaped piece of metal to which the share, land-slide and moldboard are attached.
- FRONT GATHER** - The gather of wagon wheels, both front and bottom, which causes them properly to follow a track and which is brought about by proper adjustment and forward inclination of the axle journals.
- FRONT HEARTH** - The fire resistant floor in front of a fireplace.
- FRONT-MOUNTED** - Any device or piece of equipment mounted at any point ahead of the rear wheels of a tractor.
- FROST ALARM** - An alarm which rings by an electric mechanism when the temperature falls to a predetermined level near freezing. It is used as a warning of pending frost.
- FROST CONTROL** - Measures taken to prevent frost damage to valuable crops, such as citrus, some other orchard and truck crops. Preventive measures are the use of any of several types of heaters, sprinkler irrigating the plants, using propeller blades to mix the upper warm with the lower cold air when a temperature inversion is present and use of coverings of paper, cloth or plastics.
- FROST LINE** - The depth to which the ground freezes in a given locality.
- FROST PENETRATION** - The depth of frost in the soil.
- FRON** - A cleaving tool, with a wedge-shaped blade which is used by coopers in splitting staves for casks, etc., and in making shingles and clapboards. The handle is at right angles to the back of the blade and is held in the left hand, while the mallet which drives the edge into the log is held in the right hand.
- FRUIT-CUTTING KNIFE** - 1. A knife which is used to cut the cling peach around the suture from the surface to the pit. 2. Any knife which is used to cut fruit.
- FRUIT PRESS** - See: Rack and cloth press, basket press, continuous press.
- FUEL BOWL OR SEDIMENT BOWL** - A container placed in the pipe line of a liquid to allow sediment and foreign materials to settle out of the liquid.
- FUEL CUT-OFF RATIO** - A ratio of volumes of an ideal Diesel cycle. The ratio of volume on Pressure-Volume diagram at end of fuel injection to volume at beginning of injection is the fuel cut-off ratio. The volumes are sometimes expressed as per cent of piston travel from head dead center to bottom dead center.
- FUEL INDUCTION** - The process of transferring fuel to the combustion chambers of internal combustion engines.
- FUEL INJECTION PUMP** - A small extremely high pressure positive displacement pump used in compression ignition engines to force fuel into the cylinder while the charge of air is under compression.
- FUEL OIL** - Any combustible oil or like substance which is used for the production of heat.
- FUEL PUMP** - A pump by means of which fuel is transferred. In Diesel engines a fuel pump pumps the fuel oil from the service tank to the spray valves, which in turn admit the fuel to the cylinders.
- FULL-CIRCLE HEAD** - A rotary irrigation sprinkler head that will wet a full circular area.
- FULL FLOODED** - See: Pressure lubrication.
- FULL-FORCE LUBRICATION SYSTEM** - An engine lubrication system in which oil is forced under pressure to all wearing areas of the engine.
- FULL-HILL PLATE** - A type of seed plate used in row crop planters which has cells large enough to admit several seeds, thus allowing a full hill to be dropped at one time.
- FULL-LOAD** - The normal maximum load under which an engine or machine is designed to operate continuously.
- FULL LOAD AMPERES** - The amperes required by an electric motor when loaded to the rated horsepower and connected to the rated voltage as

- indicated by the name plate.
- FULL RANGE TRANSMISSION** - A transmission which includes enough gears to give a full range of speeds from very slow to road speed. It usually includes a torque converter, hydraulic or fluid coupling, or a planetary gear for even better selections of speeds within the range of the transmission.
- FUMIGATION** - 1. Process of circulating a fumigant through a bin of grain by means of a fan or of spreading it over the surface of the bin. 2. Soil is fumigated by injection of certain chemicals.
- FUNCTIONAL ANALYSIS** - An analysis of the functions of the component parts of a machine, building or system for the purpose of determining efficiency.
- FUNGICIDAL** - Anything toxic to molds or other fungi.
- FUNICULAR POLYGON** - A method of resolving forces on a beam or other member to get the reaction forces.
- FUNNEL FLOW** - Flow of grain from a bin in which the column of grain directly above the opening flows out first. Then the grain falls in from the top and the rest of the bin empties from the top down. If the opening is in the side of the bin a narrow column along the bin edge flows out and then the grain empties from the top down.
- FUNNELING** - A funnel-shaped depression at the surface of granular material where an open core forms, extending from the discharge opening up through the bulk of the material; or the material may be discharged to the level where the material is more compacted and therefore has greater strength to resist flow.
- FURROW** - 1. The opening left in the soil after the furrow slice has been turned by the plow bottom. 2. A depression in the ground surface, plowed along a prescribed line, for controlling surface water and soil loss. To make a furrow with a plow.
- FURROW CROWN** - The upper surface of the furrow slice turned by a moldboard plow.
- FURROW DRAIN** - To drain surface water from a field by means of open furrows. See: Bedding.
- FURROW DRILL** - A planter to which are attached furrow openers.
- FURROWER** - A type of cultivator shovel consisting of two high wings and a heavy point used to open a rather deep furrow and pile the soil in high ridges along the furrow.
- FURROW FACE** - The smooth vertical wall left by the rolling coulter and landside of a moldboard plow. Frequently called "furrow wall".
- FURROW INFILTRMETER** - An instrument designed to approximate the conditions which exist in a furrow during irrigation and directly measure the rate of water infiltration in the furrow.
- FURROW IRRIGATION** - A method of irrigating in which water is run in small ditches, furrows or corrugations usually spaced close enough together to afford lateral penetration between them.
- FURROW OPENER** - A disk or shoe-like attachment which is placed ahead of the planting mechanism on a seed planter, such as a corn planter, to open a furrow for the satisfactory placement of the seed.
- FURROW PLANTING** - A method of seeding practiced in semiarid conditions in which the seeds are placed in the bottom of a furrow in order to catch any precipitation and get the roots closer to sub-soil moisture. Also called lister planting.
- FURROW SLICE** - The soil cut, raised and inverted by the plow-share and moldboard.
- FURROW SOLE** - The bottom of the open furrow left by the plow bottom.
- FURROW WALL** - The vertical side of the cut in the soil which is made by a plow, away from which the turned soil is thrown.
- FURROW WHEEL** - A plow wheel which

rolls along in the furrow as land is being plowed or disked. The frost furrow wheel rolls in the previously opened furrow, the rear furrow wheel in the furrow left by the rear bottom.

FUSE - A device placed in electrical circuit to protect it from excessive electric current. It usually consists of metal which melts when current in excess of its designed value is conducted through it.

FUSIBLE ALLOY - An alloy which will melt at a comparatively low temperature, employed for safety fuses in electric circuits and for the filling of safety plugs in boilers. An alloy of one part tin, two of bismuth and one of lead will fuse at 100° C.

FUSIBLE PLUG - A plug attached to a boiler designed to melt and blow the fire out should the water level become too low, and thereby prevent damage to the boiler.

FUSION WELDING - Two pieces of metal are brought together and the edges in contact are melted together with or without the addition of molten metal from a welding rod.

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- GABLE ROOF - A roof with two sloping surfaces of equal pitch as opposed to a hip roof which has four sloping surfaces.
- GAGE BRACKET - A substantial, rigid element, permanently affixed to the bulk milk cooling tank designed for supporting and positioning the gage rod, which is the device for measuring the contents.
- GAGE DISTANCE - In spacing of rivets it is the distance between rivets across the width of the joint.
- GAGE HEIGHT - The elevation of a water surface above or below a figure corresponding to a zero on the staff or other type of gage by which the height is indicated.
- GAGE PRESSURE - Pressure in excess of atmospheric pressure.
- GAGE ROD - 1. A graduated measuring device which is designed to be partially immersed into a liquid and to be read at the point where the liquid surface crosses the rod. Also called dip stick. 2. In drain tile installation, it is the distance from the top of the tiler's target line to the bottom of the tile trench.
- GAGE SHOE - A shoe which is attached to a small plow or furrow opener so as to cause the shoe to maintain a uniform depth in the soil. See: Gage wheel.
- GAGE STATION - 1. A selected station adjacent to a stream channel which is equipped with a gage and facilities for measuring the stage of water. 2. A place on a stream where continuous stage data are gathered from which continuous discharge records may be developed.
- GAGE WHEEL - Any wheel used as a means of regulating and maintaining the position of an implement element with respect to the surface on which it is operating.
- GAGING - A measurement of discharge in a stream or river corresponding to a certain stage.
- GALLERY - 1. A subsurface collector of percolating water. 2. A passageway, as in a dam. 3. An underground conduit or reservoir.
- GALLONAGE CHART - A chart showing tank capacity in gal. as related to the graduations on a gage rod or a surface gage.
- GALLONS PER MINUTE - An index or unit of flow (generally abbreviated as gpm) which is used to indicate the rate of flow of a liquid.
- GALVANIZED IRON - Iron sheets protected by a coat of zinc applied by galvanizing.
- GALVANIZED NAILS - Nails coated with zinc to protect them from rust.
- GALVANIZED STEEL - Steel sheets protected by a coat of zinc by galvanizing.
- GALVANIZING - The process of coating an iron base metal with a layer of zinc for protection against corrosion of the metal. Galvanizing is accomplished by dipping the iron base metal in a molten zinc bath.
- GAMBREL (STICK) - A wooden or metal rod whose ends are inserted in the hocks of hogs, and which is used to support animals while butchering. Also called gamble.
- GANG - A combination of implements or tools, as nozzles, disks, etc., which are fastened together and used simultaneously.
- GANG BOLT - Any bolt used to hold a series of items rigidly together. For example, that bolt which holds all the disks together on a single gang of a disk harrow.
- GANG DISK PLOW - A disk plow which has two or more bottoms.
- GANG MILLING - The use of two or more milling cutters on one spindle to produce a surface with a required profile or to mill the face and sides of the work at one operation.
- GANG PLOW - A plow with two or more bottoms attached to its frame.
- GARBAGE DISPOSAL - Any means of getting rid of food wastes and other garbage in a sanitary manner.

- Some methods would be grinders, burning, burying and pits.
- GARBAGE PIT** - A covered hole in the ground for the disposal of garbage.
- GARDEN CULTIVATOR** - Any of several different devices either hand or power operated for cultivating a garden or a similar small tract. It usually consists of two handles attached to single or double wheels, a beam for attaching various tillage tools. See: Garden tractor.
- GARDEN DIBBLE** - See: Dibble.
- GARDEN HOE** - A hand tool which consists of a long wooden handle at one end of which a steel cutting blade is attached approximately at right angles. It is used in weeding, in cultivating, in making small furrows for garden seeds, etc. See: Hoe.
- GARDEN HOSE** - Rubber or plastic tubing 1/2 to 3/4 in. inside diameter, which is used to carry water from a hydrant to the point of use on lawns, flower beds, gardens, etc.
- GARDEN RAKE** - A hand tool which consists of a long, wooden handle to which a bar with projecting fingers is attached at right angles. It is used to pull leaves, grass beds, etc. See: Rake.
- GARDEN TRACTOR** - Any gasoline-engine powered tractor, usually not over five horsepower, which is used to plow and cultivate gardens. It may also furnish power for sprayers, pumps, weed bars, snow plows, carts, etc.
- GASOLINE** - A mixture of hydrocarbons; a highly volatile product formed by the distillation of crude petroleum or by the distillation of bituminous coal which is used as a fuel mainly for internal combustion engines.
- GASOLINE OR "GAS" ENGINE** - An internal combustion engine in which the energy contained in a mixture of air and vapor of gasoline is utilized, the gasoline fuel being vaporized and mixed with air in a device called a carburetor before it enters the combustion chamber, and after compression is ignited by an arc or spark furnished by a low tension or high tension ignition system respectively. There are two general classes of gas engines; the two cycle and four cycle in which the cycle is performed in two or four strokes respectively.
- GATE** - 1. A frame open or covered with pickets, woven wire fencing, etc., fastened by hinges to a fence post, wall, etc., which may be opened or closed for travel control. 2. In irrigation a device used to control the flow of water. It may be opened or closed by screw or slide action. Slide type gates are used only under low pressures and velocities.
- GATED PIPE** - A pipe that runs across the furrows to be irrigated. Slide gate openings on the side of the pipe distribute and regulate the water outflow to the different furrows.
- GATEPOST** - A sturdy post to which a gate is hinged.
- GATHERING BOARD** - Either of two inclined pieces on the corn harvester or picker on which the gathering chains are mounted. In addition they guide the stalks of grain as they pass to the processing section of the machine.
- GATHERING CHAINS** - Endless finger chains which straddle the row and are mounted on the gathering boards of a corn binder, picker or forage harvester. These chains move inward and upward, the fingers carrying the stalks to the processing unit of the machine.
- GEAR CLUSTER** - A set of gear-wheels integral with, or permanently attached to a shaft, as on the main shaft of an automobile gear-box.
- GEAR HEAD MOTOR** - An electric motor equipped with a system of gears as an integral part of the motor housing for increasing or reducing the speed, or changing the direction of rotation of the drive shaft.
- GEAR PUMP** - A positive type of pump for forcing liquids into a line under pressure. It consists of a

- housing and two gears with square ended teeth which rotate in opposite directions. The liquid is carried in the space between the teeth to the outlet where it is forced out when the teeth of the two gears mesh together.
- GEAR RATIO** - A ratio representing the number of turns made by the drive shaft per unit turn with respect to the number of turns of the driven shaft. Also a ratio of teeth on drive gear to number of teeth on driven gear.
- GEAR SHIFT** - A mechanism by which the transmission gears in a power transmission system are engaged and disengaged.
- GEAR TRAIN** - In mechanics, an arrangement of gears and pinions used to transmit power from one shaft to another.
- GEAR WHEEL** - A toothed wheel; a cog wheel.
- GENERAL PURPOSE BARN** - Used as housing for all kinds of animals and as storage for grain, feed, machinery, etc.
- GENERAL-PURPOSE MOLDBOARD** - A type of plow bottom which turns a more ribbon-like furrow slice with less pulverizing action than a bottom designed for use in stubble fields.
- GENERAL PURPOSE MOTOR** - Any open electric motor having a continuous 40° C. rating and designed, listed and offered in standard operating characteristics and mechanical construction for use under restriction to normal types of application.
- GENERATOR, ACETYLENE** - A closed tank in which small amounts of calcium carbide are fed from a hopper into a comparatively large volume of water. The acetylene formed is cooled and purified as it bubbles up through the water.
- GERMICIDAL LAMP** - A lamp whose radiation output is particularly effective in destroying bacteria (micro-organisms).
- GETTER** - A substance placed in electric incandescent lamp bulbs to retard their blackening or in a vacuum tube to remove traces of free gas.
- GIB** - A piece of metal in the shape of an elongated channel, used as a clamp.
- GILPIN SULKY** - A popular sulky plow which was patented by Gilpin Moore in 1875.
- GIN** - 1. The entire machine processes, considered as a unit, which remove cottonseed from the cotton lint and bale lint cotton. 2. The grounds, buildings, management, etc., of a gin. Also called cotton gin.
- GINACA MACHINE** - A machine used in the canning of pineapples which automatically cuts a cylinder from the central portion of the fruit, removes the shell, cuts off the shell at each end of the fruit, removes the core, and scrapes out the edible flesh remaining on the shell.
- GIN COMPRESS** - A compress that is adapted for use in a gin. It is a device which is used for pressing the cotton together to make a tight bale.
- GIN HOOD** - An enclosed conduit which is fitted to the rear of the cotton gin to carry the lint removed from the seeds to the lint flue as it is.
- GINNERY** - See: Gin.
- GINNING** - A process used in the preparation of cotton for market in which the lint is separated from the seed with a machine known as a cotton gin.
- GIN POLE** - A contrivance for raising or moving heavy weights. Consists of a pole laterally supported by three or more guy wires fastened on the top of the pole.
- GIN SAW** - A saw, 10 to 12 ins. in diameter, one of 70 to 80 in a gin stand, which is used to draw the lint cotton from the seed.
- GIN TURN-OUT** - The ratio of the weight of recovered lint to the weight of seed cotton as it comes from the field.
- GIRAFFE** - The mechanism which is used for elevating a man to do pruning in an orchard. Also called orchard

- giraffe, steel squirrel.
- GIRDER** - A heavy beam to support floor joists.
- GIRTS** - Structural members running horizontal on the side of a building or perpendicular to the rafters to which is nailed the siding or roofing.
- GLASS** - A term used loosely to denote coldframes, hotbeds, greenhouses, conservatories, etc., i.e. a plant is grown under glass.
- GLASS HOUSE** - See: Greenhouse, conservatory.
- GLASS WOOL** - A material of woolly nature made from fine threads of glass. Used for insulating purposes.
- GLAZED BRICK** - A type of brick with a smooth glossy surface. The finish is formed in a high temperature process especially for high moisture resistance and wearability.
- GLAZED TILE** - A type of masonry material made of clay, durable, fire resistant and easily cleaned. The glazed surface is obtained by adding salt to the surface during firing.
- GOOD DRAINAGE** - The removal of excess surface or subsurface gravitational water from land at a rate which prevents damage to growing crops or other desirable vegetation.
- GOOSE-NECK** - An iron or steel hook fitted into the inner end of a boom for temporary attachment to a clamp or an eye bolt; a curved pipe for discharging material from a caisson by means of compressed air; a piece of steel bent in S shape.
- GOTHIC ROOF** - A roof style consisting of circular arc-shaped rafters extending down from a slightly pointed ridge.
- GOVERNOR** - A device used to automatically regulate the speed of an engine.
- GRAB** - A piece of metal about 3/16 x 3/8 x 1 in. brazed onto a horse shoe, used in place of heels, which tends to help a horse travel straight.
- GRADE-CONTROL STRUCTURE** - A structure designed to prevent excessive erosion where the natural slope of the ground may be too great and soil conditions unstable for the desired water flow.
- GRADED** - Ground that has been worked to a specific slope as for surface irrigation or for surface drainage.
- GRADED TERRACE** - A terrace with a constant or variable grade along its length and with only sufficient slope to cause runoff to flow at a non-erosive velocity.
- GRADELINE** - The planned surface of the water in a ditch, beginning at the outlet and proceeding upstream. Also called hydraulic gradient.
- GRADER** - 1. Any of several blade devices which move soil or smooth land, such as a road grader. 2. Any mechanical device for separating material into several different sizes, qualities or grades.
- GRADE STABILIZATION** - The use of a structure to control erosion and sediment damage where vegetation will not do a complete job.
- GRADE STABILIZER** - Control structures and/or vegetation which reduce soil erosion in a water channel.
- GRADIENT** - The rate of change of a dependent variable in respect to the rate of change of one or more of its independent variables, i.e. the rate of change of elevation, velocity, pressure, temperature or other characteristics per unit length.
- GRADUATED CYLINDER** - A cylindrical glass vessel which has flanged foot type base and is generally graduated to mark its contents in cu.cm.
- GRAIN** - 1. The direction of the fibers with respect to the longitudinal axis of the tree, log, the edges of a sawed piece of wood or laminated wood. 2. Also a general class of farm crops such as wheat, oats, corn, etc.
- GRAIN BIN** - 1. Usually one of several compartments in the granary

- building which is used for the storage of grains; such as wheat, oats, etc. 2. A small compartment, open on the top, used to receive threshed grain on a combine and to hold it until dumped into a waiting truck or wagon.
- GRAIN BINDER** - A horse or power-driven harvesting machine which is designed to cut standing grain, forming it into bundles and tying them with twine.
- GRAIN CLEANER** - A device which is used for removing weeds and trash from grain during or after harvest.
- GRAIN COOLING SYSTEM** - A setup which forces a small amount of air (0.1 to 0.02 cu.ft. per min. per bu. of grain) through a grain storage to prevent heating and spoiling of the grain because of moisture accumulation in the upper layers of the bin. This is not to be confused with a grain drying system, since there is not enough air flow to dry a high moisture content grain down to a safe moisture content before it spoils. Sometimes called aeration system or mechanical cooling system.
- GRAIN DIVIDER** - A finger-like member projecting forward from the outer end of the cutter bar of a grain binder or harvesting machine which divides the standing grain and guides the outer stems into the cutting mechanism.
- GRAIN DRILL** - A mechanical seeding device used for the uniform placement of small grains, grass and legume seeds. It consists of furrow openers commonly spaced 6, 7 or 8 ins. apart into which the grain is fed, and seed metering devices to control and regulate the rate of seeding.
- GRAIN DRYER** - A mechanical device which is used to remove excessive moisture from harvested grain usually by forcing unheated air through the grain.
- GRAIN-DRYING SYSTEM** - Any set up for the mechanical drying of grain. May be either a heated air or forced air drying system.
- GRAIN ELEVATOR** - 1. A mechanical device especially adapted to the moving or elevation of grain from the wagon or truck to the storage bins. 2. A central facility for the handling and storage of grain from many farms. See: Elevator.
- GRAIN HANDLING SYSTEM** - Mechanical means of moving grain from one place to another so it does not have to be moved by hand.
- GRAIN HARVESTER** - See: Combine.
- GRAIN HEADER** - A grain harvesting device which cuts off the heads of the grain and elevates them to a wagon. It is now largely replaced by the combine.
- GRAIN ISOTHERM** - A plot of equilibrium moisture content versus relative humidity for a grain.
- GRAIN PAN** - Also, a metal pan on a grain thresher or combine onto which grain falls after being separated by the straw rack. The grain is conveyed to the head end of the cleaning shoe either by an oscillating motion, or by a mechanical drag conveyor.
- GRAIN PROBE** - A sampling device which is commonly used by elevator operators when purchasing grain to obtain a sample of a load, bin or bag in order to determine grain and dockage. It consists of a long, hollow tube which is inserted into grain to obtain a representative sample of the load. See: Grain trier.
- GRAIN SAMPLER** - See: Grain trier.
- GRAIN SCALE** - A balance which is used for the accurate weighing of small quantities of seeds, grains, etc., for grade determination, weight per bu. purity or experimental purposes.
- GRAIN SEPARATOR** - A system of sieves, a blower and shaker which separates the chaff and straw from the threshed grain. Also a grain threshing machine.
- GRAINS PER U.S. GALLON (gpg)** - A measure of the hardness of water. It is the number of grains of calcium carbonate equivalent per U.S. gal. of water, where 7000 grains = 1 lb.

- GRAIN TRIER** - An instrument or device used for obtaining representative grain samples. It usually is made of metal and consists of two tubes from six ins. to eight ft. in length. These tubes are slotted on the sides, and one is closely fitted but freely moving within the other. When closed this instrument may be inserted in a bag or bin of grain and then opened to admit a representative sample from each and every layer of the grain. After filling the trier is closed and withdrawn and the sample discharged upon an examination cloth for inspection or grading. Also called grain sampler, grain probe.
- GRAIN WHEEL** - The wheel located on the grain side of the binder, corn picker, etc., away from the bull wheel which supports part of the weight of the implement. It is canted inward slightly at the bottom, and it is usually placed behind the divider that separates the grain swath to be cut from that which will remain uncut.
- GRANARY** - 1. A store house or repository for grain after it is threshed or husked. 2. Any store room where food or supplies are kept or stored. 3. A large food producing area, as, the central west of the United States is sometimes called the food granary of the world.
- GRANARY WEEVIL** - A boring type insect which attacks and damages grain in storage.
- GRANULAR INSECTICIDES** - A sorptive inert granulated material treated with some type of toxicant such as D.D.T. The carrier granules hold the insecticide until it comes in contact with water which releases the insecticide. Especially good because of resistance to drift by wind and ability to penetrate thick foliage.
- GRANULAR MATERIAL** - Loose material in a solid shape similar to pelleted material except that the small masses need not be spherical in shape and may have a range in their size. A type of free flowing material.
- GRAPE HOE** - A machine which is used for mechanical hoeing between grape or blueberry plants in the row. Sometimes called Friday hoe.
- GRAPPLE FORK** - A device used to remove loose or baled hay from wagons. It consists of four to six curved forks which are held in a closed position with special linkage when loaded. When this linkage is released the forks open and the load is released.
- GRASS BOARD** - A shaped wooden board which is attached to the outer shoe on the cutter bar of a mowing machine whose purpose is to divide and deflect the cut material away from the uncut material so as to leave a clean place for the inside shoe on the next round to be cut.
- GRASSED WATERWAY** - A vegetated, natural or artificial waterway, used to conduct runoff from cultivated and uncultivated land. It is designed to prevent gully erosion.
- GRASS-SEED ATTACHMENT** - A device attached to a grain drill for the purpose of seeding grasses and legumes. It is so designed that it will place the seed to the rear of the grain drill either on top of the ground or in a band over the furrows left by the drill.
- GRASS SEEDER** - An attachment used on grain drills for the purpose of distributing small grass and legume seeds uniformly. One type consists of small diameter fluted wheels for the seed distribution. Other types are a vaned disk turning at high speed to spread the seed. Such a seeder is often tractor mounted.
- GRASS STICK** - A three to four ft. long stick attached to a grass board to further aid in turning the cut forage away from the uncut forage.
- GRATE** - Parallel steel bars or tines placed just below and behind the concaves on grain threshers or

- combines which separate most of the grain from the straw. Parallel bars to screen out trash at a surface inlet to a tile drainage line.
- GRAVEL ENVELOPE** - A method of stabilizing tile in water-bearing sand by placing enough graded gravel or crushed limestone in the trench to stabilize the subgrade. After the tile is laid, the saturated paper is placed over the upper 2/3 and is covered with graded stones.
- GRAVITATIONAL MOISTURE** - Water that moves freely in response to gravity and drains out of the soil.
- GRAVITY AIR CIRCULATION** - The free circulation of air caused by differences in density resulting from temperature differences of the air.
- GRAVITY CONVEYOR** - A conveyor in which the material flows from a higher to a lower point as the forces of gravity pull it downward. Usually the conveyor has many rollers.
- GRAVITY DAM** - A dam which depends on its shape and weight distribution to resist the overturning, sliding or pivoting forces of the water and soil load behind it.
- GRAVITY DRAINAGE** - Drainage without the aid of pumps; i.e., the slope of the ditch or tile is such that the water flows due to the effect of gravity.
- GRAVITY FEED** - Any dispensing device which depends on gravitational forces alone to cause the transfer of material from a higher to a lower point.
- GRAVITY FLOW** - See: Gravity feed.
- GRAVITY FLUE** - A type of ventilating duct which takes in air at the ceiling of a stable and discharges it at the ridge of the roof, due to the difference in the density of the air in the stable and in the duct.
- GRAVITY OILER** - A type of lubricating system consisting of a small oil reservoir mounted above the bearing to be lubricated. The oil drips into the bearing as needed.
- GRAVITY OUTLET** - An outlet that will drain land without the use of pumps or other mechanical devices.
- GRAVITY RETAINING WALL** - A retaining wall that resists lateral pressures by reason of its own weight.
- GRAVITY SEPARATOR** - A cleaning and sorting device which operates on the principle that the material being separated will flow down an inclined plane and that upward motion of air will produce a floating effect. The result is a separation based on the specific weight of the different materials in the mixture.
- GRAVITY TYPE FILLER** - A type of milk bottle filler. Milk is fed into a container called the filler bowl. In the bottom of the filler bowl are a number of filler valves. As the bottles are carried around on moving pedestals they raise the filler valves and are filled. As the bottles near the unloading position, the filling pedestal drops, the valve is closed and the bottle is transferred to the capper by a starwheel.
- GREASE** - 1. A thick petroleum derivative which is used for lubrication. 2. To lubricate a machine.
- GREASE CUP** - A type of lubrication system using a reservoir with a threaded cap. Grease is placed in the cap which is then screwed onto the base forcing the grease into the bearing.
- GREASE GUN** - A grease containing and expelling device used for the lubrication of bearings equipped with specially designed fittings. The device itself is equipped with a nozzle which grips the fitting while the lubricant is supplied under high pressure from a hand or power operated pump integral with the gun.
- GREASE TRAP** - A device to catch the grease contents of sewage so it will not plug up a disposal field. Often put on a garbage disposal unit.
- GREENHOUSE** - Any of several different

- types of heated, glass or plastic covered structures which is used for the growing of plants. See: Forcing house, conservatory.
- GREEN WOOD** - Wood of any kind as it comes from the tree and before it is dried. Not suitable for building purposes until dried since it will warp and shrink if used wet.
- GRIDIRON** - A system of parallel lateral underdrains which enter a submain or main from one side only.
- GRIND** - 1. To sharpen an instrument by making a thin cutting edge with a grindstone, a carborundum, etc. 2. To abrade a material by means of a stone.
- GRINDER** - 1. Any of several different mechanical devices which crush grain into small particles. 2. A motor driven wheel of aluminum oxide or other abrasives for sharpening cutting tools.
- GRINDING-IN** - The process of obtaining a pressure tight seal between a conical faced valve and its seating by griding the two together with an abrasive mixture such as carborundum and oil.
- GRINDING MACHINE** - A machine tool in which flat, cylindrical, or other surfaces are finished by the abrasive action of a high-speed grinding wheel.
- GRINDSTONE** - A circular disk of sandstone revolving on an axle, turned by a crank or treadle (often powered by a small, reluctant, weary boy) which is used to sharpen cutting tools. Natural sandstone, in which quartz comprises the abrasive medium. Formerly it was widely used for sharpening tools, finishing of cutlery, snagging of castings, etc. It has largely been displaced by artificial vitrified abrasive wheels and by polishing wheels. See: Whetstone.
- GROOVED BIT** - A wood-boring bit with a cylindrical shank in which is a helical groove.
- GROSS DUTY OF WATER** - The irrigation water diverted at the intake of a canal system, usually expressed in depth on the irrigable area under the system; diversion requirement.
- GROUND** - The connection of an electrical system to earth or another reference body whose electrical potential is considered zero.
- GROUNDING CONDUCTOR** - A wire connected to the ground or the earth.
- GROUNDING CONDUCTOR** - A conductor used to connect equipment or wiring system with a grounding electrode.
- GROUND JOINT** - A sanitary fitting onto which pipes will screw to make the connection. The contact between the two parts of the joint is tapered and finished smoothly so that it is tight without the use of a gasket.
- GROUND ROD** - A metal rod in the ground used to provide a ground for electrical wiring.
- GROUND SPEED** - The speed of an object relative to the ground.
- GROUND WATER** - That part of the active, happed or connate subterranean water which occurs in saturated pores of the containing materials.
- GROUND-WATER FLOW** - The movement of ground water under hydraulic gradient; the water that comes to the surface in springs or causes streams and rivers to flow after periods of surface runoff have ended. See: Ground water.
- GROUND-WATER RECHARGE** - Precipitation, irrigation or other water that infiltrates the soil and percolates downward to the ground-water reservoirs.
- GROUND-WATER RESERVOIR** - Reservoirs under the ground surface which get their water through infiltration and percolation.
- GROUND WATER RUNOFF** - The movement of ground water through permeable subsurface formations to stream channels.
- GROUND WATER STORAGE** - That portion of the total precipitation which infiltrates into the earth's crust, percolates downward into the porous spaces in the soil and rock

until contained by impervious boundaries.

GROUPING SYSTEM - A system of tile underdrains which combines two or more systems such as the parallel, gridiron and herringbone systems.

GROUSER - See: Lug.

GROUT - A thin mixture of mortar made of cement or lime, sand and enough water to produce a consistency that will flow without separating the ingredients.

GROUTER - See: Lug.

GRUB AX - A tool which has two cutting edges for digging up roots; one a broad chisel-shaped point and the other a flat adze-like blade.

GRUBBER - A mechanical, plow-like device which digs out plants by the roots. See: Grubbing hoe.

GRUBBING HOE - An implement which is provided with a wide, heavy, adze-like cutting blade and a socket for inserting of a wood handle; a mattock which is used for digging and cutting grubs or roots.

GRUB PULLER - See: Stump puller.

GUARD - One of several generally similar elements of the cutter bar of a mowing machine, combine, etc., which serves to protect the cutting knives, to provide a mounting for the ledger plates against which the sickle shears, and to divide the material being cut. Any protective device which keeps people from being injured by the moving components of a machine. See: Cattle guard.

GUARD PLATE - See: Ledger plate.

GUARD RAIL - A protective device in farrowing houses. Put 8 to 10 ins. above the floor and 8 to 12 ins. from the wall to allow the small pigs to crawl behind in order to avoid being crushed by the sow when she lies down.

GUN ATOMIZING BURNER - A type of oil burner used in drying products in which the oil is forced through a small special shaped orifice into a burner to be burned and supply heat for drying. Also called jet atomizing burner, mechanical pressure atomizing burner.

GULLET SAW - In saw milling, a saw whose teeth are deepened and followed in their roots. Circular and pit saws are usually gullested, in order that the dust may run away, the gullests being sloped outwards on alternate sides.

GULLY CONTROL STRUCTURE - A structure designed to lessen soil erosion by water.

GULLY EROSION - That type of accelerated erosion by water that produces definite channels too deep to be obliterated by normal tillage.

GUM - 1. A bright reddish brown wood; heavy, hard, rough and close grained tends to shrink and warp; very good for furniture, interior and exterior finish. 2. A viscous liquid or solid formed by hydrocarbon fuels, especially those made by cracking and containing unsaturated unstable compounds. When fuel containing these compounds is left to stand for a period of time the gum forms and will then plug screens and jets and make valves stick.

GUNNEL - The vertical portion of a plow share that acts as an extension of the landside.

GUNNEL TYPE SHARE - A type of plow share having a vertical portion which acts as an extension of the land side. This type of share can be reshaped and sharpened when worn as compared to a disposable type share.

GUSSET PLATE - 1. A flat piece of wood at the joint of a truss or set of rafters to which all members meeting at the joint are fastened. 2. A flat piece of steel at the joint of a steel framed structure to which the members that meet at the joint are fastened.

GUTTER - 1. A channel in the barn floor behind the cows in stanchion barns which is used to catch the manure and to simplify cleaning. 2. All channels in buildings used to house livestock, used to facilitate the collection of

- manure. 3. A shallow channel or conduit of wood or metal set just below, and following the eaves of a house to catch the rainwater from the roof and carry it off. Also called eave trough.
- GUTTER CLEANER** - A power driven mechanical conveyor type device which is used to remove manure from gutters in barns and dropping pits in poultry houses.
- GYP SUM BLOCK** - A type of masonry material used in wall construction. It is very durable, fire resistant and for certain architectural styles has a good appearance.
- GYP SUM PLANK** - A type of roof decking made from gypsum cast in short units. Must be well covered since gypsum cannot withstand moisture.
- GYP SUM WALL BOARD** - A thin (3/8 or 1/2 in. thickness, generally) sheet of gypsum covered on each side with a layer of smooth paper. It is used as a substitute for plaster finish in "dry-wall" construction. A slightly different gypsum board is called "plaster bath" and used as a base for plaster. The plaster bath has a rough paper finish to secure a bond with the plaster.
- GYROSCOPIC COUPLE** - Forces tending to rotate a vehicle in a direction perpendicular to its line of travel when it pitches in a vertical plane through the line of travel. This is especially important in turning since a gyroscopic couple will tend to tip a vehicle over during the turn. These forces are usually generated by the tractor flywheel and crankshaft.
- GYROSCOPIC FORCES** - Forces effecting the stability of a tractor due to the rotating action of the engine flywheel which may cause forces to act on the tractor perpendicular to the line of travel. These forces are important when tractors are operated at high speeds with very low or no drawbar loads.
- GYROTILLER** - A machine which is used in England to pulverize subsurface soil below depths of ordinary plowing.

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- HALF SHAFT - One of the two rear axles of a truck, car, or tractor.
- HALF SHOVEL - A cultivator shovel with a side wing on only one side, thus allowing cultivator shovel to pass through the soil close to the plant without danger of disturbance of the roots of the plant by the wing of the shovel.
- HALF SPEED SHAFT - In internal combustion engines, the camshaft of an ordinary four cycle explosion, so called because it is set by gearing to revolve once to every two revolutions of the crank. Also known as half motion or half time shaft.
- HALF SWEEP - A specially designed sweep made without one wing for working close to the crop row. See: Sweep.
- HAMMER MILL - A feed grinding device or mill in which hammer-like projections are mounted on the surface of a cylinder. The hammer-like projections are usually free to rotate. This cylinder of hammers revolves at a high speed within a heavy perforated metal enclosure and shatters the feed material by beating or hammering it to pieces. Interchangeable screens around the rotor chamber allow control of particle size.
- HAMMER MILL MAGNET - A magnet which is placed on the apron of a hammer mill to attract bits of iron, wire, etc., so as to prevent them from entering the mill and damaging the hammer.
- HAMMOCK SEAT - A seat on a riding (horse-drawn) cultivator which is suspended between two parallel bars so that the operator has an unobstructed view of the plants.
- HAND ATOMIZER - Manually operated device which breaks up liquids or dusts into finely divided particles.
- HAND BRAKE - A manually actuated device for slowing motion.
- HAND CAPPER - A manually operated device which places bottle caps on milk or soft drink bottles.
- HAND CULTIVATOR - A garden tool consisting of a handle or handles at one end of which are attached three or five curved rods or shovels which are used to break soil crust and to weed in gardens.
- HAND DRILL - 1. A drilling machine fitted to be worked by manual power. 2. A light drilling apparatus in which the drill is operated by means of a fiddle bow, a swing or geared brace or a ratchet.
- HAND DUSTER - A crop duster which is manually operated.
- HAND FLAME GUN - A flame throwing gun directed by hand operation and used for weed control.
- HAND GUN - A spray gun which is held in the hands during operation. See: Hand duster.
- HAND GUN DUSTER - A crop dusting device operated by hand power. The direction of flow of dust is controlled by hand.
- HAND HAMMER - 1. In shop practice, the machinist's working hammer used in engine and boiler work, in contradistinction to the two-handed flogging hammer and the sledge. 2. A carpenter's hammer.
- HAND HARVEST - To pick or gather by hand as contrasted with mechanical harvesting by combine, corn picker, etc.
- HAND HOE - See: Hoe, garden hoe.
- HAND LEVEL - A surveying instrument capable of being held and adjusted in the hand so as to provide a horizontal line of sight from which differences in elevation may be found. The instrument has non-magnifying lenses thereby severely limiting its range.
- HAND LIFT - In elevator construction, a lift or elevator operated by turning the gearing by hand. It is used in hoisting and lowering loads small distances.
- HAND OPERATED FORCE PUMPS - A plunger type pump where the movement of the plunger is done by hand.
- HAND PACK FILLER - Canning, a machine which semiautomatically fills cans with vegetables, fruits, etc.

HAND REAMER - A tapered cutting tool used to remove the burr left on the inside of the pipe by the cutter; also used for enlarging holes in metals.

HAND SAW - Any of several different kinds of saws operated manually, in contrast to power saws, which is used for sawing wood or lumber.

HAND SPRAYER - A sprayer in which the pressure is usually generated by hand pumping and which is small enough to be manually operated. See: Hand atomizer.

HAND TURNING - Turning done in a wood or iron lathe without mechanical devices for guiding and resting the hand.

HANGER - A metal bracket or stirrup of various shapes used to support one of the bearings in which a line of shafting revolves. The hanger hangs downwards from a beam or the like, hence its name. Also a device for supporting objects when they cannot be supported from the floor.

HARD FUEL - Fuel having certain properties of size, shape and texture such as hard or soft coal, wood and wood products.

HARD SOLDER - A solder which fuses only at a red heat; as, one composed of zinc and copper, or silver and copper. An alloy. A fusible alloy, ordinarily composed of copper and zinc, or copper, zinc, and silver. Hard solder in general is sometimes erroneously called spelter. It is often called silver solder.

HAND HOLE - A hole through which the hand may be inserted for the purpose of making mechanical adjustments or for cleaning as in a steam boiler.

HANDLING SYSTEM - A method of moving products from place to place as needed in a farm set-up. Usually as much as possible of this moving is done by machine conveyors or elevators.

HAND TOOL - Any tool or implement, cutting or otherwise, which is used manually as distinguished from a machine tool.

HAND TRUCK - A piece of handling equipment used to carry a load. It usually has an L-shaped frame mounted on two wheels and a pair of handles separated by stretchers so that a man can easily guide and push the truck. Some trucks have four wheels.

HAND VISE - A small vise used in the hand to hold and clamp small work.

HANKINSON FORMULA - A formula used to compute allowable unit stress in bearing in wood members when compression is not normal or parallel to the grain.

$$N = \frac{PQ}{P \sin^2 \theta + Q \cos^2 \theta}$$

where N = the allowable unit stress perpendicular to the direction of the bearing force, P = the allowable unit stress in compression parallel to the grain, Q = the allowable unit stress in compression perpendicular to the grain, θ = the angle between the grain and the direction of the load.

HARDENABILITY - The property which determines the depth to which a steel will transform to martensite when quenched from the austenitic condition. An inverse relationship exists between the hardenability of a steel and its critical cooling rate. Steels high in hardenability have low critical cooling rates, and as a result have a deep penetration of the effect of quenching.

HARDENING ROOM (CABINET) - 1. A room, cabinet, etc., in which ice cream, sherbet, etc., is placed after freezing to reduce the temperature to -20° F. 2. A room which is kept at about 65° F. in which plants, grafted plants, etc., are hardened.

HARDENING TUNNEL - A device used to freeze packaged ice cream. The packages travel on a conveyor through a cold room, usually at -30 to -40° F.

HARD-GRADE BARS - A reinforcing

rod made of high carbon steel used for reinforcing concrete.

HARDNESS OF WATER - Presence of calcium and/or magnesium salts in water. Usually expressed in grains of weight per gallon or in parts per million (ppm).

HARDWARE - All small metal parts used in making a building including nails, hinges, door knobs, etc.

HARDWOOD - The botanical group of trees that are broadleaved. The term has no reference to the actual hardness of the wood. Angiosperm is the botanical name for hardwood.

HARDY - A wedge-shaped tool which is mounted on a blacksmith's anvil, serving as the bottom shear.

HARP - A tool consisting of a frame on which parallel wires are stretched for cutting the coagulum of milk for cheese making.

HARROW - An implement which is used to level the ground, stir the soil, and eradicate weeds. There are many types of harrows, ranging from the simple hand garden rake to the large, many section spike or springtooth and disk type harrows.

HARROW CART - An attachment for a horse-drawn harrow which consists of a seat mounted between two wheels for the convenience of the operator.

HARROW, DISK - A series of concave disks mounted on a central axis and usually operated at an oblique angle to the direction of travel through the soil. Used to cut surface trash and cut layers of soil which are partially inverted as in the preparation of a seed bed. Outer cutting edge may be smooth or serrated.

HARROWED - A field or plot of land which has been treated with a harrow.

HARROW PLOW - A type of disk harrow with all disks mounted in a common axis, throwing the soil in one direction. There may be from 4 to 30 or more disks, which are usually larger in diameter than disks used in a conventional disk harrow. See: Wheatland plow.

HARROW TEETH - The points of a harrow which are in contact with the soil. Various widths and shapes are used on harrows used for different types of work. The teeth are made of steel and may be of several different shapes, such as square, round, oval, etc. The teeth are held rigid to the harrow frame, but the frame may be adjusted to give the teeth a wide range of contact with the soil. 1. The regular tooth is of medium width and is used for all around work. 2. The quack grass tooth has a sharper point for a better digging effect. 3. The alfalfa tooth, intended for cultivating alfalfa, has a very narrow end which will penetrate the soil deeply and cut around the crowns of the alfalfa roots and not cut them off. 4. The detachable point has a special end which can be removed and replaced when worn.

HARVESTER - 1. An agricultural implement, a further development of the reaper, in which the cut grain falling on the traveling canvas belts of a conveyor is gathered into sheaves, bound with string, and discharged clear of the machine. 2. Any machine used in the harvest of a crop.

HARVESTER-THRESHER - An implement which includes the combined operations of harvesting and threshing grains.

HARVESTING LOSS - The loss or losses involved in the harvesting process of a crop due to shattering, dropping, cracking, etc.

HATCHERY - A place, building, company, etc., where eggs are incubated, usually a commercial establishment where newly hatched young (chicks, pullets, ducklings, etc.) are produced and sold.

HATCHET - A small ax which is used for splitting or rough dressing timber.

HAUL-BACK - In logging, a small, wire rope traveling between the

- power skidder and a pulley set near the logs which is used to return the main cable with tongs, chokers, or hooks, to the next log.
- HAY BALER** - A machine which is used for compressing loose hay into compact bales and securing them with twine or wire. There are two principal types, the stationary and the field baler. The field or pick-up baler is most extensively used. This baler picks up hay from a windrow and the bale is made while the machine is in motion. See: Hay press.
- HAY BARN** - Any structure used to store hay and protect it from the weather, such as the conventional farm livestock barn or shed.
- HAY BLOWER** - An attachment which is used with a hay chopper to blow the chopped hay into the hauling truck or into the storage.
- HAY CHUTE** - An opening in a two-story barn, to throw hay through to the downstairs, usually has a trap door or a protective railing enclosing it.
- HAY CONDITIONER** - 1. A mechanical device consisting of two closely spaced, parallel, smooth surface rollers which crush by pressure the fresh cut stems of hay. 2. A mechanical device consisting of two closely spaced, parallel rollers with corrugations resembling gear teeth paralleling the axle that kinks the stems of hay to break them open. Both methods result in a more even and rapid drying of the hay and less loss of leaves than conventional swath curing methods. 3. Any chemical which is beneficial in prevention of storage losses and/or increased palatability.
- HAY CRIMPER** - Hay conditioning where processing rolls are fluted or fitted with projections that intermesh during operation. Crushes the hay in order to make it cure faster.
- HAY CRUSHER** - Hay conditioning where one or more of the processing rolls are smooth. Crushes the hay to make it cure more rapidly.
- HAY DENSITY** - The mass or quantity of matter of hay per unit of its volume.
- HAYDITE** - A coarse lightweight aggregate made by burning expanded clay. Used in concrete as a substitute for gravel in masonry block.
- HAY DRYER** - See: Drying.
- HAY ELEVATOR** - 1. An implement which is used for stacking cut hay, usually called hay stacker. 2. Any implement used to elevate baled hay into the barn or stack.
- HAY FORK** - 1. A retractable harpoon device of single, double, or grapple design, which is inserted into parts of a load of hay and then lifted by means of ropes, pulleys, into the hay mow where the load is discharged. 2. A tined pitch fork for hand use designed to handle hay.
- HAY GRINDER** - A combination of a cutting or chopping device with either a burr or hammer mechanism which is used for reducing roughages, such as hay, to a ground meal or feed condition.
- HAY HOOK** - A steel hook sharpened at one end and with a hand grip on the other. It is inserted into the end or side of a bale of hay, assisting in easier and faster handling.
- HAY KEEPER** - A special type of storage building similar to a silo in which chopped hay is stored. It is often equipped with self-feeding arrangements.
- HAY KNIFE** - A long hand operated, sharp, serrated, single blade knife which is used in cutting hay from a stack or mow, or from a tangled mass of hay. Two handles, at right angles to each other, at the upper end of the blade, are usually used. Lower end of blade is pointed.
- HAY LOADER** - A light machine, drawn behind a hay wagon, which picks up the hay from the swath or windrow and elevates it onto the wagon.

- There are two common types, the fork type and the cylinder type.
- HAY LOFT** - See: Hay mow.
- HAY MOW** - A loft or space in the upper part of a farm barn where hay is stored. Also called a hay loft.
- HAY MOWER AND CRUSHER** - A power-drawn machine combining the cutting mechanism of the mowing machine with a set of rolls which crimp or crush the stems and heavy parts of the hay as it is cut. This makes possible faster and more even drying and curing and reduction in the loss of the valuable leaves.
- HAY PICK-UP** - A pick-up cylinder, an elevating unit of either canvas or lugged chains, and a cross conveyor which receives the hay from the elevator and carries it to the self-feeder on the baler, forage chopper, or waferer.
- HAY PRESS** - An agricultural implement, usually driven by horse power, which presses loose hay into a bale (becoming obsolete). See: Hay baler.
- HAY RACK** - A slotted wooden frame used to contain hay prior to its consumption by livestock. A wooden frame, sometimes called a basket, usually about 8 feet wide and 16 feet to 18 feet long, which is placed on the running gears of a wagon and used to haul loose or baled hay or bundles from field to barn stack, threshing machine, other storage, or to market.
- HAY RAKE** - A machine used for gathering cut hay and placing it in bunches and windrows. Any of several different kinds of rakes. See: Windrow rake, side-delivery rake.
- HAY SLING** - A device usually made of ropes and slats which is especially adapted to use in unloading hay from the hay rack or wagon to the hay mow or stack. The hay sling is placed on the wagon and the hay placed on top of the sling. A double pulley pulls the ends of the sling together and cradles the hay. The sling is made in two parts and a latch allows the sling to separate and drop the load.
- H BEAM** - A steel beam with a cross section in the shape of an H.
- HEAD CONTROL STRUCTURES** - Temporary dams used to control ditch levels where desirable in irrigation.
- HEADER** - 1. A machine that is used to cut the heads from the grain straw instead of cutting the straw near the base. The heads are transferred to a wagon or tank. 2. A structure which is installed at the head or upper end of a gully to prevent overfall cutting. 3. A cross beam between two full length beams supporting the ends of shorter beams framed over an opening. 4. A lintel. 5. A brick laid lengthwise across a masonry wall to serve as a bond.
- HEADER BLOCK** - A block laid lengthwise across a wall; a block serving as a bond at the end of the wall.
- HEAD FLUME** - A flume, chute, trough, or lined channel which is used at the head of a gully or at the lower end of a terrace outlet to prevent soil erosion.
- HEADGATE** - 1. The control works at the entrance to a diversion on a large canal or stream. 2. The gate on the front of a cattle squeeze chute.
- HEAD** - 1. The discharge end of a materials handling system such as an elevator, conveyor, etc. 2. The height in feet against which a fluid is to be pumped. 3. The height to which a column of water rises, or would rise above a given datum if a vertical pipe were installed at some point in a closed system which is under pressure. Used also in various ways, such as energy head, entrance head, pressure head, lost head, etc. The difference in elevation of the water level at the entrance and the exit of a conduit.

HEADRACE - A channel which diverts water to a waterwheel.

HEAD ROOM - The vertical clearance over an object. The distance between the object and the structure or material over it.

HEADING TOOL - A blacksmith's implement, consisting of a die at the end of a stalk or handle. The die is bored to the correct shape for the necks of bolts, round or square, and the piece of bolt material is held therein while the head is formed, thus giving the correct dimensions to the neck at the same time.

HEAD SPACE - The space in a container of food that is not occupied by the product. The head space is usually described by the distance from the surface of the product to the top of the container.

HEAD WALL - 1. A vertical wall, usually of reinforced concrete, at the ends of a culvert to prevent earth from spilling into the channel. 2. The vertical wall with a weir opening of reinforced concrete or rubber masonry over which water falls to a lower elevation in a gully head control structure.

HEAD WATER - 1. The upper source region of a stream. 2. The water immediately up stream from a structure.

HEADWORK - The diversion structure at the inlet end of a conduit; an intake heading.

HEART CENTER - A timber defect which lowers the quality of the member.

HEARTH - The masonry floor of a fireplace; it includes the front hearth and back hearth.

HEART, HEARTWOOD - The central portion of a tree, usually distinctly separated from the sapwood. The cells of the heartwood do not take part in the life processes of the tree and it is harder and more durable than the sapwood and is usually darker.

HEAT CONDUCTANCE - See: Overall heat transfer coefficient.

HEATED AIR DRYING - Use of forced ventilation with the addition of heat for removing moisture from a product.

HEATED FORCED AIR SYSTEM - A method of heating a building by heating air and forcing it through ducts to rooms where it heats the rooms.

HEAT EXCHANGER - A device for transferring heat from a hot fluid to a cold one. The fluids are prevented from mixing by a separating heat conducting wall. A heat exchanger may be used to heat or cool a fluid depending on what is desired.

HEATING CHAMBER - The place air is heated, as in a dryer.

HEATING COILS - Coils through which hot water or steam is passed and which in turn heat surrounding air.

HEATING VALUES - The heat given off by a fuel when it is burned. Usually expressed in Btu per unit weight or unit volume.

HEAT LOAD - The amount of heat that has to be added or eliminated to keep building interior at a specified temperature. It is equal to the algebraic sum of the heat originating from various sources including air temperature, solar radiation, objects brought into the building, heat generated by animals, people, stored products, motors, machines and lights.

HEAT OF FUSION - The amount of heat it takes to change a solid to a liquid state at the same temperature.

HEAT OF RESPIRATION - Heat given off by stored products due to oxidation of the products in their breathing process.

HEAT PUMP - A refrigeration machine installed to make use of the heat discharged from the condenser instead of the heat absorbed by the evaporator. It pumps heat from a low temperature source for use at a higher temperature.

HEAT PUMP DRYER - A drying system utilizing a heat pump for removing moisture from the product.

HEAT TRANSMISSION COEFFICIENT - A constant for each wall section,

- indicates how much heat will be lost or gained through this section of the building. When multiplied by the temperature difference between inside and outside air and the area of the surface, it will give the heat loss or gain per unit time which is usually an hour.
- HEAT VALUE** - Amount of heat that a substance will release when burned, usually measured in Btu's per pound or calories per gram.
- HEEL** - The part of a blade or bit that rides on the work as the action takes place.
- HEIGHT OF INSTRUMENT** - The elevation above a known or assumed bench mark of the line of sight of a surveying instrument.
- HELD** - The lower end of an axe or other tool handle which is encased by the metal portion of the tools.
- HELICAL RUBBER STATOR** - The stationary part of a helical or rotary-screw pump. The motor turns the rotor; the rotor rolls within the rougher stator in such a manner that the water is squeezed upward. The rolling action is continuous resulting in a continuous flow of water.
- HELL FENCE** - A fence which is made of stumps laid upside down on edge. Also called stump fence.
- HEN HOUSE** - A building usually of light or shed type construction, which is used for housing laying hens. More commonly called laying house or poultry house.
- HENNERY** - A building or enclosure where laying hens are kept.
- HERMETIC** - Air tight, no gas exchange into or out of container. See: Hermetically sealed.
- HERMETICALLY SEALED** - A container sealed so that it is air tight.
- HERRINGBONE SYSTEM** - 1. A system of laying out tile lateral underdrains in which the main lies in a shallow depression and the laterals in parallel lines enter at acute or right angles from both sides. 2. A zig zag pattern in masonry work. 3. A milking parlor arrangement of stalls where the cows stand in parallel rows on the side of the operator's area; a plan view of the system would look like the spine of a herring.
- HERTZIAN** - A radio-wave region that develops radiations with a wavelength between 3×10^6 and 0.3 cm. Normally called radio waves.
- HEWED POST SYSTEM** - A post system of wood framing in which the timbers have been shaped with hand tools. Not used much in the United States after the early 1900's.
- HIGH EARLY STRENGTH CEMENT** - A cement that acquires nearly its full strength in 5 days after being mixed and placed, as contrasted to 28 days for regular cement.
- HIGH FRONT MANGER** - A floor type manger with a width of 34 inches and a high front from 18 to 24 inches.
- HIGH HEAT VALUES** - The high heat value of fuels as obtained from combustion tests in a calorimeter.
- HIGH MOISTURE GRAIN** - Any of the grains with a moisture content higher than that which would ensure safe storage. Usually somewhere around 13 percent, wet basis.
- HIGH SLIP MOTOR** - An induction motor having armature resistance and high starting torque.
- HIGH STARTING TORQUE MOTORS** - Motors that have a starting winding for higher torques at beginning of run.
- HIGH TEMPERATURE LIMIT SWITCH** - A safety feature on a heated air dryer. It will stop the burner at a certain high temperature but the fan will keep running.
- HIGH-TEMPERATURE SHORT-TIME METHOD** - A pasteurizing process where milk is heated to a high temperature (161° F.) for a short time, up to 60 seconds. This process destroys disease organisms in the liquid, and gives a high rate of kill of other organisms. This pasteurizer is usually combined with a regenerator and cooler.
- HIGH TENSION INSULATOR** - Insulator

- of extra size and special design, and possessing great insulating properties, employed in high voltage electric circuits. 2200 volts and above.
- HIGH-WATER CONTROLS** - Controls that consist of the whole channel and flood plain over a considerable reach, or a large structure, such as a bridge, whose general configuration and dimensions are not seriously affected by any except the most extraordinary floods.
- HILL-DROP** - A method of planting in which two or more seeds are placed in a cluster with regular spacing between clusters.
- HILL PLANTER** - A planter which hill-drops seed.
- HILLSIDE PLOW** - See: Two-way plow.
- HIP** - The external angle formed by the intersection of two roof surfaces.
- HIP RAFTER** - A rafter which forms the intersection of two external roof surfaces.
- HIP ROOF** - A roof so constructed that it slopes in all four directions. For a square building the four sets of hip rafters are of equal length and meet at a point in the center of the roof.
- HISSING ARC** - An arc lamp which gives off a peculiar hissing sound because the tips of the carbons come too near together; a frying or noisy arc.
- HIT-AND-MISS GOVERNOR** - A mechanism which controls the speed of a one cylinder engine by holding the exhaust valve open when the crankshaft reaches a pre-determined speed. When the exhaust valve is opened no vacuum is created in the cylinder to open the intake valve to let fuel into the cylinder chamber.
- HITCH ANGLE** - The angle between the line of pull and the line of draft.
- HITCH, BALL-AND-SOCKET** - A mechanism used to attach one piece of equipment to another consisting of a ball secured to one frame and a socket secured to another. The socket fits over the ball. The ball and socket connection allows flexibility in all directions.
- HITCH PIN** - The pin which is placed in hitch holes to connect two pieces of equipment.
- HITCH POINT** - The point at which one piece of equipment is connected to another piece of equipment.
- HODOGRAPH METHOD** - A method for finding a general solution for the position of the water table under equilibrium conditions over a series of parallel tile drains on a homogeneous soil for constant rates of rainfall and deep seepage. It utilizes the hydrograph plane, which is a plot of the velocity along the boundaries of the flow region connected with a drainage system on a plane with the horizontal and vertical velocity components as axes.
- HOE** - A hand implement used for weeding or cultivating, consisting of a wooden handle with a metal blade at right angles on one end. See: Garden hoe.
- HOE-TYPE TRENCHING MACHINE** - A machine with a stiff-arm digging bucket that loads toward the machine for making deep excavations. Commonly called back hoe.
- HOG HOOK** - A tool which consists of a short, iron shank, a ring or hand grip on one end, and a sharpened hook on the other. It is used in hog slaughtering and dressing to lift, move and hold the carcass.
- HOG HOUSE** - Any structure used for farrowing or sheltering of swine in any phase of the enterprise. See: Farrowing house.
- HOGRINGING CRATE** - A wooden box-like device which is used to facilitate the job of nose ringing pigs to keep them from rooting.
- HOG-SCALDING KETTLE** - A large cast-iron kettle which is used on farms to hold boiling water for scalding the hog carcass.
- HOG TROUGH** - 1. A rack into which a slaughtered hog is placed to hold the carcass on its back to facilitate skinning. Also called

- skinning rack. 2. A trough which is set low to the ground and used for feeding and watering swine.
- HOLIST** - Any of several different types of hand or power-operated devices which may be used to lift heavy weights, as the block-and-tackle and hydraulic pistons common to tractor-powered hoists. v. To lift heavy weights.
- HOLDER, KNIFE** - Also called knife clip. A part mounted on the cutter bar of a mower which holds the knife close to the ledger plates of the guards.
- HOLDING ALLEY** - A confined area in a milking parlor system where cows are held prior to being milked. Also called holding area.
- HOLDING AREA** - A section of a barn, shed or open lot where cows are confined prior to being milked.
- HOLDING FUNNEL** - A funnel-like device which is sometimes used to hold a chicken and to prevent bruising while killing. The bird is placed head downward in the device so that its head protrudes through a narrow opening at the bottom.
- HOLDING METHOD** - A method of pasteurization of milk in which the milk is pre-heated to about 143° F. and then pumped to a holding tank where it is held for 30 min. The milk is then cooled to about 40° F. See: Low-temperature, long time.
- HOLDING PERIOD** - The time during which the product is kept at a certain uniform temperature and humidity so it will retain its best qualities just prior to sale of the product.
- HOLDING TEMPERATURE** - The optimum temperature for the successful storage of a specific product.
- HOLLOW CLAY TILE** - A masonry unit having a cross section of a square or rectangular tube, made of clay, cured and burned.
- HOMEOTHERMIC MECHANISM** - The means of balancing heat losses of animals or humans with heat gains.
- HOMEOTHERMY** - The ability of an animal or human to maintain constant internal body temperature.
- HOMOGENEOUS MATERIAL** - Material having uniform physical properties throughout.
- HOMOGENIZATION - EFFICIENCY OF** - This is determined by examining a sample of milk with a high power microscope and noting the diameter to 2 microns of the fat globules in comparison.
- HOMOGENIZED MILK** - Milk which has been forced under pressure through a small orifice. The treatment breaks up the large fat globules into particles of small, uniform size so that they will not rise to the surface.
- HOMOGENIZER** - 1. A high-pressure, pump machine which renders products, such as milk, homogeneous by breaking up the fat globules. 2. A machine consisting of a high-pressure pump fitted with a minute orifice having an adjustable opening through which fluids are forced at high pressure causing a marked change in the physical properties of the product treated and producing a very intimate mixture of the ingredients of the fluid.
- HOMOGENIZER VALVE** - The unit assembly of a homogenizer in which fat globules are broken up during passage under high pressure. May also be used to treat materials other than milk.
- HONE** - The whetstone, carborundum stone, metal or other device which is used in sharpening knives, scissors or other cutting tools. v. To sharpen a knife; to put a very fine, sharp edge on a knife.
- HONEYCOMB** - Any condition in a material with large void spaces making the material resemble the comb in honey.
- HONING** - A term applied to the lapping of the interior of cylindrical bores. It is used for the accurate finishing of automotive cylinders, cylinder in hydraulic and refrigeration units, bushings, bearings, connecting rods, etc. It consists essentially in the passage of a honing stone or stones

- in an axial direction through the bore, the hone being rotated at the same time. Tolerances of 0.0005 to 0.0002 in. are commercially possible.
- HOOD (ED) SHIELD** - A shield or fender attachment for a cultivator which consists of an open-ended, metal hood used to prevent young plants from being covered with tilled soil during early cultivations.
- HOOD CAP** - See: Cover caps.
- HOOF SHOVEL** - A cultivator shovel which has a triangular point.
- HOOK** - 1. A piece of metal or other hard material, made in the shape of a curve, which is used for catching, holding or sustaining, as a bale hook, gate hook, etc. 2. A hook-shaped steel rod with a short cross handle which is used to grab and handle baled hay.
- HOOK GAGE** - A pointed hook attached to a graduated staff or Vernier scale for accurately measuring the elevation of a water surface.
- HOPPER** - 1. The box-like device on many farm machines in which materials are placed for processing or distribution or for temporary accumulation. For example the box-like part of a hay baler in which the hay is placed before it is pressed into a bale; the box-like apparatus on the top of a grain drill which holds the seed; the box-like holding device on a feed grinder into which feed materials are placed for metering into a grinder; gathering or holding, funnelling device to direct material into materials handler. 2. In flour milling, a conduit, shaped as an inverted cone or pyramid, to supply grain to millstones, or perform similar services to other machinery; originally provided with a dancing or hopping motion, to shake the grain free, and strew it equally. 3. In engineering, a tapering conduit leading from the underside of the smoke box, between the wheels, and closed by a shutter, so that cinders, etc., can be allowed to fall from the bottom of the smoke box; also known as front end hopper, cinder chute, etc.
- HOPPER BOTTOM BIN** - A grain bin with a funnel shaped bottom to facilitate removal of the grain.
- HOPPER BOTTOM PLATE** - The solid plate on which the seed plate rotates in row crop planters.
- HOPPER CUT-OFF** - A device used in a weighing and recording mechanism of threshing machines which shuts off the hopper when the required weight of product has been emitted.
- HOPPER FUNNEL** - A funnel that directs the silage into the feed rolls of a silage harvester.
- HORIZONS** - A series of soil layers overlying one another. Classified into three main categories: A horizon - topsoil; B horizon - subsoil, horizon of accumulation; C horizon - parent material; D horizon - underlying strata.
- HORIZONTAL BATCH ICE CREAM FREEZER** - An early type of power-driven, refrigerated ice cream freezer with a horizontal cylinder. The freezing unit was two-walled with the refrigerant circulating about it causing the ice cream to freeze on the inner walls. This was removed by an agitating scraper or dasher that revolved within the freezing cylinder. This type of freezer has been largely replaced by the continuous freezer.
- HORIZONTAL BENCH TERRACE** - A type of bench terrace which has no appreciable slope from the back to the front of the bench.
- HORIZONTAL ENGINE** - An engine in which the cylinders are located in a horizontal rather than a vertical position.
- HORIZONTAL HITCH** - The bar or hitching point in a horizontal position.
- HORIZONTAL OR FLAT BIN STORAGE** - A wide, long storage structure with a height less than or equal to its width.
- HORIZONTAL-PLATE SEED-METERING DEVICE** - A seed plate metering device which operates within the seed hopper in a horizontal position.
- HORIZONTAL PROJECTION** - Projection

of the view of an object onto a drawing from an assumed viewpoint directly above each point of the object and without regard to depth of drawing.

HORIZONTAL SILO - 1. A silo which is built just below the ground level by excavation or on top of the soil surface by constructing vertical walls. Both ends may be open to facilitate filling with chopped material for silage. 2. A silo which is built with its long dimension parallel to the ground surface rather than perpendicular as in the case of a tower silo.

HORIZONTAL SUCTION - The degree to which the point of the plow share is bent out of line with the land-side toward the unplowed soil. The object of this suction is to make the plow take the proper amount of furrow width.

HORN - The pointed end of a blacksmith's anvil, which is used for shaping hot metal.

HORN SOCKET - In well boring, an implement to recover lost tools, especially broken drill poles, etc. It consists of a conical socket, the larger end downwards, which slides over the broken part with a spring latch to grip it, frequently a flaring mouth piece is riveted to the horn socket, making it a bell mouth socket.

HORSE BARN - A barn which is designed with stalls, floors, mangers and other equipment suitable for the stabling and handling of horses.

HORSE CAR - A special type of railroad freight car which is so designed and arranged for the satisfactory and safe shipping of horses.

HORSE-DRAWN - Designating an implement, vehicle, etc., which is pulled by a horse.

HORSE-DRAWN BROADCAST SEEDER - A horse-pulled implement designed to broadcast grass or other light seeds. There are two types, the narrow track and the wide track. The main difference is that the

wide track seeder has the wheels at the end of the seeder while the narrow track seeder has the wheels placed behind and closer to the middle. Both types use the fluted-wheel type of feed.

HORSE-DRAWN MOWER - This consists of a cutter bar, four or five ft. long, hinged at one end to a two-wheeled frame, and projecting from the side of the machine. The cutting is done by a scissors-like action, the power being transmitted from the land-wheels of the machine.

HORSE GANG - A plow that has two or more bottoms (usually from two to five) and is powered by horses.

HORSE HOE - A horse drawn implement, a forerunner of modern cultivators which was invented by Jethro Tull in 1701 and improved upon and first used in England during the latter half of the 18th century. It consisted of various kinds of plowshares, shovels and sweeps attached to a frame and drawn by a horse. It was revolutionary at the time of its introduction in that it was an important implement in the new row cultivation system. It replaced hand hoeing in a large measure and was more efficient.

HORSEPOWER - A horsepower is a unit of power and is equal to 33,000 ft.lb. of work per min.

HORSE POWER (BRAKE) - The horse power actually delivered to the shaft of a machine, and is usually determined by a Prony brake or other type of dynamometer. See: Prony brake formula.

HORSE POWER (EFFECTIVE) - In any system of which the engine is only one element, the effective horse power is the actual horse power given by or to the system. Thus, in a tractor, the effective horsepower given by the tractor

to the implement is $HP =$

$$\frac{\text{DRAW BAR PULL (Lbs.)} \times \text{SPEED} \left(\frac{\text{ft}}{\text{min}} \right)}{33,000}$$

- HORSEPOWER-HOUR** - One horsepower working for 1 hr. It is 1,980,000 ft.lb. of work.
- HORSE VAN** - A large truck or trailer with an enclosed body which is especially equipped for transporting horses.
- HOSE COUPLING** - 1. In an air brake, a coupling designed to connect the flexible air lines pipes at the end of railway cars, the purpose sought and attained being to make a rigid and air tight connection between two faces with one motion. With the vacuum brake, this is effected by making the couplings exactly alike, with horns on the top and bottom, so that it is impossible to couple them up wrongly. 2. A connection for lengths of hose, or to unite a hose with a fitting. The nut or female portion is free to turn in the socket of that end, so that the joint is exactly similar to a lip union, the contact being between internal and external cones.
- HOSE, HIGH PRESSURE** - A reinforced flexible hose suitable for withstanding high fluid pressure.
- HOSEPORT** - An opening, usually with self-closing door, which is placed in the exterior milkhouse wall to accommodate the transfer hose and electric motor cord during the milk transfer operation from the bulk tank to the tanker truck.
- HOT AIR ENGINE** - A prime mover which uses heated air for its working fluid, the principle of its action depending upon the alternate heating and cooling of the air employed. The lower part of the vertical cylinder is exposed to the source of heat in such a manner that the internal air becomes rapidly heated and expands, doing work upon a power piston. The heated air exhausts through a regenerator or interchanger, where it parts with some of its heat to incoming air and passes into the compression cylinder, where it is rapidly cooled, by means of a water jacket, etc., and is then sent back by another piston through the regenerator to perform the same cycle once more.
- HOT BEARING** - Hot bearings are detected by applying the hand to the different parts of the machine, and also by a smell of overheated insulation, paint or varnish. The temperature of a bearing should not exceed 80° F., above the surrounding air, and this temperature should not be reached under normal operating conditions.
- HOT CUTTER** - A wedge-shaped, tempered steel tool which is used to cut hot metals in a blacksmith's shop.
- HOTEL PARER** - A boning knife which is used in drawing and boning poultry.
- HOT ENGINE** - An engine that develops more heat in the combustion chamber due to design factors than another engine of same size and rated power output.
- HOT GAS METHOD** - A measured amount of chemical is pumped into the coils of a steam boiler in which the poison is vaporized and from which it is passed through a hose to the tented tree.
- HOT HEAD IGNITION** - In an oil engine, a method of igniting the charge (fuel-air mixture) by means of heat applied to a portion of the cylinder cover or head.
- HOT PACK PROCESS** - A method of canning in which the product is pre-cooked and placed in the hot container, sealed and processed either in boiling water or a pressure cooker. Formerly it was much used by processors as well as in home preservation.
- HOT ROLLED STEEL** - Finished steel that will have a coating of iron oxide or mill scale after the hot-finishing process is completed. The metal is first poured into an ingot mold and the cast ingots are then rolled.
- HOT SPARK PLUG** - A spark plug with a long insulator over the center electrode in order to transfer the heat slowly away from its firing end. Thus it operates at a higher

- temperature and burns off combustion deposits which might tend to foul the plug.
- HOT TUBE IGNITION** - In an internal combustion engine, a method of igniting the explosive mixture by contact with a heated tube of platinum, porcelain or nickel alloy. The tube which is closed at its far end is maintained at a red heat by an external flame; at the proper moment, the timing valve opens and permits communication between the cylinder clearance and the open end of the hot tube, the combustion following.
- HOT-WATER HEATING SYSTEM** - A heating system using circulating pumps to force hot water through a pipeline to distribute heat by radiators.
- HOT-WIRE ANEMOMETER** - A measuring device to indicate speed of air flow. A wire is heated by electrical current and the cooling effect of air passing over the wire varies with the amount of air flow. The cooling effect determines the temperature of the wire, hence its electrical resistance. The electrical resistance is calibrated in terms of flow rate.
- HOUND** - Either of a pair of bars which are used as braces to strengthen various parts of the running gear on vehicles.
- HOUSING** - 1. The brackets or frames which support a bearing. 2. A building for storage or comfort of animals.
- HOVERS** - A sheltering cover for chicks, pigs or lambs, usually placed inside a regular building housing them. It may be heated artificially when needed.
- HOWARD METHOD FOR WORM COUNT** - A quick test for fragments of insects in vegetable products.
- HOWE TRUSS** - A type of truss in which there are 5 internal diagonals or members. The 2 short diagonals join the upper chords at their midpoints and go vertically down to the lower chord. The long diagonals join the upper chords at the ridge where they meet and the lower chord at its midpoint. The 2 medium length diagonals join the upper chords at its midpoint.
- H.P.** - Abbreviation for horse power, or high pressure.
- H-TYPE FLUME** - A flume particularly adapted for runoff measurements requiring considerable accuracy at low rates of flow and still providing reasonable accuracy for high rates of flow. Designed with a flat bottom and v-shaped sides, receding and diverging in an upstream direction.
- HUB** - The central portion of a wheel from which the spokes radiate, and which is bored for the reception of the axle; the nave of a wheel.
- HUB CAP** - A cap or cover which covers the central portion of a wheel.
- HUB SPLINE** - That part of a power take-off unit which fits onto the shaft. It has grooves on the inside diameter which match the spline-ways on the shaft. The power is transferred normally from the shaft to the hub.
- HULL CONVEYOR** - A conveyor on an air-blast cotton gin which takes the discharge of the huller picker-roller.
- HULLER** - 1. A device in a cotton seed oil mill which removes the hulls from cotton seed. 2. A machine for threshing out clover or alfalfa seed.
- HULLER PICKER** - A cotton harvester which picks and removes the lint from the seed in one operation.
- HULLER RIB** - A device on an air-blast cotton gin which holds back the hulls, but allows cotton to pass into the roll box.
- HULLER ROLL-BOX** - The outer roll-box which receives cotton from the feeder in an air-blast cotton gin.
- HULLER WITH DOUBLE RIBS** - A cotton hulling implement that consists of ribs on each side of the entering cotton to insure a more complete hulling operation. See; Huller.
- HUMIDISTAT** - A measuring and controlling device which reacts to the

- changes in moisture content of the air relative to saturated air at a specific temperature.
- HUMIDITY** - See: humidity ratio, relative humidity.
- HUMIDITY RATIO** - The lbs. of vapor per lb. of dry air in an air-vapor mixture.
- HUMID VOLUME** - The volume of 1 lb. of dry gas with the liquid vapor it contains usually expressed in cu.ft. It depends upon the pressure, temperature and humidity of the mixture.
- HUNG GUTTER** - A gutter permanently fastened to the eaves of a building and not adjustable.
- HUNTING** - The tendency of a governor on an engine, due to excessive friction or lost motion, to move too large a distance when it shifts because of a change in speed or spring pressure. This tendency causes overshooting its mark, and gives rise to large variations in the speed. A hunting governor may also be caused by improper fuel-air mixture in internal combustion engines.
- HUSKER ATTACHMENT** - Grain combines may have a husker attachment replacing the gathering and cutting attachment normally used for harvesting grain, so that corn may be harvested.
- HUSKER-SHREDDER** - A machine which removes the ears of corn from the stalks, shreds the stalks and blows the shredded stover into the barn or storage space. It is used to husk and shred previously shocked corn and is a stationary, power-operated machine.
- HUSKING HOOK** - One or more metal hooks secured to a base metal which is attached to a piece of leather and strapped around the hand and wrist. The hooks are carried in the palm of the hand and are used to assist in the removal of the husks from an ear of corn.
- HUSKING PEG** - A small, narrow, flat metal strap with a curved, pointed end or a sharpened, hardwood stick held in the hand by means of a leather thong or strap passing over the middle finger. It is used in husking corn by inserting the point into the husks on the tip of the ear and pulling them back, so the ear is more easily cleaned of the shucks and snapped from the stalk. Very similar to the husking pin.
- HUSKING UNIT (HUSKING ROLLS)** - Consisting of usually four rolls in each unit which rotate in pairs. Each pair rotate against each other in opposite direction. The pairs of rolls are held together at each end under adjustable spring tension. As the ears of corn pass over the rolls the husks are caught between the rolls thus stripping them from the ear.
- HYDRATED LIME** - A white finely ground material used as a component of mortar.
- HYDRAULIC BELLOWS** - A chamber with flexible sides for producing a flow of hydraulic fluid.
- HYDRAULIC BRAKE** - A brake operated by hydraulic pressure.
- HYDRAULIC CONTROLS** - Valves or controls are interposed between pumps and cylinders to control the direction, quantity and pressure of hydraulic fluid into the hydraulic cylinder. Relief valve, check valve, foot valve, control valve.
- HYDRAULIC CONDUCTIVITY** - The readiness with which any material transmits water. It is the flow velocity of the water v divided by the hydraulic gradient. In formula $K = v/(dp/dx)$ for one dimension. If p is expressed in cm. water, K is in cm. sec. in the c.g.s. system.
- HYDRAULIC COUPLING** - Sometimes called fluid drives, fluid clutches or hydraulic clutches. Used to transmit rotary power at constant or variable speeds. This device may be used to permit the power source to attain nearly full speed before picking up the loads, or as a shock absorber to isolate shock and vibration. These couplings permit smooth speed variation by changing the quantity of oil in the circuit. Hydrodynamic

- transmissions are of two general types, hydraulic couplings and torque converters.
- HYDRAULIC CYLINDER** - A cylindrical housing with closely fitting piston which is activated back and forth by the introduction of hydraulic fluid into or out of the chamber.
- HYDRAULIC CYLINDER STOP** - An adjustable stop placed on the rod of a hydraulic piston to regulate the pre-determined length of stroke.
- HYDRAULIC DREDGE** - A floating excavator which consists of a suction pipe to which is attached a cutting head, a high-pressure pump, and a discharge pipe. Excavated material, consisting of mud, sand, gravel or clay is sucked from the bottom of the stream, bay, etc., and transported through a pipe to the shore.
- HYDRAULIC DRIVE** - A form of drive usually incorporated in automobiles. (It is sometimes called liquid drive, fluid or hydromatic drive, etc.) It consists principally of two paddle wheels termed driver and follower enclosed in a low viscosity mineral oil, and by means of which power is transmitted from the engine to the rear wheels without a solid mechanical connection.
- HYDRAULIC EFFICIENCY** - The ratio of the actual head developed to the head imparted to the liquid by the impeller.
- HYDRAULIC ELEMENT** - The depth, area, wetted perimeter, mean depth, hydraulic radius, slope, velocity, energy, roughness, viscosity and other qualities which are involved in the flow of water in pipes and channels.
- HYDRAULIC-FILL DAM** - A dam composed of earth, sand, gravel, etc. sluiced into place; generally the fines are washed toward the center for greater imperviousness.
- HYDRAULIC FLUID** - A liquid or fluid used in a hydraulic system to transmit and control forces, i.e. a petroleum oil having special characteristics and properties.
- HYDRAULIC FRICTION** - A force-resisting flow which is exerted on the contact surface between a stream and its containing channel. It usually includes the normal eddies and cross currents attendant upon turbulent flow occasioned by the roughness characteristic of the boundary surface, moderate curvature and normal channel variations. Whenever possible, the effects of excessive curvature, eddies, and impact, obstructions and pronounced channel changes are segregated from the effects of hydraulic friction.
- HYDRAULIC GOVERNOR** - Governor or regulating device which is actuated or operated by hydraulic means.
- HYDRAULIC GRADE LINE** - 1. In a closed conduit, a line which joins the elevations to which water could stand in risers. 2. In an open channel, the free water surface.
- HYDRAULIC GRADIENT** - 1. The slope of the hydraulic grade line. 2. The slope of the free surface of water flowing in an open channel.
- HYDRAULIC RECOIL CYLINDER** - A cylinder used in a cushion hitch for tractors. It consists of an orifice, a spring and a piston inside this orifice. The resistance can be regulated by varying the size of orifice, or the unit can be made to give constant resistance in combination with the spring. Energy is dissipated in the spring and in the fluid.
- HYDRAULIC JACK** - A device using hydraulic pressure operating against a piston to lift heavy loads.
- HYDRAULIC JUMP** - The sudden and usually turbulent passage of water from low stage below critical depth to high stage above critical depth during which the velocity passes from super-critical to sub-critical. It represents the limiting condition of the surface curve wherein it tends to become perpendicular to the stream bed.
- HYDRAULIC MECHANISM** - The equipment or mechanism used in the transmission and control of forces through hydraulic systems.

- Basically composed of a pump, valves, motor, cylinder, reservoir and fluid or oil.
- HYDRAULIC MOTOR** - A device designed to convert hydraulic pressures generated by pumps into mechanical power.
- HYDRAULIC PRESS** - A machine for exerting great pressure, deriving its power from a hydraulic ram. This was the earliest application of such power, and was invented by Bramah; its principle depends upon the incompressibility of water, and the property possessed by fluids of pressing equally upon the walls of the vessel containing them.
- HYDRAULIC PUMP** - A mechanical pump used to transmit and control hydraulic fluids under pressure in a closed circuit.
- HYDRAULIC RADIUS** - The right cross-sectional area of a stream of water divided by the length of that part of its periphery in contact with its containing conduit; the ratio of area to wetted perimeter.
- HYDRAULIC SPRAYER** - Any sprayer in which the spray liquid is pressurized by means of a hydraulic pump and in which the pressure may be stabilized in an air chamber.
- HYDRAULIC-STEERING SYSTEM** - A system using a hydraulic pump to produce pressure in a system, whereby a light movement of the steering wheel actuates valves which cause the hydraulic fluid pressure to do the main work of steering of the vehicle.
- HYDRAULIC TORQUE CONVERTER** - A torque converter resembles a fluid flywheel except that it has a stationary member called the stator which multiplies the torque delivered by the power source. It is used in automotive and other applications to permit the power source to operate continuously at its most efficient speed while selecting automatically the proper output torque for any load.
- HYDRAULIC VALVE LIFTER** - The use of fluid pressure to lift or open the valves of a gasoline or Diesel engine.
- HYDROCARBONS** - Chemical compounds containing only hydrogen and carbon. Gasoline is a good example.
- HYDROGEN SWELL** - A swelling of cans which is caused by the formation of hydrogen in the can as a result of corrosion of the tin plate.
- HYDROGRAPH** - A graph which shows the fluctuations, the flow of water, with respect to time.
- HYDROLOGIC CYCLE** - A water cycle which involves the following: water from the surface of the oceans is evaporated into the atmosphere. That moisture in turn is lifted and is eventually condensed and falls back to the earth's surface as precipitation. Some of the precipitation, after wetting the foliage and ground, runs off over the surface to streams. Of the precipitation that soaks into the ground, some is available for growing plants and for evaporation. Some reaches the deeper zones and slowly percolates through springs and seeps to maintain the streams during dry periods. The streams in turn eventually lead back to the oceans, thus completing the cycle.
- HYDROLOGY** - The science treating of the waters of the earth in their various forms: precipitation, evaporation, runoff and ground water.
- HYDROMETER** - An instrument for measuring the specific gravity of liquids. It is usually constructed of glass and consists of a graduated stem, a fine tube of uniform diameter; a bulb or enlargement of the tube containing air; and a small bulb at the bottom, containing lead shot or mercury which causes the instrument to float in a vertical position. The graduations represent either specific gravities, or the numbers of an arbitrary scale, as in Beck's, Twaddell's, etc.

HYDROMETEOROLOGICAL - Pertaining to the atmosphere and its phenomena, especially as it deals with water.

HYDROPNEUMATIC - A type of water pressure system. The water is pumped into a tank near the bottom, compressing the air above it. The compressed air above the water in the tank maintains a constant pressure on the water. The pressure causes the water to flow whenever a faucet is opened.

HYDROSTAT - A device that automatically controls the flow of water. It is equipped with a porous cup, which acts as a tensiometer. When the tension of the soil water approaches a predetermined limit, a vacuum is created, which opens a valve in the hydrostat and permits water to flow.

HYGROMETER - An instrument which is used for determining the relative humidity of the air. Human hair, wood and certain animal tissues which expand or contract as their moisture content changes are used as indicators, transmitted through kinematic chain to a recording pen or a dial.

HYGROMETRIC METHOD - An indirect method of obtaining the moisture content of a product by measuring the relative humidity of the air in a closed container with the product. This is an indication of the moisture content of the product.

HYGROSCOPIC EQUILIBRIUM - See: Equilibrium moisture content.

HYGROSCOPIC MATERIAL - A product which may absorb moisture.

HYGROSCOPIC MOISTURE OF WATER - Immobile soil water that can be driven off only by heat. Water held tightly to the surface of soil particles by adsorption forces.

HYGROTHERMOGRAPH - An instrument that will record humidity and temperature on the same chart simultaneously.

I

- I BEAM - A steel beam with a cross section in the shape of a letter I.
- ICE BANK - A refrigeration system whereby the refrigeration unit working over many hours stores refrigeration capacity as the latent heat of fusion of water. It freezes a quantity of water on the refrigerating coils in a closed tank and develops a bank of ice that can be used to chill cooling water (sweet water) during the peak period of refrigeration requirement.
- ICE BANK COOLING SYSTEM - See: Ice bank.
- ICE BANK EVAPORATOR - Part of a refrigeration system in which evaporation takes place in a series of plates or bank of tubes immersed in a tank of water. Ice accumulates on the plates.
- ICE BANK SYSTEM - A system for cooling milk where milk inside of a tank is cooled by water circulated over the tank and an ice bank.
- ICE CREAM PLANT - A factory which is equipped to make ice cream.
- ICE HOUSE - A building which serves as a storage house for ice.
- ICE PLANT - An ice manufacturing concern, especially the building in which the ice is manufactured and stored. See: Ice house.
- IDLE ADJUSTING NEEDLE - A screw with needle point which meters the air-fuel ratio of a carburetor while the engine is operating at slow or idling speed.
- IDLER - 1. In gearing, a tooth wheel occupying an intermediate position in a train, which communicates motion from the driver to the follower. 2. A pulley or drum which supports a belt or conveyor, or prevents it from coming into contact with a stationary part.
- IDLER PULLEY - A pulley or mechanism to tighten a belt or chain running between driver and driven pulleys, gears or other mechanisms. Idler pulley is located on the non-driver side of the belt or chain.
- IDLING - To operate at slow speed or stationary position. Equipment in operation or rotating but doing no useful work. Idling jet of a carburetor.
- IDLING SPEED ADJUSTMENT - A stop-screw adjustment on the throttle butterfly shaft of a carburetor to regulate the idling speed of an engine.
- IGNITER - A device, either portable or attached to a lamp or fire to light it; electrical or other attachment to internal combustion engines for ignition of the charge.
- IGNITION - The act of igniting, kindling, or setting on fire.
- IGNITION COIL - A primary or secondary coil forming a part of a low tension (make and break) or high tension (jump spark) ignition system, respectively.
- IGNITION CONDENSER - A fixed condenser shunted across the timer circuit for the purpose of stopping the primary current as rapidly as possible at break, thus suppressing an arc at break and producing the maximum voltage in the secondary circuit for the spark. The condenser and primary winding of the ignition coil form a series resonant circuit which provides an alternating voltage of the proper frequency to cause the high voltage spark to jump the spark plug gap rather than the plug insulation.
- IGNITION DISTRIBUTOR - A switching device used on high tension synchronous ignition systems consisting of a combination of timer and distributor elements working synchronously on one shaft.
- IGNITION, HIGH TENSION - A method of producing a spark with a device called a spark plug, very high voltage current being used. In the production of the spark, two distinct circuits are necessary: a low voltage or primary circuit and a high voltage or

- secondary circuit. The current which flows through the low voltage circuit is called the primary current and that which it induces in the high voltage circuit, the secondary current. In order to obtain a high voltage, required to produce a spark, a device known as a secondary induction coil is used which transforms the primary current of low voltage and high amperage into a secondary current of high voltage and low amperage.
- IGNITION KNOCK** - Detonation, abnormal combustion, etc.
- IGNITION PLUG** - An ignition device inserted into the cylinder wall or head of an internal combustion engine. It may involve either make and break or jump spark ignition, and provides easy removal of the ignition points for inspection, repair, or renewal.
- IGNITION TIMING** - The crank angle relative to top dead center at which the spark occurs in a gas engine.
- IGNITION VOLTAGE** - 1. The voltage required to start the discharge in an electric discharge tube.
2. The voltage required to jump the spark plug gap causing ignition in an internal combustion engine.
- IHP** - Indicated horsepower. The horsepower developed within the cylinders of an engine as ascertained from the displacement pressure record on an indicator diagram along with engine rpm.
- ILLUMINATION** - The density of light flux projected on a surface; it denotes the art of using artificial sources of light, that is to say, the problem of illumination involves the selection and arrangement of these artificial sources of light so that the objects to be lighted will show up to the best advantage and with the minimum amount of artificial light. In general, the visual sensation produced when radiant flux within the limits of wavelength of so-called visible light, of sufficient intensity and duration, impinges on the retina.
- ILLUMINOMETER** - A simple form of photometer for comparing illuminations with approximate accuracy. It works on the principle of an extinction photometer, the light being varied until certain test characters become invisible.
- IMMERSION FREEZING** - A process whereby products, packaged (indirect immersion) or unpackaged (direct immersion) are immersed into a chilled solution for freezing. The solution may be of a sugar base for unpackaged immersion of cherries, strawberries, etc., or may be of a brine, alcohol, propylene glycol, etc. for packaged products.
- IMMERSION HEATER** - A type of electric water heater which is used for warming small quantities of water in which the heating element is placed directly in the water to be heated.
- IMPACT ALLOWANCE LOAD** - A percentage allowance for impact loads added to the total live load to get an estimate of applied stresses for design purposes.
- IMPACT LOADS** - A short time load suddenly applied as though dropped from a distance.
- IMPACT LOSS** - The head lost as a result of the impact of particles of water; included in and scarcely distinguishable from eddy loss.
- IMPACT TYPE ROTARY CUTTERS** - A cutting mechanism which cuts material through contact with a rotary blade. The blade does not necessarily have a sharp cutting edge.
- IMPELLER BLOWER** - A blower or fan giving centrifugal action to materials in addition to a wind blast for the movement or conveying of materials, i.e. a silage blower moving chopped corn stalks into a silo.
- IMPERFECT DRAINAGE** - Impeded removal of excess water from all or some portion of the soil profile producing some limitation of plant growth or tillage of the

- land.
- IMPERVIOUS** - A bed or stratum of material through which water will not move under ordinary hydrostatic pressure.
- IMPINGEMENT TYPE BREATHER** - A general purpose crankcase breather filter that removes dust particles from the air by impingement on oil coated wires.
- IMPLEMENT** - Any tool which aids man to make his work and effort more productive and effective.
- IMPLEMENT SHED** - A farm building used primarily as a storage place for farm implements, frequently including an area where machines may be repaired.
- IMPLEMENT TOOL** - A machine or piece of equipment operated by extension from the basic machine, i.e. a plow or other tool operated by or from a tractor.
- IMPOUNDING DAM** - Dam used to withhold water giving stability or withholding water for other purposes.
- IMPOUNDMENTS** - Decreased bed gradients where water will pond and deposit soil materials.
- IMPREGNATED PAPER** - A heavy paper saturated with tar or some other preservative.
- IMPULSE COUPLING** - A coupling in a magneto drive shaft, designed to provide a full-intensity spark at approximately compression-dead-center to facilitate starting, and a fully advanced spark at all engine speeds after the engine starts. It consists of a coupling and hub connected by a strong spring. One half of the coupling is keyed to the magneto drive shaft, while the other half is keyed to the magneto rotor shaft. At cranking speeds, pawls on the magneto half engage a stop-pin mounted on the magneto frame. This stops the magneto rotor, while the engine continues to turn, winding up the connecting spring. At the proper point, the pawls are released, and the spring snaps the magneto rotor over at high speed, giving a full-intensity, fully retarded spark at cranking speeds. As the engine starts and picks up speed, centrifugal force withdraws the pawls to a position where they no longer function, and the magneto operates with a fully advanced spark.
- INCANDESCENCE** - The emission of visible radiation by an electric conductor whose temperature has been raised to a point where it glows, by the conversion.
- INCLINED COLUMN GRAIN DRYER** - A grain dryer in which the passage or column holding the grain for drying is in an inclined position.
- INCLINED GAGE** - A staff gage on a slope graduated to read vertical heights above the datum.
- INCLINED PLATE SEED METERING DEVICE** - The seed plate of a metering device positioned at an inclined angle or axis to a horizontal position.
- INCONEL** - A nickel alloy composed of approximately 80 percent nickel, 14 percent chromium, and 6 percent iron.
- INCUBATOR CELLARS** - A room in which incubator batteries are kept while the eggs are hatching.
- INDEPENDENT POWER TAKE-OFF** - A power distribution system used on tractors in which the transmission and power take-off are operated through independent clutches. Either the transmission or power take-off are operated without affecting the other.
- INDEX PLATE** - A plate perforated with variously spaced holes, arranged in concentric circles, used in a milling or similar machine for dividing work, such as spacing out teeth in wheel cutting.
- INDICATED MEAN EFFECTIVE PRESSURE (imep)** - The average gas pressure on the pistons of an engine. It is obtained by means of the cylinder pressure volume card made by an engine pressure indicator. The horizontal distance is proportional to piston travel; the vertical distance is proportional

- to the pressure within the engine cylinder. To obtain the average or indicated mean effective pressure within the cylinder, the area within the diagram is found by means of a planimeter and the average height is then calculated.
- INDICATING THERMOMETER** - A temperature indicating device which has to be read directly to obtain the temperature in contrast to a recording thermometer which records the temperature.
- INDICATOR** - A gage or measuring device on motor vehicles to indicate oil pressure, amount of gas in gas tank, water temperature, etc. A device that shows by an index, pointer, dial, etc., the instantaneous value of such quantities as depth, pressure, velocity stage, or the movements or positions of water controlling devices; a gage.
- INDICATOR DIAGRAM** - A diagram which represents the pressure on an engine piston at the various piston positions throughout the stroke.
- INDIRECT CONTACT** - A method for freezing food in which the food is placed in metal cans and immersed in cold brine until frozen. Usually the cans are pushed through a submerged tube. The refrigerant is noncorrosive and is usually held at about -40°F .
- INDIRECT EXPANSION** - The name given to a type of evaporator for a refrigeration system in which the refrigerant expands in a pipe coil immersed in a tank of brine. Cooled brine is then pumped to heat exchangers which cool air from the storage room.
- INDIRECT HEATER** - A classification of heater according to method of heat transfer in a heated air drying system. With this method, a heat transfer surface is heated and air is circulated past this to pick up heat before going to the product to be dried.
- INDIVIDUAL BEAM SHEAR PINS** - When an obstruction is encountered with the plow bottom, the bottom shears the soft upper holding pin and pivots to the rear, clearing the obstruction on the lower bolt. The sheared pin or bolt must be replaced to maintain proper operations.
- INDIVIDUAL EQUIPMENT CIRCUIT** - A branch circuit installed to supply a single motor or other appliance.
- INDIVIDUAL FARROWING HOUSE** - A separate building equipped so that sows that are to farrow may be kept isolated in clean and quiet individual pens at farrowing time.
- INDUCTION MOTOR** - A type of alternating current motor in which voltage is induced in the secondary winding due to the changing magnetic flux across the air gap between the stator and the rotor.
- INDUCTION HARDENING** - A method of securing a hard surface on carbon steel by using high-frequency electric currents. Success depends upon heating and quenching the outer layer so rapidly that the interior of the body is not heated enough to be affected by the treatment.
- INERTIA** - That property of matter by virtue of which it persists in a state of rest or of uniform motion in a straight line unless some force changes that state; the state or quality of being inert; indisposition to move or to act; inertness.
- INERTIA FORCE** - The force necessary to change the movement of a body possessing mass.
- INFILTRATION** - The flow or movement of water into the soil or a structure.
- INFILTRATION CAPACITY** - The rate of water entry into the soil surface.
- INFILTRATION INDEX** - The point at which the rate of rainfall equals the infiltration capacity of the soil.
- INFILTRATION RATE** - The rate at which soil will take in water. Expressed in inches of water depth per hour.
- INFILTRATION VOLUME** - The volume

- of water that passes through the soil surface or structure during a given time.
- INFILTRMETER** - A device which is used to measure the rate of water absorption into the soil applied uniformly over an area at a given rate or in a given volume.
- INFLAMMABILITY LIMIT** - The lowest temperature at which a material will ignite and burn in favorable surrounding conditions.
- INFLATION PRESSURE** - The amount of internal pressure above atmospheric within a container such as a balloon, tire, diving suit, or airplane fuselage.
- INFLOW** - The flow of water into a reservoir or structure.
- INFLOW HYDROGRAPH** - The graphical representation of inflow rate against time.
- INFRARED** - Radiation of a longer wavelength than that of visible radiation, but adjoining it. This is evidenced as radiant heat. 0.3 to 7.6×10^{-5} cm = wavelength.
- INFRARED LAMPS** - Lamps that emit radiations of wavelengths between 0.3 to 7.6×10^{-5} cm.
- INITIAL ABSTRACTION** - The total amount of rain which falls during a storm period before there is significant runoff.
- INITIAL DETENTION** - The volume of water either in depressions or in transit, at the time active runoff begins.
- INJECTION, COMPRESSION IGNITION** - The introduction of fuel by force, into an enclosed cylinder as in a diesel internal combustion engine. Injection starts as the piston nears the top of its stroke and heat of compression causes ignition of the fuel and burning continues throughout the duration of the injection.
- INJECTION, SPARK IGNITION** - The introduction of fuel by force, into an enclosed cylinder such as in an internal combustion engine. In this case, injection is early in the stroke at low pressure. Nearing the extreme point of compression an electrical spark is produced causing a burning or explosion of the mixture of fuel and air.
- INJECTOR** - 1. A nozzle and back-up valve used to inject fuel into an internal combustion engine cylinder. 2. A hydraulic device designed to force water into a steam boiler under pressure.
- INJECTORS - FUEL** - Three types: single hole fuel valves for pre-combustion chambers; multi-hole nozzles for combustion chambers of direct injection types; and the pintle type fuel injectors for turbulence chambers.
- IN LEVEL** - That known and reproducible position of the bulk milk cooling tank which results when a standard level indicating means, such as a circular spirit level, two-way level, plumb-bob, etc., shows by its indication that the tank is in the normal, desired operating position.
- IN LINE GEAR** - A gear in a power steering mechanism which has the hydraulic cylinder on the axis of the steering shaft.
- INNER SHOE** - The piece of metal which carries the weight of the cutter bar head of a mowing machine. The shoe slides along the ground while the mower is in operation. The inner shoe is located at the left-hand end of a right-hand cutter bar.
- INPUT HORSEPOWER** - Product of the input torque (lb.ft.) time rotary speed (rpm) times 2 divided by 33,000.
- $$\text{Input Hp} = \frac{T \times \text{RPM} \times 2.7}{33,000} =$$
- $$\frac{T \times \text{RPM}}{5252.1}$$
- INSERTED TOOTH** - 1. A separate saw tooth, a series of them being placed in sockets around the circular plate, thus facilitating repairs, replacement, and permitting the use of harder cutting edges. 2. A wooden cog fitted into gearing. Pairs of

- toothed wheels are frequently employed in millwrighting, where a silent drive is desirable, in which the driving wheel has its teeth composed of apple wood or hornbeam, the follower having ordinary iron teeth.
- INSOLATION** - Exposure to solar radiation.
- INSPECTION COVER** - A cover which may be removed to permit visual inspection of an operation or process.
- INSTANTANEOUS PITCH RADIUS** - The radius which extends from the center of the rear axle to the point near the outer diameter of the wheel that is stationary with respect to the earth.
- INSULATED PLIERS** - Pliers provided with handles covered with insulating material, usually used by electricians.
- INSULATING BOARD** - A type of rigid material which combines some heat and sound insulating properties with structural strength for use as sheathing in houses and farm structures.
- INSULATION** - In structures, a material that resists the flow of heat. In rural electrification the material used to prevent flow of electricity between two conductors.
- INSULATION BATT** - A heat insulating flexible material made of wood, vegetable fibers, or mineral wood preformed to a definite thickness usually 2 or 3½ inches and in widths suitable for 16-inch stud facing. This usually is 24 or 48 inches long. A flexible material 1½ inches to 3½ inches thick, 16 inches or 24 inches wide and 24 inches or 48 inches long, designed with high heat insulating characteristics. Either organic (wood and vegetable) or inorganic (mineral wood, glass, etc.) fibers are used.
- INTAKE** - The head of a conduit.
- INTAKE MANIFOLD** - A tube or duct which directs the flow of materials from a central supply source to one or several outlets, i.e., from a carburetor to each of the several cylinders of an engine; the duct leading air from a supply source into an enclosure like an air conditioning unit.
- INTAKE VALVE** - 1. A valve which controls the intake of water.
2. A valve in an internal combustion engine that permits the unburned gaseous mixture to enter the engine.
- INTEGRAL HORSEPOWER MOTOR** - A motor built in a frame having a continuous rating of 1 hp, open construction, at 1700-1800 rpm, or in a larger frame.
- INTEGRAL HYDRAULIC GEAR** - A type of power steering device where the valve and cylinder are fastened to or incorporated into the housing of the steering gear proper, the whole forming a compact package.
- INTEGRAL MOUNTED PLOW** - A plow entirely supported and carried by the tractor during transport.
- INTEGRAL MOUNTED TRACTOR COTTON PLANTERS** - Cotton planter entirely supported, carried, and operated from the tractor.
- INTEGRAL REAR MOUNTED MOWERS** - A mower attached to the rear end of a tractor and entirely supported and operated from that position.
- INTEGRAL TRACTOR GENERATOR** - An electric power generating device receiving its operating energy from the tractor and mounted as a part of the tractor.
- INTEGRATION METHOD** - A means of determining the mean velocity at a vertical of a stream by noting the total number of revolutions of a current-meter vane, and the time consumed, while the meter is slowly lowered from the surface to the bed and returned one or more times.
- INTENSE RAINFALL** - Heavy rainfall usually from a thunderstorm which occurs over a small area.
- INTERCHANGEABLE GEARING** - This term denotes gears whose teeth are so designed that wheels of any number of teeth, if of the

- same pitch, will mesh together correctly.
- INTERCOOLER** - A type of economizer or surface condenser used in refrigeration to remove the heat of compression generated in the low pressure cylinder before the gas passes to the second or high pressure compressing cylinder of a compound compressor.
- INTERLOCK** - 1. An electrical or mechanical device used in connection with electrical control gear to make the operation of one piece of equipment dependent on that of another. 2. Combination of grooves and projections at the sides of the units of steel sheet piling for holding one pile to the adjacent piles.
- INTERMEDIATE COLUMN** - A wood column whose least dimension is between l and K where $K = 0.702 \sqrt{E/S}$ where E = the modulus of elasticity of the wood used, S = the maximum allowable design stress for the member.
- INTERMEDIATE GRADE BARS** - A reinforcing rod, for concrete, made of intermediate grade steel.
- INTERMEDIATE WHEELS** - Idler wheels in a gear for the purpose of reversing the direction of rotation of the driven gear.
- INTERMITTENT DRYING** - Drying in a series of runs alternately with periods of rest, e.g., drying runs of 3-6 min. with period of rest of 2 to 3 hrs.
- INTERMITTENT DUTY** - A requirement of equipment operation or service consisting of alternate periods of load and rest so apportioned and regulated that the temperature rise at no time exceeds that specified for the particular class of apparatus under consideration.
- INTERMITTENT STREAMS** - Streams which flow in direct response to the volume of water supply.
- INTERMITTENT TIME SWITCH** - A switch that will turn a device alternately on and off for specific time intervals.
- INTERNAL COMBUSTION ENGINE** - A heat engine deriving its power from the energy liberated by the combustion of a mixture of some hydrocarbon, in gaseous or vaporized form, with atmospheric air.
- INTERNAL DOUBLE RUN FEED** - Double faced fluted revolving wheels or plates inside the feed cup of grain drills. The flutes or fins scoop up the desired quantity of seed and meter it into the flexible seed tubes which lead to the soil or soil openers. The speed at which the feed wheel revolves ordinarily governs the seeding rate.
- INTERNAL FORCE FEED** - A type of lubrication system in use on all larger late model internal combustion engines which supplies oil under pressure to all main bearings as well as crankshaft bearings. Also double run grain drill feed.
- INTERNAL FRICTION** - Resistance to operation or friction between moving parts within a machine or mechanism.
- INTERNAL SPUR GEAR** - A spur gear which has the teeth on the inside of the rim.
- INTERNAL TRACK FRICTION** - Friction or resistance to movement, arising between the track sections and other parts of the tractor with which the track makes contact.
- INTERPOLE MOTOR** - A d.c. motor which has in addition to the main poles, a series of interpoles, placed between the main poles. The object of these poles is to provide an auxiliary flux of commutating field at the point where the armature coils are short circuited by the brush. Sometimes called commutating pole motor.
- INUNDATION** - Covering with water (flooding).
- INVERSION** - An increase instead of a decrease in temperature with an increase in elevation.
- INVERT** - The floor, bottom, or lowest part of the internal cross section of a conduit.
- INVERTED SIPHON** - A pipe, tube, or conduit carrying a liquid material

- from an open channel on one side of a depression, highway, railroad, etc., to a similar open channel on the opposite side, but at a slightly lower elevation. The flow line of the structure is always at a lower elevation than either open channel.
- INVOLUTE TEETH** - Gears whose curves are formed by the involutes of a circle, the root and the point of such teeth forming one continuous curve. This gives these teeth the property of working smoothly with each other if the distance between the wheel centers is varied, which is a necessary point in rolling mills and the like where the axes of the wheels are apt to approach or recede from one another.
- ION EXCHANGER** - A water softening plant, such as the zeolite type, which depends on the exchange of ions, especially of sodium for calcium and magnesium, in water by means of the sodium salts or certain compounds which readily release sodium and take in its place calcium and magnesium.
- IONIZING RADIATION** - Radiation as for example beta or gamma rays that have sufficient energy to ionize molecules.
- IOWA EAR CORN PROBE** - A probe, consisting of a shaft and a handle attached at right angles at one end, used to obtain a sample of ear corn in the bin. A portion of the shaft is hollow and has saw teeth at an opening. When the shaft is twisted, kernels are shelled and fall into the hollow portion of the shaft for removal and inspection.
- IRON TIE** - A long, thin, narrow, iron band which is used to bind a bale of cotton.
- IRRADIATED** - Objects which have been exposed to electromagnetic type rays. For example, the irradiation of milk with ultraviolet light.
- IRRADIATION** - The process of exposure of a product to radioactive materials or electromagnetic rays to kill insects, to affect the germinating qualities of the product, or to alter genetic structure and for various other reasons.
- IRRIGABLE AREA** - The area under an irrigation system which is capable of being irrigated as determined principally by the quality of soil and elevation of the land. It generally includes, in addition to farm land, roads, farm lots, building sites, and miscellaneous area not actually irrigated.
- IRRIGATE** - To apply water to the soil for plant growth in place of, or in addition to, natural precipitation, by surface flooding or sprinkling, and subirrigation methods.
- IRRIGATED LAND PREPARATION** - In surface irrigation, the reshaping of the ground surface to facilitate a more uniform application of irrigation water and less wastage of water in which at least a fairly uniform grade is developed in the direction of irrigation.
- IRRIGATING** - The application of water to soil for plant growth by means other than natural precipitation.
- IRRIGATING HEAD** - 1. The measure of stored up water ready to be used in irrigating. 2. The height of a body of water in covering land, as by flooding.
- IRRIGATION CANAL** - A canal used to convey water to land to be irrigated.
- IRRIGATION CHECKS** - Soil or other material used to direct the flow of water where desired.
- IRRIGATION DISTRICT** - An organization operating under legal regulations for financing, constructing, and operating an irrigation water distribution system.
- IRRIGATION EFFICIENCY** - 1. The percent of irrigation water applied to the land that is stored in the root zone for use of crops. 2. The percent of

irrigation water used based on the water diverted.

IRRIGATION REQUIREMENT - The quantity of water, exclusive of precipitation, that is required for crop production. It includes economically unavoidable wastes.

IRRIGATION WATER - Water of suitable quality for application to land for crop production.

IRRIGATION WATER REQUIREMENT - The amount of irrigation water required to supply the consumptive use requirement plus the amount lost by runoff and deep percolation losses.

IRROMETER - A meter which is sensitive enough to pick out small specks of color in a color grading process of fruits or vegetables.

ISOBARINE - See: Isopiestic line.

ISOCHRONOUS - Having equal times. The term is applied to uniform motion, as with an isochronous governor, whose pendulum, traveling in the path of a cycloid, performs its revolutions or beats in uniform time, whether the arc be large or small; also to two or three motions which occur in the same time, as of two pendulums swinging exactly in time with each other.

ISOCHRONOUS GOVERNOR - A governor which is very steady at one fixed speed, but which requires only a slight variation in speed to make the arms fly up or down, according to the increase or decrease in speed. This is effected by placing a cross piece upon the governor spindle, the two ball arms being hinged to this piece in a crosswise manner, so that the ball is on the opposite side of the spindle to its pin. Care needs to be taken in designing such a governor that it is not oversensitive.

ISOHYET - An isohyetal line which is drawn on a map or chart to indicate places or points of equal rainfall.

ISOHYETAL ANALYSIS - A method of determining the average depth of

precipitation over an area by plotting the depth of rainfall at the location of various rain gages and plotting isohyets (lines of equal rainfall) by the method used in drawing topographic maps. The area between isohyets may then be planimeted and the average rainfall determined by the following equation:

$$P = \frac{A_1 P_1 + A_2 P_2 + \dots + A_n P_n}{A}$$

$P_1, P_2 \dots P_n$ represent the rainfall depth in the areas A_1, A_2

($\dots A_n$ determined by isohyetal lines).

ISOMERS - Paraffins that may have the same number of atoms of carbon and hydrogen, but have different molecular structure.

ISO-OCTANE - A paraffin normally referred to as an isomer whose chemical composition is



ISOPIESTIC LINE - A curve representing moisture content relationships plotted at constant pressure. Also called isobar line.

ISOPLUVIAL - A type of chart that shows the amount of rainfall that might be equaled or exceeded at any given locality in periods of 1 to 6 days, with a frequency of 1 in 15, 25, 50 and 100 years.

ISOTERE - A curve representing moisture content relationships plotted at constant moisture content.

ISOTHERM - A line on a chart or diagram which is drawn through places or points having equal temperature.

J

JACKET - An outer casing or cover constructed around a cylinder or pipe, the annular space being filled with a fluid for either cooling, heating, or maintaining the cylinder contents at constant temperature.

JACK RAFTER - A short partial rafter which does not reach from the plate to the ridge. It might extend from the plate to a hip rafter or from the valley to the ridge. In special cases, it could be from a valley rafter to a hip rafter.

JAMB - An upright piece which forms the side or lining of a doorway, window, or any other opening.

JANSSEN'S EQUATION - A method of estimating lateral pressure in deep storages by use of the equation:

$$L = \frac{WR}{u} \left(1 - e^{-\frac{Kuh}{11}} \right)$$

L = the lateral pressure of grain, $\frac{\text{pounds}}{\text{foot square}}$

W = weight of grain, pounds per cubic foot

u = coefficient of friction of grain on walls, between 0.30 and 0.48

R = hydraulic radius of the bin

so R =

$$\frac{\text{area of cross section, sq. ft.}}{\text{circumference, feet}}$$

h = depth at any point

y = vertical pressure of the grain, lb. per ft. sq.

K = the ratio of lateral to vertical pressure,

$$\text{so } K = \frac{L}{y} (0.6)$$

JERK PUMP - A pump which supplies the injectors of diesel engines with the required amount of fuel at a pressure which will open the injector automatically as soon as the fuel in the line has reached the correct pressure level.

JET - A pipe end or nozzle from which water (or water and compressed air) is emitted under pressure.

JET ATOMIZING BURNER - A type of oil burner where fuel is atomized as it is fed to the burner by forcing it through a small hole. Also called gun or mechanical pressure atomizing burner.

JET CONDENSER - A condenser consisting of a chamber with baffle plates into which is forced a stream or spray of cold water. The water comes in direct contact with and condenses the vapors from the vacuum pan. It is used in the commercial production of fruit and vegetable syrups and concentrates. This is normally part of a system for production and maintenance of vacuum.

JET NOZZLE - A flask-shaped nozzle containing a removable inner core with spiral flanges that impart a swirling motion to the liquid, breaking it up into coarse droplets before it leaves the orifice.

JET PUMP - 1. Shallow well type: a combined centrifugal and jet pump with the jet located in the pump above the ground. A single suction connects the well to the pump. 2. Deep well type: a simple centrifugal pump above ground and a jet (or injector) in the well. When the impeller is operated at normal speed, it draws water up the suction pipe to the restricted nozzle or injector where it passes through a restricted opening at high velocity. This creates a vacuum which in turn causes atmospheric pressure to force water into the chamber

- from the well through a foot valve. This incoming water is mixed with water coming through the jet and is forced up the suction pipe under pressure.
- JETTED WELL** - A well that is excavated by the use of a high velocity stream of water.
- JETTING RIG** - Equipment used for drilling holes in the soil by means of a high velocity stream of water.
- JETTY** - A dike built of piles, rock, or other material, extending into a stream or into the sea at the mouths of rivers to induce scouring or bank building, and for protective purposes.
- JET TYPE WASHER** - A washer which sprays the bottles both inside and out with washing solutions from a series of jets to wash and sterilize them; washer used for cleaning fruits and vegetables.
- JOCKEY ARCH** - A device used on horse drawn cultivators to hold the two gangs a fixed distance apart. It had the shape of an arch so as to straddle any plants in the row.
- JOINTER** - A miniature plow attached to the moldboard plow beam whose purpose is to turn over a small furrow slice directly ahead of the main plow bottom, to aid in covering trash.
- JOINT** - See: Panel point.
- JOIST** - One of a group of parallel beams used to support floors or ceilings, supported in turn by walls or larger beams.
- JOIST HANGER** - A steel strap used to hold joist, butted up against a girder or beam, in place. With this method, the joist can be placed on the same level as the girder or beam instead of being on top of it; also reduces the effects of shrinkage of the members.
- JUDICIAL DITCH** - A drainage ditch, whose organization and operation are functions, of a court.
- JUICE EXTRACTOR** - Any of several different types of devices which are used to remove juice from plant stems, roots, fruits, berries, and vegetables.
- JUMP CLUTCH** - A safety type clutch sometimes called snap clutch, consisting of two irregular but mated faces which are held in contact by an adjustable spring pressure. The driving portion of the clutch is held against the driven portion by the spring pressure, hence when the load exceeds the spring pressure, the faces will slip over each other.
- JUMP PLOW** - A plow which is designed to jump over impediments in soil without slowing forward progress.
- JUNCTION BOX** - 1. A rectangular or round well of permanent material that is installed where two or more tile lines join or where several lines join at different elevations. 2. A metal box with partially punched holes in the side through which electrical wires are run to be connected.

K

- KANSAS DYNAMOMETER CART** - A two-wheeled vehicle fitted with hydraulic type measuring devices and recording instruments that is pulled by the drawbar of a tractor and is used to determine implement draft and drawbar pull.
- KEEPING QUALITY TEST** - A simple, sample holding test in which a sample of a product is taken to determine the ability to maintain quality in storage.
- KEYSTONE** - The top center stone at the crown of a dome, arch or vault.
- KICKER** - A vane so placed on an auger shaft as to centrifugally propel materials laterally and out a side opening; used to move lint cotton from the chute into the press box.
- KILLING FLOOR** - The place in a slaughterhouse at which a stunned animal is killed, bled, skinned, eviscerated, and where the carcass is split, washed, and wrapped.
- KILLING FROST** - A frost or temperature condition which is sufficiently low to freeze crops.
- KILN** - An oven, furnace, or large heated room for the curing of lumber, tile, bricks, etc.
- KILN DRIED LUMBER** - Lumber dried by artificial heat to a moisture content which is less than can normally be obtained through the natural process commonly known as air seasoning.
- KILN DRYER** - See: Kiln.
- KILOWATT HOUR** - A quantity of electric energy equal to one kilowatt for one hour. 1000 watts flowing for 1 hour is equal to 1 kilowatt hour.
- KILOWATT HOUR METER** - An integrating meter embodying a motor whose speed is proportional to the energy flowing in the circuit to which it is connected, so that the number of revolutions made by the spindle is proportional to the energy consumed by the circuit.
- KING PIN** - The vertical pin connecting the front axle of a fifth wheel wagon gear to the front bolster and the reach.
- KING POST** - The main supporting frame housing the steering columns used in some tricycle type tractors.
- KING VENTILATING SYSTEM** - A flue ventilating system for barns which introduces fresh air at or near the ceiling and removes foul air from a point near the floor. Usually used where electric power is not available.
- KNAPSACK DUSTER** - A hand powered device carried on the back and shoulder of the operator used to apply dusts.
- KNAPSACK SEEDER** - A device for broadcast sowing which consists of a canvas sack fastened to a seeding mechanism. A crank, turned by hand, revolves a wheel having radial ribs which throw seeds to the front and sides.
- KNAPSACK SPRAYER** - A device which is carried on the back and shoulders of the operator to which is attached a hand pump to pressurize a liquid for atomization at the nozzle of the hand gun.
- KNEE BRACE** - A brace fastened to a vertical post or member at one end and to a horizontal joist, beam or other member at the other end. Forms a triangle and thus gives a stiffening effect.
- KNEE CUTTER** - See: Knife coulter.
- KNIFE CLIP** - A steel or malleable fixture used on cutter bars to hold the knife close to the ledger plates.
- KNIFE COULTER** - A rearward curving sharpened blade that is attached to the plow beam so that it cuts the soil just ahead of the point of the plow share.
- KNIFE COVERER** - Attached to a planter, which consists of rearward curving blades which cover seed in the row.
- KNIFE HARROW** - See: Acme harrow.
- KNIFE HEAD** - That end part of the

sickle bar of a mowing machine to which the pitman is attached.

KNIFE REGISTER - See: Register.

KNIFE SECTION - One of several truncated, triangle-like, sharpened, metal pieces which are attached to the knife bar or the knife of a mowing machine.

KNOB AND TUBE WIRING - Building wiring supported by porcelain knobs and tubes. Has largely been replaced by more modern methods.

KNOCK OUT PAWL - A pawl used in the seeding device of row crop planters which forces the seeds from the cells of the seed plate into the tube leading to the soil.

KNOCK RATING - The measurement of the anti-knock value of a volatile liquid fuel in terms of the percentage of iso-octane in an iso-octane and normal heptane mixture of equivalent knock intensity.

KNOCK TEST - A test conducted on petroleum fuels in internal combustion engines to determine the knock characteristics of the fuel. From this data an octane number is assigned to the fuel.

KNOTTER HEAD - The mechanism which ties the twine or wire around the bale in the baler, or twine around the bundle in a grain binder.

KUTTER'S FORMULA - An empirical formula expressing the value of the coefficient, C, in the Chezy formula, in terms of the friction slope, hydraulic radius, and a coefficient of roughness.

K VALUES - A term applied to denote conductivity of heat of various materials.

KWH - (or Kw-Hr) - A unit of electrical energy being equal to one kilowatt flowing for one hour.

- LACING BARS** - Bars that connect two leaves of a strut to make them act as one member. The system of bars does not intersect each other between the leaves of the strut.
- LACTOMETER** - An hydrometer for determining the specific gravity of milk.
- LALLY COLUMN** - A type of reinforced concrete column being a steel pipe filled with concrete.
- LAMINAR FLOW** - Flow in which there are no cross currents or eddies, and where the fluid particles move in approximately parallel paths with a sort of telescopic motion, and for which the head loss is proportional to the first power of the velocity. It occurs at velocities lower than Reynolds' critical velocity. Flow through granular materials is usually laminar. Laminar flow is sometimes called "stream line" or viscous flow.
- LAMINAR VELOCITY** - That velocity below which, in a particular conduit, laminar flow will exist and above which the flow may be either laminar or turbulent, depending on circumstances.
- LAMINATED PACKAGE** - A package where the packaging material consists of two or more films or papers that are glued, sealed, or formed together. A multi-walled package.
- LAMINATED RAFTERS** - Structural members made of laminated wood, usually built up of wood planks one inch thick.
- LAMINATED WOOD** - A piece of wood built up of plies or laminations that have been joined either with glue or with mechanical fastenings. The term is most frequently applied where the plies are too thick to be classified as veneer and when the grain of all plies is parallel.
- LAND CAPABILITY CLASSES** - Eight classes of land in the United States based on similar characteristics. An agricultural grouping of soils that provides information at three different levels of generalization. Namely, land suitable for many uses, land limited in its use, and land generally not recommended for cultivation.
- LAND CAPABILITY MAP** - 1. A map which shows characteristics of the land which will effect the use made of the land. 2. A soil conservation survey map which is colored to show land capability classes.
- LAND CROWNING** - The process of using earthmoving equipment to elevate the surface of flat land into a series of broad, low ridges known as "turtle backing" in the sugar cane area. This practice differs from bedding in that the drains each side of the ridge are farther apart, and the elevated area between drains is checked during and after construction to insure there are no pockets.
- LAND DRAINAGE** - The removal of surface water and excess gravitational water from the soil profile in the crop root zone so as to make the land more productive and generally more usable for both agricultural and non-agricultural purposes.
- LAND FORMING** - The process of reshaping and smoothing the land surface to insure the orderly movement of water over the land. Through popular usage throughout the United States, the term land forming includes one or a combination of practices including land leveling for irrigation, land grading for drainage, land shaping for erosion control, land smoothing, as well as water channeling to provide water courses to carry water on or off the field.
- LAND GRADING** - The surface drainage practice of changing the topography of a field by making cuts and fills according to a predetermined plan so that each row or place is graded without ponding

- throughout its length to a field drain.
- LANDING** - 1. A horizontal platform between flights or stairs or at the top or bottom of a flight of stairs. 2. A place where logs are assembled for transportation in loads or rafts.
- LANDING OF THE BEAM** - The angle that the plow beam makes with the line of the landside. It varies with the size of the plow. Wedges are forced between the beam and the frog, or landside to obtain the desired landing.
- LANDING THE POINT OF THE SHARE** - The projection of the point of the share toward the unplowed land by an amount of 1/8 to 1/4 inch. Also called horizontal suction.
- LAND LEVELER** - A piece of equipment that removes the high areas and fills the low spots of a field so as to produce a surface with a continuous smooth slope.
- LAND PLANE** - A large, tractor-drawn machine which is designed for planing or smoothing land for more efficient use of irrigation water or for easier tillage of land. It consists of a long steel frame, mounted on wheels, near the center of which is attached a large and long adjustable combination steel blade and scraper to remove soil from high points and convey it to depressions. It is designed to smooth a field by removing minor humps and filling hollows.
- LAND RECLAMATION** - 1. Making land capable of more intensive use by changing its character and/or environment through operations requiring collective effort. The clearing of stumps, brush, and stones from land or simple techniques of erosion control which can be effected by an individual are not usually included with reclamation. 2. Land reclamation by drainage consists of the recovery of land from seas, lakes, and rivers; and the improvement of marsh, fen, and swamp land for agricultural and other purposes. 3. Making arid land suitable for crop production by preparing land for irrigation by constructing reservoirs, dams, and canals.
- LAND ROLLER** - An implement, of a number of different kinds, which is used primarily for crushing clods and compacting or firming the soil in the preparation of seed beds.
- LANDSIDE** - That part of the plow bottom which slides along the vertical face of the furrow wall. It helps to counteract the side pressure exerted by the furrow slice on the moldboard, and to steady the plow while being operated.
- LANDSIDE CLEARANCE** - The adjusted space of 1/2 to 3/4 inch between the heel of the landside on the rear bottom of a trailing plow, and the plane of the furrow sole. The rear wheel is adjusted to provide this clearance. On all moldboard plows mounted on wheels it will be noticed that the heel of the landside does not touch the floor when properly set. The vertical suction in this case will be the amount the heel of the landside is elevated above the floor.
- LAND SMOOTHER** - See: Land plane.
- LAND SMOOTHING** - The process of removing minor irregularities on the land surface such as small depressions, etc., without changing the general contour of the field. It is the finishing operation to correct small surface irregularities following all land forming practices.
- LAND SUCTION** - See: Horizontal suction.
- LAND WHEEL** - The wheel that travels on the unplowed soil on the landside of any type of plow.
- LAP JOINT** - A joint made by one piece lapping over another and connected by a fastener, welding, or glue.
- LARD PRESS** - A mechanical device consisting of a hopper box and a

- screw press which is used for pressing warm lard from the cooked fat of pork.
- LATENT HEAT** - The heat added or removed during a change of state, i.e., from a solid to a liquid, liquid to a gas, solid to gas, gas to liquid, or liquid to solid, at constant temperature.
- LATENT HEAT OF FUSION** - The quantity of heat required to change a solid to a liquid; the process occurs at constant temperature.
- LATENT HEAT OF VAPORIZATION** - The quantity of heat needed to change a liquid to a gas without a change in temperature. Usually at the boiling point of the liquid but it can take place at other temperatures, depending on pressure.
- LATERAL** - 1. One of the branches of a system, such as the tile lateral drain that connects to a main drain in a drainage system. 2. A conduit diverting water from a main conduit, for delivery to distributaries. 3. A secondary ditch.
- LATERAL DUCTS** - Air passages to carry the air from the main duct and distribute it through a drying product.
- LATERAL FLOW SPILLWAY** - A spillway in which the initial and final flow are approximately at right angles to each other; a side-channel spillway.
- LATERAL SPACING** - The design spacing of the laterals, pipes, or ditches, measured perpendicular to the direction of flow.
- LATH** - Thin strips of metal or wood, gypsum sheets or large pieces of insulation board, that are fastened to the framework of a building for a plaster base.
- LATH HOUSE** - A structure for the propagation and raising of tropical plants and other plants needing shade, it consists of a frame covered with slats or laths with about one inch separations. This cuts outdoor light by about one half and provides shelter from the wind.
- LAYING HOUSE** - A building constructed and equipped to house laying hens. It may range from a simple structure of small capacity to specially designed, insulated, ventilated, and mechanized building to accommodate several thousand hens.
- LAYING SHELTER** - An inexpensive, low roofed open shed-type shelter for laying hens, it may be made of pole or light frame construction with overhanging roof and chicken wire sides.
- LEACH** - 1. To remove soluble materials by downward percolating water. 2. To remove alkali or salts, or both, from soil by abundant irrigation combined with drainage. 3. To wash or drain by percolation.
- LEAD** - The setting of the outer end of a mower cutter bar a little in advance of the inner end to offset the backward strain produced by the pressure of the cutting and the frictional drag of the ground and vegetation thus allowing the knife and pitman to run in a straight line.
- LEAD ACID STORAGE BATTERY** - A storage battery in which the active material is lead peroxide on the positive plate and finely divided or sponge lead on the negative plate. The plates are immersed in a solution of sulphuric acid and water, called electrolyte.
- LEAD HOLE** - A pre-drilled hole for a screw to be turned into easily without splitting the material. The lead hole should be 90 percent of the root diameter of the screw for hardwoods and 70 percent of the root diameter for softwoods.
- LEAK DETECTOR VALVE** - An accessory to a pasteurizer which prevents unpasteurized milk pocketed in the valve from reaching the bottle filler. The milk is drained out by means of special grooves at the bottom of the valve.
- LEAN-TO** - A wing or extension of a building having a single pitched roof which usually projects from a higher structure.

- LEDGER** - A horizontal board which forms the top rail of a simple fence.
- LEDGER PLATE** - In a mower, the nonmoving, hardened steel plate which is attached to the guards used on cutter bars. The knife section slides over the top of the ledger plate resulting in the cutting action.
- LEDGER STRIP** - A strip of lumber nailed along the bottom of the side of a girder or beam. It supports joists that are butted against the girder. Also called spiking strip.
- LEFT-HAND** - 1. A term applied to many objects as a classification to denote their arrangement, position or motion. 2. Said of an engine, when the flywheel is upon the left-hand side looking from the cylinder. 3. In a saw bench, having the circular saw upon the left-hand side of a person, towards whom the top edge is running. 4. Said of a rope when the strands are laid up similarly to the thread of a left-hand screw, the reverse of the usual method.
- LEFT-HAND BOTTOM** - A plow which throws the furrow slice to the tractor operator or driver's left as he faces the direction he is plowing.
- LEG** - The enclosed section of a vertical cup elevator through which the belt and cups pass.
- LEG FINISHER** - A mechanical device which is used in a large poultry dressing plant to remove the feathers from the legs of poultry.
- LENGTH OF RUN** - The distance water must run in furrows or over the surface of a field from one head ditch to another or to the end of a field.
- LENGTH OF SLOPE** - The length of a continuous field slope. It is a factor in the rate of sheet erosion.
- LESPEDEZA BAR** - A mower bar equipped with special closely spaced guards for cutting fine material and which allows the cutter bar to cut close to the ground.
- LET-IN BRACE** - A diagonal brace fitted into notches in the studs so that the brace is flush with the surface of the stud framing.
- LETTING DOWN** - The process of tempering hardened steel by heating until the desired color is reached and then quenching.
- LEVEE** - An earthen dam which is placed at varying distances from the banks of a river to serve as a containing protective barrier to adjacent low land during flood periods.
- LEVEL** - An instrument which is used to ascertain the elevation of different points as a guide in terracing, ditching, laying foundations, etc.
- LEVEL-BED DIGGER** - A design used on some mechanical potato diggers in which the bed is nearly parallel to the ground surface.
- LEVELER** - A buck scraper, drag, or any device which is used for smoothing land for irrigation or drainage.
- LEVEL TERRACING** - Terracing on the contour in areas where soil is sufficiently permeable to prevent overtopping of the ridge.
- L HEAD VALVE ENGINE** - An engine having the intake and exhaust valves mounted in the crankcase block, and on the side of the cylinder, rather than in the head block.
- LIFTER GUARDS** - Specially designed guards which are attached to regular guards used on cutter bars. They are so constructed as to reach under and raise fallen stalks and stems, thus allowing the regular cutter bar to pass through and cut the stems.
- LIFT PUMP** - A pump designed to pump water from the source to the level of the pump spout only.
- LIFT TRUCKS** - A specially designed vehicle for handling bags, bales, hampers, boxes, and similar units particularly with the use of pallets, and which has means for lifting the cargo. See: Fork lift.

- LIGHT - Electro-magnetic radiation to which the human eye is sensitive.
- LIGHT CONSTRUCTION - Small buildings not needing large wood or steel members or heavy reinforced concrete.
- LIGHT FROST - A frost which is not killing in its effect, but one which may cause partial injury to the more tender and susceptible plants in exposed places. See: Frost, killing frost.
- LIGHTING OUTLET - An electric outlet intended for the direct connection of a lampholder, a lighting fixture or a cord terminating in a lampholder.
- LIGHTNING ARRESTER - A device used across an electrical circuit to protect it from abnormal surges of high voltage, such as from lightning.
- LIGHTNING ROD - A metallic rod set up on a building and connected with the earth for the purpose of protection from lightning.
- LIGHT TEXTURED - Those soils which have high sand contents. Also called coarse textured.
- LIGHT TIMBER FRAMING - Wall framing consists of studs 16 or 24 in. apart instead of large columns spaced 10 to 16 ft. apart. Used for small buildings having a short roof span.
- LIGHTWEIGHT AGGREGATES - A coarse filler or component lighter in weight than stone used in making concrete. Usually haydite, cinders, blast furnace slag. See: Lightweight concrete.
- LIGHTWEIGHT ALUMINUM PIPE - Pipe made of aluminum alloy used to carry irrigation water.
- LIGHTWEIGHT CONCRETE - A concrete made with lightweight coarse aggregate such as cinders, blast furnace slag, or haydite. Especially desirable where light weight is necessary. It does not have the strength of regular concrete, but provides more insulation.
- LIME PUTTY - 1. A combination of lime and boiled linseed oil used in combination with cement and sand to make mortar. The lime putty makes the mortar more workable and more easily troweled.
2. A mixture of soaked lump lime in water the consistency of cream. It is then left to harden by evaporation until it looks and feels like soft putty. It is used with plaster of Paris or sand for finishing coat in plastering.
- LIME SPREADER - Any mechanical device which is used to spread lime on fields.
- LIME SPREADER ATTACHMENT - A device which can be attached to a conventional manure spreader making it suitable for the spreading of agricultural lime.
- LIMIT CONTROL - A type of control system in which any action once initiated will continue until pre-selected but adjustable stops or limits are reached.
- LIMIT SWITCH - A mechanically operated electric switch, used to control or limit the operation of a mechanical device.
- LINE DIAGRAM - A scale drawing consisting of a diagram showing the arrangement of structural members, controlling dimensions, design loading, design stresses and cross section views of members and structures.
- LINE DROP - The difference in voltage along a transmission line between two given points due to the resistance of the line between the two points.
- LINE OF DRAFT - See: Line of hitch.
- LINE OF HITCH - An imaginary straight line which passes from the center of load or resistance of the towed implement through the clevis or hitch to the center of power or where the hitch is attached to the power.
- LINE OF SIGHT - The sighting or pointing line of a telescope, defined by the optical center of the objective and the intersection of cross hair.
- LINE SHAFT - A long continuous bar supported in bearings by hangers so that it can rotate and transmit power.

- LINING** - A protective covering over all or a portion of the perimeter of a conduit or reservoir, to prevent or reduce seepage losses or to resist erosion. Conduits are sometimes lined to reduce friction or otherwise improve conditions of flow. Also a covering on the inside of pipes and containers for protection of the interior surface.
- LINKAGE** - The arms, rods, braces, etc. which when attached to the hydraulic system of a tractor provide the lift and control for any implement mounted on a tractor. System may be manually operated also.
- LINKAGE BOOSTER** - A type of hydraulic power steering device. A hydraulic valve is inserted between the reduction gear and the knuckles in the steering linkage and shifts to different positions as the steering wheel is turned; thus the power of a hydraulic cylinder connected with the valve is applied directly to the linkage.
- LINTEL** - A horizontal structural member spanning the top of a door or window opening to support the load over the opening.
- LINT SLIDE** - An inclined chute down which lint cotton slides into the press box.
- LIP ROLL** - The roll of thick glass which is molded on the top of a glass milk bottle in which the milk cap is seated. It must be smooth and perfectly formed for the proper machine bottling of milk.
- LIQUEFIED PETROLEUM GAS** - A petroleum fuel made from gases recovered from oil-well casings, and from the still in the refining process. The gases are compressed, liquefied, blended and then sealed in containers.
- LIQUID BALLAST** - A means of adding extra weight to tractor tires for the purpose of increasing traction. The rear tires are partially filled with water. In freezing areas, calcium chloride is added to the water.
- LIQUID DIFFUSION** - Movement of water within a product throughout its mass.
- LIQUID FERTILIZERS** - Water soluble plant food elements which are supplied in liquid form and which are applied by being pumped, pushed by air pressure, or allowed to flow by gravity from a spray applicator.
- LIQUID SLUDGE** - Sludge containing sufficient water to permit it to flow by gravity or be pumped (ordinarily above 80 percent).
- LISTER** - A double moldboard plow which is used for opening a furrow and throwing the soil in the opposite directions. In the south it is called a middlebuster, and in semi-arid regions where crops are planted in the bottom of the furrow, it is more often called a lister or lister plow; also called middlebreaker.
- LISTER CORN PLANTER** - A type of lister equipped with row crop planting equipment so that the furrow may be opened and the seed planted in the bottom in one operation.
- LISTER CULTIVATOR** - Any of four general types of cultivators of which the sled lister, often called a go devil, and the tractor-drawn lister are the most common. It consists of two heavy runners with crusher boards attached to the front end. Back of these are large curved knives that destroy the weeds and move the soil from the lister ridge down into the lister furrow and about the growing crop. Gangs of two or three disks are placed on the rear to further stir the soil. There is a protective hood on the rear end of the sled runners to protect small plants from being covered.
- LISTER FURROWING** - A system of furrowing and loosening the ground with a lister crosswise to the prevailing wind direction to encourage moisture retention and to help control soil blowing or

- washing.
- LISTER PLANTER** - A drill planter which is designed to place the seeds in the bottom of a deep furrow made by the use of the lister plow. There are many different types of seeds, such as corn, wheat, sorghum, etc.
- LITTER ALLEY** - The alley behind the cows in stanchions in dairy barns, where litter and manure can collect. It is also serving as a passageway for animals going in and out of the barn.
- LITTER CARRIER** - A container suspended from an overhead track; the track is located for convenient loading of manure in the dairy barn or other livestock or poultry building so that the material can be carried outside.
- LITTER STOP** - A board across the bottom of a doorway in a poultry house. It retains the litter and allows adequate clearance for the door to swing during a build up of litter in the house.
- LIVE FENCE** - A hedge fence of heavy, dense growing plants, such as Osage orange; the plants are closely spaced and maintained in a living condition.
- LIVE LOAD** - Any applied load on a floor or roof that moves, or can be moved without changing the structure, e.g. vehicles, furniture, snow, ice, wind, grain, hay, potatoes.
- LIVE POWER TAKE OFF** - See: Independent power take off.
- LIVERY STABLE** - A business concern which rented saddle or driving horses by the day and which fed and housed horses for others. In some instances, a livery stable operated in conjunction with an inn serving meals especially for farmers who remained in town over night.
- LOAD** - 1. The weight carried by a beam, girder, truss span, or structure of any sort, or any part of such a structure, including its own weight. 2. A burden; a weight, as a heavy load. 3. The work done by a prime mover when working. 4. The output in watts of a dynamo. 5. The resistance offered to a motor by the machinery it drives; this does not include friction offered to the motor by its own moving parts.
- LOAD BEARING** - A member or surface carrying a load as contrasted to a nonload bearing surface which does not carry a load.
- LOAD CENTER** - The point at which the center of the electrical load is located on the farmstead. Also known as distribution center.
- LOADED RADIUS** - Static - Distance from the center of the axle to the floor for a tire when inflated to recommended pressure, mounted on recommended rim size and carrying maximum recommended load.
- LOADER** - 1. Any of the various types of elevators which is used to lift products and place them on a transportation unit. 2. Any mechanical device which aids in placing of material.
- LOAD FACTOR** - The ratio of the average load to the maximum load that can be applied to a machine. This term is most often used when speaking about internal combustion engines.
- LOADING** - The loads or weights on a structure or structural member, including live and dead load.
- LOADING CHUTE** - A narrow, inclined walkway which leads from the pen or yard floor to the elevated floor of the cattle car or truck in which animals are to be loaded. The floor of the loading chute is usually cleated to keep animals from slipping.
- LOADING LEG** - Also loading chute, feeding leg. A chute through which material flows into a bucket elevator. Usually located two or three buckets above the center of the foot wheel.
- LOAD LINE** - A drawing of a series of connected vectors each of which represents a load on the same point. Since in a non-moving load the forces have to balance, this results in a

- closed polygon.
- LOAFING PEN - See: Loafing shed.
- LOAFING SHED - A light shed type of building which is usually attached to the main dairy barn where cows may be turned loose after feeding and milking for comfort and exercise. Also called loafing pen.
- LOCKED ROTOR CURRENT - The current required by an electric motor when the rotor is blocked from turning.
- LOESS - A deposit of windblown soil particles ranging in diameter from 0.002 to 0.0002 inch.
- LOESS SOILS - Soils formed by deposits of windblown loess particles.
- LOFT - The storage space under the roof in a building, such as a barn or house.
- LOFT BARN - A barn which has a second story under the roof available for storage of hay or straw. Also called two-story barn.
- LOG - 1. An abbreviation for logarithm. 2. A bulky piece of a stick of lumber, usually a tree trunk or a length of a tree trunk which has been trimmed up and is ready to saw into lumber.
- LOGARITHMIC SPIRAL - A shape with an increasing radius in the ratio of logarithm to the base 10, i.e.,

$$r = \log_{10} \theta$$
where r is the radius, and θ , the angle of rotation.
- LOG BOAT - A short, tongueless sled with wood runners which is used for transporting logs for short distances.
- LOGGING WHEELS - A pair of wheels from 7 to 12 feet in diameter which are used for transporting logs. Also called katydid, sulky, or timber wheels.
- LOG HOUSE (CABIN) - A building which is made from natural logs sometimes squared by the use of an adz, usually laid horizontally one on top of the other and notched at the ends to tie the walls together. It was a very common type of building construction in the timbered section of the country in the pioneer days.
- LOG ROLLER - A type of clod crusher or land roller which consists of a heavy log mounted on an axle and which when pulled across a field crushes clods, levels, and firms the soil.
- LOG RULE - A table which shows the estimated to calculated amount of lumber which can be sawed from logs of given length and diameter.
- LONG BINDERS - A designation used to describe the construction and location of the binding mechanism of corn binders. A long binder brings the binding mechanism high for tall crops as compared to a lower placement called a short binder for shorter crops.
- LONG COLUMNS - A column whose length exceeds K times the least dimension.
- LONG FLOW HOLDER - Type pasteurizer; a continuous pasteurizer consisting of many large diameter tubes of a capacity such that the time for milk to flow through them just exceeds the required 30 minute holding period for this type of pasteurizer. The milk is first brought up to pasteurizing temperature and then discharged into a holding tube.
- LONG HAY - Hay as it is cut with a mower in the field. Farmers used to handle all their hay this way, but long hay is now being replaced by chopped, pelleted, and baled hay.
- LONGLEAF PINE - Same characteristics as longleaf yellow pine except for darker wood.
- LOOSE FILL INSULATION - An insulating material that may be poured or blown into open spaces between studding or above a ceiling. It may be a granular material or composed of small, detached clusters of fiber made of mineral wool, or plant fibers.
- LOOSE HOUSING - A management system for dairy cattle wherein the adult animals are given unrestricted access to the feeding area,

- water, a resting area and possibly an adjoining open lot. The lactating animals are milked in a milking parlor. Other dairy animals may be in separate pens, lots, or buildings.
- LOOSE ROCK DAM** - A dam which is built of rock without the use of mortar; the rock may be confined by woven wire.
- LOPPING SHEARS** - A long-handled pair of shears which is used to prune trees. It has one sharpened, half-moon blade which cuts against a heavy convex metal piece. Also called loppers.
- LOST HEAD** - The energy of fluid flow that is converted into heat as a result of friction, eddies, and impact. This energy conversion is expressed as head.
- LOT** - 1. A small piece of enclosed land usually adjacent to a barn or shed provided for livestock. 2. A small tract of land usually less than an acre for house construction.
- LOUVER** - Slatted opening for a ventilation system with the slats so arranged to allow the entrance or exit of air while it excludes rain, direct sunlight, or vision.
- LOWER PLASTIC LIMIT** - The moisture content at which the soil can barely be rolled into a thin, wire-like formation.
- LOW HEAT** - The net or sensible heat value of burning a material. This value is obtained by subtracting the heat of vaporization from the total heat of combustion.
- LOW LIFT** - 1. A type of pump designed for a small head capacity. 2. In irrigation such a pump is used to raise water to the high points of this system. 3. In drainage, a low head high volume pump.
- LOW OR CONSTANT PRESSURE HEATING VALUE** - The heating value of a fuel in which the heat of vaporization of the steam formed in the combustion process is not accounted for.
- LOW PRESSURE CUT-OUT** - An automatic control set to work on pressures. When the pressure gets below the point the control is set for, the control is actuated, and either shuts the system off or turns it on depending on what is desired.
- LOW PRESSURE REFRIGERATION** - Refers to systems using low pressure refrigerants such as sulfur dioxide, freon, or methyl chloride.
- LOW PROFILE** - A term used to refer to a tractor tire tread design having less depth for sand and orchard work.
- LOW SECTION HEIGHT** - Low section height tires are designed to have the same overall diameter and loaded radius as a nominal tire but have increased section width, thus giving a lower section height to width ratio. This design enables oversizing tires without changing rim diameter or axle height.
- LOW TEMPERATURE CONCENTRATOR** - A unit using a refrigeration type cycle to evaporate liquids at low pressure to leave a concentrate at quite low temperature. Used on heat sensitive materials.
- LOW-TEMPERATURE, LONG-TIME** - A method of pasteurization in which the material to be pasteurized is exposed to a temperature of 143° F. (61.7° C.) for at least 30 minutes. See: High-temperature short-time method. Also called L-T, L-T.
- LOW TENSION IGNITION** - Electric ignition of the charge in the cylinder of an internal combustion engine by the interruption of a current carrying circuit inside the cylinder, no special means being employed to produce a high voltage spark as in high tension ignition.
- LP GAS** - Liquefied petroleum gas.
- LUBRICANT** - Any substance used to grease or oil machinery to reduce friction or wear. Most ordinary lubricants for farm machinery are petroleum compounds.
- LUBRICATING OIL** - A type of refined oil usually of a petroleum base which is used for lubricating

machinery and in emulsion sprays.
LUBRICATION SYSTEMS - The complete equipment, methods, and devices used to supply lubricating oil to the moving parts of a machine.
LUELLEN DRIVE - See: Reeves drive.
LUG - 1. Any kind of a projection for carrying or supporting something, as a projection on tractor tires to assist in traction.
 2. A wooden crate or box approximately 6 x 12 x 24 inches, inside measurement, which is used as a container for berries, grapes, etc., during harvesting or transportation to processing plants or to market.
LUG ANGLE - The angle which the lug of a tractor tire makes with the vertical axis of the tire.
LUG BASE - The width of the lower part of the tractor tire lug which is next to the undertread or body of the tire.
LUG BOX - See: Lug.
LUG FACE - That horizontal portion of a tractor tire lug which comes into contact with the ground surface.
LUG FILLET - The curved section used to blend the sides of the lug into the undertread of a tire.
LUG HEIGHT - Distance measured from the undertread to the face of the lug on a tire.
LUG LENGTH - Distance measured from end to end along the center line of the face of a tire lug.
LUG PITCH - Center to center spacing of lugs on one side at the center line of the tire. It is measured at the periphery of the lugs.
LUG SIDE-LEADING - That nearly vertical portion of a tractor tire lug against which pressure is exerted when the tire is rotating in the direction for which it is designed.
LUG SIDE-TRAILING - The lug side opposite the leading side. See: Lug side-leading.
LUG SPACING - Circumferentially: The distance from the leading side of a lug to the trailing side of the lug ahead measured parallel to the center line of the tire.
LUG WIDTH - Width of face of lug measured at right angles to the center line of the face of the lug.
LUMBER - A wood product from the trunks of trees, sawed, planed and shaped into the many sizes and grades for use in construction. For full discussion and information see the "Wood Handbook" by The Forest Products Laboratory, Madison, Wisconsin, USDA Handbook No. 72.
LUMEN - The flux on a surface all points of which are at unit distance from a uniform point source of one candle.
LYSIMETER - A vessel or container designed specifically to receive an undisturbed core of soil. It is calibrated or weighed to measure moisture changes of the soil.

M

- MACERATOR** - A machine which is designed for extracting seeds of deciduous plants or for depulping fleshy fruits.
- MACHETE** - A very large, heavy knife which is used for cutting sugar cane and brush.
- MACHINE GENERATION** - A method of fumigating trees, especially citrus, in which a generating chamber is filled with sulfuric acid and water to which cyanide is added. The generated gas is forced by its own pressure into a tent covering the tree.
- MACHINE GRADING** - 1. Movement of earth by bulldozers or other equipment to establish a predetermined grade. 2. Grading of fruit, vegetables, eggs, etc., by mechanical and mostly automatic machines.
- MACHINE MILKING** - The practice of milking dairy cows by a power operated, mechanical device. There are several different types but most employ some type of pulsating suction. Machine milking is a great labor saving development and has largely replaced hand milking in the dairy herds in some countries.
- MACHINE SCREW THREADS** - In the A.S.M.E. standard for machine screw threads, the basic form is the same as that of the U.S. standard system, but certain definite limits are given both for screw and tap threads.
- MACHINE SHED** - A farm building usually of open and light construction used for housing machinery.
- MAGNETIC BRAKE** - A friction brake controlled by electro-magnetic means.
- MAGNETIC CLUTCH** - A clutch in which the necessary force to hold the two parts together is provided by means of an electro-magnet.
- MAGNETIC STARTERS** - Starters that consist of contactors actuated by magnetic relays mounted on a panel and generally enclosed in a sheet metal cabinet. They are equipped with some form of overload protective relay which opens the circuit of the operating coil of the line contactor upon the occurrence of overload on the motor.
- MAGNETO** - A rotating machine for converting mechanical energy into high-voltage electrical energy for ignition of internal combustion engines in which the armature rotates in a field produced by permanent magnets as in a dynamo. Formerly magnetos were extensively used for automobile and tractor ignition, but have been largely replaced by the storage battery system charged by a generator operated by the engine.
- MAGNETO IGNITION** - An ignition system for internal combustion engines in which the voltage necessary to produce the spark is provided by a special generator using permanent magnets.
- MAGNETRON** - A vacuum tube containing an anode and a heated cathode, the flow of electrons from cathode to anode being controlled by an externally applied magnetic field.
- MAIN** - 1. In water systems it is the principal line in a water supply system. 2. In drainage, the conduit that collects water from the laterals and conveys it to a point of outlet.
- MAIN BEARINGS** - The supports for the principal shaft that supplies or transfers power in a machine are called main bearings. In internal combustion engines the main bearings are located on and support the crankshaft.
- MAIN CANAL** - See: Canal. In irrigation systems it is the main ditch which supplies water to the laterals.
- MAIN DUCT** - In ventilation and heating it distinguishes a duct or tunnel which distributes air to or collects air from two or more smaller (lateral) ducts or to a perforated or slatted floor.
- MAIN JET** - The jet through which most of the fuel enters the air stream in a jet carburetor under normal operating conditions.

- MAIN SERVICE** - This is the conductor and equipment at the point where electric service is metered and controlled.
- MAIN WHEEL** - A large wheel equipped with lugs on a binder or harvester which bears a high percentage of the weight of the machine and which furnishes the power to operate the machine. Sometimes called bull wheel.
- MAKE-AND-BREAK** - A type of ignition system used on early internal combustion engines, consisting mainly of a battery, a coil, and an ignitor all connected in series. The ignitor is mounted in the cylinder and ignites the fuel mixture. Current flows through the system until ignitor points open. The magnetic field around the coil collapses inducing a higher voltage which jumps the gap between the contacts of the ignitor.
- MALE** - That one of a pair of corresponding parts which fits into the other; as, a shaft in a bearing or a bolt in a nut, the other piece being termed the female element; external threads are known as male threads.
- MALLEABILITY** - The measure of ability to be hammered into sheets or forms.
- MANGER** - A box or trough in which feed is placed.
- MANIFOLD CHAMBER** - A plenum chamber serving more than one duct.
- MANIFOLD VACUUM** - The partial vacuum which exists in the intake manifold of a gasoline engine caused by the suction of the pistons on their intake stroke.
- MANILA CABLE** - An assembly of three hawsers (3-3 strand ropes) twisted together usually 10 inches or larger in circumference.
- MANNING'S FORMULA** - An empirical hydraulic formula for velocity in an open channel, the factors of which are the hydraulic radius, a coefficient of roughness, and slope.
- $$V = \frac{1.486}{n} r^{2/3} s^{1/2}$$
- MANOMETER** - A simple and reliable device used to determine pressure. It is essentially a U-tube partially filled with a liquid, usually water or mercury. The difference in height of liquid between the two sides of the U-tube is related to the pressure difference acting on the two sides.
- MANTEL** - The shelf-like projection above a fireplace. In some cases it is understood to mean the entire finish around a fireplace including the chimney breast in front and on the sides.
- MANUAL POWER** - The muscular power of men's bodies, approximately equal to 1/10 h.p.
- MANURE BUCKET** - A scoop attachment for a tractor which is used to lift and load manure. Also called manure scoop, manure fork.
- MANURE CELLAR** - A cellar which is placed beneath a barn into which manure is dropped through a trap door from above for storage.
- MANURE CISTERN** - A large underground container designed to receive liquid manure from livestock structures and lots.
- MANURE FORK** - 1. A sturdy fork which is used for handling manure. 2. The attachment for a loader used to lift and load manure.
- MANURE LOADER** - A power-lifted fork mounted on a farm tractor for loading of manure from piles, yards, sheds or barns into manure spreaders for transport to fields. It is used extensively where loose housing of dairy cows is practiced. See: Manure bucket.
- MANURE PIT** - A large pit for storage and preservation of barnyard manure.
- MANURE SPREADER** - A wagon-type implement which is used to carry barnyard manure to the field, shredding it and spreading it uniformly on the land. The power for the spreading mechanism and conveyor is supplied from the rear wheels or from a tractor power take-off.

MARBELIZED LINOLEUM - A linoleum with a pattern or grain looking like marble.

MARKS FEED - On a fertilizer drill, an inverted cone with a stationary projecting lip beneath which a revolving plate brings the fertilizer to the lip which deflects it to the center of the cone and drops it through the spout to the soil.

MARL - A deposit consisting mostly of clay mixed with calcium carbonate that is applied to surface soil to reduce its acidity.

MARSH HAY - A dry vegetative material harvested in low areas and sometimes used to cover drain tile joints in organic soils. See: Blinding.

MASONRY PAINT - A paint applied to masonry units to prevent water seepage through the units and also used for decoration.

MASS FLOW - Flow that occurs in a very steep sloped hopper when the whole mass of grain flows down simultaneously. The flowing core increases in diameter until it includes all of the material in the hopper.

MASS TRANSFER COEFFICIENT - The reciprocal of the resistance to drying in thin layer drying, represented by

$$K_g a_m = \frac{\text{Lb. H}_2\text{O}}{(\text{hr})(\text{ft}^2)}$$

MASTER CLUTCH - A clutch which transmits all power from the engine and controls both travel and the power take-off.

MASTER SHIELD - The safety shield over the power take-off of a tractor which incorporates the attaching point for the shields of driven machines, and is strong enough to support the weight of the tractor operator.

MASTICA - A plastic material which is used in the place of putty for glazing greenhouse glass and hot-bed sash.

MATCHED LUMBER - Lumber edge dressed and shaped to make a tongue-and-

groove joint at the edges or ends so when laid edge-to-edge or end-to-end will not allow open cracks through the surface.

MATCH MARKING - A system of marking the parts or members of a structure so that they always may be connected in exactly the same order and manner.

MATERIALS HANDLING - Any operation which changes the location of a material without changing its form or make up except as an incidental effect.

MATERNITY PEN - A special pen in a barn where animals about to give birth to young may be isolated from the rest of the herd.

MATTOCK - A hand tool which consists of a short handle with a two-bladed steel head. One blade that is perpendicular to the handle is flat and is used for grubbing. The second blade may be pointed like a pick or it may be flat and ground to a sharp edge like an axe for cutting.

MATTRESS - A blanket of brush or poles which is interwoven or otherwise lashed together and placed to cover an area subject to river bank erosion, and which is weighted with rock, concrete blocks, or otherwise held in place. Also used on foundations for machines operated in low, wet areas.

MAXIMUM DEMAND - The greatest of all the demands for electric power which have occurred during a given period. It is determined by measurement in kilowatts over a prescribed time of service, usually a 15 minute period.

MAXIMUM DRAWBAR PULL - This is the maximum sustained pull that a tractor can maintain at the drawbar with the pull exerted horizontally and in the vertical plane containing the longitudinal axis of the tractor.

MAXIMUM PERMISSIBLE TIME OF DRYING - The maximum elapse of time that may be used to accomplish drying of the last portion of grain in the bin without occurrence of

- significant undesirable quality changes.
- MBT** - Maximum brake torque. The maximum torque an engine will develop with throttle fully open at a specific speed is called the maximum brake torque.
- MEAN DEPOSIT RATE** - The average amount of deposited material over the entire swath when the material is applied with spray or dusting equipment.
- MEAN DEPTH** - Cross-sectional area of a stream divided by its surface width.
- MEAN EFFECTIVE PRESSURE** - The theoretical constant or average pressure which can be imagined as being exerted during each power stroke of the engine to produce a power output equal to the brake horsepower.
- MEAN VELOCITY** - V or v (LT^{-1}) - 1. At a section of a conduit, the velocity obtained by dividing the flow by the cross-sectional area of the water prism. 2. For a reach of a stream or conduit, the velocity obtained by dividing the flow by the average cross-sectional area of the water prism in the reach.
- MEASURING WEIR** - A device for measuring the flow of water. It generally consists of rectangular, trapezoidal, triangular, or other shaped notch cut in a thin plate with the plates in a vertical plane through which the water flows. The head above the crest, measured upstream from the notch, is an index of the flow. See: Cipoletti weir; Rectangular weir; Triangular weir.
- MEAT GRINDER** - A machine for reducing meat to very small pieces.
- MEAT SAW** - A tool used in meat cutting consisting of a thin steel saw blade set in a U-shaped frame which is especially designed for sawing bone. It is reciprocating in action and can be hand powered or electrically powered. Also, an electrically powered machine which is essentially a band saw and is used as above.
- MECHANICAL ANALYSIS** - A sieve analysis of a granular material showing the percentage distribution of the various sizes of individual particles in soils.
- MECHANICAL BLOWERS** - Powered fans used for moving air.
- MECHANICAL BUFFER** - A machine which is used in the final operation of plucking feathers from poultry slaughtered for market. Also called buffer or mechanical picker.
- MECHANICAL CONTROL** - Man-built structures which are used to control erosion, such as, terraces, dams, retards, baffles, etc., in contrast to vegetative control.
- MECHANICAL DAMAGE** - Damage done to plants or harvested material by a mechanical device.
- MECHANICAL DUCKER** - A machine which is designed to hold hogs under water in the scalding vats of slaughtering plants.
- MECHANICAL EFFICIENCY** - 1. In an engine, the ratio of the brake or useful horsepower to the indicated horsepower developed in the cylinders, i.e., the efficiency of the engine regarded as a machine. 2. The ratio of the actual or useful power output to the power supplied by the source or the input power.
- MECHANICAL EGG WASHER** - A washing machine which cleans soiled eggs to improve appearance for marketing.
- MECHANICAL EQUIVALENT OF HEAT** - 778.2 ft.lb. is equal to 1 Btu.
- MECHANICAL HARVESTING** - Harvesting crops through the use of power equipment, i.e., a potato harvester which digs, shakes, and crates the potatoes. The machine digs or cuts, removes the crop portion wanted and puts them into containers for hauling.
- MECHANICAL LEAF LOSS** - The loss of hay leaves due to handling with machinery.
- MECHANICAL MILKER** - See: Milking machine.
- MECHANICAL MOVEMENT** - Any special arrangement or sequence of related parts of a machine acting on each

- other and accomplishing a motion.
- MECHANICAL PLANT THINNER** - A device for mechanically reducing the number of plants in a unit area. See: Two-row plant thinner.
- MECHANICAL POULTRY PICKING** - The removal of feathers in dressing poultry for market by the use of machines in contrast to removal by hand labor. See: Mechanical buffer.
- MECHANICAL POWER** - 1. There are six devices through which mechanical power may be conveyed: lever, wheel and axle, pulley, inclined plane, screw, and the wedge. 2. Any means of doing work with a machine.
- MECHANICAL REFRIGERATION** - A cold condition which is created by a system in which a low boiling point liquid (refrigerant) is allowed to expand under low pressure (thus absorbing heat), is compressed by a mechanical compressor, then cooled to liquefy the refrigerant and give off its heat. The refrigerant is then recycled to the low pressure part of the system to absorb more heat.
- MECHANICAL SEPARATION** - An operation where a product is isolated or cleaned by using mechanical agitation or centrifugal force or screens.
- MECHANICAL VIBRATOR** - A machine to stir freshly poured concrete to remove air pockets.
- MEEKER HARROW** - A type of harrow consisting of a large number of flat disks, uniformly spaced, and rotating on a transverse axle mounted in a frame. It is designed to pulverize the soil, make a smooth surface, and firm the seedbed. It is especially useful in preparing fields for garden crops.
- MEETING RAIL** - The horizontal rails of a double-hung sash that fit together when the window is closed. That is, the bottom rail of the top sash and the top rail of the bottom sash.
- MELTER** - A machine used for melting the caps removed from honeycomb by the uncapping knife or plane. The melting process makes it possible to separate the wax from the honey in the caps.
- MERCAPTOBENZOTHAZOLE** - An ingredient of a corrosion inhibitor which prevents corrosion by forming a very thin film over all the interior surfaces of the cooling system. Commonly called MBT.
- MERCURY-ARC LAMP** - A mercury-vapor lamp which has an electric discharge through mercury vapor, emitting a blue-green light and ultra-violet rays. Commonly used for water sterilization, photography, etc.
- MERCURY SWITCH** - A type of switch which employs mercury for making and breaking the contact.
- MERRIMAN'S EQUATION** - A method of estimating the dead load of a wood roof truss in which
- $$W = 1/2 SL (1 + 0.1L)$$
- where W = the weight of one truss in pounds, S = the distance between adjacent trusses in feet, and L = the span of the truss in feet.
- MERRY-GO-ROUND** - A revolving rack in which uncapped honeycomb is put while waiting to be put into the extractor. Any honey draining from the combs is caught by a stationary pan beneath; this pan slopes toward the center.
- MERRY-GO-ROUND DIPPER** - A method for dipping raisin grapes into a boiling lye solution. The most commonly used type of dipping outfit consists of two or more hinged wire baskets suspended from the ends of levers which in turn are hinged to a central pivoted upright.
- METABOLIC HEAT** - Heat produced by tissue oxidation of a living substance.
- METAL CHURN** - A container constructed of metal used to separate the fat globules from milk by agitation and thus obtain butter. This type of churn has sanitary advantages over the wood churn. The principle problem in this churn is preventing

- the butter from sticking to the metal. It has been found that roughing the surface will allow a film of moisture to form on the surface between the metal and butter and prevent the butter from sticking.
- METAL LATH** - A sheet of metal slit and drawn out to form openings on which plaster can be spread. The metal lath is a fire preventive device.
- METALLIC FLAVOR** - A disagreeable taste imparted to some liquids by contact with certain kinds of metals or by enzymatic reactions.
- METALLIC PACKINGS** - Owing to the combustible or friable nature of fibrous packing, it is necessary to use rings or segments of bronze or white metal alloy in their stead for packing rods working in high pressure or superheated steam. These rings or segments are generally made in internal and external cones to fit in each other, and are frequently retained in place by means of springs thus floating them on the rod to eliminate friction.
- METHODS OF FREEZING, DIRECT CONTACT-**
In this method freezing is affected by direct immersion of the product in the refrigerated liquid (brine or sirup). Critics of this process aver that brine, if used, will penetrate the tissues of the product being frozen. If the material is enclosed in tin cans and then immersed in brine the can may subsequently rust due to the action of the brine. However, this fault has been eliminated by careful rinsing and drying of the container.
- MICROMANOMETER** - A manometer provided with very accurate measurement and calibration.
- MICROMETER** - A device for measuring width, length, or thickness with precision, usually in conjunction with a microscope or telescope.
- MICRONIZED DUST** - Extremely fine particles.
- MIDDLEBREAKER** - A special type of plow which is constructed with two moldboards, one for turning the soil to the right, the other for turning it to the left. The share is double-winged to take care of both the right and left boards. Instead of having a land-side, it has a rudder that has a knife or blade attached to the bottom of it which cuts through the soil and prevents the plow from weaving to the side.
- MILD STEEL** - A class of steel with up to 0.25% carbon content. It has a crystalline structure and is weldable but cannot be hardened. It is used for the cores of electro-magnets and for concrete reinforcing rods.
- MILK BOTTLE CAPPER** - A machine which places paper or metal caps on bottles of milk.
- MILK BOTTLE CLOSURE** - A hood or cap for a milk bottle.
- MILK BOTTLE FILLER** - A machine which mechanically fills bottles with milk.
- MILK CAN** - A specially constructed steel container, lined with tin, provided with lifting handles and either a plug or umbrella cover, which is used in the transport of milk from producer to distributor or processor. Its usual capacity is ten gallons.
- MILK CLARIFIER** - See: Clarifier.
- MILK COOLER** - 1. Any device used to hold milk at a temperature at which it will keep for a period of time. 2. Any device for removing heat from milk.
- MILK DRYER (DRIER)** - Any mechanical device which is designed to remove most of the water from milk. The water may be evaporated from pans or from steam heated rollers or the milk may be sprayed into a stream of hot air. See: Dehydrator; Dryer; Spray drying.
- MILKER HEAD** - The head of a milking machine to which the teat cups and pulsator are attached.
- MILK-HANDLING ROOM** - A room separate from or attached to a modern dairy barn and separate from the milking parlor in which milk is cooled and stored in preparation for

- shipment.
- MILKHOUSE** - Same as a milk room except that it is not a part of, but may or may not be connected with any other structure.
- MILKING BARN** - A barn which is constructed primarily for milking and housing of dairy cattle. More often called a dairy barn.
- MILKING CUP** - The part of a milking machine which fits onto the teats of a cow's udder.
- MILKING MACHINE** - A mechanical device replacing hand labor in the milking of cows, the essential parts being teat cups, a vacuum pump, and a milker pail or milk line. Milk is drawn from the udder by application of alternate vacuum and atmospheric pressure.
- MILKING ROOM** - A room where the cows are milked but not housed. It is an essential part of loose housing but optional with a stall barn. Also called milking parlor.
- MILKING SPACE** - The space in a dairy barn which is used for the milking of cows but which may also include feeding and bedding.
- MILKING STALL** - A partial enclosure in a dairy barn designed to restrict the movement of a cow during milking. It is usually about eight feet long including the manger and is provided with a stanchion or other means of securing the animal.
- MILK IRRADIATOR** - A device which uses ultra-violet radiation from an electric arc or mercury vapor lamp to convert ergosterol in milk into vitamin D. It is no longer in common usage.
- MILK LINE** - 1. A pipe line which carries milk from the milking machine to the milk house. 2. A visible layer of milk in the bottom of a bottle of cream. See: Cream line.
- MILK PLANT** - A building equipped for the handling or processing of milk.
- MILK PUMP** - Any pump which is specially constructed for the sanitary handling of milk.
- MILKROOM** - A room with one or more sections for handling raw milk, wholly or partly enclosed by the structure in which the cows are milked.
- MILKSTONE** - A hard substance (a protein-mineral complex) which forms on the walls of containers used to handle, process or hold milk. It is very difficult to remove.
- MILK STRAINER** - 1. A metal dish or funnel-like utensil with a wire sieve or perforated metal plate and cotton filter bottom which is designed to fit into a milk pail, into the milk tank of a cream separator, or into the neck of a milk can for straining extraneous matter out of milk. 2. A sock-like cotton filter which is used in the line of a pipe line milker.
- MILK TANK** - Any of a number of different sized and shaped receptacles for holding liquid milk, especially a metal or lined metal or glass container in which milk is transported on a truck from collection centers to distributors and processors or in which milk is held in dairy plants.
- MILK TO MILK REGENERATOR** - A heat exchanger used in dairy plants. The hot milk from the pasteurization process is on one side of the heat transfer surface and incoming cold milk on the other side.
- MILK TRAIN** - A railroad train used primarily to transport milk in insulated tank cars from rural areas to cities. This is now largely supplanted by tank trucks.
- MILK TUBE** - The tube of rubber or plastic which connects the teat cup and the milker pail of a milking machine.
- MILK TUBE BRUSH** - A brush which is used for cleaning a milk tube.
- MILK WASTES** - Washings from milk handling equipment, product spillage, and non-marketable manufacturing by-products such as whey and buttermilk.
- MILL** - A building or establishment which is provided with machinery for grinding, pressing, processing, etc., e.g., grain mill, cane mill, cider mill, saw mill, etc.

- MILLING** - 1. The grinding of wheat and other cereals into meal or flour for food purposes. 2. The grinding or disintegrating of ores to recover their metallic contents. 3. The shaping of metals by means of revolving tools or milling cutters.
- MILLING QUALITIES** - The qualities of grain, rice, etc., which promote easier milling. Some of these qualities may be correct moisture content, temperature, etc.
- MILLSTONE** - One of a pair of cylindrical stones used in grinding. For flour mills, a burrstone is used.
- MILLWORK** - The finished wood portions of a building which are customarily obtained from a planing mill, such as doors, windows and door frames, sash, panel-work, etc. It does not include lumber used for structural purposes or siding, which are items of yard lumber.
- MINERAL STREAKS** - Brown or black discolorations in wood caused by oxidation and other chemical changes. They usually do not affect the strength of the wood but may injure its appearance.
- MINERAL WOOL** - Ironworks slag, blown like spun glass by a jet of compressed air through its molten substance into a fluffy material resembling cotton or wool. It forms an excellent non-conductor of heat. It is also known as silicate cotton and is used widely as an insulating material.
- MINER'S INCH** - 1. The amount of water that will flow through a one inch square opening, given a certain head. (In parts of California 50 miner's inches equal one second foot; in Colorado 38.4 miner's inches equal one second foot.) 2. $(L^3 T^{-1})$ The free flow through a vertical orifice, per square inch of area, under a head above the center of the orifice that varies with local usage (usually 4 to 7 inches). Most of the western states have statutes defining the miner's inch in cubic feet per second (usually as 1/50 to 1/38 cubic foot per second). 3. In mining laws of various regions, the quantity of water that will pass an opening of one square inch in 24 hours under a head of 6 inches.
- MINIMUM TILLAGE** - The least amount of tillage that will result in quick germination and a good stand. Several implements may be drawn behind a tractor to reduce the number of times that the tractor is driven over the field. It does not mean that primary tillage, secondary tillage, fertilization and seeding must be done in one trip across the field, although this is sometimes accomplished.
- MIRROR FINISH** - Denoting a metallic surface so highly polished that it acts almost like a mirror. A surface with a degree of surface roughness less than 10 microinches.
- MISSISSIPPI SCRAPER** - A type of plow which was designed especially for very shallow cultivation of cotton and used in the South up to the middle of the 19th Century. It is now obsolete.
- MISSOURI-TYPE FLUME** - A gully head control flume that is constructed by shaping the soil to conform to the shape of the flume and by applying a layer of concrete reinforced with woven wire mesh. Also referred to as the formless flume.
- MIST BLOWER** - A type of spray equipment which is constructed to break up and atomize concentrated insecticide and fungicide mixtures and to disperse them into an air stream of high velocity. It is used to apply solutions or suspensions.
- MIXA HOOK** - A specially designed hook which is used to hang chickens for boning in poultry slaughter.
- MIXED-BASE CRUDE** - Crude oil for the manufacture of gasoline, kerosene, distillate, lubricating oil, and asphalt.
- MIXED FLOW PUMP** - A pump with a

combination propeller and centrifugal-type impeller.

MIXING FLOOR - In feeding barns, a floor space which is used for mixing livestock feeds.

MIXING NOZZLE - A nozzle in which the extruded liquid is subjected to disruption of air before it finally leaves the orifice.

MIXTURE RATIO - In internal combustion engines, the ratio of fuel to air in a combustion chamber.

MODIFIED VERMOREL - A type of spray nozzle which has the liquid entering from a separate tube in back of the nozzle. The tube with the nozzle on it has a shut-off valve which also regulates liquid output.

MODULAR PLANNING - The coordination of space and function in a building to permit easy extension of a building by the addition of "modular" building units of standard widths and to permit flexibility and economy in the use of the structure by arranging the space to allow for easy rearrangement into other space units without extensive structural changes.

MODULAR RATIO - The ratio of the modulus of elasticity to compression for concrete.

MODULUS OF ELASTICITY - The ratio of stress to accompanying strain provided the stress does not exceed the elastic limit.

$$E = \frac{\text{unit stress}}{\text{unit strain}}$$
 where E is the modulus of elasticity expressed in pounds per square inch. The value for steel is approximately 30,000,000. E is measured by the slope of the elastic portion of the stress-strain curve.

MODULUS OF RESILIENCE - The maximum amount of energy per unit volume that can be stored in a material by a stress acting on it and can then be recovered when the stress is removed.

MODULUS OF RUPTURE - The maximum stress in lb. per sq.in. that a material can take before rupturing. It is equal, at any point,

to the bending moment at that point which will cause failure divided by the section modulus at that point.

MODULUS OF TOUGHNESS - A measurement of the capacity of a material to resist fracture under an impact load. It equals the amount of work done on a material when it is loaded to failure.

MOISTURE CONTENT - For agricultural products, usually expressed as percentage by weight of moisture based on wet weight in a sample, wet basis, w.b.; or expressed as percentage by weight of moisture based on dry weight of sample, dry basis, d.b. For air, usually expressed as weight of water vapor per pound of dry air, called humidity, H.

MOISTURE CONTENT RATIO - A dimensionless quantity which is useful in finding various facts about a certain type of drying operation with a certain product.

$$\text{Moisture content ratio} = \frac{M - M_e}{M_o - M_e}$$

M = the moisture content (dry basis) at any time; Me = the equilibrium moisture content (dry basis); Mo = the original moisture content (dry basis).

MOISTURE EQUIVALENT, ME - The percentage of moisture, on dry weight basis, that a sample of soil of specified weight, after being prepared and saturated in a predescribed manner, will retain against a centrifugal force of 1,000 times the force of gravity. The moisture equivalent is approximately the same as the field capacity for most fine-textured soils. It is an approximate single-valued measure of soil texture.

MOISTURE EXTRACTION PATTERN - The moisture withdrawal pattern which indicates root activity in the soil.

MOISTURE GRADIENT - A condition of graduated moisture content between the successive layers of material, such as wood, due to the losing or absorbing of moisture. During

- seasoning the gradations are between the moisture content of the relatively dry surface layers and the wet layers at the center of the piece.
- MOISTURE-HOLDING CAPACITY** - The maximum amount of moisture that can be held in the air, soil, etc., under specified conditions.
- MOISTURE MIGRATION** - The movement of moisture to one area in a bin of grain due to temperature differences between parts of the bin.
- MOISTURE MOVEMENT** - The movement of soil moisture in response to a potential gradient. It may be expressed as follows:
- $$V = K \frac{d\phi}{ds}$$
- which states that the rate of movement (V) is proportional to the potential gradient ($d\phi/ds$). ϕ is the potential, (s) is distance along the path of greatest change in potential, and (K) is the conductivity.
- MOISTURE PAN** - An adjunct to egg incubators; a vessel that contains the water which provides the humidity necessary for incubation.
- MOISTURE PENETRATION (L)** - The depth to which moisture readily penetrates the soil following an irrigation or rain.
- MOISTURE PERCENTAGE (of soils), P_w** - The ratio of the weight of water in a soil to the dry weight of the soil, expressed as a percentage on a dry weight basis. The standard basis for expressing soil moisture.
- MOISTURE REQUIREMENTS** - The amount of water, usually expressed in inches of depth, that a certain crop needs during its growing season.
- MOLDBOARD** - That part of the plow just back of the share which receives the furrow slice from the share and partially or completely turns it over.
- MOLDBOARD EXTENSION** - A curved piece of metal which is bolted onto the upper rear of the moldboard to aid in turning the furrow at slow speeds.
- MOLDBOARD HILLER** - A curved, metal, board-like attachment for a cultivator which is designed to bank or hill the soil around a growing crop.
- MOLDBOARD PLOW** - A plow which is equipped with a moldboard to turn the furrow slice.
- MOLDBOARD-TYPE DITCHER** - A tool similar to a lister but with much larger moldboards for making ditches for the distribution of irrigation water or for drainage. See: Middlebreaker.
- MOLDING** - A strip of wood or other material shaped to some graceful or fancy form used to decorate architectural work.
- MOLDS** - Types of budding fungi.
- MOLE DRAINAGE** - A method of land drainage. An unlined cylindrical channel is constructed by pulling a two to eight inch diameter projectile shaped ball through the soil at depths of two to three feet thus forming an opening or tube for the flow of water.
- MOMENT** - The tendency of a force to produce rotation. This tendency is measured by the product of the force and its lever arm.
- MOMENT AREA** - The area under the moment curve in a moment diagram.
- MOMENT ARM** - The perpendicular distance from a force to its axis of rotation.
- MONEL METAL** - Nickel alloyed with copper which has special corrosion-resistant properties combined with mechanical strength properties that frequently exceed those of ordinary steel.
- MONITOR ROOF** - A roof with a raised projection in the form of a turret, usually with slats for ventilation. Some monitor roofs have windows on both sides of the monitor.
- MONOCHROMATIC LIGHT** - Light having only one color and one wave length.
- MONOCHROMATOR** - An optical instrument which disperses light by means of a prism and permits light of only one color or narrow band of wave lengths to pass through a slit.
- MONTI PROCESS** - A method, in commercial use in Italy, by which fruit

- juice is concentrated by freezing.
- MORNING GLORY INLET** - A morning glory shaped inlet structure to an underground conduit used to control water movement in an erosion control structure.
- MORTISE** - A blind slot is cut into a member, usually edgewise, to receive tenon of another member to form a joint.
- MOTION-AND-TIME-STUDY** - Studying the methods of a workman with an idea of rearranging materials or the workman's motions to take less time.
- MOTOR GENERATOR** - A converter consisting of a motor connected to a supply of one voltage, frequency, or number of phases, and a generator providing output power to a system of different voltage, frequency, or number of phases, the motor and generator being mechanically connected.
- MOTOR-GRADER** - See: Road grader.
- MOTOR OILS** - Mineral oils or blends of mineral and vegetable oils especially prepared for lubricating automobile engines (the internal combustion engines), viscosity being adjusted to the season. Additives are generally added to improve its properties.
- MOTOR PATROL** - See Road grader.
- MOTOR SLIP** - The % difference between synchronous speed and the speed at which an electric motor runs.
- MOTOR STARTER** - A device for operating the necessary circuits for starting and accelerating to full speed an electric motor, but not for controlling its speed when running.
- MOTOR STARTING RHEOSTAT** - A resistance provided to prevent too great a rush of current into a motor when starting; a motor starter.
- MOULDING WIRING** - A method of wiring a building by running the conductors along the walls and ceilings under suitable mouldings.
- MOUNTED EQUIPMENT** - Equipment or apparatus attached or fastened directly to the propelling vehicle and/or power source. Implements are quite often attached directly to a lift mechanism which is operated by hydraulic controls or direct power from the engine. Equipment that is attached to the tractor in such a manner that it is steered directly by the tractor and, at least for the raised position of the implement, is completely supported by the tractor.
- MOUNTINGS** - That by which anything is prepared for use; equipment; as, the mountings of a steam boiler, meaning the safety valves, water gauges, etc.
- MOVABLE DAM** - 1. A portable dam such as a canvas dam used in an irrigation field ditch. 2. A water barrier that may be opened in whole or in part. The movable part may consist of gates, stop logs, flash boards, wickets, or any other device whereby the water flow over the dam may be controlled.
- MOVABLE HOG HOUSE** - A portable hog house, frequently mounted on skids, which may be moved for sanitary purposes or for better use of summer pastures.
- MOVABLE LAYING HOUSE** - A portable poultry house mounted on skids which can be easily moved for purposes of sanitation or for new forage.
- MOW** - The place in a barn where hay is stored.
- MOW CURING** - See: Finishing hay.
- MOW-DRYING** - The use of a blower and duct system in the hay mow to provide forced ventilation to reduce the moisture content of the hay. Under this system, hay having approximately 40% moisture may be put in the mow and the curing completed with the aid of the blower system. Normal outside air or artificially heated air may be used.
- MOWER** - 1. A machine with a mowing sickle cutting bar which is designed to cut forage for hay, weeds, etc. 2. A machine which is equipped with a cutting reel or rotating blade for cutting the grass of a lawn.

- MOWER KNIFE** - The long horizontal cutting bar which includes mower sections and knife head.
- MOWER SECTION** - One of the triangular cutting blades on the mower knife of a mowing machine.
- MOWER WHEEL ROLLER** - A land roller which is homemade from the wheels of worn-out mowing machines. It can be made by stringing the wheels on a shaft or by using only two wheels on a shaft or by using only two wheels fastened together to make a cylindrical roller.
- MUD CAPPING** - A method used to break up large rocks in which an explosive is placed on the surface of a rock and covered with mud so as to direct the force of the explosive against the rock.
- MUD-CONCRETE** - A type of wall construction in which load bearing walls of earth are made by pouring thoroughly mixed mud into wall forms similar to those used in concrete wall construction.
- MUD FENCE** - A fence made of earth. Adobe fences have been made occasionally in the United States.
- MUD PLASTER** - A type of finish applied to completed earth walls to help prevent the wall from dusting or absorbing water.
- MUD SILL** - A log or timber resting on the ground to support some part of a building.
- MUFFLER** - A vessel, chambered and partitioned within, the diaphragms being usually perforated with small holes, designed to silence or reduce the noise, occasioned by the blowing off of steam from a safety valve or the exhaust gases from an engine, by allowing the steam or gas to expand gradually.
- MULCH PLANTING** - Planting a crop in small grain stubble mulch.
- MULEY SAW** - A straight rip saw which was used during the early lumbering days in the United States.
- MULLION** - In a window, an upright division bar between lights of glass.
- MULTI-DRUM FEEDER** - A gin stand cleaning feeder.
- MULTI-GRADE OIL** - A grade of oil which has a viscosity range for use in all seasons through the year.
- MULTIHITCH** - 1. A hitch which consists of a combination of double-trees, bars, braces, evener arms, and chain levers permitting successful use of a team of three or more horses in pulling a plow, etc. 2. A hitch hooked to a tractor for pulling. See: Hitch.
- MULTIPLE-DISK CLUTCH** - A clutch used mainly on track-laying tractors to lower the unit pressures required. The transmission of high torques is accomplished by using more than one disk to absorb the energy.
- MULTIPLE PLOW** - A plow which is so constructed that there are two or more bottoms. Also called gang plow.
- MULTIPLE-ROW SEEDER** - Any planter that sows more than one row in a single operation. See: Seeder; Grain drill; Planter.
- MULTIPLE SPRINGS** - Springs used in governor design to regulate the speed of a tractor.
- MULTISERVICE METAL CAN** - A metal can; a bulk container for ice cream which can be used over again after washing.
- MULTISTAGE CENTRIFUGAL** - A centrifugal pump that contains more than one impeller and housing arranged in series to give high pressure.
- MULTISTAGING** - The process of putting two or more units (usually pumps) in series to increase air flow, water flow, power or whatever operation is being performed.
- MULTI-START WORM** - A worm in which two or more helical threads are used in order to obtain a larger pitch and hence a higher velocity ratio of the drive.
- MULTIVANE FAN** - A fan with a number of blades on it.
- MUNTINS** - The small members that divide the glass or openings of sash, doors, etc.
- MUST-FREE** - Designating a product free of a musty smell. See: Musty.

MUSTY - Designating a defect of milk, cream, butter, or ice cream that has an unpleasant or offensive odor as that imparted by molds or that imparted by a damp, unventilated cellar or basement. Also a defect of hay baled too wet which causes the hay to become moldy or give off an offensive odor.

MUTE PULLEY - A pulley used to guide a belt and which is adjustable to various position upon its stand.

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- NAILING GROOVE** - Steel framing which has a groove through its mid-section to permit nailing of wood rafters on such.
- NAPHTHENES** - Contained in crude oils which are dark in color and have a relatively high specific gravity. They have the general chemical formula: C_nH_{2n} and are saturated compounds. They have molecules made up of carbon and hydrogen with a ring structure, and the prefix cyclo is used in their name. The naphthenes have high antiknock values.
- NAPPE** - The sheet or stream of water which overflows a weir or dam.
- NARROW BASE TERRACE** - A terrace constructed for the control of soil erosion which is similar to a broadbase terrace in all respects except for the width of ridge and channel; the base width of a narrow terrace is usually four to eight feet. It is not as tillable as the broadbase.
- NARROW TRACK SEEDER** - A seed drill which has the wheels closely spaced leaving the ends of the seed box projecting beyond them on either side.
- NATIONAL ELECTRICAL CODE** - A set of advisory safety rules published by the National Fire Protection Association and widely used as the basis for state and local laws governing the installation of electrical wiring.
- NATIONAL INSTITUTE OF AGRICULTURAL ENGINEERING** - An institute located in England which carries out tests on any agricultural machine including tractors. The English tests are similar to those at the University of Nebraska but vary mainly in that the drawbar tests are carried out on ordinary agricultural land located at Silsoe, Bedfordshire, England.
- NATURAL DRAFT VENTILATION** - A ventilating system using natural forces (wind, natural convection) to force air through a building or product.
- NATURAL GAS** - That obtained from wells, etc., largely used for fuel and illuminating purposes.
- NATURAL GASOLINE** - Casing head gasoline made from gases recovered from oil well casings and from the still in the refining process. Its manufacture is essentially a process of compressing, liquefying, and blending with less volatile fuels, or it is sealed in containers or bottles as "Liquefied Petroleum" (LP) gas.
- NATURAL GAS ENGINES** - Engines which are adapted to burn natural gas, sometimes stored and carried in the liquid form (LP) but vaporized before entering the engine.
See: Natural gasoline.
- NATURAL REFRIGERATION** - The use of water, ice, or ice-salt mixtures for cooling.
- NATURAL SYSTEM** - The system of land drainage in which the tile lines are located in the natural drainage depressions. Also called random system.
- NATURAL WATER COURSE** - A well-defined water channel which may carry continuous or intermittent flow. It is distinguished from an artificial water course, such as a ditch or canal.
- NEBRASKA TRACTOR TESTS** - Tests conducted by the Agricultural Engineering Department of the University of Nebraska for the purpose of determining the capabilities and characteristics of new model tractors. Annual reports are made giving the test results. State law in Nebraska requires that each model of a tractor sold in Nebraska shall have been given an official test by the University.
- NECK FINISHER** - A mechanical buffer of picking machine for finishing the dressing of poultry for the market which cleans blood and feed from the head and removes feathers and pin feathers from the neck.

- NECKYOKE - A bar, usually of wood, which connects two draft animals abreast and supports the forward end of the tongue of a wagon.
- NEEDLE - 1. The curved steel member which feeds twine around the bundle or bale and places it in the twine holder disc preceding the operation of tying the knot around the bundle or bale. 2. Anything resembling in shape a sewing needle; a pointer or index, as the needle of a telegraph instrument or of a pressure gage. 3. A slender pointed instrument used in sewing.
- NEEDLE BEARING - A form of roller bearing employing a large number of small diameter rollers without a cage or spacers; well suited to applications involving oscillating motion.
- NEEDLE PITMAN - A connecting rod on the binding attachment of a grain harvesting machine or a baler.
- NEEDLE POINTS - 1. Needle-like pins used to fasten fine cabinet work together; as dowels. 2. Needles used as points for compasses, dividers, and other mathematical instruments used for engineering drawings. The needles are usually locked into the instrument with a nut and bolt so as to be easily renewable. 3. A short length of wood or steel placed in the face of a wall to take the abutment of shores. 4. Sharp projections on a beam used to hold dead shores in position for the support of the upper part of a wall during underpinning.
- NEEDLE VALVE - A valve consisting of a screw with a long tapered point fitted into an orifice. Turning the screw opens or closes the valve. Needle valves are used in carburetors, etc.
- NEGATIVE LEAD - In valve gears, the amount by which the steam port is closed to admission when the piston is at the bottom of the cylinder.
- NEGATIVE PRESSURE - 1. Less than atmospheric pressure, as a partial vacuum in a sealed container. 2. The lifting or pulling force of wind on surfaces and structural elements.
- N.E.M.A. - Abbreviation for National Equipment Manufacturers Association or a standard thereof.
- NEON TIMING LIGHT - A light that is used for the accurate adjustment of spark timing in magneto or battery ignition systems. It is connected in series with No. 1 spark plug, and the flashing light makes visible a timing mark on the engine flywheel.
- NERNST LAMP - An incandescent lamp having for its light giving element a pencil composed of the refractory oxides of rare earth, termed the "glower" which becomes incandescent upon the passage of an electric current. The glower is an insulator when cold, but becomes a conductor when heated. The necessary heat is conveyed to the glower by means of "heaters" consisting of thin porcelain tubes wound with fine platinum wire and coated with a refractory paste. A cut out device opens the circuit through the heater when the glower arrives at the proper temperature, and a steadying resistance called the "ballast" prevents the glower's burning out.
- NET DUTY OF WATER - The amount of irrigation water delivered to the land to produce a crop which is measured at the point of delivery to the field.
- NET HEAT - See: Low heat.
- NET HEIGHT OF TERRACE - The difference in elevation between the highest point in the terrace channel and the lowest point on a terrace crown as measured at proximate points along a terrace.
- NET SECTION - The cross-sectional area of a member after the holes for fasteners have been subtracted. This is usually the critical section. Net section equals gross section minus area of holes.

- NEUTRAL AXIS** - The intersection of the neutral surface and a right angle plane passed through a structural member. See: Neutral surface.
- NEUTRAL SURFACE** - The plane of zero stress and deformation in a structural member. In a homogeneous member, it is usually located half-way between the upper and lower surfaces.
- NEUTRON SCATTERING METHOD** - A method of measuring the moisture content of soils by measuring the presence of hydrogen nuclei. Neutrons from a radioactive source are directed into the soil; when they hit hydrogen nuclei of water they are back scattered to the source and are counted by a radiation counter. The number coming back per unit time to the source is an indication of the moisture content of the soil.
- NEUTRAL CONDUCTOR** - The grounded conductor of any electric wiring system.
- NEUTRALIZER FLAVOR** - A flavor defect in a dairy product, such as butter, suggestive of the alkali used in reducing the acidity of the milk or cream used in the manufacture of the product.
- NEWEL POST** - A vertical post which is joined to the outer edge of a stair and which carries the hand rail and supports the balusters where the stairs begin.
- NEW-GROUND PLOW** - A plow which is especially designed for plowing ground cleared of trees and brush whose soil still contains roots. A breaking plow for prairie land.
- NEW YORK SINGLE STACK SYSTEM** - A system of ventilation similar to that of the King ventilating system. The essential difference is that all the outlet flues are combined in one large stack or flue.
- NICHE** - A hollowed recess in the thickness of a wall usually made to receive a vase or statue.
- NICHOLS' TERRACE** - A small terrace for disposal of runoff water which has a comparatively deep, narrow channel and a low flat ridge, having a slope that merges quite closely with the downhill side. Named after Dr. M. L. Nichols.
- NIGHT CORRAL** - An enclosure or pen on western ranges in which ewes may be placed at night or at lambing time.
- NIGHT-DROPPING SHED** - A shed of special construction which is used on western sheep ranches for the more efficient handling of ewes during the lambing period.
- NOISELESS WATER HEATER** - A device used to heat water directly by injecting steam into the water through a jet located under the surface of the water.
- NOMINAL DIMENSIONS** - The size of dimension lumber before it is finished; i.e. the nominal dimensions are 2 in. x 4 in. The actual dimensions of s4s lumber are 1-5/8 in. x 3-5/8 in.
- NON-CONCURRENT** - Forces which are not parallel and do not have a common point of intersection.
- NON-ELASTIC DEFORMATION** - Deformation past the elastic limit of a material. If the load is removed, the material will not spring back to its original shape.
- NON-FREE FLOWING** - Those materials that have cohesive forces acting on them. They are usually fibrous and will not flow after a portion of a bin is removed, e.g. silage, hay, molasses, mixed feeds.
- NON-SPRING-LOADED SINGLE-TYPE SEAL** - A packless seal which depends on accurate fits and needs only light pressures as compared with heavy pressure utilized with packing and packing units.
- NON-UNIFORM FLOW** - A fluid flow in which the velocity is undergoing a positive or negative acceleration.
- NORMAL** - 1. The average value.
2. Perpendicular to.
- NORMAL DEPTH** - The depth of water in an open conduit that corresponds to uniform velocity for the given flow. It is a hypothetical depth under conditions of steady non-

- uniform flow; the depth for which the surface and bed are parallel, also termed the "neutral" depth.
- NORMAL HEPTANE** - A petroleum fuel possessing low antiknock qualities and zero octane rating used as a reference fuel in knock testing. The chemical formula is C_7H_{16} .
- NORMALIZING** - In the dairy industry, a heat treatment sometimes used to restore the fat globules and other constituents of milk to a normal condition. Usually the milk is heated to 140° F. for a short time.
- NORMAL RAINFALL** - The average rainfall over a long period of time.
- NORTHWESTERN BOX** - A standard type of container for packaging apples which has the capacity of one bushel.
- NOSE** - The projecting part on anything such as the projecting part of a cam.
- NOSE TREAD** - In a stair, a projection of the tread beyond the riser.
- NOTCH** - The opening in a dam or spillway for the passage of water.
- NOTCHED COLTER** - A rotating, circular attachment for the forward part of the plow which has a cutter edge with a serrated perimeter for cutting the soil surface and trash in front of the plowshare. See: Coulter, Cut-away disk, Cut-away coulter.
- NOTCHED WEIRS** - See: Measuring weir.
- NOTCH GRADER** - A metal or wooden strip having different sized notches in the side which is used for grading grape cuttings into different sizes to facilitate grafting to varieties of the vinifera grape.
- NOZZLE** - The mouthpiece of a spout or the projecting vent through which liquids are discharged.
- NOZZLES, BORDEAUX SPRAY** - A spray nozzle that has a larger capacity than most and that usually makes a flat, fan-shaped spray which may be coarse and heavier in the center than at the edges.
- NUCLEAR RESONANCE-ABSORPTION METHOD** - A method of measuring moisture content of soil by measuring the presence of hydrogen nuclei. This method utilizes a double electrical field; one field is magnetic and the other is a radio-frequency field. Maximum energy absorption occurs when resonance occurs which is shown by an increased current flow through the coil producing the field; with more water present there is greater energy absorption from the field.
- NO. 1 COMMON** - A grade of lumber. Minimum requirements to meet No. 1 common grade are minimum sized pieces 3 in. x 4 in., percentage of clear face cuttings 66.7% minimum sized cutting 4 in. x 2 ft. or 3 in. x 3 ft.
- NO. 2 COMMON** - A grade of hardwood lumber now obsolete. The minimum size piece in the grade is 3 in. x 4 in. and must have 50% clear face cuttings with the minimum sized cutting being 3 in. x 2 in.
- NURSE RIG** - A service rig; mobile tanks with pumps, which deliver mixed spray material, water, or other ingredients to the spray rig in an orchard.
- NURSERY DIBBLE** - A small, hand implement consisting of a triangular or rounded blade attached to a short handle which is pushed into the soil to make a hole suitable for planting seedlings.
- NUT** - A short prism of metal having a central hole which is threaded to receive a bolt or a screw.
1. A small block of metal or wood, containing an internal screw, used for retaining or tightening a bolt or the like.
 2. A projection on each side of the shank of an anchor to secure the stock in its place.

- OAK - A heavy, hard, strong wood of many varieties used for interior finish, furniture, and flooring.
- OAT KICKER - A machine which is used to remove weed seeds from wheat. See: Fanning mill.
- OBLIQUE REEL-SIDE DELIVERY RAKES - A type of side delivery rake with reel heads set at an acute angle from the reel axis but in parallel planes. The horizontal movement of the teeth can be set 90° to 100° from the forward direction of travel.
- OBSERVED HORSEPOWER - The horsepower developed by an engine or motor without any correction for atmosphere temperature and pressure.
- O.C. - In construction terminology, it is the abbreviation for "on center"; the distance structural members are placed apart when measured from center to center.
- OCTANE NUMBER - A number assigned to a petroleum fuel that gives an indication of the anti-knock quality of the fuel. The higher the octane number, the higher the quality of the fuel. Octane number is used as a reference for fuels burned in spark ignition engines.
- O.D. - Indicates outside diameter.
- ODOMETER - An instrument attached to the hub of a wheeled vehicle to keep a record of the revolutions of the wheel so that the distance traveled can be computed.
- OFF-PEAK RATES - Electric rates which are established to encourage increased use of electricity during off peak periods.
- OFFSET-DISK HARROW - A harrow adapted for use in orchards and vineyards which inherently runs to one side of the tractor centerline and thus can be used to cultivate under branches too low for the tractor to pass under. It consists of one right hand gang and a left hand gang operating in tandem.
- OFFSET PULL - See: Side draft.
- OFFSTREAM STORAGE POND - Reservoir adjacent to a continuously or intermittent flowing stream, with an intake, either a pipe or open channel, that diverts water from the stream into the pond. Also water storage pond.
- OHIO STATE SYSTEM - A system of overhead, automatic watering of benches in a greenhouse in which water is spread from a special nozzle in the center of the bench covering the soil uniformly without excessive moistening of foliage of plants.
- OIL ALLOYS - Any additives to oil where the objective is to improve the working qualities of the oil.
- OIL BATH - A bath or reservoir of oil in which revolving parts subject to excessive friction are partially or wholly immersed to provide them with constant lubrication. Worm gearing, when run at a high speed, is often immersed in an oil bath.
- OIL-BATH FILTER - A device used to filter dust and other foreign particles from air. The most common use of this device is on the intake air of internal combustion engines. The air passes through a bath of oil where the majority of foreign particles are removed and then through a wire screen which removes oil and the remaining particles from the air.
- OIL CAN - A portable receptacle for oil; a can with a spout for dispensing oil.
- OIL CUP - 1. Lower part of an air cleaner on an engine where oil is stored and used for filtering dirt from intake air. 2. A small storage vessel from which the oil drains into an oil hole to lubricate the part.
- OIL ENGINE - An internal combustion engine using the vapor from petroleum, crude gasoline, instead of for fuel.
- OIL FILTER - A device placed in the oil line to remove foreign material, such as dirt, metal particles from the engine, water, and carbon from burned fuel and

- oil from the lubricating oil.
- OIL FILTER ELEMENT** - The replaceable portion or cartridge of an oil filter. When the element becomes clogged with refuse or foreign materials, it no longer allows oil to pass through it and must therefore be replaced with a new filter.
- OIL FLASH POINT** - See: Flash point.
- OIL FUEL** - Oil used as fuel for steam generation, metal working, etc.
- OIL GAS** - 1. Gas formed from petroleum by spraying it over heated cast iron cylinders, the gas being afterwards compressed nearly to a liquid, for use in buoys, illuminating railway vehicles, etc. 2. Petroleum gasified in retorts for admixture with water, gas to give the proper illuminating power to the latter.
- OIL GAGE** - 1. A gage used to indicate the amount or level of oil in the sump. 2. A gage to indicate oil pressure.
- OIL GROOVES** - In machinery, small semicircular or nearly semicircular grooves cut in the internal faces of sleeve bearings and on the sliding surfaces of machines for the distribution of the oil for lubricating purposes. The oil grooves are cut diagonally across the bearing surfaces.
- OIL HOLE** - A hole drilled in a bearing to form a channel for lubricating oil. Oil holes are countersunk at the top, the better to receive and store the oil, and are usually covered with a pivoted disc when not in use. An oil hole and an oil cup or a lubricator differ in that the former requires frequent replenishing while the latter is only supplied at long intervals.
- OILINESS** - The property of an oil causing it to adhere to bearing surfaces.
- OILING MACHINE** - In the poultry industry, a machine which is used for dipping eggs in an oil to form a protective coating and to retard loss of moisture and quality. It is used especially on eggs placed in storage.
- OILING RING** - A simple device commonly used to feed oil to a journal bearing. It consists of a light metal ring, larger in diameter than the shaft, and riding loosely thereon, located at the mid-point of the journal, the top of which is slotted to receive it. The ring dips into an oil reservoir in the base of the housing and as it rotates, carries oil up to the bearing.
- OIL PUMP** - In lubrication, a small pump used to provide a constant and positive supply of oil under pressure to a bearing. It is more reliable than a lubricator.
- OILWAY** - In machinery, an oil hole; a groove in a bearing surface for the flow of oil.
- OIL-WETTED FILTER** - A type of air cleaner with a filter in it which was soaked in oil before placement into the cleaner (obsolete).
- OLEFIN** - Hydrocarbon molecules found in gasoline made by the cracking process usually of low octane rating but are more resistant to detonation than the paraffins.
- ONCE-OVER** - The operation whereby a farmer will plow the land and plant the field in the same operation. See: Plow-planting.
- ONE-HALF ROW CULTIVATOR** - A one horse cultivator which cultivates one-half of the middle between rows in a trip across a field. It is used on small farms in the eastern and southern United States, especially one not entirely cleared of stumps. It could be adjusted to cover the entire middle between the rows.
- ONE-HORSE EQUIPMENT** - Denoting any machinery that could be operated or pulled by a single horse.
- ONE-HORSE PULL-TYPE HAY PRESS** - A stationary hay baler operated by

- one horse which walks around a gear box pushing a sweep to supply power to the press.
- ONE-KETTLE ONE-PERIOD PROCESS** - The preparation of fruit for preservation by boiling in steam jacketed open kettles and impregnating with syrup in a single operation. See: Slow open-kettle process.
- ONE-RUN PROCESS** - A procedure in the manufacture of vinegar by the generator or German process. The alcoholic liquid is acidified by the addition of vinegar to increase the acidity to three and one-half percent representing about one gallon of hard cider to two gallons of vinegar. One passage of this liquid through the generator converts the remaining alcohol into acetic acid. See: Two-run process.
- ONE-WAY DISK PLOW** - A plow which combines the principles of the disk plow and the disk harrow. It was designed initially as a disk harrow. The disks are set to throw the soil one way. Also called wheatland plow, cylinder plow, harrow plow, harrow disk plow, tiller plow.
- ONE-WALL PLANS** - A kitchen arrangement where all the utilities and work centers are placed along one wall.
- ONE-WAY TIE** - A system of steel reinforcement for concrete columns in which the vertical rods are kept from bucking by bands of small diameter, horizontal rods placed around the whole group of vertical rods at frequent intervals thus tying them together.
- OPEN BELT** - A driving belt which proceeds in a direct line from the top of one pulley to the top of another without crossing.
- OPEN-CENTER CONTROL VALVE** - A type of control on the oil system of a hydraulic control that allows the unit to operate at low pressure when no piston movement is required. This is done by the open center control valve which provides an open by-pass from the oil pump back to the reservoir when in the neutral position.
- OPEN-CENTER WHEEL** - The wheel of a planter consisting of two rims with a space between them which serves as both a covering device and a press wheel.
- OPEN CIRCUIT** - An incomplete metal pathway or circuit as when a switch is opened or when a fuse has burned out and opened the circuit.
- OPEN CONCENTRATOR** - An uncovered vessel, such as a kettle, in which fruit juices and sap are concentrated by heat to a syrupy consistency.
- OPEN CONSTRUCTION** - A building that may have uncovered joists and studs, a large framed opening in place of doors, or be open on one or more sides.
- OPEN CORNICE** - The rafter ends are surfaced and left exposed. The sheathing is exposed under the projecting part of the roof.
- OPEN-DITCH DRAINAGE** - Drainage of excess surface and subsurface water from land by open ditches as opposed to tile drainage.
- OPEN-END HARROW** - A harrow which has no side guard rails which connect the tooth bars at the ends.
- OPEN-FIRE CURING** - One of the three common methods of curing tobaccos in which fires are built directly under the tobacco which is hung on scaffolds in the curing barn.
- OPEN-FLUME** - An uncovered flume conveying water.
- OPEN-FRONT SHED** - A building with one side open to the weather, satisfactory for housing animals and poultry or machinery in milder climates.
- OPEN-FRONT VENTILATION** - A system of ventilation which leaves an opening in the front of the building with only a wire screen covering the opening; gives little or no temperature control.
- OPEN-GRAINED WOOD** - Common classi-

- fication of painters for woods with large pores, such as oak, chestnut, and walnut, also known as coarse textured.
- OPEN-HOPPER COOLING SYSTEM - An evaporative type engine cooling system used on some single cylinder engines which consists of an open reservoir attached to the cylinder so the water can flow freely by gravity around the cylinder.
- OPEN-KETTLE METHOD - A method of canning fruits and vegetables in which the products are cooked in an open vessel to kill bacteria prior to placing in sterilized cans or jars.
- OPEN-KETTLE RENDERED LEAF LARD - The leaf fat of hogs which is melted in uncovered steam jacketed kettles provided with mechanical agitators. The system provides the highest grades of commercial lards outside of the neutral lards.
- OPEN SHIELD - A fender attachment for a cultivator which consists of spaced rods or wires to protect young plants from being covered with soil.
- OPEN STORAGE - Stacking hay, straw or silage on the ground with no building around the stack.
- OPEN-THROTTLE TESTS - A test run on tractors to determine various characteristics of the engine. The throttle is held wide open and the speed of the engine depends on the load.
- OPEN-TIRE WHEEL - See: Open-center wheel.
- OPEN-TROUGH HOPPER - A feed hopper for poultry that does not require a grid to make it non-wasting of feed.
- OPEN-TYPE IMPELLER - An impeller which lets trash pass through the pump.
- OPERATIONS EFFICIENCY - How well and fast a job is done compared to how well and fast it could be done with a change in the methods of doing it, or a change in equipment or arrangement of equipment used.
- OPERATOR AREA - The area within the milking room which is used by the personnel performing the routine milking operations.
- OPTIMUM TEMPERATURE - The dry bulb air temperature at which a particular plant or animal grows and produces best, other conditions being favorable.
- ORANGERY - An artificially heated house, the predecessor of the greenhouse, which was used as early as the fourteenth or fifteenth centuries in Europe primarily for growing oranges and citrons in climates too cold for outdoor growth.
- ORCHARD CULTIVATOR - A subsurface cultivator which breaks, without bringing to the surface, compact clay subsoils or hardpans. Also called subsoil tiller; chisel plow.
- ORCHARD DISK HARROW - A disk harrow differing from the regular single disk harrows by having a wide frame so that the gangs can be set at varying distances apart. This enables the operator to cultivate under trees with the disk and without going under the branches with this power unit. See: Off-set disk harrow.
- ORCHARD DISK PLOW - A disk plow which has no long levers to catch overhanging branches. The wheels are set inside the frame to allow passing close to trees. The hitch is designed to allow the plow to be shifted to either the right or left making cultivating close to trees possible.
- ORCHARD DUSTER - A power duster for applying insecticide and fungicide dusts to fruit trees.
- ORCHARD HARROW - A rigid tooth harrow which is used in extremely hard soils for subsoiling and in the preparation of seed beds.
- ORCHARD HEATER - Any of several types of heaters used to prevent frost injury to orchards.
- ORCHARD POWER SPRAYER - A power sprayer for insecticides and fungicides which is adapted for fruit trees. See: Power sprayer.

- ORCHARD RUN - Fruit as it comes from the orchard with no grading or sorting.
- ORCHARD VALVE (OUTLET) - A valve which is inserted inside the riser pipe. It provides flow control by screwing a horizontal disk up and down from a seat below. The opening is smaller than the inside diameter of the riser pipe, and therefore, the flow capacity is low. The top of the riser may be cut off at or slightly below ground surface, may rise 6 in. or a foot above ground surface with a notch cut in one side, or may similarly rise above the ground and have two or more outlet gates inserted in the riser a few inches off the ground.
- ORDERED - A condition in tobacco in which after being dried, the tobacco becomes pliable by absorption of atmospheric moisture.
- OREGON TUNNEL DRIER - A type of drier used in dehydration of fruits which consists of a series of parallel, sloping, narrow chambers above a furnace room. Heated air enters the lower end of the chambers through a sliding door which regulates the heat.
- ORIEL WINDOW - An upper story bay window, in gothic work, projecting out from the face of the wall.
- ORIFICE - 1. The mouth or aperture of a tube, pipe or other cavity; an opening. 2. A hole or opening, usually in a plate wall, or partition, through which water flows, generally for the purpose of control or measurement. 3. The end of a small tube, as the orifice of a Pitot tube, piezometer, etc.
- ORIFICE COEFFICIENT - A number used in formulas of the flow rate of liquids through orifices. It is usually designated by C and depends on the shape of the orifice and condition of flow.
- ORIFICE PLATE - A plate containing an orifice. In pipes, the plate is usually inserted between a pair of flanges. The orifice is smaller than the pipe used in measuring rate of flow.
- ORLEANS PROCESS - A process used in the manufacture of vinegar which results in aging and produces a vinegar, superior in flavor. It is used in Europe in the preparation of vinegar from wine, and it employs *Acetobacter orleanense*.
- OROGRAPHIC - A type of storm brought about by warm moist air moving up a mountain side. Cooling takes place, condensation of excess moisture in the air results, and it falls to the earth in the form of precipitation on the windward side.
- OSCILLATING BEARING - A journal bearing, usually made in one piece, and bushed with bronze or white metal, which swings on trunnions in its pedestal, thus affording alignment to the shaft. Much used about conveyers, etc.
- OSCILLATING CONVEYER - A machine for moving materials by means of a constant stroke eccentric drive that shakes the material forward.
- OSCILLATING-PIPE SPRINKLERS - A water applicator used in overhead irrigation. The line of pipe is supported in a straight line on posts about seven feet above the ground. Nozzles are located about three feet apart on one side of the pipe. Also called nozzle line. A water piston causes the line to oscillate from side to side.
- OTTO CYCLE - The four phase cycle commonly employed in internal combustion engines, giving an impulse each alternate revolution on every fourth stroke. After explosion: 1. The return or exhaust stroke of the piston expels the products of combustion from the cylinder; 2. The suction or next outward stroke draws in a fresh charge of gas or vapor with the properly proportioned dilution of atmospheric air; 3. The compression or return stroke which compresses the charge into the clearance preparatory to;

4. The explosion which does work on the piston.
- OUTAGE - 1. A vent or outlet.
2. Electrical - A period during which the supply of electrical energy from a generating station or system is interrupted.
- OUTBOARD BEARING - 1. On a dynamo or motor, the bearing at the commutator end. 2. On a steam engine, the bearing farthest from the crank.
- OUTDOOR BROODER - A portable brooder that may be used outdoors.
See: Brooder house.
- OUTDOOR CELLAR - A cellar, especially one for winter storage of root crops, which is constructed outdoors. See: Cold cellar.
- OUTER DEAD-CENTER - The position of the crank of a reciprocating engine or pump when the piston is at the end of its outstroke, i.e., when the piston is nearest to the crankshaft.
- OUTFALL - The point where water is discharged from a conduit; the mouth or outlet of a drain or sewer.
- OUTFLOW HYDROGRAPH - A graph showing the rate of outflow (spillway discharge) as a function of time.
- OUTHOUSE - A small building separate from the house, usually with a ground pit beneath, which is used for the deposit of human excrement.
See: Privy.
- OUTLET BOX - A metal, porcelain or plastic box used to support and to protect an outlet and the electric connections.
- OUTLET CHANNEL - A waterway designed to receive and carry away the runoff discharge from terrace channels. Also called terrace outlet channel.
- OUTLET DITCHES - Ditches used for the drainage of tile mains and the removal of surface runoff.
- OUTPUT HORSEPOWER - See: Tire horsepower (net).
- OUTTRIGGER - A beam or joist projecting from a structure, used to support a load at its end.
- OUTSIDE SHOE - The shoe on the outside of the cutter bar to hold cutter bar the desired distance off the ground.
- OVEN CANNING - The processing of foods for preservation in glass jars in an oven at an elevated temperature.
- OVER-ALL EFFICIENCY - It is the ratio of final output of a power converting system to the beginning input energy, i.e., a steam turbine and a generator, or a transformer and a synchronous converter.
- OVERALL HEAT-TRANSFER COEFFICIENT - A coefficient, expressed in BTU per hour per degree fahrenheit temperature difference per square foot of surface, which gives an indication of the amount of heat that is possible to pass through an entire wall.
- OVERALL VAPOR PERMEABILITY - The sum of the permeability factors for an entire wall. Gives the grains of water transmitted per hour per square foot of surface for a vapor-pressure difference of 1 lb/in². This is an indication of how much a wall section resists transfer of vapor.
- OVERALL VAPOR TRANSMISSION RESISTANCE - The sum of the reciprocals of the vapor permeability factors for each component of a wall; gives the resistance of the entire wall to the transmission of vapor.
- OVER-CHARGE - To continue charging of a battery at a normal rate for a longer period than is required to charge the battery; charging a battery at too high a rate.
- OVERDRAFT - The removal of water from the ground water basin exceeds the safe yield.
- OVER-FALL - The part of a dam spillway or channel weir over which water flows and falls to a lower level.
- OVER-FALL DAM - A dam constructed to allow water to overflow its crest.
- OVERFLOW - 1. In cotton gins, having a belt distributor system, the surplus cotton is diverted to the floor when the feeders are full. 2. The filling of a water channel to a stage above its

- capacity causing it to overflow its banks.
- OVERFLOW STAND** - A standpipe in which water rises and overflows when the hydraulic grade line rises to the level of the top of the pipe.
- OVERFLOW VALVE** - In steam engineering any valve by which surplus liquid is allowed to run away. Overflow valves are used in injectors and tanks.
- OVERHANG** - In leg elevators, the section of header which allows a vertical drop-out of materials. In farm augers, elevators and conveyers, that portion of the machine which is supported only by its cantilever strength.
- OVERHANGING BEAM** - A timber supported at two points which extends beyond one or both of its supports and carries loads on the extended portion.
- OVERHAUL** - 1. Go over an entire machine and replace worn parts. 2. The rehandling or repacking of ham during the pickling period to permit a more uniform distribution of pickle. 3. The transportation of excavated material beyond certain specified limits.
- OVERHEAD BINS** - Storage space for grains located above the area they are to be used in; grain can be obtained by opening a chute and allowing it to flow out by the action of gravity.
- OVERHEAD CARRIER** - A container which is suspended from an overhead track for the more efficient carriage of feed to stalls and for removal of manure to storage pits, especially in dairy barns.
- OVERHEAD HAY STORAGE** - A method of storing hay in which the hay is kept on the second floor of the barn.
- OVERHEAD SPRINKLING SYSTEM** - A sprinkler irrigation system.
- OVERHEAD STORAGE** - Space on the second floor of a building for the storage of feeds, etc.
- OVERHEAD VALVE** - A term used to describe a type of internal combustion engine which has the valves located above the pistons usually in the head of engine in a vertical position, as contrasted to an L-head valve arrangement located in the block of the engine. A valve in an internal combustion engine located above the engine block.
- OVERHUNG CRANK** - A crank with a single arm or web, as in small horizontal engines, used to transmit power on one side only.
- OVERIRRIGATION** - Application of water in excess of the available water holding capacity of the root zone of the crop being produced on that soil.
- OVER LATCH** - A type of quick repair washer which opens to slip over a rod and then closes and is snapped together.
- OVERLOAD CAPACITY** - The capacity which an electrical machine or apparatus has of carrying an overload without suffering serious injury by heating, sparking or mechanically weakening.
- OVERLOAD PROTECTION** - A device operative on excessive current to cause and maintain the interruption of current flow to the device governed.
- OVERRUNNING PTO CLUTCH** - A PTO clutch in a tandem tractor set-up which permits the rear tractor to be placed in a lower gear than the front tractor making it possible for the rear tractor to take some of the load and help move through wet spots when the front tractor begins to slip or mire.
- OVERRUN TESTER** - A weighing apparatus which is calibrated to show the percentage overrun in ice cream. Overrun is the additional ice cream volume obtained over the initial amount of ice cream mix by freezing the mix to a stiff consistency and then whipping air into it.
- OVERSHOT STACKER** - A device which is used for lifting hay from the ground to the top of a hay stack.

The hay, brought to the stacker teeth by the sweep rake, is carried up over the stacker frame and delivered to the stack in much the same manner that a man would stack hay with a hay fork. The stacker usually has a rigid frame extending from the stack out to the stacker teeth. The whole is raised by means of ropes and pulleys.

OVERTURNING MOMENT - Forces that are acting to upset an object or a machine. Used to label the forces which cause tractors to tip.

OZONE - A gas, one and one half times as dense as ordinary oxygen, having the chemical formula O_3 . A powerful air purifier used in fruit storage to keep the air pure; has the faint smell of weak chlorine, is a powerful oxidizing agent and kills microorganisms by simply "burning them up."

P

- PACK-AQUIFER RATIO** - The ratio of gravel to sand in a gravel envelope used with well screens.
- PACKER** - A field tool of the roller type, horse or tractor drawn, consisting of a set or series of rollers which pack the loose soil after plowing. See: Cultipacker; Land rollers.
- PACKER ARMS** - Arms on grain or corn binding equipment which pack the material against the trip arm before the tying mechanism. They are curved arms which oscillate and pick up the material and force it against the trip arm which is spring loaded.
- PACKER CAP** - A cork lined, tin cap held in place by a turndown wire bail which is used for sealing glass jugs, bottles of cider, vinegar, and other products.
- PACKER SHAFT** - The power shaft which runs the packer arms on a binder.
- PACKER'S STYLE** - A method of dressing pork in the United States in which the carcass is split into two sides and the face removed but the jowls left attached.
- PACKING CHISEL** - A steel caulking tool used to force spun yarn or caulk lead into the bell and spigot joint of cast iron piping; also known as yarning tool.
- PACKING HOOK** - A tool used to remove packing from stuffing boxes.
- PACKING HOUSE** - 1. A slaughtering and meat distributing organization that buys, slaughters, processes, and distributes livestock products. 2. A separate building or shed adjacent to a range of greenhouses where flowers and greenhouse plants may be packed for market. 3. A building which is equipped and arranged for grading and packing fresh fruit or vegetables.
- PACKING SHED** - A roofed but otherwise open structure in which fresh fruits, vegetables, etc., are sorted, packaged and graded for the market.
- PADDLE STAFF** - A spud inserted into a long handle which is used to clean a plough share and to destroy weeds. It is an English implement rarely used in the United States.
- PADDLE-WHEEL** - See: Straight bladed fan.
- PADDY RICE** - Rice raised under irrigation in small land units which can be flooded.
- PAD FILTER** - A form of filter press which is used in the wine and brewing industries for the final or polishing filtration of wine and beer.
- PALACE STOCK CAR** - In the railway transportation of livestock, the first railway car which was built to provide separate stalls for the animals and which was provided with ventilation and water trough.
- PALING FENCE** - A light, modern fence which is made of narrow slats or pales, sharpened and driven into the ground a few inches apart to be supported at top and bottom by horizontal strips nailed to each pale. It is used for gardens, backyards, and small enclosures.
- PALLET** - 1. A platform which has an upper and usually a lower deck spaced and held together by wooden stringers. It is lifted and moved by the forks of the lift equipment. A number of containers may be placed on the pallet and handled as a unit load. See: Pallet box. 2. A wooden slip built into the joints of brick work to fasten woodwork to. 3. A click or pane used to work a ratchet.
- PALLET BOX** - A box of from 20 to 40 bushel capacity with a pallet as its bottom which is used for storing and transporting crops, such as carrots, potatoes, and apples.
- PANEL DOOR** - A door made up of panels with alternate rails and stiles between.
- PANEL POINT** - The point where the members of a truss meet. Also

- called a joint.
- PAN METHOD** - A method of grading strawberries which consists of emptying each box into a grading pan and removing the defective berries as the fruit is poured back into a box.
- PAPER BOTTLE FILLER** - A machine used to fill paper containers. This device is frequently used in dairy plants to fill milk containers.
- PARABOLIC WEIR** - A round crested measuring weir, with a notch of parabolic cross-section.
- PARALLEL-LINK HITCH** - A type of hitch used extensively on mounted row crop cultivators. The virtual hitch point is at infinity and there is no change in pitch as the height varies.
- PARALLELOGRAM LAW** - Parallelogram of forces.
- PARALLELOGRAM OF FORCES** - A graphic method for determining the resultant of two forces, acting in the same plane, by constructing a parallelogram having sides equal and parallel respectively to the forces, whereupon the diagonal of the parallelogram will represent in magnitude and direction their resultant. It is known as parallelogram law.
- PARALLEL SHIFT** - A method of control designed to prevent cultivators from plowing up plants in which the gangs are rigidly connected together at the front by bars. The parallel shift or crosshead gang prevents the shovels from trailing when shifted sidewise as a unit. Each gang is provided with lifting springs to aid in lifting and carrying the greater part of the weight. Also called pivot gang; treadle guide.
- PARALLEL TERRACE SYSTEM** - A terrace system where adjacent terraces are parallel or nearly parallel and the point row area is reduced or eliminated.
- PARALLEL WIRE STRETCHER** - A form of lineman's wire clamp for gripping a wire and bringing it to the proper tension.
- PARAPET** - A solid or pierced guard rail placed at the edge of a balcony, bridge, terrace, the lower part of a roof or other similar places.
- PARCHMENT PAPER** - A paper used principally for food wrapping, for example, in the packaging of butter. It is made by a process of passing paper through sulphuric acid and is water resistant.
- PARFAIT** - An ice cream which is made from cream, sugar and egg yolks, with or without nuts or fruits and other natural flavoring.
- PARK NOZZLE** - A type of nozzle throwing a solid stream of spray solution used in spraying tall trees.
- PARQUET FLOORING** - Thin pieces of hardwood laid in some kind of a pattern on a wood subfloor, usually laid in glue and secured with panel pins. Parquet flooring is thinner, cheaper and more decorative than wood blocks but is less durable.
- PARSHALL FLUME** - A venturi-type commonly used in irrigation for measuring the discharge of small streams and ditches. Also in erosion control research for runoff measurement.
- PASSBURG PROCESS** - A process of German origin in the manufacture of milk powder which involves the use of a vacuum roller-drier consisting essentially of a steam heated drum partly immersed in the milk which is drawn into the vacuum chamber. A knife removes the film of dried milk in the usual way - its capacity being from 350 to 400 gallons per hour. See: Milk dryer.
- PASTEURIZATION** - A process of holding a food product at a certain temperature for a given time in order to kill all pathogenic bacteria and reduce the total microbiological population.
- PASTEURIZE** - Treatment of a food product which insures the destruction of all pathogenic

- organisms. Commonly accomplished by heat, but may be accomplished by irradiation or other methods.
- PASTEURIZED MILK** - Milk which has been subjected to treatment which insures the destruction of all pathogenic organisms.
- PASTEURIZER** - A device for destroying pathogenic organisms in a food product by heat, irradiation, or other means.
- PASTEURIZING** - The process of destroying all pathogenic organisms in a food product by heat treatment, irradiation, or other means.
- PASTEURIZING AND BOTTLING PLANT** - Building used for the purpose of processing and bottling milk to be sold.
- PASTURE CUTTER** - A stalk cutter with a larger wheel and more knives than a regular tractor stalk cutter for cutting weeds and sprouts.
- PAVERS** - Men who lay or set paving stones or paving bricks; also concrete mixers.
- PAWL** - 1. That part of the drive wheel of a machine, such as a grain drill that engages the ratchet and transfer power to the rest of the machine. Pawls consist of small pieces of cast iron or steel which fall in place in the ratchet as the machine moves forward. 2. A hinged or pivoted piece, having an edge or hook made to engage with ratchet teeth, as for driving a ratchet wheel or for preventing reverse motion; a click or ratchet.
- PAWL PLATE** - The keyed plate to which the pawls are riveted, on a wheel drive mechanism. It is located in the hub of the wheel, and when the wheel is turned forward, the pawls engage the ratchet teeth and cause the axle to turn as a unit with the wheel. When the wheel is turned backward, or when the axle turns faster than the wheel, the pawls slip over the ratchet. See: Pawl.
- PAY-OUT CHECK-WIRE ANCHOR STAKE** - An anchor stake used when operating a tractor check row planter. It is set in line with the check head on the wire side of the planter. When the planter approaches the stake and is eight buttons from it, the angle of the wire swings the ratchet on the stake out of engagement and permits the rope on the drum to pay-out, relieving the tension on the wire.
- PEA HARVESTER** - A mechanical device consisting of a winged drum revolving rapidly over a stationary or sharp edged plate which knocks the pods back onto a platform from which they are elevated into a box or bag. Green peas are also harvested with a regular mowing machine and the cut vines are taken to a viner for hulling.
- PEAK** - The summit or ridge of a roof.
- PEAK FLOW** - The maximum rate of flow which is recorded at a gauging station.
- PEA LIFTERS** - Lifters which consist of guards attached over the regular guards, which project to the front quite a distance so that pea vines can be lifted, allowing the cutter bar to slide underneath and cut off the stems below the heads.
- PEANUT DIGGER** - Any of various plow-like devices for removing the peanut and the vine from the soil. This may vary from a one-horse turning plow, with moldboard removed, to a machine potato digger, etc.
- PEANUT PICKUP** - See: Pickup device.
- PEAT** - A large accumulation of partially decayed organic underwater matter in depressional areas which gradually develops into organic soil. It is used in some countries for fuel.
- PEAVEY** - A stout lever five to seven feet long which is fitted with a socket, spike, and a curved steel hook that works on a bolt hinge. In lumbering

- operations, it is used in handling logs. Also called peavy.
- PECK - 1. A measure of volume equal to one-fourth of a bushel or eight quarts dry measure. 2. A pocket of decayed wood in the living tree usually associated with cypress and incense cedar.
- PECK GUARD - Any kind of material installed on wall board inside a poultry house to keep the birds from pecking at the material and pulling it apart.
- PEDAL - A lever or machine part actuated by the foot, as the pedals of a bicycle by which it is driven; the pedals of a tractor or motor car which actuate various controls, etc.
- PEDIMENT - The triangular space that forms the gable over door or window openings or over a portico. It is usually finished with a cornice.
- PEELER - 1. A rotary veneer machine that cuts logs into thin sheets. 2. A device which removes peels from fruit or vegetables.
- PEG-TOOTH HARROW - See: Spike-tooth harrow.
- PELLETING - 1. Coating small irregular seeds with an inert material to make them regular in shape so they can be planted more easily. 2. Compressing hay into a small bundle for easier bulk handling. Sometimes called wafers in connection with hay. 3. Compressing ground concentrates and/or feed stuffs into small pellets to increase feed consumption.
- PELLETIZED PRODUCTS - Loose material in a solid state which has been formed into small masses of similar size and shape, usually cylindrical or oval in shape.
- PEN - A small space enclosed by any kind of fence which is used for confining pigs, cows and other animals.
- PENDANT CORD - A flexible cord containing a pair of insulated conductors, employed for suspending incandescent lamps, or for making electrical connection with other movable electric devices.
- PENDANT SOCKET - A lamp socket for light electrolier or ceiling lamps, provided with pendant or hanging chain for turning on or extinguishing the light.
- PENETROMETER - A device which measures the force required to push a probe into the soil. It can be used to measure the density or degree of compaction in a soil.
- PENNY (NAIL) - 1. The term penny, when used to mark the length of nails, is supposed to be an abbreviation of pound. Thus, a four penny nail was such that one thousand of them weighed four pounds, ten penny such that one thousand of them weighed ten pounds, etc. 2. Also supposed to be the original price, e.g. a ten penny nail cost 10 cents a hundred nails.
- PENTACHLOROPHENOL - A chemical toxic to fungi and other decay organisms. Used for treating wood, posts, etc.
- PEN-TYPE BARN - A modern barn designed for cattle in which the animals are not confined or stanchioned but have free run for exercise, loafing, and free access to roughage and water. The cows are moved a few at a time into a milking parlor arranged for the feeding of concentrates and for milking.
- PERCH - 1. A unit of land measurement which is $16\frac{1}{2}$ ft. in length; a rod; also used to denote a sq. rod. 2. In a poultry house, a roosting pole where chickens roost for the night.
- PERCHED - Bodies of ground water within the zone of aeration that are permanently maintained above the zone of saturation.
- PERCOLATION - The movement, or flow, of water through the interstices or the pores of a soil or other porous medium due to the action of gravity.
- PERCOLATION LOSS - The amount of water that moves to a depth beyond the root zone of crops.
- PERCOLATION RATE - The rate of

- gravitational water movement thru soil.
- PERIPHERAL VELOCITY** - The speed of the outer surface of a rotating object. This is expressed as distance per unit of time.
- PERENNIAL STREAMS** - Streams which flow continuously. Perennial streams are generally fed in part by springs and/or ground water and their upper surfaces generally stand lower than the water table in the localities through which they flow.
- PERMANENT WILTING PERCENTAGE, P.W.P.**
- The moisture content of the soil (expressed as a percentage of the oven dry weight) at the time when the leaves of the plant growing in that soil first undergo permanent wilting.
- PERMEAMETER** - A meter developed to estimate the seepage from a canal without interfering with the flow. It consists of a cylinder or opened chamber for confining a portion of the canal bed area and a metering device for measuring the water admitted to the confined area.
- PERMISSIBLE VELOCITY** - The maximum velocity at which water may be carried safely in a canal or other conduit without causing scouring of the canal wall or conduit surface.
- PERVIOUS** - A bed or stratum of material through which water will move under hydrostatic pressure.
- PET COCK** - A small valve used to release air in pipes or pumps that are airbound, or at the end of a steam cylinder to drain it of water.
- PHOTOPERIODISM** - The response of plants and animals, as by growth and change in habits, to the relative length of day and night. Photoperiodic reactivity.
- PHREATIC WATER** - Subsurface water; ground water; free water.
- PHREATOPHYTES** - 1. Plants that send their roots down to the water table or the capillary fringe just above the water table which provides a ready supply of water. 2. Water weeds in irrigation and drainage ditches.
- PICK** - 1. An iron tool tapering to a point from a heavy mass or head, in which is inserted, transversely, a wooden handle; sometimes pointed at both ends, and having the handle inserted at the middle. It is used for loosening and breaking up hard earth, ground, stones, etc. Various kinds are employed by quarrymen, miners, etc. 2. In weaving, the same as shot; one pass of the shuttle.
- PICKAX** - A hand tool which has a short handle and a double blade. One part of the blade is narrow, curved and sharpened on the face like an ax, the other is pointed as a pick. It is used in grubbing roots or working in stony or hard soil. In mining and excavating, a heavy iron tool, curved and sometimes pointed at both ends, welded by means of a wooden handle inserted in the middle; used by excavators, miners, quarrymen, etc.
- PICKER** - A mechanical device that removes the fruit from the plant. A type of machine potato planter which is provided with metal forks (pickers) attached to a vertical revolving disk. The picker moves through the hopper and spears the seed potato which is then punched off by a special ejector into the seed spout. See: Cotton picker, corn picker.
- PICKER ARMS** - Arms which are attached to the picker wheels on an automatic potato planter, and contain a picker head to pick up seed.
- PICKER BARS** - The bars in the picker drums which contain the picker spindles in a cotton picker.
- PICKER-CHOPPER** - A type of machine used for corn picking which first picks the ears from the standing stalks and delivers them to a wagon trailing behind the machine. The stalks are then cut and fed into a conventional forage-chopper cutterhead. The picking unit is actually an attachment for a field chopper.
- PICKER DRUMS** - The drums inside a

- steel box which hold the picker bars in a mechanical cotton picker.
- PICKER HEAD** - A head on a picker arm of an automatic potato planter which is equipped with two sharp picking points which pick out a single seed piece, carry it over to the front and, as the arm starts downward in its rotation, releases the seed or forces it off the points, dropping it into the seed spout.
- PICKER-HUSKER** - A type of corn picker which includes the following components: an arrangement to guide the stalks into the machine; snapping rolls to remove ears from stalks; lugged gathering chains above the snapping rolls to assist in feeding the stalks into the rolls and moving the stalks and snapped ears rearward through the snapping zone; a unit to remove the husks from the ears; and a conveying system to elevate and deliver the husked ears into a wagon.
- PICKER ROLLER** - A part of the mechanism of a cotton gin; a roller, with spikes attached, which disposes of the hulls after the cotton lint is removed.
- PICKER-SHELLER** - A type of corn picker similar to the picker-husker, but it does not have a husking unit. It does have a shelling and cleaning unit. The shelled corn is generally delivered to a bulk tank on the machine, from which it is unloaded into a wagon.
- PICKER-SHREDDER** - A corn picker which has a mechanism which shreds the stalks after the ears have been removed.
- PICKER SPINDLES** - Spindles on a cotton picker which are driven by individual gears enclosed in the picker bars. The picking spindles are spaced so as to pick a high percentage of the open cotton but permit room for the green unopened bolls to remain on the plants.
- PICKER WHEEL** - 1. The rotating disk faced with sharp projections which is the basic shelling mechanism in the spring type corn sheller. 2. A wheel used in potato planters to meter the seed into the discharge outlet. 3. A small vertical toothed wheel which removes seed from the plate in a picker-wheel drop cotton planter.
- PICKER-WHEEL DROP** - A type of cotton planter drop which consists of a horizontal, rotating, agitator plate with fins or fingers radiating outwardly from the body of the plate. The fingers press the cotton seed downward on the picker wheel, notched and about 3/4 in. wide, which picks the seed from the mass dropped down on it.
- PICKET FENCE** - A light, wooden fence made of narrow pickets or slats which are usually woven into a fence by the use of wires at the top and bottom. It is often used for small enclosures, such as gardens, chicken yards, etc.
- PICKING CHAMBER** - The chamber in an automatic potato planter which contains the seed, and through which the picker head passes.
- PICKING MACHINE** - 1. In poultry dressing, a device for removing the feathers from poultry. 2. In vegetables and fruit harvesting, a device for removing the vegetable or fruit from the plant.
- PICKING TABLE** - A part of the equipment of a fruit or vegetable grading machine; a roller table which carries the produce past sorters to facilitate the removal of undesirable fruit or vegetables.
- PICKLE PUMP** - An instrument used in meat curing. The two methods of curing are: arterial, in which the curing solution is injected through the arterial system of the carcass; and stitch, in which the solution is injected into the cut of meat by means of a perforated needle.
- PICK-UP** - A light form of automobile truck usually with a load capacity of 0.5 to 1.0 ton which is adaptable to many different uses especially on farms.
- PICK-UP ATTACHMENT** - A special mechanical device which may be attached to a regular grain combine,

- baler or field chopper to pick up cut or mowed crops from the window or swath.
- PICK-UP BALER** - A power driven baler with a windrow pick-up device and with or without cross conveyor attachment similar to that used on combines. This may consist of a rotating cylinder, elevator mechanism, and cross conveyor to carry the hay to the self-feeder in the baler.
- PICK-UP DEVICE** - A device on combines or balers, etc., which is attached to pickup grain or straw as the case may be after it has been windrowed. It consists of spring metal tines which rotate to lift the material onto a canvas or into an auger feed.
- PICK-UP GUARD** - A special guard for a cutter bar, longer than normal, whose purpose is to lift fallen grain, etc., so that the cutter bar can cut off the stem below the head. Also called lifters; bean lifter.
- PIER** - A column of stone, concrete or brick used to support other structural members.
- PIEZOMETER** - 1. An instrument for measuring pressure head, usually consisting of a small pipe tapped into the side of a conduit flush with the inside, and connected with a pressure gage, mercury, water column or other device for indicating pressure head. 2. An instrument to measure the position of the water table in soil.
- PIEZOMETRIC SURFACE** - As applied to a ground water area; an imaginary surface that everywhere coincides with the static level of the water in the aquifer. A ground water basin may have more than one piezometric surface. It would correspond with the water table in an open or porous formation with no confining beds of low permeability.
- PIG-GUARD RAIL** - See: Guard rail.
- PILASTER** - A flat rectangular projection forming a structural or decorative part of a wall, and having the same cap and base design. Usually projects $\frac{1}{2}$ or less of its own width beyond the face of the wall.
- PILE** - A column of some structural material such as steel, concrete or wood driven or jacked into the ground to support a load; usually has a diameter of less than 24 ins.
- PILLAR** - A slender vertical support, may be either a column or a pier, takes a load independently of the rest of the walls.
- PILOT GUIDE** - An indicator with a left and right-hand pointer. The left-hand pointer indicates extension of the hydraulic cylinder and is a convenient reference in returning the implement to the same working position when re-entering the field. The right-hand pointer is connected to the cam arm to indicate reaction of the traction control linkage, and is used as a guide to assist the operator in selecting the proper ratio of implement reaction to the cam arm for the most efficient operation.
- PILOT LIGHT** - A small flame kept burning in gas fired furnaces, lamps, etc., to relight the main burner whenever the gas to it is turned on.
- PILOT WATERSHED** - A demonstration watershed used to illustrate flood and erosion control methods applied in agricultural areas.
- PIN-CONNECTED JOINTS** - The members are joined by passing a pin into holes bored through the ends of the members being connected.
- PINGING** - The noise that comes from irregular or uncontrolled combustion in an engine. Usually called detonation. (Also called knock.) The noise produced by detonation in the combustion chamber of an engine as contrasted to the sound of regular controlled combustion.
- PINNING KNIFE** - A dull, shortbladed knife which is used in removing pin feathers in the dressing of poultry.
- PINTLE** - A heavy-duty link of roller chain, generally forged or cast.

- In mechanics, a pin upon which anything pivots. In wagon building, the kingpin of a wagon.
- PINTLE CHAIN** - A type of power transmission chain made of malleable iron in which the links are held together by pins or rivets for easy repair.
- PIN WHEELS** - Wheels which have short, pointed pins on their periphery.
- PIPE DROP INLET** - A vertical conduit used to carry overflow from a reservoir to an outflow structure.
- PIPE HEAD** - The same as exhaust head; a sort of cowl fitted to the upper extremity of an exhaust pipe to prevent emission of fine sprays of water or oil, etc., which may do damage to surrounding property.
- PIPELINE MILKER** - A mechanical milker which is connected to a pipeline which conveys the milk from the stall direct to a bulk tank.
- PIPE SPILLWAY** - A closed conduit under an embankment may be a culvert or a combination of a riser, conduit and special outlet structure.
- PISE DE TERRE** - See: Rammed earth.
- PISTON CLEARANCE** - 1. The distance from the top of the piston to the closest point on the cylinder head, measured when the piston is at top dead center. 2. The radial clearance between the piston and cylinder wall.
- PISTON DISPLACEMENT** - A volume swept by the piston which equals $R^2 \times \pi \times$ length of stroke; where, R is the radius of the piston.
- PISTON HEAD** - A term occasionally employed to denote the solid end of the body of main part of a piston, distinguishing it from its rings, etc.
- PISTON OR GEAR TYPE PUMP** - See: Piston type pump.
- PISTON OR PLUNGER SPRAYER PUMP** - A pump in which the fluid is forced into the discharge line by the action of a piston moving in a cylinder. They are well suited for high-pressure applications.
- PISTON RING** - An incomplete circular metal ring used to fit in the recessed grooves of an engine piston to more completely seal the space between the piston and the cylinder wall.
- PISTON RINGS, OIL** - Concentric rings inserted in the lower grooves of a piston to prevent oil pumping into the combustion chamber.
- PISTON ROD** - In a steam engine, a rod or bar of wrought iron or steel, working through a stuffing box in the cylinder end or cover; it is fastened to the center of the piston at one end, and transmits the power exerted upon the latter by the steam or other working fluid to the cross head.
- PISTON SLAP** - An engine knock which is caused by the piston moving from one side of the cylinder to the other, as a result of the forces acting on the piston under the influence of the angularity of the connecting rod. Most noticeable in worn engines.
- PISTON TYPE PUMP** - A positive displacement type pump which operates with a steam or motor drive. A crank and connecting rod may be the driving mechanism.
- PITCH** - 1. The rise or angle of a roof. It is equal to the vertical divided by two times the horizontal distance covered by each rafter. 2. Center to center distance between rivets in a joint. 3. The angle fan blades are turned on their hub to catch air. 4. The distance a point travels in one revolution. 5. An angle or incline. 6. Distance from center to center of two adjacent teeth of gearing, measured on the pitch line. 7. Distance between two adjacent threads on a screw measured on a line parallel to the axis of the screw and to the same points of the threads, e.g. from outside diameter to outside diameter.
- PITCHED ROOF** - Any roof which is not flat and has any degree of slope.

- PITCHER PUMP** - A hand pump with a short suction stroke, which is suitable for lifting water only a short vertical distance, as from a cistern or shallow well.
- PITCHFORK** - A fork, usually with from three to six long, sharp-pointed tines which is used in handling loose hay, straw, bundles of unthreshed small grain, etc.
- PITCH LINE** - 1. The line or circle upon which the centers (or pitchers) of teeth are measured. 2. In a rack, the line along which the teeth are measured, corresponding to the pitch circle of a wheel or pinion.
- PITCH-LINE VELOCITY** - The peripheral velocity of a gear at its line of pitch, usually expressed in ft. per sec. (fps) or ft. per min. (fpm).
- PITCH POCKET** - An opening between annual rings in a tree filled with free resin. Found only in pines, douglas fir, tamarack, spruces and western larch.
- PITCH RADIUS** - The radius of the circle of effective action of a gear or sprocket.
- PITH** - The small soft core at the original center of a tree around which wood formed.
- PITMAN** - In machinery, a rod that connects the crank of a rotating shaft with a reciprocating part, as the knife of the cutter bar. One end is attached to a crank and the other is similar to a wrist pin; a connecting rod.
- PITMAN SHAFT** - The power shaft which runs the pitman wheel.
- PITMAN WHEEL** - A wheel to which a pitman rod is attached to convert circular motion to reciprocating motion.
- PIT SILO** - A shallow pit dug in well-drained soil and used for storing silage.
- PIT STORAGE** - Storage in a shallow pit. Applies to vegetables. They are placed in layers, each layer covered with straw and earth.
- PITTER** - A machine for removing the seeds or stones from drupaceous fruits, as from peaches or cherries.
- PITTING** - 1. The action of water on a metal surface under high pressure. The high pressure water causes small indentations on the surface of the metal. 2. Chemical action of any liquid on metal causing an etched or corroded surface.
- PIVOT** - A center of rotating action.
- PIVOT BOLT** - The bolt connecting the front axle to the frame of a standard four-wheel tractor.
- PIVOT BUSHING** - A bushing which acts as a bearing for a pivot shaft.
- PIVOT POINT** - See: King pin, pivot.
- PIVOT WHEEL** - A type of cultivator which gets its name from the way the wheels are pivoted to the right or left. Foot pedals, extending toward the center of the machine, are placed on the axle. Both wheels are so connected that they swing together and remain parallel. A slight press on either foot pedal pivots the wheels. No sidewise movement of the gangs is obtained, however, until cultivator is drawn forward. Also called pivot axle.
- PLAIN BAR** - A type of concrete reinforcing rod not deformed.
- PLAIN CUT JOINTS** - Joints in masonry work which are smooth cut (no ridges, etc.).
- PLAIN DRILL** - A grain drill used for sowing seed only in contrast to one that has a fertilizer attachment.
- PLAIN (GIN)** - See: Single-breast gin.
- PLAIN LIFT** - A lift for a cutter bar on a mowing machine by which the operator, using a foot lever, can raise the cutter bar high enough to clear low obstructions or turn corners, but must leave his seat and raise the cutter bar by hand to place it in a vertical position.
- PLAN** - The general layout of a structure or object projected on a horizontal plane.
- PLANCHIER** - A board or boards used to cover the space under the overhang of a roof. It is placed

- horizontally between the fascia board and the siding.
- PLANETARY** - See: Planetary gear.
- PLANETARY GEAR** - A class of torque modifying gear for tractors in which one or more small gears travel around the circumference of a larger one, with the teeth constantly in mesh.
- PLANET WHEEL** - A wheel revolving around, or within the circumference of another wheel, by which it is driven.
- PLANK** - A broad board with thickness greater than 1 in.
- PLANK DRAG** - A drag made of heavy wooden planks which is used to break up dirt clods after plowing. See: Planker.
- PLANKER** - A drag which is made of planks, such as 2 x 8 ft. or 2 x 10 ft. fastened together. This type crushes clods and levels soil but does not compact the soil appreciably.
- PLANTATION GIN** - A small cotton gin which is operated for individual plantation use, rather than for custom ginning.
- PLANT BLOCKING** - Cross-cultivation with sweeps, knives or other cutting tools which gives the desired widths of cuts and skips in plant thinning. Also called "cross-blocking".
- PLANTER** - 1. A mechanical device which is used for the rapid, efficient and uniform planting of seeds and the like. There are many different kinds, from the simplest hand planter to the large highly mechanized multi-row power driven machines. 2. A container usually rectangular in shape containing soil or vermiculite which is used for growing foliage plants indoors. It may be made of plastic, pottery, wood, metal or other material and may be movable or a permanent part of the building. 3. A machine constructed for putting seeds into the ground; each may be accompanied by fertilizer. A planter sets seed in a single row, as distinguished from a drill which plants numerous rows abreast of each other, and a sower which sows broadcast.
- PLANTER RUNNER** - A curved piece of metal, wide at the trailing portion, used to open a trench in the soil for the placing of seed or plants.
- PLANTING BAR** - A hand tool which is used in making a slit-like hole in the soil in which seedling trees are planted. See: Planting rod.
- PLANTING BORER** - A device which is used to remove a core of soil and make a hole for planting extensively rooted seedlings or transplants.
- PLANTING HOE** - In forestry, a digging tool which consists of a rectangular steel blade with a pointed cutting edge firmly bolted to a standard adz handle.
- PLANTING MACHINE** - Mechanical device which opens a hole or furrow and closes it again and firms the soil about a plant or tree seedling.
- PLANTING MATTOCK** - A specially-constructed hand hoe which is used for seedling tree planting.
- PLANTING PLOW** - A special heavy-duty machine, which is designed to plow furrows in reforestation planting.
- PLANTING ROD** - A hand tool which is used to make cylindrical holes in soil in which cuttings are planted. See: Planting bar.
- PLANT SETTER** - A miniature drill or planter, carried by hand which saves the labor of digging the hole, by inserting the seed and fertilizer, and covering them.
- PLANT THINNER** - See: Two-row plant thinner.
- PLASTICITY** - The ability of a substance to be deformed permanently without rupture.
- PLASTICITY NUMBER** - A measure of the plasticity or colloidal content of a soil being the difference between the upper and lower plastic limits of the Atterberg consistency constants.
- PLATE** - 1. A flat board or plank laid on top of a wall to support girders, rafters, etc., to hold

- studding in line and to take care of side thrust of roof between cross ties. 2. A flat, circular, rotating piece of metal on a mechanical planter usually located in the bottom of seed container and containing cells at intervals through which seed falls or is pushed when planting.
- PLATE TYPE HEAT EXCHANGER** - A very compact unit used to cool or heat liquids. High heat transfer rates can be obtained so sweet water (cold water) is often used instead of brine as a cooling agent. Incoming cold products on one side of the plates may be used to cool outgoing warm products on the other side of the plates.
- PLATE-TYPE PASTEURIZER** - A pasteurizer for liquid food products which is made of a large number of plates clamped together with proper passageways between alternate plates and water. See: High temperature-short time method.
- PLATFORM CANVAS** - A canvas which travels on rollers and conveys straw, hay or grain, usually in a horizontal manner.
- PLATFORM COMBINE** - A type of combine which has the cutting mechanism to one side. The grain is carried across the platform, and elevated into the threshing unit.
- PLATFORM CRANE** - A crane mounted on the platform of a truck.
- PLATFORM CUTTER** - A sled type of cutter, usually homemade and is pulled by one horse or mule for harvesting corn as a silage crop, or for shocking. It has the advantage of low cost and cheapness of operation as compared with the corn binder (obsolete).
- PLATFORM FRAMING** - A type of light timber framing in which each successive floor is supported on studs of one story height which bear on the framing of the story below.
- PLATFORM PLANTER** - A potato planter with a dropping mechanism consisting of a device which elevates the seed piece from the hopper to the horizontally revolving platform where it is carried to the opening over the seed spout through which it falls into the furrow.
- PLATFORM SCALE** - 1. A weighing machine with a flat platform on which objects are placed. 2. A weighing device which has a large platform as might be needed to weigh trucks and wagons or a smaller platform unit that might be used for weighing sacks of grain or cans of cream.
- PLAY** - 1. A looseness in a joint or in parts of a machine or structure permitting some freedom of motion. 2. A shop term for the amount of slack or looseness of fit between two machine members; the movement of one member within another.
- PLENUM** - An air chamber maintained under pressure (positive or negative), such as the distributing duct or ducts in a drying aeration system. Also used to designate the air chamber under the perforated floor in a grain bin or the pressure chamber between grain columns in a batch bin.
- PLOW** - 1. The whole agricultural implement, of various types which is used to cut, break or turn a soil layer for preparing land for planting or seeding or carrying out other agricultural practices. 2. Any such implement which is not used primarily for agricultural use, such as a snow plow.
- PLOW BEAM** - The wooden or metal part of a plow which extends out in front of the plow bottom and to which the pulling power is attached.
- PLOW BOLTS** - Bolts that may have many different kinds of heads; most have from one to four shoulder-like points that fit into a groove prepared for them in whatever material they are placed. The undersides of the heads of plow bolts are always countersunk, so that the head may go deep enough into the material to fit flush with the surface. Such bolts are used for holding plowshares.
- PLOW BOTTOM** - The working unit or base of the moldboard plow which

- is composed of the frog, share, moldboard and landside.
- PLOW-BOTTOM ATTACHMENT** - Any attachment for plows, mounted to stir or break up the bottom of the furrow below the normal depth of plowing. Also any attachment fastened to the bottom of a plow, like cover boards and moldboard extension.
- PLOW DRAFT** - The horizontal force parallel to the direction of travel necessary to pull a plow.
- PLOW FOOT** - The lower or bottom part of a plow. See: Plow bottom.
- PLOW HEAD** - The draught iron at the end of the beam of a plow.
- PLOW LAYER** - Usually the top 6 to 7 ins. of soil.
- PLOWLESS FARMING** - Tilling the soil in such a manner that the crop residue will be left on the surface. Also referred to as trash farming, stubble mulch, residue management and subsurface tillage.
- PLOW PLANTING** - The plowing and planting of land in a single operation.
- PLOW POINT** - The point of the plow-share of the moldboard plow. The point is the first part of the plow to enter the soil in plowing. See: Plow tip.
- PLOW SHARE** - That portion of a plow bottom which shears the furrow slice from the soil. It is slightly curved and pointed at one corner. Various types for specific work, i.e., stubble, alfalfa, breaker, bottom land, etc.
- PLOW STEEL WIRE** - Denotes a very high quality of wire originally used in the manufacture of steel rope, sometimes used for supporting electric conductors.
- PLOW STOCK** - The frame of a plow to which the handles, share, coulter, etc., are secured.
- PLOW TIP** - The tip end of a plow-share. It is subject to the most severe wear and is replaceable by welding on a new tip in place of the worn tip on the old share. See: Plow point.
- PLOW-TYPE TRENCHING MACHINE** - A type of trenching machine which usually scoops and loosens the soil and has a conveyor that carries soil out of the trench.
- PLUG FUSE** - A device for protecting an electric circuit against over current. It contains a visible fuse link and is threaded to screw into a fuse holder.
- PLUMB** - To be plumb is to be perfectly vertical.
- PLUNGER BALER** - A baler which has a plunger operated by crank and pitman which compresses hay or straw by pushing it through a tapered chamber.
- PLUS DISTANCE** - Fractional part of 100 ft. used in designating the location of a point on a survey line.
- PLUS SIGHT** - See: Backsight.
- PLY-RATING** - The strength code used by tire manufacturers to identify a given tire with its maximum recommended load and inflation when used in a specific type of service. It does not necessarily represent the number of plies in the tire.
- PLYWOOD** - A sheet of wood made of three or more layers of veneer, laid with the grain of adjoining plies at right angles and joined with glue. Usually an odd number of plies are used to give balanced construction.
- PNEUMATIC CHAIN SAW** - A light, air-operated saw which is designed to give high speed in the felling or cutting of trees. See: Chain saw.
- PNEUMATIC CONVEYOR** - A type of conveyor which moves material through a cylindrical tube by the force of air. The tube is polished on the inside to reduce friction and is usually tilted downward, although this is not necessary under high air flows and lighter materials.
- PNEUMATIC GOVERNOR** - A governor that uses the suction created in the engine induction pipe to control the fuel supply. Used in Diesels.
- PNEUMATIC SEPARATOR** - A method of separating chaff and other foreign

- materials from grain by blowing air through the grain.
- PNEUMATIC SPRAYER** - A hand pumped, compressed air sprayer which is in common use by gardeners for the control of insects and plant diseases. It is of a size that can be easily carried on the shoulder.
- PNEUMATIC TRANSPORT WHEELS** - Rubber tired wheels on machinery that are air filled. They are used in place of the steel transport wheel because of the reduction in rolling resistance.
- POCKET CLEANER** - A disk type seed cleaner where pocketed vertical disks are used as a separating mechanism. In cleaning wheat, the weed seed that are shorter than the wheat kernels fall into and remain in the pockets. As the disk passes upward through the grain and the weed seed, the latter are carried out of the grain and discharged into a trough or hopper. Also called disk cleaning.
- POCKET ROT** - A form of advanced decay in trees which appears as a hole, pocket or area of soft rot surrounded by apparently sound wood.
- POCKET-TYPE SEPARATORS** - Equipment used to separate seeds on the basis of length or width which includes indented vertical disks, indented cylinders, and inclined belts with indents. A disk separator consists of a series of rotating disks having pockets on each side. Selection of seeds is primarily on the basis of differences in length. The seeds picked up by the disks are carried over the top and discharged into trough-like receivers. The remaining material is propelled axially from one disk to the next by means of bladeshaped spokes.
- POINT GAGE** - A sharp-pointed rod attached to a graduated staff with a vernier scale for measuring the elevation of the surface or water.
- POINTING** - 1. Treatment of joints in masonry to form a neat appearance and to prevent moisture from moving through the mortar joint.
2. Filling put in joints of roofing of tile, slate, etc., to make the joint weather proof.
- POINT OF IGNITION** - The moment at which the charge in a gas engine cylinder is ignited with reference to the operating cycle. It occurs before the piston reaches the end of the compression stroke, the exact point or amount of advance depending (for best results) on the speed of the engine, etc.
- POINT-SUPPORTED** - Supported only at certain points along the axis of a member as contrasted with full bearing, which is support along the full length of a member.
- POLAR FRONT** - The surface boundary of the leading edge of a mass of cold air advancing toward warmer latitudes.
- POLE DRILL** - In well boring, a system where a rigid connection is used between the drilling tools and the reciprocating beam.
- POLE FENCE** - A fence made of poles, tapered at each end to wedge with the pole on the opposite side into a mortice in the post. There are usually three or four horizontal poles between each post. Sometimes called rail fence.
- POLE FRAME** - Frame work of a building in which the main structural wall members are poles. Usually treated with creosote or some other water resistant material and embedded in the ground without a concrete foundation for them.
- POLE HOOK** - In carriage and wagon making, the hook on the end of the tongue.
- POLE METERING** - Is the locating of meter on centrally located pole with feeders from pole to principal buildings.
- POLING BOARDS** - Boards placed vertically against the sides of an open trench to keep the earth from caving in, usually braced with waling and struts. See: Waling.
- POLLINATOR** - Any of several different kinds of technical apparatus which

- may be used to collect pollen from one plant and transfer it to the flower of another plant for subsequent fertilization.
- POLLUTED WATER** - Water made unclean or contaminated by sewage, or other substance.
- POLYETHYLENE** - A plastic film. It may be used to seal a pond by placing it over the bottom and sides of the pond. In greenhouses, to cover the roof and sides. To cover the walls of animal shelters in winter. To cover stacks of silage.
- POLYMERIZATION** - A commercial method of producing fuels. Light gases are converted to gasoline and gas oils by use of a catalyst, heat and pressure.
- POLYPHASE INDUCTION MOTOR** - Usually refers to a three-phase or two-phase induction motor that has three or two complete sets of field windings, all of which are exactly alike and a squirrel cage type of rotor. These motors are simple, rugged and speed changes very little with changing load.
- PONDING** - The collection of water in a reservoir.
- POPPET VALVE** - A disk valve with a guide stem as employed for many types of gasoline engines; the valve may not be completely operated by positive means, but is usually seated by means of springs, and frequently opens by a cam or automatically by suction.
- POP-UP SPRINKLERS** - Sprinkler heads which rise above the lawn surface to apply water when supplied under adequate pressure.
- PORE-SIZE DISTRIBUTION** - A fundamental physical characteristic of soil which determines the permeability for water and air and the manner in which water is held. It is the fraction of the total soil volume occupied by pores of a diameter between \underline{d} and $\underline{d} - \Delta \underline{d}$, as determined by the pore diameter \underline{d} .
- POROSITY** - 1. An index expressing the degree to which a soil mass is permeated with pores. 2. Ratio of void volume to total volume of soils, or rock, generally expressed in percentages. 3. The porosity is equal to the sum of the specific yield and the specific retention.
- POROUS** - Full of pores; having many small openings.
- PORTICO** - A roofed space, which can be open or partly enclosed, at the entrance to a structure.
- PORTLAND CEMENT** - A hydraulic cement manufactured from a mixture of limestone and clay materials, which are mixed thoroughly, then burned in a kiln to form an inert clinker. This clinker is finely ground to make cement.
- POSITIVE BENDING MOMENT** - When a bending moment acts on a member causing the top fibers of the member to be in compression.
- POSITIVE CLUTCH** - A clutch that consists of two parts which have teeth so placed that when they are brought together they engage instantly and allow no slipping. It causes various mechanisms of the machine to start instantly at a high rate of speed when the clutch is engaged.
- POSITIVE-DISCHARGE ELEVATOR** - An elevator with buckets suspended at intervals between two chains. Discharge is accomplished by two snubber sprockets located just below the head wheel. These cause the buckets to be carried towards the center of the elevator far enough to clear a discharge shoot located below the head wheel. Discharge is by gravity and pickup is similar to that of the centrifugal discharge type. Suited to the handling of light, fluffy, dusty or sticky materials.
- POSITIVE DISPLACEMENT GEAR PUMP** - A small pump used in governors, hydraulic systems, etc., which pumps a constant amount of fluid per revolution.
- POSITIVE DISPLACEMENT PUMP** - A pump that will deliver a constant amount of fluid regardless of pressure per pump stroke or per

- revolution of the pump.
- POST - 1. A vertical structural member placed along the foundation of a structure to support the plate and wall construction.
2. In a fence, the wooden or steel supporting member embedded in the ground at the lower end and spaced at given distances.
- POST DRILL - A drill which may be bolted to the side of a post, standard or pillar, and requires no foundation.
- POST-EMERGENCE SPRAYING - Spraying a crop with a general-contact herbicide if crop is resistant to injury from such sprays after the crop has emerged from the ground.
- POST FRAME - A pole frame except that the posts which support the frame are set on a sill or foundation rather than being set in the ground.
- POST HOLE AUGER - A cylindrical auger or screw, furnished either with a crown or a disk cutter which is used for boring holes in the earth for the insertion of fence posts. It may be hand or power operated.
- POST HOLE DIGGER - An implement for digging circular holes for posts which consists of two semi-cylindrical cutting blades, hinged together but each mounted on separate handles. The soil is cut or loosened by plunging the blades downward and removed by moving the handles outward and lifting.
- POTATO COMBINE - A combined digger-picker which lifts the potatoes from the soil onto a sorting conveyor. Vines, stones, clods, and other foreign material are removed on the conveyor by workers. The potatoes are then discharged from the sorting conveyor into sacks or barrels or are elevated into bulk handling trucks. See: Potato digger.
- POTATO DIGGER - A field machine composed of a shovel-like bottom which runs beneath the potato plants, lifts the tubers and plants out of the soil, and slides them onto the elevator where most of the clinging soil is shaken off. The potatoes are separated from the vine and windrowed on the ground, in separate rows from the vines.
- POTATO FORK - A five-tined hand fork used in digging potatoes. The tines are round or a flattened diamond shape, approximately twice as wide as they are thick.
- POTATO-HILLING ATTACHMENT - An attachment placed behind cultivators which hills the soil. Can be of several designs, i.e. shovel type, disk type, etc. These devices are slanted toward each other from front to rear so dirt is hilled as it goes between the plates.
- POTATO HOOK - A four-pronged tool somewhat like a hoe which is used in hand digging of potatoes.
- POTATO PLANTER - One of several types of mechanical planters that opens a furrow and drops and spaces the seed pieces of the potato. See: Picker, platform planter.
- POTATO-STORAGE - A building or bin in a building especially designed to keep potatoes at optimum holding conditions until their sale. Temperature and humidity control is important.
- POTENTIAL DROP - The difference in voltage between two points due to the resistance in the line.
- POTENTIAL EVAPO-TRANSPIRATION - The amount of moisture that could possibly be removed through evaporation from surfaces or by transpiration from plants.
- POTENTIOMETER - An instrument for comparing or measuring electromotive forces.
- POTHOLES - Natural depressions in the land where surface water collects in relatively large amounts due to no drainage outlet.
- POT TYPE BURNER - See: Vaporizing burner.
- POT VALVE - A safety valve shaped like an inverted pot. It is a lift valve, and the conical pivot

- of the lever drops loosely into a recess in the crown of the pot. The advantage claimed is that such valves being in a condition of unstable equilibrium are less liable to stick than the ordinary form. The lift of the valve is controlled and maintained by a guide, cast on the top of the seating.
- POULTRY NETTING** - Wire netting with hexagonal meshes, made in various widths, with 1, 1½ or 2 in. mesh openings which is used for fencing, for constructing wire partitions, cages, trellises, etc.
- POULTRY PICKER** - Any of various patented machines which are designed to remove feathers from poultry. It may consist of a revolving drum to which many rubber fingers are attached.
- POULTRY PINNER** - A specially designed, flat-bladed knife which is used to remove pinfeathers from fowls in poultry dressing. See: Pinning knife.
- POUNDING** - 1. The act of beating, breaking up or disintegrating by means of blows; reducing to a powder. 2. Thumping or knocking in a marked degree, on the part of running machinery, either through slackness or disarrangement of the moving pieces.
- POURED ADOBE** - See: Mud-concrete.
- POUR POINT** - A specification for petroleum products that gives an indication of viscosity at low temperatures. The pour point is the lowest temperature at which an oil is considered to flow.
- POUR-POINT DEPRESSANTS** - Ingredients added to lubricating oils which reduce the pour-point. These ingredients are important additives in cold weather operation.
- POWDERED CULTURE** - A dry milk culture which is dried and handled so as to retain viability and purity of the desired microorganism.
- POWER** - The rate at which energy is expended or work is done, usually expressed as the number of ft. lbs. done in 1 min.; example, power = $\frac{\text{ft. lbs.}}{\text{min.}}$. The result is usually reduced to horsepower by dividing by 33,000, that is horsepower = $\frac{\text{ft. lbs. per min.}}{33,000}$. Electrical power is expressed as watts or kilowatts (1000 watts).
- POWER ADJUSTED TREAD** - A tractor which can change the effective width between the rear wheels through the power produced by the engine after critical bolts are loosened.
- POWER-ANGLING** - A method of angling the gangs on disk harrows without the operator having to get off the tractor seat to change the angle. Several methods have been developed, but hydraulic systems are most prevalent.
- POWER AT THE DRAWBAR** - The drawbar power for a given gear ratio is the maximum sustained power available at the drawbar on a horizontal surface in this gear, with the controls set as specified by the manufacturer for drawbar work. The drawbar pulley shall be applied horizontally and in the vertical plane containing the longitudinal axis of the tractor. Measurements at the drawbar have no significance unless the following factors are defined: tractor weight, distribution of tractor weight, nature and condition of soil or track, wheel or track equipment and the drawbar height.
- POWER AT THE POWER TAKE-OFF** - The maximum sustained power delivered through the power take-off, with the controls set as specified by the tractor manufacturer for power take-off work.
- POWER AT THE PULLEY** - The maximum sustained power measured with the pulley shaft directly coupled to a dynamometer.
- POWER BALERS** - Hay balers that are powered by auxiliary engines.
- POWER-CART DUSTER** - A power dusting unit (q.v.) which is mounted on a cart or upon a truck, in contrast to one mounted directly on a tractor. Power for the duster mechanism is furnished by a

- gasoline engine.
- POWER CHAIN SAW** - A power-operated saw which has a continuous running chain to which cutting edges are attached.
- POWER CYLINDERS** - Hydraulic cylinders which are used on farm equipment to raise and lower angle disk gangs, etc. These cylinders are powered by oil under pressure.
- POWER DISTILLATE** - A term used to label tractor fuel usually of lower API gravity than gasoline.
- POWER DRIVE SHIELD** - A piece of metal usually curved to form a semi-circle, which is placed over rotating drive shafts to prevent accidents.
- POWER-DROPPED** - Designating corn planting similar to drilling, in which kernels are released by a power device operated either from the tractor or by the wheels of the planter.
- POWER DUMP RAKE** - A hay rake on which the teeth are raised by means of a small foot lever which engages pawls in the main wheels and supplies the power to trip the dumping mechanism.
- POWER DUSTER** - A field dusting machine using the conventional principles of any duster which has its power supplied by a separate source, such as gasoline engine or power take-off from the tractor. Power dusters may be very large when used in extensive orchard or plantation operations.
- POWER FACTOR** - The ratio of the watts consumed by an electrical load divided by the product of the volts and amperes. Low power factor causes heating and inefficient operation of alternating current equipment such as motors.
- POWER FUEL-LIGHT** - Low flash distillate fuels used in tractors and trucks. A typical fuel of this type has an API gravity of about 30, a weight of about 6.5 #/gal. and falls between third grade gasoline and kerosene in octane number.
- POWER JET** - The jet in a carburetor which is used at full throttle.
- POWER LAWN MOWER** - Lawn mowers which are operated by power, usually a gasoline engine or electric motor, in contrast to the ordinary mower operated by power from the ground wheels when pushed by the operator.
- POWER-LIFT** - 1. A mechanical device which lifts a load or adjusts a part of the equipment by means of a hydraulic lift of power supplied by a power-take-off from the tractor. 2. A platform or cage working in suitable guides, and operated by hydraulic or other power, used to raise or lower weighty articles; an elevator used for transporting other than passengers.
- POWER LIFT LEVER** - A lever of a plow or other tillage implement which operates the power lift mechanism. The lever may be controlled from tractor seat by a rope extending to the lever.
- POWER-LIFT PLOW** - A tractor-drawn plow in which the plow bottoms are lifted or lowered as a unit by means of a one-half revolution dog clutch which can be engaged or disengaged by the operator of the tractor. This lift has been largely replaced by hydraulic power lifts.
- POWER LOADER** - A fork or fork and scoop combination which is mounted at the front or rear of a tractor and is operated by hydraulic power to load manure, bales of cotton, baled hay, pallet boxes, soil, gravel, etc.
- POWER PRESS** - A stationary press, or baler, in which an internal combustion engine supplies the power for compressing the hay, in contrast to earlier mechanisms in which horses supplied the power.
- POWER SHOVEL** - A machine which will excavate dirt through the use of a large bucket. It is powered by an engine mounted on the machine.
- POWER SPRAYER** - A conventional sprayer which is equipped with some source of power such as a gasoline engine, to furnish the necessary power to operate the spray pump and spray equipment.

- POWER-TAKE-OFF** - A powered shaft, usually extending from the rear of the tractor and driven by the tractor motor, to supply rotative power to an attached or trailed implement, such as a combine, hay baler, mower, etc. This shaft can be operated independently of the ground movement of the tractor in modern tractors.
- POWER TRENCHER** - A machine which is used on agricultural land to narrow trenches in which to lay drain tile. The power is usually supplied by an internal combustion engine.
- POWER UNIT** - The unit which supplies the power for any device. Usually an engine or electric motor.
- P.P.M.** - Parts per million. Used in designating the impurities content of a liquid.
- PRAIRIE BREAKER** - A long, low mold-board plow with a gradual twist that completely inverts the furrow slice with a minimum of breakup and complete coverage of vegetation. It was used especially to cut and turn the tough virgin sod of the prairies of the midwest.
- PRAIRIE SCHOONER** - A covered wagon which was used in early days by settlers in their westward movement and settlement of the prairies and plains of midwestern United States. (obsolete)
- PRAIRIE-TYPE COMBINE** - A type of combine or harvester-thresher for small grain, either tractor drawn or self-propelled, which is primarily adapted for level land as opposed to the hillside-type combine. Prairie-type combines are usually characterized by a smaller straw rack area per ft. of cutter bar width than newer combines used in humid regions.
- PRATT TRUSS** - A truss having 5 internal members. Two vertical members join the top chords at their mid-point and join the lower chord vertically below this point. The third vertical member meets the top chord at the ridge and the bottom chord at its mid-point. The two diagonals meet the top chords at the ridge and join the bottom chord vertically below the mid-point of the upper chords. Especially suited for spanning long distances (24 to 40 ft. or more) and can be modified for a flat roof.
- PRE-CAST** - Concrete or other material which has been shaped or formed before it arrives on location.
- PRE-CAST-CONCRETE** - Concrete poured in forms and then transported to the site after it has set, as contrasted to concrete poured in its forms at the site.
- PRECIPITATION** - 1. Includes any moisture falling from the atmosphere in liquid form as rain or drizzle or in the frozen form as snow, sleet or hail. 2. The total measurable supply of water received directly from clouds, as rain, snow and hail; usually expressed as depth in a day, month or year, and designated as daily, monthly or annual precipitation.
- PRE-CLEANER** - A preliminary cleaning device used for the protection of the engine air cleaner, and to reduce the load on it. The pre-cleaner will prolong the required service interval by removing the coarse particles before they reach the engine air cleaner.
- PRE-COMBUSTION CHAMBER (DIESEL ENGINES)** - A small chamber connected with the combustion chamber through a comparatively narrow throat for the purpose of attaining smoother combustion. Approximately 1/3 of the total compression volume is in this chamber. Shortly before the piston reaches top dead center, fuel is sprayed into the small chamber, being directed toward the base to meet the incoming air. Ignition of fuel in the pre-combustion chamber is accompanied by a rapid rise of pressure, with the result that the unburned fuel droplets are violently blown out and distributed in the main combustion chamber for final combustion.
- PRE-COOLING** - 1. Preliminary cooling of milk immediately after a milking

- to prevent spoilage by bacterial action. 2. The cooling of vegetables and fruits immediately after harvesting to retard ripening and/or deterioration. 3. The cooling of meats after slaughter and before cutting.
- PRE-COOK** - In food preservation, to heat before canning.
- PRE-EMERGENCE SPRAYING** - Spraying a selective herbicide onto the soil directly over the row after the seed has been planted but before emergence of the crop plants. The selective herbicide will kill emerging weeds without harming the emerging crop.
- PRE-IGNITION** - The ignition of fuel in a gasoline engine cylinder before the spark occurs. Pre-ignition results in engine knock and is caused by excessive combustion chamber temperatures due to hot carbon particles.
- PRE-IRRIGATION** - In rice culture, the application of irrigation water prior to the usual irrigation after emergence of the plants.
- PRE-PEELED POTATOES** - Potatoes peeled in a flood type washer where they are agitated and rubbed against each other by action of compressed air and high pressure spraying, thence they are conveyed to a pressure steamer-peeler where about 6 lbs. of them are charged continuously. Steam is maintained at 60 lbs. pressure and is condensed at the exit by spray water from water-jet condensers. The peeled potatoes are dipped in a sulfite solution of a controlled pH to prevent discoloration.
- PRESERVATION FREEZING** - The freezing of food products so as to prevent spoilage.
- PRESERVES** - A fruit product which has been processed by cooking with the addition of some preserving agent, such as sugar.
- PRESS BOX** - The part of a cotton gin in which the lint cotton is compressed into a bale. The size of the press box is standardized to make a bale of uniform size. Also called baling press.
- PRESSED BRICK** - A masonry building unit made from a dry or semi-dry clay formed into a unit under heavy pressure.
- PRESSED FIBERBOARD** - A rigid board made from waste cellulose material like shredded wood, vegetable fiber, wood pulp or cane fiber. The fibers are chemically treated and pressed to form a homogeneous sheet. May be used for insulation or/and sound deadening.
- PRESSED STEEL** - Steel plate bent or pressed by means of dies into channel or other sectional forms, giving great strength with a minimum weight of metal.
- PRESS FIT** - A shop term for the class of fit where a shaft is turned so much larger than its hole that a screw or hydraulic press is necessary to get the pieces together.
- PRESSING** - 1. The extraction of the juice or oil from fruit, vegetables or seeds with a hydraulic or mechanical process. 2. The process of bringing the small loose pieces of curd together in a shaped solid body in cheese making by means of a press.
- PRESSURE ATOMIZER** - A nozzle from which a fluid under pressure is sprayed to give very small particles.
- PRESSURE BULB** - Pressure in the soil under a footing or foundation wall which extends laterally and to a considerable depth in the soil, having the general shape of a light bulb.
- PRESSURE CAP** - A screw-on cover that seals against pressures up to a pre-determined level. The most common use is on automotive and tractor radiators, to permit higher operating temperatures without excessive loss of cooling liquid.
- PRESSURE COOKER** - A vessel or vat in which steam pressure is developed around a food product during the cooking process to raise the boiling point of the product.
- PRESSURE COWL** - A type of rotating natural ventilation duct which faces into the wind so air is forced down the duct and into the

- building or product for drying purposes.
- PRESSURE DOME** - Effect of horizontal pressures in a deep bin caused by grain exerting pressures on the side walls. This causes an interaction of pressure shaped like a dome. See: Doming, bridging.
- "PRESSURE-GUN" GREASE** - A lime-soap grease that is smooth in texture, water resistant, the consistency of which varies less at subnormal temperature than that of soda soap greases. The soap and oil, under some applications may tend to show separation at elevated temperature.
- PRESSURE HEAD** - Weight per unit area exerted on an object expressed in psi, psf, etc. and usually in ft. or ins. of water or mercury; the pressure which a column of the material of specified height would exert, e.g. a 1 ft. head of water would exert 62.4 lbs. per sq.ft. One atmosphere equals 14.7 psi or 33.9 ft. of water.
- PRESSURE LUBRICATION** - Lubrication by forcing lubricant to the moving parts by pump pressure.
- PRESSURE OR INDUCED PAN** - An artificial subsurface soil horizon or layer having a higher bulk density and lower total porosity than the soil material directly above and below, but similar in particle size analysis and chemical properties. The pressure pan is usually found at the lower depth of normal cultivation and is variously called a plow pan, plow sole, or a tillage or traffic pan or sole.
- PRESSURE REGULATOR** - 1. A by-pass valve in a hydraulic system or spray machine which maintains the pressure desired, by-passing the excess fluid at a low pressure to reduce power consumption and heat generation. 2. An in the line valve which uses a diaphragm to actuate the movement of a throttling type valve which allows only sufficient fluid to pass as required to maintain the desired pressure.
- PRESSURE RELIEF VALVE** - A special spring-loaded valve which acts as a safety device. It prevents a build-up of pressure above the maximum required for normal operations.
- PRESSURE (SOLDERLESS) CONNECTOR** - A pressure connector is a connector in which contact between the conductor and the connector is obtained without the use of solder by means of mechanically applied pressure.
- PRESSURE SPRING** - A spring which is used to hold grain drill and planter openers down to proper depth but allows them to rise when an obstacle is encountered.
- PRESSURE SYSTEM** - A system of air movement for drying purposes in which the air is forced through the product with the air duct or ducts at a pressure above atmospheric pressure. This is also called pushing or forcing systems of air movement. Also refers to meteorological usage.
- PRESSURE THERMOMETER** - A type of temperature gage which consists of a sensing bulb and a Bourdon tube, bellows, or a pressure spring connected by a capillary tube. A change in temperature at the sensing bulb causes a pressure change in the system which causes a movement of the pointer connected to the pressure spring. This movement is calibrated to be read in degrees.
- PRESSURE-VOLUME CARD** - The card by which the indicated mean effective pressure (imep) of an engine is obtained. The horizontal distance is proportional to piston travel; the vertical distance is proportional to the pressure within the engine cylinder. To obtain the imep within the cylinder, the area within the diagram is found by means of a planimeter and the average height is then calculated.
- PRESSURE-VOLUME PLANE** - A thermodynamic plane on which the pressure and/or the volume may be held constant. A constant entropy line would be a curved line on the plane.

- PRESSURIZED COOLING SYSTEM** - A forced circulation cooling system designed to dissipate heat by circulating a cooling medium through the system and is kept under pressure by means of spring-loaded, sealed radiator cap that will open at a pre-determined pressure, usually around 6-7 lbs.
- PRESSURIZED PACKAGING** - The general term applied to the packaging of a product in a container where a gas or vapor is added so as to dispense the product in a spray at the touch of a button.
- PRESS WHEELS** - Wheel attachments to grain drills which follow the furrow openers and press the loose soil over the seeds for better covering and compaction, resulting usually in increased germination.
- PRE-STRESSED** - The procedure of putting initial stresses in the components of reinforced concrete, prior to construction, for the purpose of load-balancing and increasing load-carrying capacity. These stresses may be introduced prior to pouring the concrete (pre-tensioning) or after the concrete has been poured and set (post-tensioning).
- PREVENTIVE MAINTENANCE** - The idea of keeping an implement in good repair at all times to prevent a costly break-down of any part of the implement. (Included in daily service.)
- PRIMARY DRAINAGE** - Drainage in a watershed as a whole, in contrast to secondary or that of an individual farm.
- PRIMARY JET** - The jet through which the low pressure at the throttle plate draws the mixture of fuel and air in a compensating air-bleed carburetor.
- PRIME MOVER** - The power source to which an implement is connected.
- PRIMING METHOD** - A method of harvesting tobacco by picking the leaves from the stem as they ripen.
- PRITCH** - A staff with sharp metal points on the ends which is used in skinning operations in cattle slaughter. A pritch, stuck on either side of the withers, may be used to brace the body of the animal, keep it on its back, and thus replace the skinning rack.
- PRIVY** - A small private building usually located in a secluded corner of the house yard which is equipped with seats and a pit beneath for the deposition of human excrement. Also called out house; back house.
- PROBE** - 1. One of several kinds of sampling tubes used to take samples of cheeses, grain and various other agricultural products. 2. A rod that is pushed into the soil to locate objects, such as pipe and drain tile.
- PROCESS CHEESE** - Cheese made by blending, grinding and melting Cheddar and various other kinds of cheese and emulsifying them with salts, citrates and phosphates; sometimes whey powder and non-fat dry milk are used. The mixture is pasteurized and wrapped in foil to keep it moist.
- PROCESS DILL PICKLES** - Cucumber pickles which are made by soaking salt-rock cucumbers in hot water to remove salt followed by storage in barrels with a solution in which dill is added.
- PROCESSED MILK** - Milk which has been pasteurized, clarified or changed in any way after production by the cow.
- PROCESS TANKAGE** - Organic fertilizer, made from nitrogenous waste material steamed in tanks under pressure, which contains 6.5 to 10.0% nitrogen.
- PROCESSOR** - 1. One who processes (prepares, by cooking, curing, etc.) agricultural products. 2. The metal tank container, or cooker, in which cans of fruit and vegetables are cooked in hot water or steam in preparation for market. Also applied to tanks for treating milk products.
- PRODUCT ANALYSIS** - A method of studying processing operations with the object to improve the product, done by following the steps performed on the product during

manufacture.

PROFILE - 1. A vertical section of the surface of the ground, or of underlying strata, or both along any fixed line. 2. A longitudinal section of waterway.

PROFILE SURVEY - A survey along a line or route in which elevations are determined usually at uniform intervals, as in staking out a terrace tile line or drain line.

PRONY BRAKE - A device for making brake horsepower tests. It consists of a friction band which may be placed around the fly wheel or a pulley fixed on the crank shaft, and attached to a lever bearing upon the platform of a weighing scale.

PRONY BRAKE FORMULA - The delivered or brake horsepower is calculated from the following formula:

$$\text{H.P.} = \frac{2}{33,000} \frac{\text{RNW}}{\text{W}} \quad \text{In which W =}$$

unbalanced weight or net weight in lbs., acting on lever arm at distance R; R = length of lever arm in ft. from center of shaft; N = number of revolutions per min. and H.P. = horsepower.

PROPAGATION METHOD - Construction of drainage ditches by use of dynamite. Charges are closely spaced so that detonation of one charge causes the explosion of the next charge and so on until the complete series of charges is exploded. A water filled soil is most desirable for this method.

PROPELLER FAN - A type of axial flow fan in which two or more blades are mounted on a hub, usually at 15° angle with the plane of rotation. This type of fan will usually work only at low resistances up to 5 ins. of water.

PROPELLER PUMP - The flow through the impeller is parallel to the axis of the driveshaft. Also referred to as axial-flow or screw-type pumps.

PROPORTIONAL DIVISION BOX - A device

to divide the flow from a pipe or open channel into two or more parts; used primarily in irrigation.

PROPORTIONAL LIMIT - An elastic limit of a material beyond which if the material is stressed, strain will no longer be a direct function of stress.

PROPORTIONAL WEIR - A weir which is so shaped that the flow rate varies proportionally with head.

PROPYLENE GLYCOL - An anti-freeze material that raises the boiling point of water; has negligible corrosiveness when inhibited; medium specific heat; and it is not inflammable.

PROTEIN SUPPLEMENT - Feed with a high percentage of protein in it that is added to a ration to increase the amount of protein fed.

PRUNER - 1. A mechanical device which is used to cut off roots of seedlings in the seedbed. 2. Any mechanical device of several kinds, such as a hooked cutting blade mounted on a pole, connected to an operating lever with a wire, or long handled shears for manual operation, which is used to cut branches of trees.

PRUNING SAW - Any manually operated saw having either a straight or curved blade which is used for pruning.

PRUNING SHEARS - Short-bladed shears which are used for small cuts on trees and for pruning roots.

PUBLIC DITCH - A drainage ditch which is constructed by a public or a legally constituted drainage district.

PUDDLE - Earthy material as a mixture of clay, sand and gravel placed with water to form a compact mass to reduce percolation.

PULL-TYPE LATERALS - Pipe laterals used in sprinkler irrigation which are moved by towing the pipe-lines lengthwise with a truck or tractor. They are used to irrigate forage crops and orchards.

PUMP - A hydraulic machine for transferring fluids. It may be centrifugal, rotary, piston or

- jet type.
- PUMP CAPACITY** - The quantity of water a pump will deliver at a given head of lift, usually expressed in gal. per min. (g.p.m.)
- PUMP DRAINAGE** - Drainage of low lands or elevations by means of a pump which forces the liquid to a higher elevation where it will flow away. Low head pumps can handle immense quantities of water at low cost.
- PUMP EFFICIENCY** - The ratio of the theoretical power, or water horsepower, to the actual power required to operate the pump.
- PUMPING PLANT** - 1. A pump installation to transfer water from a lower to a higher level. 2. A plant where water is lifted from drainage canals over a levee and discharged into surrounding stream channels by automatically controlled pumps.
- PUMP JACK** - A device for applying power to operate the pump rod of a deep well piston pump. Electric motors or internal-combustion engines supply power through belts and/or gears to operate the device.
- PUNCHED HOLES** - In structural iron work, rivet holes are commonly punched in plates for boilers, bridge and girder work. Only in the best work are they drilled. The holes are either marked direct with a compass or from a templet and punched single, the plates being moved by hand or, in some cases, automatically.
- PUNCTURE** - 1. A pricking or perforation with a pointed instrument. 2. Perforation of an inflated rubber automobile tire by contact with some sharp substance on the roadbed, etc.
- PSYCHROMETER** - An instrument which is used to measure the relative humidity of air.
- PSYCHROMETRIC CHART** - A graphical illustration of psychrometric data from which the relationship between saturation pressure and temperature, vapor pressure and relative humidity, weight of moisture per lb. of dry air, specific volume, vapor pressure, total heat, and the dew point for an air-vapor mixture for different conditions of the air may be secured.
- PSYCHROENERGETICS** - Science dealing with the effect of ambient temperature and humidity upon conversion of feed into bodily heat or energy. It is important in the study of housing for livestock and its effect on production.
- PULLBOAT** - A flatboat carrying a steam skidder, or a donkey engine which is used in logging cypress and tupelo.
- PULLER** - 1. In turpentineing, a strong, elliptical shaped knife on a long handle which is used to chip timber when the face has advanced too far up the tree for chipping with a hack. 2. In poultry slaughter, a hooked tool which is used for drawing tendons. 3. In bean harvesting, the part of the harvesting machine which consists of two broad blades set at an angle to sever the bean plants just beneath the surface of the ground.
- PULLERY** - In packing plants, the wool house; the plane where wool is pulled from the skins of slaughtered sheep.
- PULLEY RATIO** - The ratio of the diameter of the driving pulley to the diameter of the driven pulley.
- PULLEY ROLLS** - A sort of skeleton roller employed to support conveyor belting, consisting of a number of uniform pulleys keyed close together on a shaft.
- PULL-GRADER** - An earth moving machine with an angled blade usually mounted under the machine to scrape the dirt to one side. Pulled by some type of power unit.
- PULLING JACK** - A hydraulic or screw jack having the reverse motion of a lifting jack as it pulls things together instead of separating them.
- PULL IN TORQUE** - The maximum constant torque at which a synchronous motor will start and reach rated speed under rated voltage.
- PULL OUT TORQUE** - The maximum sustained

- torque which a synchronous motor will develop at synchronous speed for one min., with rated voltage applied at rated frequency and with normal excitation.
- PULL PLUNGER PRESS** - A hay baling machine so constructed that the hay is pulled rather than pushed into the compressing box.
- PULL-TYPE PLOW** - A unit pulled by a power source and used to turn the soil over in slices.
- PULL UP TORQUE** - The maximum torque developed by an electric motor operating from zero to rated speed at rated voltage.
- PULSATING POINT** - A phenomenon occurring in blowers when delivering 20 to 50% of the designed air flow with pressures usually exceeding 15 ins. of water. It is an alternate delivery of large amounts of air.
- PULSATOR** - A device on a mechanical milking machine which acts to break the steady suction on the teat cups and to produce a pulsating effect similar to the sucking of a calf.
- PULVERIZER** - A tool used for part of the preparation of the seedbed and for other uses. It crushes any clods of earth on the surface, pulverizes and firms the loose soil so there will be no large air spaces or pockets and may be used to pack land down which has heaved while crops were growing on it.
- PUMP - BUCKET OR BARREL** - A manually operated piston-type pump which may be held or mounted in a container holding the spray material. Draws spray material into the pump when plunger is operated and discharges it in a continuous spray through the discharge equipment. Provides flexibility in size and type of container and high pressures.
- PUNCHEON** - A short, upright piece of timber in framing; a short post; an intermediate stud.
- PURIFICATION OF WATER** - The removal of contamination or pollution in water to make it safe for drinking purposes.
- PURLIN** - A horizontal timber laid on top of trusses between the ridge and plate to support rafters. Members laid horizontally upon rafters to support the roof covering.
- PUSH BAR** - A bar on a hitch for a single-disk plow which can be adjusted to line center of pull of plow with tractor drawbar hitch.
- PUSHER-TYPE MACHINE** - Any machine in which a prime mover pushes another machine to accomplish work.
Examples: earth moving, harvest-transporting.
- PUSH PLUNGER BALER** - See: Push plunger press.
- PUSH PLUNGER PRESS** - A hay baler which has a long pitman and operates by pushing the hay into the baling chamber.
- PUSH-TYPE SCRAPER** - A bulldozer blade mounted on the front of a tractor for the purpose of moving material by shoving it from place to place.
- PUTREFACTIVE SPOILAGE** - Decomposition of organic matter, especially the typical anaerobic process of splitting of proteins by bacteria and fungi with formation of foul smelling, incompletely oxidized products as mercaptans and alkaloids.
- PV FACTOR** - The combination of friction force and peripheral velocity of a bearing. The PV factor is used in determining the heat generated or energy dissipated by the bearing.
- PYRHELIOMETER** - A thermopile designed for the purpose of measuring intensity of solar radiation.
- PYROMETER** - An instrument for measuring temperatures above the range indicated by mercury thermometers. It may use the principle of change of electric resistance, the production of a thermoelectric current, the expansion of gases, the specific heat of solids or the intensity of heat or light radiated.

Q

QUACK GRASS TOOTH - See: Harrow teeth.

QUALITY OF STEAM - Amount of moisture in the steam. Wet steam contains free moisture and is less than 100% quality; dry-saturated steam contains just enough heat to be all vapor and is 100% quality; super-heated steam has more than enough heat to change all its moisture into steam.

QUARTER DRAIN - In the sugar cane system of surface drainage in Louisiana, a small surface drain which carries water to the lateral drain or split ditch.

QUARTER ROUND - A kind of molding that has a profile of a quarter of a circle.

QUARTER-SAWED - A method of sawing logs into boards by first cutting the log into quarters and then sawing the quarters into boards by cuts at 45° to the flat surfaces. Quarter sawed lumber presents the edge grain on the surface, is better looking, wears better, warps and shrinks less than that which is tangentially sawn. (Forest products handbook states that in commercial practice, only an approximation of this method is used.)

QUARTZ LAMP - A mercury vapor lamp which uses in place of a glass container a tube of quartz.

QUATERNARY AMMONIUM COMPOUNDS - Very complex, organic chemical compounds which are used mainly as bactericides in sanitation, cleansing and sterilizing in food and catering industries, and to some extent as insecticides. Sometimes called quats; Q.A.C.

QUICK-COUPLED PORTABLE LATERALS - Laterals used in sprinkler irrigation that are made up of lengths of pipe which are easily uncoupled to enable the line or lateral to be moved quickly to a new location.

QUICK COUPLER - A coupler which is used with portable irrigation pipe,

that, through the use of split gaskets expanding under increased water pressure, effects a water seal between the coupler and the coupled section of pipe. Rapid coupling and uncoupling are possible with this special coupler.

QUICK FREEZING - Freezing of products; fruits, vegetables, poultry, meat, dairy products, etc., for preservation under conditions in which the temperature of the product is lowered from 28° F. to -15° F. within 30 min.

QUICKSAND - Any loose sand, usually found in grain size, which is mobile or semi-fluid when super-saturated with water. It is encountered in excavations for drainage ditches, tile lines and other excavations especially in localities where soils are derived from or the land surface underlain by, lacustrine sediments or river alluvium. Also called running sand.

QUIESCENT LOAD - A stationary load.

QUOINS - Bricks or stones at the external corner of a wall.

QUONSET - A trade name for a building, now commonly applied to any one story round-roofed building when the roof is finished with metal roofing and extends nearly to the ground on both sides.

R

- RABBIT - A rectangular groove or channel cut lengthwise in the surface of a plank to receive another member.
- RACE - The channel which leads water to or from a waterwheel; the former is headrace, the latter, tailrace.
- RACK - 1. A frame fitted to a wagon or trunk to carry farm produce as hay, straw, tobacco, etc. 2. A frame-work for holding feed for cattle, swine, sheep, etc., with upright partitions and giving access to the feed. 3. A frame placed in a stream to prevent passage of fish. 4. A frame placed at the entrance to a pump sump to remove debris that would clog the pump.
- RACK AND CLOTH PRESS - A closely woven, heavy cloth support is folded over crushed fruit, as ground apples or grapes, and a wooden rack made of hard slats is placed on the folder cloth to support a second cloth containing crushed fruit. Several layers of cloths of fruit and the racks are prepared prior to pressing in a cider or juice press.
- RACK AND PINION - In mechanics, a bar with teeth on its face which engage those of a pinion.
- RACK LOSSES - Grain lost on the straw rack of a combine by going through the rack or being carried over the end of the rack.
- RAD - An amount of radiation sufficient to cause one gram of animal tissue to absorb 100 ergs of energy.
- RADDLE RAKES - Rakes used in the separating part of the hillside combine to move the straw.
- RADIAL - Any direction from the center of a circle.
- RADIAL-BLADE - See: Straight bladed fan.
- RADIAL FORCE - A force bearing in all directions from center point.
- RADIAL GATE - A pivoted gate whose face is usually a circular arc with center of curvature at the pivot. See: Taintor gate.
- RADIAL HONEY EXTRACTOR - A centrifugal honey extracting machine in which the uncapped combs are arranged on a rotating reel like the spokes of a wheel with the bottoms of the combs toward the center of rotation. The reel rotates inside a round tank having an outlet for honey at the bottom.
- RADIAL KNIFE TYPE CUTTERHEAD - See: Flywheel-type cutter head.
- RADIAL SAWN - See: Quarter sawed.
- RADIAL WELL - Usually a large diameter, dug well, which has collection pipes and screens driven horizontally from the bottom of the excavation to increase the inflow of water.
- RADIANT ENERGY - Emitted by all bodies and upon striking another body is reflected, transmitted or absorbed as heat. Radiant energy is transmitted through space from the sun to the earth, follows a straight line path and can be reflected or absorbed.
- RADIANT FLOOR HEATING - The warming of the air, the enclosing surface and/or the space by heat given off from a warm floor surface.
- RADIATED - Transmitted by radiation. The giving off of radiant energy by a body or material. See: Radiant energy.
- RADIATION COOLING - Cooling by radiation to a colder atmosphere or body.
- RADIATOR SHUTTERS - Shutters placed in front of a radiator to control air flow through the radiator, and thus the amount of heat transfer. Shutters may be either thermostatically or manually operated. Primarily used to promote rapid warm-up on kerosene or distillate engines.
- RADIOACTIVATED MILK - Milk which has been treated by cathode rays (electrons) through special electrical equipment which sterilizes the milk without a sensible rise in the temperature. Also called cold sterilization.

RADIUS OF INFLUENCE - The radius under which a drop in water level occurs when pumping is taking place from a well.

RAFTER - A beam extending from plate to ridge which gives slope to a roof and supports the roof covering.

RAG IRON - The adjustable flat spring-like part of the corn sheller which permits the shelling of both large and small ears. It serves to hold the ears against the shelling mechanism.

RAG IRON SPRING - The mechanism on a corn sheller which keeps the rag iron in tension so it will hold the ear corn tightly against the stripper wheel so it can be shelled.

RAILING - A hand rail running parallel to a stairway for persons to use as support in climbing up and down the stairs.

RAILS - 1. Horizontal wooden rails forming part of a rail fence. 2. The cross or horizontal members of the framework, of a door, sash, blind or any paneled assembly which separates the panels.

RAIN - Precipitation in the form of water condensed from the atmosphere which falls in drops. See: Precipitation.

RAIN CLOUDS - Clouds that contain enough nuclei to form ice crystals which may or may not be heavy enough to fall to the ground.

RAINDROP EROSION - Soil splash resulting from the impact of water drops directly on soil particles or on thin water surfaces.

RAINFALL - The amount of precipitation expressed in the form of water but including snow, sleet and hail which falls in a given time. In the United States it is usually measured in ins. of water. See: Precipitation.

RAINFALL EXCESS - 1. A rate of rainfall in excess of prescribed minimums by the USWB. 2. That part of the rain of a given storm which falls at intensities exceeding the infiltration capacity.

RAINFALL INTENSITY - The rate at which rainfall occurs expressed in ins. per hr.

RAINFALL INTERCEPTION - Interception of the fall of raindrops by a canopy of vegetation or vegetative residue which is usually expressed as ins. depth retained.

RAINFALL VOLUME - Symbol P.

RAIN GAGE - A vertical, cylindrical container with a top opening of 8 ins. in diameter. A funnel-shaped hood is inserted to minimize evaporation losses. It measures the depth and intensity of rain falling on a flat surface without considering infiltration, runoff or evaporation.

RAIN GAGE STICK - A stick made of wood or preferably non-absorbent material that is used to measure the depth of water in the inner cylinder of the rain gage.

RAINMAKER - 1. A rain-simulator which is used for applying water in drops upon a plot surface. 2. The ingredient used in artificial rainmaking, such as dry ice, silver oxide, etc. 3. An individual who contracts to increase the rainfall of an area.

RAINMAKING - Methods of weather modification where artificial nuclei are supplied to the clouds to encourage precipitation.

RAIN WATER - Water that falls from the atmosphere in the form of rain at times being caught and confined for further use. See: Soft water.

RAINY - Designating a period in which rain falls more or less continually.

RAINY SEASON - The season of heavy or more than normal rainfall as contrasted to the dry season of little or no rainfall.

RAINY WEATHER - A period of relatively short duration during which there are numerous showers of rain as contrasted to rainy season.

RAISING - Raising, nailing and bolting the assembled framing of a barn and making the structure ready for putting on the roofing and siding. In former years in the United States, neighbors came

- from miles around to help with the raising.
- RAKE** - A farm machine used to gather hay or stubble. In roofs, rake is the exposed edge of the roof, as at the gable end.
- RAKE-BAR HAY LOADER** - See: Fork loader.
- RAKE BAR** - The wooden or metal bar on which the teeth of a rake are attached.
- RAKED OUT** - The process of removing excess mortar from mortar joints prior to pointing.
- RAKE DRUM ECCENTRIC** - The drum on the gleaner cylinder of a cylinder hay loader to which the bars with flexible fingers are attached.
- RAKE TEETH** - The teeth of a rake usually made of springy metal.
- RAMMED EARTH** - A method of earth wall construction in which moist soil is tamped into the wall between heavy plank forms.
- RAMP** - An inclined plane which serves as a passage way between two different levels. It is commonly used in loading livestock and machinery on trucks or trailers.
- RANDOLPH PLOW** - A hillside type of plow, bearing the name of Thomas Mann Randolph of Virginia, which was used in early American farming in Virginia. It is said to have been used on the farm of Thomas Jefferson.
- RANDOM SYSTEM** - A tile drainage system design where the laterals drain small or isolated wet areas. The tile lines usually follow natural draws and other low depressions and have no particular spacing or layout pattern.
- RANGE NOZZLE** - The nozzle on a multiple nozzle rotary irrigation sprinkler which is set to throw water to the out part of the wetted circle.
- RANGE SHELTER** - See: Summer-range shelter.
- RAOULT CORRECTION** - A correction which may be applied in the freezing point test for the detection of water added to milk.
- RAPID ABNORMALITY INDICATOR** - An electrical apparatus which is used for the rapid detection of abnormal milk.
- RASP** - A file that has coarse, single teeth, made by straight cuts of a pointed chisel, either cut or crossed.
- RASP-BAR** - A bar with small diagonal teeth which is mounted on a cylinder or in a concave or a threshing cylinder of a combine. Some bars have herringbone teeth about a common centerline.
- RATCHET** - A device used on many tools to permit positive action only one way. When turned the opposite direction, the tool will not do the work. Mechanism composed of ratchet wheel, lever and pawl.
- RATCHET BAR** - In machinery, a straight bar serrated with teeth, like those of a ratchet wheel, to receive the thrust of a pawl. The use of the ratchet bar is to permit movement in the one direction, while preventing it in the direction opposite.
- RATCHET DRILL** - A drill attached to a ratchet, so as to be revolved by the reciprocating motion of a hand lever; called also pawl wrench and ratchet brace.
- RATCHET DRIVE** - A drive which has positive action in only one direction. The teeth are built so they will slip in the other direction.
- RATCHET JACK** - A machine applying the mechanical principle of the fulcrum and lever in the process of lifting. The ratchet lock engages the rack when the lever is being returned for another tooth.
- RATCHET TEETH** - In machinery, the teeth of ratchet wheels are formed according to their use. When the ratchet pawl must work in opposite directions at will, the teeth are like those of ordinary spur wheels, but when the motion is in one direction only, their outline is roughly that of a right angled triangle.

- RATCHET WHEEL** - In machinery, a wheel provided with teeth into which a pawl fits. The pawl either moves and turns the ratchet wheel with an intermittent motion, which renders it capable of feeding a machine cutter, or the wheel moves it, motion being independent of that of the pawl.
- RATED ENGINE SPEED** - The revolutions per min. of the engine crankshaft as recommended in the manufacturer's specifications.
- RATED GEAR** - The speed or gear recommended in the manufacturer's specifications as being the most suitable for average agricultural operation.
- RATED OUTPUT** - The energy delivered by a machine when it is operating at conditions specified by the manufacturer, commonly given in horsepower at some given r.p.m.
- RATE OF PONDING** - The number of cu.ft. per sec. of runoff or seepage water entering a pond, depression, pothole, etc.
- RATING CURVE (TABLE)** - A tabular representation of a calibration, such as rate of runoff in cu.ft. per sec. versus clock time.
- RATING FLUME** - 1. The open conduit built in a channel to maintain a consistent regiment for the purpose of measuring the flow and developing stage-discharge relationships. 2. A flume containing still water for rating current meters, Pitot tubes, etc.
- RATING OF BOILERS** - An indication of how much steam a boiler will produce. The rating is usually made on the basis of the amount of water a boiler can evaporate in a given time under standard conditions. The standard unit is the boiler horsepower which is equivalent to the evaporation of 34.5 lbs. of water per hr. at 212° F. into steam at the same temperature (U.S.); the Btu equivalent is 33,449 Btu per hr.
- RAT TAIL FILE** - In machinist work, a file, circular in section, and tapering or bellied in the direction of its length.
- RAW COTTON** - The cotton as it comes from the field.
- RAWHIDE** - The untanned skins of cattle which are hard and tough when dried; cut into strips and twisted, it is used for whips, ropes, etc.; in sheets, it is assembled in several thicknesses, compressed sidewise between iron cheeks, and cut to form gear wheels and pinions.
- RAZORBACK TERRACE** - A narrow terrace constructed for the control of soil erosion. It may be only three to five ft. wide at the base and only one to two ft. high, and is either graded or level. The narrow terrace is not tillable, has other serious deficiencies and is not in common use.
- REACH** - 1. A comparatively short length of a stream or channel. 2. A pole or bar connecting the rear axle truck or runners, as of a vehicle, with the bolster of some part of the forward end. Also called the perch or reach rod.
- READY AVAILABLE MOISTURE** - The amount of water stored in the root zone between the field capacity and the silting point of the soil, that is generally considered available for plant use.
- REAL DENSITY (OF SOIL) - P (ML^{-3})** - The mass per unit volume of the oven dry solid soil matter, pore space excluded. When expressed in grams per cu.cm., it is equal numerically to real specific gravity.
- REAL SPECIFIC GRAVITY (OF SOIL) R_s**
- The ratio of the weight of a given volume of oven dry solid soil matter, pore space excluded, to the weight of an equal volume of water at a temperature of 40° C. The average specific gravity of single soil particles.
- REAM** - To enlarge a hole by means of a cutting tool having fluted cutters on the side.
- REAMER** - A tool used to enlarge a hole and bring it to the shape of the counterpart of the tool,

- whether cylindrical or tapering. It is fluted and slightly tapering, the blades being worked out of the solid metal by planing or milling on a machine. The flutes are then backed off like a tap to give a good cutting edge.
- REAPER** - An early machine for harvesting grain. There have been several kinds, the first patented by Hussey 1833 and McCormick 1834. These evolved into and were replaced by the binder; the binder was replaced by the combine.
- REAPER FILE** - A file, 7 to 10 ins. long, slightly tapering, with a trapezoidal section and 2 safe edges which is used to sharpen the knives of reaping and mowing machines.
- REAP HOOK** - See: Sickle.
- REAPING ATTACHMENT** - An extra seat placed over the right wheel of a horse drawn mower so the operator can rake clover off a wooden platform trailing the cutter bar.
- REAR FURROW WHEEL** - A small wheel which follows the plow in the furrow to help balance and support the plow.
- REASONABLE USE DOCTRINE** - Each riparian owner has the right to use that portion of a stream that is in reasonable relationship to the like rights of use of all other riparian landowners lying below on the same stream.
- REBATE** - A rabbet cut into the corner of a framed opening to allow a storm window, screen door, etc., to fit tightly to the opening. See: Rabbet.
- REBORING** - In engineering, when an engine cylinder becomes grooved or out-of-round through long use and wear, and is enlarged to a larger diameter. This requires the installation of new pistons and rings.
- RECARBURIZATION** - In steel manufacture, the adding of a definite amount of carbon to iron which has been first completely decarburized. Steel of various grades is thus made in the Bessemer converter, and in the cementation process.
- RECEIVING HOPPER** - A conveyor usually placed flush on the ground to receive and convey material from a self-unloading wagon, dump truck, etc.
- RECEIVING ROOM** - A room in a processing plant for taking in raw products.
- RECEIVING VAT** - A vat or container at a milk plant or receiving station for the reception of milk, usually from cans or bulk tankers.
- RECEIVING YARD** - A large enclosure into which sheep are initially herded at sheep yards (Australia and New Zealand).
- RECESSLESS TYPE FITTING** - See: Solderless type fitting.
- RECHARGING GROUND WATER** - Replenishing ground water by artificial means. See: Water spreading.
- RECIPROCATING BAND-CUTTER** - A type of oscillating band cutter in a threshing machine, activated by a rotating crank shaft, to give a combination back-and-forth and rotary motion for cutting the twine bands around bundles of grain.
- RECIPROCATING CHAIN SEEDER** - A machine using a reciprocating chain as a metering device. Used for spreading small seeds, granular insecticides and fertilizers.
- RECIPROCATING-ROPE SEEDER** - A grass seeder which uses a reciprocating rope as a metering device. Used for spreading small seeds and fertilizers.
- RECIRCULATING BIN DRYER** - A dryer designed so that a thin layer of 18 ins. or less of grain is exposed to heated air. The grain is normally fed into the top of the bin and fills a space of from 4 to 18 ins. between perforated sheets or expanded metal. The air moves into the center of the bin and is forced out through the perforated sheet through the grain and leaves the grain through another perforated sheet. The grain may be recycled several times at medium-high temperature

- to reduce effects of overdrying.
- RECIRCULATING DRIER** - See: Recirculating bin dryer.
- RECIRCULATING GRAIN BIN** - A storage providing a means of moving grain to maintain a more uniform moisture content distribution in the bin.
- RECLAMATION** - Making naturally unsuitable land suitable for agricultural occupation and other uses by irrigation (of arid lands); drainage (of swamps and marshes), land clearing (timber, brush, and stones) and other engineering measures.
- RECONDITIONING** - Addition of moisture to a product to bring it up to standard moisture content and to make it more palatable.
- RECONNAISSANCE SURVEY** - A preliminary in the field examination of a proposed project.
- RECORDING RAIN GAGE** - A gage that keeps a time record of rainfall. Water is caught in a bucket upon a scale mechanism. The weight of the water compresses the spring, and the amount of compression is recorded through a linkage on a chart placed on a clock-driven drum.
- RECORDING STREAM GAGE** - A gage that keeps a time record of stream depth. It usually consists of a float connected to a wire which has a counter weight on the opposite end. The wire goes over a pulley which is linked to a recording device with a time unit. As the water level rises the float will rise, causing the pulley to turn and record depth of stream at that moment.
- RECORDING THERMOGRAPH** - Recording device that collects data on the changes in average temperature. The temperature is recorded on a regularly revolving cylinder by a linkage which comes from the thermometer. See: Recording thermometer.
- RECORDING THERMOMETER** - A temperature measuring device keeping a continuous record of the temperature on a chart.
- RECRYSTALLIZATION TEMPERATURE** - The temperature at which a work hardened metal will be restored to its soft condition as a result of recrystallization which does not involve a phase change.
- RECTANGULAR SHINGLE** - See: American shingle.
- RECTANGULAR SYSTEM OF LAND DIVISION** - A system of land division which is based upon permanent meridional and latitudinal lines yielding rectangular-shaped land areas as nearly as may be; 6 mi.sq. divided into 36 secondary units called sections.
- RECTANGULAR WEIR** - A measuring weir which has a rectangular notch. A contracted weir, unless a suppressed weir is specified. See: Weir.
- RECURRENCE INTERVAL** - Actual time interval between the actual occurrence of a given hydrologic event (10-20 yr. storms, etc.)
- REDDLE** - A shop term for red lead, mixed with oil and used when filing and scraping metallic surfaces.
- RED HEAT** - In blacksmithing, there are several grades of red heat, distinguished by the prefixes, black, bright or low red; the distinguishing of these shades or colors being of importance in the hardening, tempering and welding of iron and steel.
- REDUCED LOAD CONTOUR** - A graphical means of representing the combination of different loads coming upon a structure, so as to give the value of the combination at any point by the ordinate to a curve known as the "reduced load contour".
- REDUCING FLAME** - A flame that contains an excess of acetylene and that may, therefore, impart carbon to the surface of the molten metal (also called carburizing flame and excess-acetylene flame).
- REDUCING PULLEY** - Two pulleys mounted upon the same axis, their diameters bearing to one another, the proper proportions between the stroke of the engine and the length

- of the indicator diagram; the angle through which the larger pulley is rotated, by means of a cord passed around it, from the crosshead of the engine, is transmitted by the smaller through a similar cord to the indicator drum.
- REDUCING VALVE** - A spring or lever loaded regulating valve, similar to a safety valve, whereby a lower gas pressure can be maintained within a system than at the source of supply.
- REDUCTION OF TEMPER** - 1. The process of tempering steel is the process of developing the correct degree of softness to an area of metal after it has been hardened by quenching, the correct temper being usually judged by colors observed on polished portions of the tool. 2. Softening of a steel tool by overheating it while in use.
- REEL** - 1. A frame turning on an axis which is used for winding rope, yarn, fiber or other flexible substances, such as a hose or a fishing net. 2. A winch. 3. The revolving slats of a combine, binder or windrower, which lay the cut grain back toward the platform delivery. 4. A device for winding a surveyor's tape. 5. The teeth and axle in a rake which revolve and windrow the hay.
- REEL BAT** - See: Reel slat.
- REEL BAT EXTENSION** - An attachment to the reel slat on a combine, binder, or windrower. Its effect is to widen the reel slat in a direction away from the reel axle. This enables the reel to come closer to the cutter head and thus better enables it to sweep grain and other special crops onto the elevator without loss over the cutter knife.
- REEL SLAT** - The horizontal part of a reel or a combine, binder or windrower, which tips the grain as it is cut, thus causing the grain to fall back upon the delivery platform.
- REEL SPIDER** - That part of the reel of a combine, windrower or binder, which holds the reel spokes to the reel axle.
- RE-ENGAGE** - To engage again; to interlock with a second time; as to re-engage a gear.
- REEVES DRIVE** - A variable speed drive which consists of a pulley with two sheaves conical in shape, one or both of which may be moved along the shaft. If the distance between the conical sheaves is changed, the effective pulley diameter is varied, thereby varying the speed of the driven pulley.
- REFINE** - To reduce into a fine, unmixed or pure state; to reduce; as, metals from the ore, to free from dross; to bring into an uncompounded state.
- REFLECTIVE INSULATION** - A sheet material, such as aluminum which is polished on one side and is used to reduce the passage of heat thru a wall.
- REFRACTORY** - Resisting ordinary treatment, said especially of metals and the like; not readily yielding to heat; difficult of fusion, reduction or the like.
- REFERENCE FUELS** - Two fuels, iso-octane and n-heptane, which are arbitrarily established as reference scale for measuring octane ratings of fuels. Iso-octane is assigned an octane rating of 100 and n-heptane an octane rating of 0.
- REFRIGERANT** - A volatile material by which liquefaction and subsequent expansion furnish the means of removing heat in mechanical refrigeration.
- REFRIGERANT COMPRESSOR** - That part of a compression mechanical type refrigeration system which sucks in low pressure refrigerant vapor and compresses it into a reduced volume at higher pressure so that it can be liquefied.
- REFRIGERANT CONDENSER** - That part of a mechanical refrigerating system wherein the vaporized and high pressure (refrigerant) is liquefied by removal of heat.

- The condenser may be of several types; flooded evaporative, atmospheric or air-cooled.
- REFRIGERANT EVAPORATOR** - That part of a mechanical refrigeration system in which the refrigerant is at low pressure and is vaporized by heat extracted from the surrounding medium. This cools the surrounding medium.
- REFRIGERANT GAS** - A material which can be liquified and then expanded to furnish a means of absorbing heat from the surrounding medium in a refrigeration process, for example ammonia.
- REFRIGERATED STORAGE** - A warehouse or other structure for holding products equipped with a system for keeping the temperature at a set low point.
- REFRIGERATING LOAD** - Total amount of heat necessary to remove in a given time, usually an hr., by a cooling system to keep a constant low temperature. One ton load is the removal at the rate of 12,000 Btu per hr.
- REFRIGERATION** - Artificial cooling of a product to a temperature below that of the surrounding atmosphere.
- REFRIGERATOR CAR** - An insulated railroad freight car, fitted with receptacles for holding ice or a refrigerating unit. These cars are used in the transportation of perishable goods.
- REGENERATION PROCESS** - In water softening, a process which restores the sodium content of the zeolite. A measured quantity of salt brine is brought in contact with the zeolite. The chlorine of the salt combines with the calcium and magnesium previously deposited by "hard" water to form soluble chlorides of calcium and magnesium. These soluble chlorides are taken up by the water and can then be flushed to waste.
- REGENERATIVE HEATING** - A heat exchanger which brings cold products into thermal contact with the hot one in a continuous flow system, so that the cold liquid is partially heated by the hot liquid and the hot liquid is partially cooled by the cold liquid.
- REGIMEN** - The condition of a stream and its channel as regards their stability. A river or canal is "in regimen" if its channel has reached a stable form as the result of its flow characteristics.
- REGISTER** - An adjustment on a mowing machine sickle bar. The unit is in register if the knife sections are approximately centered in the guards at each end of the stroke. In cases where the throw of the crank is different from the guard spacing, the knife is registered when it moves equal distances on each side of the mid-point between two guards.
- REGULATING RESERVOIR** - A reservoir that is used to distribute water to other storage reservoirs as they need it.
- REHEATING** - The process of making hot again; specifically, bringing piles, fagots or ingots of iron or steel once more to a proper heat preparatory to subjecting them to a further rolling or hammering; as reheating a billet between the cogging and finishing trains.
- REINFORCED CONCRETE** - Concrete designed with a series of mild-steel reinforcing rods, or mild-steel reinforcing fabric in it. This gives the concrete strength in tension and increases the overall strength.
- REINFORCING STEEL** - Mild-steel bars or mild-steel fabric incorporated in the design of concrete or brick structures to give added strength.
- RELATIVE EFFICIENCY** - The ratio of the actual indicated thermal efficiency of an engine to the efficiency of the ideal process upon which the design of the engine is based. It is a ratio giving the measure of the perfection of design and performance of the engine.
- RELATIVE HUMIDITY** - The ratio of the actual vapor pressure exerted by water in air to the vapor pressure the water would exert if the air were saturated with water.

- RELAXATION METHOD - A trial-and-error determination of the value of the hydraulic head at the intersection points of a grid placed on the flow region (a steady state solution).
- RELIEF - The variation in elevation of the ground surface. On a topographic map it may be indicated by hachures, shading or more accurately, by contour lines.
- RELIEF SPRINGS - Springs on a feeder head of a hay baler which will provide "give" to the head if it hits a hard object or if an excessive amount of material is to be fed.
- RELIEF VALVE - A spring-loaded valve plugging an opening, which will open at a pre-set pressure to relieve the pressure.
- RELIEF VALVE CAP - A small metal piece on the end of a spring located just beyond the relief valve in a hydraulic system. Its purpose is to activate some control when the fluid is forced past the relief valve.
- RELIEF WELL - Small size vertical risers extending from the tile line to one ft. above the surface that are installed to relieve the excess water pressure in the tile during periods of high outflow.
- REMODEL - The process of converting or rearranging a structure.
- REMOTE REFRIGERATION UNIT - A mechanical cooling unit which is not affixed to the frame of the equipment to be refrigerated. The unit is connected to the equipment proper only by refrigerant lines and electric cable.
- REP - An abbreviation of "roentgen equivalent, man" that is a measure of a quantity of any ionizing radiation sufficient to produce the same biological effect as one roentgen of radiation.
- REPAIR OUTFIT - A kit of tools, cements and materials necessary to effect repairs on such things as leather or rubber belting, pneumatic tires and similar fabrics.
- REPOINTING - A process whereby plow or hard ground lister shares that are badly worn or that have been sharpened a number of times are repointed by welding a 6 in. piece of steel bent U-shaped to both the lower and upper sides of the point.
- REPULSION-START INDUCTION MOTOR - An electric motor that starts as a repulsion motor and operates as an induction motor. The rotor is wound and fitted with a commutator and electrically connected brushes. Upon reaching a certain speed a centrifugal device operates to short-circuit the rotor windings by connecting all the commutator segments together and in effect forming a squirrel-cage, and the motor operates as an induction motor. This type motor has been largely superseded by the capacitor motor. Direction of rotation is changed by shifting the brushes.
- RESAW - The process of sawing a timber or plank into smaller members.
- RESERVOIR - 1. A place where anything is kept in storage, especially a place where water is collected and stored in large quantities for use when wanted for cities, irrigation, etc. See: Dam 2. 2. A pond, lake or basin, either natural or artificial, for the storage, regulation and control of water.
- RESERVOIR SEDIMENTATION SURVEY - Survey made to measure sediment accumulation from watersheds.
- RESHAPING - Mechanical operations that change the slope, grade, etc., of the land surface to facilitate or improve the uniformity of application of irrigation water or the more complete removal of gravitational water. Surface drainage.
- RESIDUAL-AFTER-COSTS THEORY - A method designating the amount that should be spent for farm buildings, as that remaining after all other necessary costs (feed, labor, taxes, insurance) have been subtracted from gross income.
- RESIDUAL GASES - In internal

- combustion engines, a term applied to the products of combustion left in the cylinder after the exhaust stroke is completed.
- RESILIENT** - The property of a material which enables it to absorb impact loads and assume its original shape after a load has been applied and removed.
- RESINOUS COMPOUND** - Any material artificial or natural having most of the properties of resin. Used as a coating on surfaces to make a material or wall waterproof.
- RESISTANCE WELDING** - A method in which the heat for welding is obtained by passing an electric current through the pieces to be welded.
- RESISTING MOMENT** - The internal forces in a structural member which resist an external bending moment. When the external bending moment exceeds the resisting moment the member fails.
- RESISTIVITY** - The reciprocal of conductivity. See: Conductivity.
- RESPIRATION LOSS** - Loss of food value in the plant by oxidation of tissue due to breathing of the living cells after the product is cut or stored.
- RESPIRED MOISTURE** - Moisture exhaled as a result of breathing.
- RESTING AREA** - A sheltered area of loose housing where cows are bedded but not fed. Also called bedded area, loafing area, lounging area. The manure may be allowed to accumulate during all or a part of the year.
- RETAINING WALL** - A wall of masonry or reinforced concrete used to prevent earth or other granular materials from assuming a natural slope under the influence of lateral pressures.
- RETARDATION** - In mechanics, a decrease of velocity or speed of movement on the part of anything, either from internal causes or from being hindered in its free progress.
- RETARDER FINGERS** - Steel fingers on a threshing machine which prevent an excessive amount of straw from contacting the cylinder at any one time.
- RETARDING STRUCTURES** - Structures constructed to slow down the flow of water to reduce its erosive effects.
- RETENTION** - The amount of precipitation upon a drainage area not escaping as stream flow which is the difference between cumulative precipitation and total runoff and closely approximates consumptive use when considered for periods of a yr. or more.
- RETENTION RESERVOIR** - A reservoir which is used strictly for flood control. It has one or more openings at the base of the dam which are open at all times and are of such size that the volume is never greater than can be handled by the stream below.
- RETRACT** - In mechanics, to draw back or backward; as the trigger of a gun; to draw in; as, in a sheath. Opposed to protract or protrude.
- RETRACTABLE STRAKE** - A wheel attachment for a tractor to give it more traction. It consists of a set of bars attached to the axle of the wheel. When more traction is desired the bars are straightened so the ends penetrate the soil. For ordinary operation they are adjusted so that the ends do not enter the soil. This gives a combination rubber-tired and steel-lugged tractor effect.
- RETURN COLUMN** - In hot water circulation systems (heating), the down setting main pipe from the upper portion of the system.
- RETURN CONVEYOR** - The part of the trough which supports the returning empty carrier, in elevators and conveyors.
- RETURN FLOW** - The movement of water in the form of waste, etc. back to the waterways.
- RETURN PAN** - A flat piece of metal on a combine which catches the grain as it falls from the straw rack and conveys it toward the forward end of the cleaning shoe.
- REVEAL** - The external jamb of a

- window or door which is at right angles to the face of the wall.
- REVERSIBLE DISK HARROW** - A single-disk harrow with the gangs constructed in such a manner that they can be reversed to throw the soil either in or out. The gangs are adjustable for cultivating ridges.
- REVERSIBLE JAW CHUCK** - One in which the dogs or jaws may be taken off and put on again in the reversed direction, they being usually made with steps on one side and grooves on the other; by turning them around they can be used to grip either a flat plate or a boss.
- REVERSIBLE MARKER BAR** - A bar which is used to mark rows for a machine planter and which can be used in going either direction across the field.
- REVERSIBLE PLOW** - A plow in which the individual bottoms can be reversed to provide the same result as a two way plow without the weight and expense of the extra set of bottoms. Common in Japan, rare in United States except for disk bottoms.
- REVERSIBLE SHOVEL** - Also called double pointed. A cultivator tooth which is pointed on both ends and can be reversed when one end becomes worn.
- REVERSING CAM** - A cam operating the valves of a gasoline engine, so arranged that by shifting it along the shaft or by reversing its motion it will cause the engine to run in the opposite direction.
- REVERSING GEAR** - A device whereby the valve timing of an engine may be so adjusted as to effect motion of the engine in either direction at will. The most common type of reversing gear is a link motion; next, possibly, comes the Walschaert and various types of radial gear, such as the Joy and Marshall on steam engines. Some Diesel engines may also be reversed by means of a special reverse gear.
- REVOLUTION COUNTER** - A device which may be attached to a rotating part of a machine and which counts the number of revolutions made by the part.
- REVOLVING-BOTTOM FEED** - A fertilizer metering mechanism which consists of a revolving bottom and an agitator which keeps the fertilizer from bridging. As the bottom revolves, the outer part of the fertilizer is carried against a stationary inclined plane which deflects a certain quantity into the fertilizer tube.
- REVOLVING HEAD CUPOLA** - A dome shaped revolving ventilator head which is placed on the roof of a barn to provide ventilation.
- REVOLVING SCREEN** - A trash screen or rack in the form of a cylinder or as a belt between pulleys or rollers revolved mechanically or by the power of the water passing through it. The successive portions of the screen appearing above water are generally freed of trash by water jets, by automatic scrapers, or by an attendant.
- RHEOLOGICAL PROPERTIES OF AGRICULTURAL PRODUCTS** - Those properties associated with the flow and deformation of agricultural products.
- RHEOLOGY** - The science of deformation and the flow of matter.
- RIBBING PLOW** - The common landside or moldboard plow. The reference is to the parallel ridges, or ribs, made by the turned furrow slice (England).
- RIBBON** - A board, usually 1 x 4 running horizontally and nailed to the studding to act as a support and guide line for joists. Syn. Ledger board, ribband nailing girt.
- RIB COTTON GIN** - That part of a cotton gin which is so shaped that the partially stripped seed are pressed forward and upward by the pressure of other seed brought forward by the saw teeth as the lint is engaged. The ginning ribs separate the seed from the lint and permit the saws to engage the lint.
- RICE COMBINE** - A combine for the harvesting and threshing of rice.

- It is similar to a grain combine except that the tires on the drive wheels are larger and have deeper tread, or are replaced by tracks. May be equipped with special pick-up reel and cylinder for rice.
- RICE FIELD TREAD** - A type of tractor tire tread where the lugs are considerably deeper than the general field tread.
- RICE OR BLACK WEEVIL** - A boring type insect which damages all grains. It accounts for much of the insect damage in stored grain throughout the world.
- RIDDLE** - A sieve or screen with coarse meshes for sorting or sifting coarse materials from fine ones as with grain from chaff. Usually made of wire.
- RIDGE** - 1. A horizontal line at the top edge of two sloping roof surfaces where the upper ends of the rafters meet. 2. An earth levee in terrace systems to hold runoff water. 3. The strip of land thrown up by a plow between two furrows.
- RIDGE AND FURROW HOUSES** - A series of gable roofed greenhouses located side by side and each sharing a common wall with another.
- RIDGE BOARD** - A board placed on edge at the ridge of the roof and between the upper ends of opposite rafters.
- RIDGE BUSTER** - A disk or moldboard implement which is used for tearing down ridges and filling furrows.
- RIDGE CULTIVATION** - See: Ridge planting.
- RIDGE JOINT** - The joint formed between the upper ends of opposite rafters.
- RIDGE PLANTING** - Planting crops on ridges that follow the contour of the field. This practice is used in areas of low rainfall where a large percent of the rainfall comes in short intense storms.
- RIDGING** - Small embankments or borders in fields to control irrigation water, conserve runoff from rainfall, or to assist in drainage.
- RIDING LISTER** - A lister mounted on a frame supported by two wheels. This frame supports a seat for an operator and has levers for adjusting the depth of the lister.
- RIFFER FILE** - A file having two curved cutting ends with a straight bar portion between, which serves as handle, the whole ranging from 5 to 9 ins. long. Such files are used by die sinkers, carvers, pattern makers and stone masons, for work in grooves and recesses. The shapes and cut of the curved ends vary considerably.
- RIFT SAWN** - See: Quarter sawed.
- RIG** - 1. An apparatus or outfit of tools for any particular purpose, more especially for well boring. 2. The complete assembly of beam, shanks, and shovels of the corn cultivator. 3. The equipment which is used for the application of spray material for the control of diseases and insects and for the control of weeds. 4. The equipment used for the threshing grain; threshing rig consisting of a farm tractor and a thresher.
- RIGGING** - That part of the saddle construction which has to do with the securing of the cinch around the horse.
- RIGHT-ANGLE DRIVE** - A gear box that will transmit power at right angles. That is, there is a 90° angle between the center line of the driving shaft and the center line of the driven shaft.
- RIGHT BANK** - That bank of a stream which is on the right when one is looking downstream.
- RIGHT GATHERER** - The gathering unit located on the right side of the unit on a two row corn picker or other field machine using gatherers.
- RIGHT HAND BOTTOM** - A plow bottom which throws the furrow slice to the operator's right as he faces the direction of travel.
- RIGHT-HANDED PLOW** - A plow equipped with right hand bottoms.
- RIGHT-HANDED ROTATION** - A clockwise rotation. The movement of rotating

- body from left to right following the direction of the hands of a clock when one is looking at its face.
- RIGHT HANDED SCREW** - A spiral screw whose threads are so cut that, in entering a nut, the latter must be turned right handed or similar to the motion of the hands of a clock. On viewing a male screw sidewise, the threads slant to the right, in going from the top to the bottom.
- RIGHT-HAND OPEN-END AUGER** - Part of the feeding mechanism which delivers the cut grain to the center elevator for delivery to the threshing mechanism of a combine. This auger is located on the right side of the combine and delivers grain to the center in contrast to a left-hand open-end auger which is located on the left and delivers the grain to the center.
- RIGID CONDUIT** - A wrought iron pipe raceway for wires.
- RIGID DRAWBAR** - A bar of steel that is rigidly attached to a tractor, usually with several holes spaced horizontally in the bar to provide attachment points for implements.
- RIGID FRAME** - All members are rigidly fastened together; the basic geometric figure can be any shape; and some or all of the component members carry bending in addition to axial loads.
- RIGID HARROW** - A spike tooth harrow that has braces across the steel bars attached to the spike teeth. This harrow is always in a working position.
- RILL EROSION** - Incipient gullies a few ins. in depth and width which frequently develop on unprotected slopes. It is an erosional stage transitional between sheet and bully erosion.
- RIM** - 1. The outer edge or periphery of a wheel or disk. 2. That part of a wheel which provides a seat for the attachment of a rubber tire.
- RIM DIAMETER** - Distance around a rim at point where the tire bead seats divided by 3.1416.
- RINGED-SHANK NAILS** - Nails used to tightly hold down such surfaces as metal, etc., through the use of narrow rings or ring on the shank of the nail.
- RING LAND** - The portion of an engine piston between the recessed ring grooves.
- RIPARIAN** - 1. Designating land which borders a stream or body of water. 2. Pertaining to the banks of a body of water; a riparian owner is one who owns to the edge of a body of water; a riparian right is the right to control and use water by virtue of the ownership to the bank or banks of a body of water.
- RIPARIAN DOCTRINE** - 1. Under common law the owner of land along a stream is entitled to have the stream flow to his land undiminished in quantity and unimpaired in quality by upstream riparian owners, except that such owners are entitled to use water for domestic purposes. 2. In some states, it is held that the riparian right includes the right to make use of the water for irrigation purposes and other uses, and that such right is a property right entitled to protection.
- RIPARIAN LAW** - The common law which deals with the nature and extent of rights to the use of water by adjacent land owners. See: Riparian doctrine.
- RIPPING CHISEL** - A chisel made to use as a prying lever, usually 18 to 24 ins. long with the point slightly cranked; a short, sharp crowbar.
- RIP RAP** - A bed of stones laid on a sloping river bank or stream or side of a levee or dam to prevent bank cutting by wave action or flood water erosion.
- RISER** - 1. A vertical face board connecting two stair steps. 2. The vertical section of a gully control structure which carries runoff water under an earth fill. 3. Pipes used in sprinkler irrigation to set the sprinkler heads above ground or crop level.

- RISER PIPE** - See: Riser.
- RIVER BASIN** - The large drainage area or watershed of a river.
- RIVET** - A short iron or soft-steel rod with a head at one end. It is put into a proper hole, and the other end is hammered down until a suitable head is formed. May be used hot or cold.
- RIVETED TRUSS** - A truss with members held together at its joints by rivets.
- RIVET TONGS** - Small tongs with curved lips to fit the shanks of rivets, by means of which they are transferred to the hole, etc.
- RIVETING** - The fastening of plates or parts together by means of rivets.
- RIVETING MACHINE** - A machine in which the operation of closing rivets is performed by power. The machine consists essentially of two parts, connected together by a hinge or by a solid yoke, one corresponding to the dolly which is held up, and the other to the riveting set, as wielded by the riveters. The former remains stationary, while the latter is operated either by gearing from a belt, or by means of a piston driven by hand power steam, compressed air, or, more frequently, hydraulic pressure.
- RIVETING SET** - In blacksmithing, a tool or die used to give a correct shape to rivet heads, under the blow of a heavy hammer.
- ROAD BRAKES** - A combination of the left- and right- wheel brakes on tractor, fastened together for use when traveling at relatively fast speeds, especially in road travel.
- ROAD GRADER** - A blade-type machine towed or self propelled, which is used in the building and maintaining of roads. Especially the moving and smoothing of earth, and also in constructing waterways and terraces.
- ROADSIDE EROSION CONTROL** - Any system for controlling and preventing erosion along roadways. Methods used will vary from elaborate structural control to simple vegetative control.
- ROAST(HOUSE)** - A house heated by hot air which is used in drying hops and malt.
- ROCK DRILL** - A reciprocating mechanism, mounted in a swiveling frame on a tripod socket, operated generally by steam or compressed air, but sometimes by hand; the reciprocating rod, with removable cutting head, revolves slowly as it works, and is provided with feed gear. Used to drill holes in rock, for shot firing, or plug and feather work.
- ROCK FILL DAM** - A dam which is composed of loose rock usually dumped in place, often with the upstream part constructed of hand-placed, or derrick-placed rock, and which is faced with rolled earth or with an impervious surface material such as concrete, timber or steel.
- ROCKING COUPLES** - Forces acting on an internal combustion engine due to the rotation of unbalancing masses. Rocking couples cause vibrations in engines and therefore, are undesirable for smooth operation.
- ROCKSHAFT** - A shaft that oscillates on its journals, instead of revolving, usually carrying levers or projecting pieces, as arms, wipers or tumblers by means of which it receives and communicates reciprocating motion, as in some valve gears.
- ROCKWOOD PULLEY** - A special type of pulley made of layers of fiber of pressed paper reinforced with metal and used on belt-operated machines that run at high speeds.
- RODDING OPERATION** - In concrete work, it is a method of settling or compacting freshly laid concrete by prodding or poking it with a small metal rod.
- ROD-FLOAT** - A rod or stall designed to float in a practically vertical position for the purpose of observing velocities.
- ROD-TYPE MOLDBOARD** - A moldboard plow which consists of round rods

- attached to the plow in such a manner as to form a surface upon which the furrow slice will be turned. There is little, if any pulverizing of the soil. It is found to be practical and useful in soils that are extremely sticky, and do not shed readily from solid moldboards.
- ROD WELDING** - A wire, stick or rod of metal of special composition used in welding as a filler material.
- ROD WEEDER** - A machine, usually about 10 to 12 ft. wide with 4 or 5 standards which support a round or square rod pulled a few ins. beneath the soil surface. This rod is driven by a ground wheel and turns in the opposite direction to the ground wheel. The action of the rod pulls up or cuts off weeds while not disturbing trash on or near the ground surface.
- ROENTGEN (R)** - The quantity of x or gamma radiation that will produce in 1 cu.cm. of air iron carrying 1 electrostatic unit of positive or negative electric charge.
- ROLL** - The revolving drum on which milk is dried in the drum or roll process.
- ROLL BOX** - The part of a round-bale hay baler, where the bale is formed.
- ROLLED SECTION** - A mild steel rolled into final shape in the form of angles or channels.
- ROLLER** - 1. A farm implement which is used for crushing lumps, smoothing the surface and firming the soil. 2. A set of rollers which is used for pressing the juice from canes for the production of molasses. 3. A set of rollers which is used for converting whole kernels of corn and other cereal grains into a flaky or gritty feed.
- ROLLER BEARING** - A bearing with several small cylindrical rollers held apart by a cage and rotating against the inside of a housing. Because of the long bearing surface these are especially suited for heavy loads.
- ROLLER CHAIN** - A power transmitting chain, or link belting, in which each rivet or joint pin is surrounded by a revolving roller or outside bushing sleeve, which reduces the friction and consequent wear and tear on the sprocket teeth.
- ROLLER DRIER** - A type of drier for milk in which the milk is dried in a thin film on the surface of a horizontal steel cylinder heated by steam. The dried milk is removed by a scraper knife.
- ROLLER GEAR** - A variety of spur wheel which has small rollers in its circumference instead of teeth, to lessen friction; it acts like a lantern wheel or wallower.
- ROLLER GIN** - A machine for separating cotton seed from the lint, it consists of a walrus-hide-covered roller which pulls the lint from the seed with the help of a moving knife and a fixed knife. This type of gin has a very small capacity of about 1 bale in 10 hr.
- ROLLER SORTER** - A machine to sort fruit and other large single objects into grades based on size, shape or geometry. One type of roller sorter consists of two diverging rollers which revolve. As the fruit passes along these rollers the smallest fruit drops through the space between the rollers first. Another type consists of a table with three or more roller units revolving counterclockwise. The fruit is fed into the smallest spaced roller first and is revolved for a time, then if it has not dropped through the space it is passed on to the next roller unit and the process is repeated.
- ROLLER SUPPORT** - Support designed as a roller so as not to resist lateral stresses of expansion and contraction. It will receive only perpendicular (vertical) loads.
- ROLLER TRACK** - An angle iron or other shaped member designed to receive the rollers on which a door, gate or other moveable item is suspended.

- ROLLER WHEEL - A broad wheel which is attached at the rear of a cotton planter to regulate the depth of planting the seed.
- ROLLING - 1. See: Roller. 2. A part of seedbed preparation in which the land is rolled with a heavy machine which crushes clods.
- ROLLING COULTER - A round, flat, steel disk sharpened on the edge and suspended on a shank and yoke from the beam of a plow, and is so constructed that it can be adjusted vertically for depth, and sideways for width of cut. It cuts the furrow slice loose from the furrow wall, especially when plowing under heavy plant growth with a moldboard plow.
- ROLLING FRICTION - A force acting on the surface of contact of two bodies when one rolls on the other. This force is much less than sliding friction.
- ROLLING LANDSLIDE - A flat-sided metal wheel which revolves on an axle fitted to the rear plow bottom, and which serves the same purpose as the bar landside.
- ROLLING RESISTANCE - A reactive force acting on a wheel when it is suffering a displacement on a bearing surface.
- ROLL-LESS CHURN - A type of churn in which agitation by concussion is utilized by allowing the soft freshly churned butter to drop violently from one shelf of the churn to another. See: Roll-type churn.
- ROLL-OVER PLOW - See: Reversible plow.
- ROLL-OVER SCRAPER - A type of earth moving equipment which supports the load of earth on the scraper bowl. When a full load has been gathered the bowl tips back enough for the blade to clear, and is then dragged to the unloading point, where it is unloaded by permitting the scraper assembly to roll over.
- ROLL-TYPE CHURN - A churn which is fitted with rollers to facilitate the working process. See: Roll-less churn.
- ROLL-TYPE ROTARY SPRAYER PUMP - A semi-positive displacement pump which has 4 or more rollers internally held against the housing by centrifugal force, and held in place by slots in the rotor. The rotor is placed off-center in the housing, and liquid is picked up as each roller enters the large side of the housing, is carried around to the smaller side, and discharged.
- ROLL ROOFING - A roofing material made of fiber saturated with asphalt. It is supplied in rolls 36 ins. wide and containing 108 sq.ft. Usually comes in weights of 55 to 90 lbs. per roll.
- ROOF COVERING - Any kind of surfacing material used to cover a roof and make it weathertight. It is fastened to the roof deck.
- ROOF DECK - The covering over the rafters to which is fastened the roof covering. Usually consists of 1-in. boards.
- ROOF FLASHING - Sheet metal used at intersections of planes in a roof to prevent water from seeping into a building. Also used around chimneys, etc.
- ROOF GIRTS - Horizontal members placed over or between and at right angles to the rafters. The girts form the deck for sheet type roofing materials such as sheet metal.
- ROOFING PAPER - A saturated felt used as underlayment for shingles or other roofing; usually weighs 15 or 30 lbs. per square.
- ROOF PLANK - A thin pre-cast concrete slab used for roof decking.
- ROOF TRUSS - See: Truss.
- ROOT CELLAR - A pit or underground room constructed to provide for the storage of root crops during the winter months. See: Cold cellar.
- ROOT DIAMETER - The diameter at the root of the threaded portion of bolts. This is the critical section as it represents the minimum cross section area.
- ROOT OF A WELD - That part of a weld at the bottom of the vee or groove.
- ROOT RAKE - A piece of clearing equipment made up of teeth that

- permits thorough combing of cleared areas to remove roots, stump fragments, small brush and undergrowth.
- ROOT ZONE** - That part of the soil profile invaded by the roots of plants.
- ROPE BLOCKS** - Lifting tackle in which a running rope is employed; except for very heavy weights, rope blocks are far handier for erecting and repairing work than chain blocks, whether differential or geared.
- ROPE DRIVE** - The transmission of power by means of rope gearing, the ropes being of either hemp or cotton, varying in diameter from 3/4 to 2 ins. The speed of ropes is from 3000 to 7000 ft. per min., 4500 being the average. The pulleys are usually of cast iron, the grooves on their surfaces being from 37° to 45°, the latter being the most common angle. Joints are made by splicing, the splice being 15 diameters in length, while the pulley should not be less than 30 times the diameter of the rope. Two plans are in use, one with independent ropes, suitable for transmitting power from an engine to numerous lines of shafting; the other, where only one rope is used, passing around all the grooves in turn and being kept taut by a tightener or jockey pulley; this last is very useful for drives at awkward angles or supplying power in series to a number of small units. With either plan the lower side should always be the driving side, and with the independent rope drive, a good horizontal sag should be given.
- ROPE SLING** - 1. A large sling or mesh-like arrangement made of rope which is placed on the wagon or truck when loading hay in the field and which aids in unloading of loose hay from the wagon to the mow. 2. A type of harness made from rope and used for lifting and supporting diseased animals when they are unable to rise and stand unaided.
- ROPE WEIGHT** - A balance weight fitted around a crane rope, to pull it down or unwind it after it has raised its load.
- ROPE WHEEL** - In machinery, a sheave pulley whose grooves receive the bight of a rope for hauling purposes. Rope wheels are used for overhead traveling cranes, hoists, etc.
- ROPE WINCH** - In rope making, a set of three revolving hooks or whirlers which, being rotated simultaneously, impart an equal twist to each of the three strands which are going to be laid up into a rope.
- ROSE BIT** - A reamer, whose cutting edges are so arranged as to cut on the point as well as at the side when enlarging a hole. A conical tool made in this manner is employed to make countersunk holes, and a development of the idea is seen in the rose cutter for milling machines.
- ROSE CUTTER** - A milling tool which has grooved edges radiating over it from a point or center, so that it may cut both on sides and point; a rose bit.
- ROSETTE** - A small two-piece insulator in which connection is made between wiring and drop cords attached to the wiring. Rosettes are made of porcelain in two parts called the base and the cap. Rosettes may be either fused or unfused.
- ROTAMETER** - A device used to measure flow rates of liquids or gases consisting of a glass tapered tube fitted with inlet and outlet connections, and containing a metering float with a diameter less than the inside diameter of the tube. The tube is placed in a vertical position and the fluid to be measured is admitted at the bottom of the tube and discharged from the top of the tube, as the fluid flows in the annular aperture. Between the float and the glass the float is elevated

- to a height where the forces acting on it are in equilibrium. The flow rate is then read from the calibration on the glass tube opposite the float.
- ROTARY ATOMIZER** - A device used in the production of evaporated milk which consists of an extremely high-speed spinner plate upon which the product flows to be atomized. The rapid whirling action picks up the particles and throws them off by centrifugal force, the degree of atomization depending upon the rotating speed and diameter of the spinner plate.
- ROTARY BEATER** - A type of machine used to shred stalks and trash in the field to allow easier working of the ground. A rotary beater consists of a set of hammers or flails attached to the rotor about every two ins. along the axis. The axis of the beater runs parallel to the row for shredding row stalks.
- ROTARY BRUSH** - 1. A metering device which is used in the application of insecticides and in sowing small seeds. 2. A cleaning device which is used in washing milk bottles and other containers.
- ROTARY CAN WASHER** - A device for washing milk cans by which the cans are washed on a large rotating table or carrier.
- ROTARY COMPRESSOR** - The unit of a refrigeration system that compresses the refrigerant into a high pressure vapor. This type is used sometimes on household or other small systems where pressure differentials are small or moderate. They are quiet, have high volumetric capacity with high rotation speeds and occupy a small space; tolerances must be close.
- ROTARY CRANE** - In erecting and operating, one having a jib swinging in a complete circle.
- ROTARY CULTIVATOR** - APTO or auxiliary motor driven apparatus which cultivates through the action of rotating knives. These knives penetrate the soil and pulverize it. This method of cultivation is used with close spaced rows such as sugar beets and various vegetable crops.
- ROTARY CUTTER** - A large, power driven blade rotating in a horizontal plane trailed by or mounted on a tractor, which is used for cutting various types of vegetation.
- ROTARY DRUM DRYER** - See: Rotary dryer.
- ROTARY DRUM WASHER** - A machine used to remove dirt, spray residues and other foreign materials from fruits and vegetables by washing them with a water solution. It usually consists of a long horizontally orientated rotating drum with corrugations on the inside much like the thread of a nut. These corrugations loosen dirt and move the product through the drum. The drum may have spray nozzles to assist in washing or the entire drum may be partially submerged in the washing solution.
- ROTARY DRYER** - A drying system often used for removing water from products. Material is fed into a horizontally oriented rotating drum which is fed with forced hot air. The rotating, trumbling action of the material as it is carried thru the drum exposes the material to the hot air, thus effecting the drying action.
- ROTARY FEED** - A metering device to spread fertilizer in a drill. It consists of a rod with short arms sticking out radially above each fertilizer hole. As the rod revolves the fertilizer is metered out the hole.
- ROTARY GRASS BOARD** - A revolving, spokeless wheel at the end of a mowing machine cutter bar which is used to divide and rake away the cut from the uncut grass.
- ROTARY HARROW** - See: Rotary hoe.
- ROTARY HOE** - A ground driven cultivating implement which usually consists of two gangs of curved, spike-like teeth rotating on axles, the points of which dig into the ground destroying young

- weeds and breaking the crust of the soil. The whole mechanism rotates by contact with the ground. For light cultivating the wheels overlap slightly to clear much better. For heavier tillage, the axles are skewed to secure a side component in the soil shearing action.
- ROTARY-HOE WEEDER** - A machine with rimless wheels attached between the cultivator gangs to run over a row crop, stirring the soil up around the young crop and at the same time shielding it from large clods.
- ROTARY HOMOGENIZER** - A machine in which the product to be homogenized is passed between two closely spaced rotating parts. (Not in common usage.)
- ROTARY KNIFE COTTON CHOPPER** - An implement which is equipped with rotary knives turning across the cotton row to thin or reduce the stand of cotton plants.
- ROTARY MOWER** - A machine that uses a rotary cutting mechanism for mowing forage, grain, weeds, lawns and other vegetation. Three common types are the rotary knife blade which rotates rapidly in a horizontal plane having a vertical shaft cutting by impact, the reel type in which knives attached to a horizontal shaft cut off the vegetation when passing a horizontal shear plate and the cylinder type in which high-speed knives attached to a horizontal shaft cut by impact.
- ROTARY PLOW** - Cutting knives (tines) or an auger mounted on a horizontal or vertical power driven shaft whose revolving tines loosen the soil or destroy weeds. Also called rotary tiller.
- ROTARY PUMP** - The general class of pumps in which rotating parts are used to cause displacement of a liquid including the gear, roller, rotor, impeller, propeller, auger and vane pump. They develop high pressure.
- ROTARY SCRAPER** - A scraper used for the handling of large quantities of earth which is constructed to tilt forward to load, to tilt backward to remove the blade from the ground for traveling and to rotate forward for dumping. Also called rotary fresno.
- ROTARY SPRINKLER** - A revolving head spray sprinkler which is used on sprinkler irrigation systems.
- ROTARY SUBSOILER** - A subsoiler with a thin, strong shank that has a chisel type point to loosen up the subsoil. A cylinder with spiral fins to cause rotation is attached to the shank to aid breakup of the soil.
- ROTARY TILLER** - See: Rotary plow.
- ROTARY TOOL** - A rotating bit used in drilling wells.
- ROTARY VALVE** - A valve, in which the disc, plug or other device, used to close the passage, is made to rotate back and forth for opening or closing; as, the Corliss valve.
- ROTATING PRESSURE COWL** - See: Pressure cowl.
- ROTATING SUCTION COWL** - See: Suction system.
- ROTATION** - The act of turning upon an axis or center; as, a wheel upon its axis.
- ROTATION IRRIGATION** - A system of irrigation through which the irrigator receives his allotted quantity of water, not at a continuous rate, but as a large flow at stated intervals; for example, a number of irrigators receiving water from the same lateral may agree among themselves to rotate the water, each taking in turn the entire flow for a limited period.
- ROUGHAGE** - Any food high in fiber and low in digestible nutrients. Usually refers to animal feeds such as hay, silage, straw, etc.
- ROUGH CUT** - In machinists' work, a first thickness of shaving removed from a piece of metal work in a lathe, shaping or similar machine. The rough cut is taken to penetrate under the skin of the metal.
- ROUGH FILE** - The coarsest cut given to a file; the other cuts, in order, the middle cut bastard, second cut, smooth and dead smooth.

- ROUGH FLOORING** - See: Subfloor.
- ROUGH GRADING** - The use of mechanical equipment to move soil to eliminate large variations in slope; i.e. the soil is moved about until the desired final grade is approached.
- ROUGHING DRILL** - A form of twist drill adapted for speedy working, but producing a rough cut; it has two cutting edges.
- ROUGHING MACHINE** - A mechanical featherpicker, usually one consisting of a rapidly revolving drum equipped with flexible rubber fingers against which the previously lightly scalded fowl is held to remove feathers.
- ROUGHING TOOL** - In machinists' work, the ordinary tool used by turners and machinists for removing the outer skin of metal, and generally, for turning cast iron, wrought iron and steel. It is either of solid cranked form or is a short length of rod held in a cutter bar. Its angles vary with the material upon which it is used.
- ROUGH LUMBER** - Unplaned and unfinished lumber as it comes directly from the saw. Dimensions are normally of full dimension.
- ROUGHNESS-COEFFICIENT** - 1. A classification of vegetal cover according to retardance in grassed waterways. 2. The factor used when relating the flow of a liquid to the medium it flows over.
- ROUGH SAWED LUMBER** - Lumber as it comes from the saw and before it is planed smooth on any face.
- ROUND BALE** - An oblong circular bundle of a fibrous material such as hay or straw.
- ROUND CRIB** - A corn crib made of snow fence or properly reinforced welded wire mesh usually of a temporary nature. May or may not have a roof.
- ROUND FILE** - In tools, a file circular in section. Round files are either tapered or parallel, the tapered files of small size being termed rat tail files. Round files are used generally for enlarging holes and shaping hollow curves. Round parallel files are also used for gulleting the teeth of large circular and pit saws.
- ROUND HEAD BOLT** - Two dissimilar shapes for bolt heads, etc., are known by this name; they are a flat circular head on a bolt with a square neck, used often by builders or carpenters, in fastening wood work. Commonly called carriage bolt and a hemispherical head, employed on bolts and rivets alike. For the sake of difference, the first one is generally known as a cheese head, the second as a snap, because it is a shape unattainable by direct hammering, but necessitates the use of a snap die to shape it.
- ROUND NOSE CHISEL** - A machinists' hand chisel, forged like a cape or cross cut, but with a semi-circular point for cutting grooves, dressing out holes, etc.
- ROUND POINT CHISEL** - A chisel with a conical point, the edge being formed by grinding it obliquely, thus presenting an elliptical cutting face. Used for cutting grooves, etc., in metals.
- ROUNDING TOOL** - In blacksmithing, a swage tool hollowed to a semi-cylindrical section and used by smiths for rounding and finishing iron rods.
- ROUTING MACHINE** - A revolving cutter machine which removes part of a surface and leaves the rest in relief.
- ROUTING TOOL** - A rotating steel cutter used for routing in metal; the cutting tool of a routing machine.
- ROW BINDER** - An implement which is used for harvesting and tying bundles of a crop grown in a row, as a corn binder.
- ROW CROP DROP EXTENSION** - An attachment which converts boom sprayers from overtop spraying to spraying between the rows of row crops.
- ROW CROP FIELD CHOPPER** - An implement which is used for harvesting and chopping row crops, especially of corn.
- ROW-CROP PLANTER** - Any machine

- designed and constructed to plant seeds in rows far enough apart so that area between rows can be cultivated.
- ROW CROPS** - The rows or planting beds are far enough apart to permit the operation of machinery between them for intertilling or other cultural operations.
- ROW-CROP TRACTOR** - A type of tractor that is primarily designed for operations in row crops. It usually consists of a tricycle type wheel arrangement.
- ROW MARKER** - Any device used on a row planter to make a continuous mark in the unplanted ground to act as a guide on the next round, planting the next rows the proper spacing from those already planted.
- RUBBER BELTING** - A belt made of rubber used to transmit power from one pulley to another.
- RUBBER-EDGE ANGLE BAR** - Used on the cylinders of the threshing mechanism of some combine or threshing machine. The grain is removed by the beating action of the bar, the rubber on the bar face forming a cushion which helps prevent cracking of the grain.
- RUBBER TILE** - A rubber floor covering material for houses and public buildings. The tiles are usually 8 x 8 ins. or 12 x 12 ins. in size. They are bonded to the sub-floor with a specially designed cement.
- RUBBER TIRE** - A wheel tire made of rubber and usually filled with air under pressure. Used on various agricultural implements, as tractors, combines, wagons, etc.
- RUBBING MACHINE** - A device which is used to remove awns and glumes from the seed of native grasses so the seed will flow through a seed drill.
- RUBBLE** - Any building stone which is not highly finished and not in a structure. Rough stone as it comes from the quarry or field.
- RUBBLE DAM** - An unmortared dam which is made of broken stones, bricks, etc., similar to a loose rock dam and used in gully control.
- RUBBLE MASONRY** - Masonry construction where large stone or ledge rock is bonded with mortar to form a wall.
- RUBBLE MASONRY DAM** - A dam which is similar to rubble dam except that reinforced concrete may be used for added protection and rocks are set in mortar.
- RUDDER** - Part of a middle breaker or lister that acts much like a landside on an ordinary plow. A knife or rudder blade is attached to the bottom of the rudder to keep the middle breaker straight.
- RUDDER BLADE** - 1. An attachment for the bottom of a lister which serves to steady the plow. 2. An attachment which serves to steady a cultivator. Also called drag iron.
- RUFFER** - A rough kind of comb used in the first operations of combing flax by hand. It consists of a tin covered stock fastened to a board, set slantwise to a bench, the teeth sloping away from the operator who operates by pulling the flax through the teeth with a circular sweep.
- RUN** - 1. The horizontal distance compared to vertical rise for any slope. 2. With respect to roofs, the horizontal distance from the outside edge of a wall to the ridge or one-half the span. 3. With respect to stairs; the total width of the treads or the horizontal distance covered by a flight of steps.
- RUNNER** - 1. One of the stones of a flouring mill. 2. A rope used to increase the mechanical power of a tackle. 3. In founding, a gate or sprue, more properly the channel conducting the molten metal from one casting to another, when several are cast in the same mould, as with plate moulding. The term is also applied to the metal left connecting the castings. 4. The fast driving pulley of a pair of fast and loose pulleys. 5. A part in a torque converter. 6. The metal bar that slides along the ground and holds the rest of the machine up on a harrow or drag. 7. The part of a

- furrow runner that bears on the soil in a planter.
- RUNNER FURROW OPENER** - A short metal strip or bar which extends down in front of the planting attachment on a planter and opens a trench into which the seed falls.
- RUNNING AWAY** - Action of an engine which when operating at open throttle with no load or very little load, will speed up and continue speeding up until burned out or turned off.
- RUNNING DEEP** - A term used to describe a plow slicing a deeper furrow than wanted.
- RUNNING FIT** - That fit in practical mechanics where one part will run indefinitely in another when lubricated, the amount of difference between the male and the female part depending upon the class of the work. Thus, for a 2 in. shaft, the hole would be bored from .0015 to .0035 in. larger, the latter size giving a very easy fit.
- RUNNING GEAR** - The wheels, axles and frame of a vehicle; usually a wagon or trailer.
- RUNNING BOND** - A condition referring to overlapping stretchers in adjoining courses of masonry work.
- RUNOFF** - 1. That portion of total precipitation that finds its way into drainage channels. It consists of ever-varying proportions of both surface water runoff, and ground water runoff. 2. Water which is removed from soil by surface drainage or subsurface drainage. Also called flowoff. 3. The surface discharge or rate of discharge of a given watershed after a fall of rain or snow.
- RUNOFF COEFFICIENT** - The percentage of rainfall in a storm which is of a specified magnitude that may be expected to run off from a watershed.
- RUNOFF LOSS** - The amount of water that flows off the lower end of the field.
- RUNOFF MODULUS** - The depth of water in ins. over the under-drained area which must be removed by the drains in 24 hr.
- RUNOFF-RETARDING STRUCTURE** - Structures such as terraces and their outlets, diversion ditches and gully control structures which reduce soil erosion by water and may increase infiltration.
- RUNOFF WATER** - See; Runoff.
- RURAL ELECTRIFICATION ADMINISTRATION**
- Created by executive order May 11, 1935, and later reorganized and revised to become a part of the Department of Agriculture, July 1, 1939. The agency authorizes loans for central station electric service; for rural electric and telephone system loans and loans to finance the wiring of farmsteads and installation of electric appliances and plumbing. Loans are not made directly to consumers but to R.E.A. borrowers for group use or relending to members.
- RUSTICATED** - The beveled grooves between adjacent stones that make the joints conspicuous in stone work.
- RUSTIC SIDING** - See: Dropsiding.
- RUST-RED FLOUR BEETLE** - A non-boring grain damaging insect which feeds only on broken kernels and bran and does not damage whole kernels.
- RUTTER** - A form of plow in the lake states in the early days of logging which was used for cutting ruts in an iced logging road for the runners of the sled to fit.

- SACKING SPOUT** - A spout through which material will pass in order to fill sacks. Such materials may be flour or grain, from a threshing machine, combine, mill or elevator. The sacks are firmly attached around the periphery of the spout.
- SADDLE** - 1. A rest, or stop, for chassis-mounted conveyors, augers and elevators primarily intended to stop scissoring chassis arms from descending beyond safe supporting angle. 2. A small double sloping roof to carry water away from the back of a chimney. 3. Horizontal pieces set on top of a post to diminish the unsupported span of a beam.
- SADDLE DUSTER** - A manually operated insecticide duster which is placed on a horse or mule so that the operator may ride and dust a row on each side; also called saddle gun.
- S.A.E. STANDARD SCREW THREAD** - The standard thread on fire equipment. These threads should only be used on high tensile strength steel as intended. The thread is too fine for softer material as, for instance, tire lug bolts which have often been stripped by using too much strength in screwing up the nuts.
- SAFE EDGE** - An uncut edge on a file; an edge presenting a smooth surface, without teeth, so that the file may be used in a corner and cut on one surface only.
- SAFETY FACTOR** - The ratio between the ultimate load and the design load for materials, structures or mechanisms. This provides a measure of safety to cope with load in excess of design load without failure. Also called factor of safety.
- SAFETY HOIST** - In machinery, any hoist constructed with differential pulleys; also an ordinary rope hoist in which an automatic catch or safety stop secures the apparatus against running down.
- SAFETY RELEASE HITCH** - An attachment which is designed to release a pulled implement, such as a plow, mower, etc., from a tractor when the implement strikes an obstruction.
- SAFETY SHIELD** - Shield used to protect a person from rotating shafts on machinery.
- SAFETY STOP** - A device fitted to many stationary engines, whereby the engine is stopped automatically should anything happen to the governor. Electrical devices are fitted to the engines of some large plants, whereby the engine may be stopped in case of accident from various points on the premises; the apparatus is placed in a glass fronted box, like a fire alarm, to protect it.
- SAFETY SWITCH** - A switch, usually of 30 amperes or more capacity, enclosed in a grounded metal box, and so arranged that the door of the box cannot be opened unless the switch is off.
- SAFETY THERMAL-LIMIT RECORDER** - Part of a short-time high-temperature pasteurizer control. The safety thermal-limit recorder serves 3 functions. It records the temperature of the milk leaving the holder tube, actuates electrically the flow diversion valve and it records whether the flow diversion valve is in forward flow or diverted flow of milk which depends on whether the bulb of the safety thermal-limit recorder is above or below the cutout temperature.
- SAFETY VALVE** - A device or valve to relieve pressure in a tank or boiler should the pressure exceed the predetermined setting.
- SAG ROD** - A member used in tension, as for sustaining a suspended weight.
- S JOINT** - In sheet metal working, a method of connecting two surfaces, which are at right angles to each other, by means of a doubly bent strip, somewhat like the letter S reversed.

- SAL AMMONIAC - Ammonium chloride, chiefly obtained by distillation of the ammoniacal liquor of gas works, neutralization with hydrochloric acid, and concentration of the liquid by evaporation until crystals are formed. The chloride is very soluble in water, and is much used as a chemical reagent and in shop processes.
- SALIENT POLE - A type of shaded-pole motor with a main winding and a shading coil for each pole.
- SALINITY - The amounts of neutral or non-alkaline salts, usually chlorides and sulfates, in the soil.
- SALMON BRICK - See: Soft brick.
- SALOMETER - A device, usually a hydrometer with special graduations in degrees or percentages, which is used to determine the strength or salinity of a particular salt solution. An apparatus for determining ash, as in sugar products, by conductivity measurements. Also called salimeter, salinometer.
- SALT ALUM TANNING - A simple method of tanning sheep skins whereby the previously salted and fleshed skins are treated overnight with a 2 to 1 mixture of salt and alum and later on with Neat's foot or glycerine.
- SALTATION - The bounding, tumbling movement of soil particles along the soil surface which is caused by wind or water action.
- SALT BALANCE - The amount of soluble materials that must be removed from the soil and ground water of an irrigated area must be at least equal to the amount entering the area from all sources.
- SALT-TOLERANT - The ability of plants to grow when supplied with water that contains salts.
- SALT WATER ENCROACHMENT - The gradual entrance of salt water into fresh water aquifers.
- SAMPLER - Any of various devices which is used for taking a representative small portion, as from a bag, a car of grain, a can of milk, a tub of butter, a cheese, etc. See: Sampling tube.
- SAMPLING TUBE - 1. Any of several tube-like devices, commonly made of brass or stainless steel, of open or closable types which is used for extracting representative samples of grains, feeds, seeds, liquids, gases, etc. 2. Any of several kinds of tubes which is used for collecting samples of soils.
- SAND-AND-BOLL SCREEN - A device for cleaning cotton seed which consists of an inclined reel covered with revolving screens of various-sized meshes to separate seeds and foreign matter according to size.
- SAND BAG - A bag of burlap or other stout fabric which when filled with sand or earth is used for flood control. Its purpose is to increase the height of or to reinforce a levee, etc.
- SAND SCREEN - 1. A screen which is used in corn shellers, etc. for the removal of grit and sand. 2. A screen which is used to separate coarse aggregate from sand.
- SAND TRAP - A device, often a simple enlargement or sump, in a ditch or conduit which is used to arrest the heavier soil particles carried by the water. The means for removal of such material may be included.
- SANITARY FITTING - Pipe fitting used on the milk piping systems of dairies. These fittings are designed so they can easily be disassembled for cleaning.
- SANITARY PUMP - Any of several kinds of pumps for the handling of milk and other liquids whose parts can be easily removed for thorough cleaning and sterilization and which is made of a metal which does not affect the product being handled.
- SANITARY SEWAGE - Sewage wastes from the bathrooms, kitchens, utility rooms of houses. Water from storm drains, surface runoff and ground seepage is not included.
- SANITARY SEWER - A sewer designed to carry sanitary sewage only.
- SANITARY TRAP - A part of a vacuum

- pump installation in a milking machine which is designed for collecting and holding unwanted materials. It can be easily emptied and cleaned.
- SANITATION** - Means biological cleanliness such as clean air, clean water and clean food for both man and beast.
- SAP CLEAR** - A grade of oak flooring which is quarter-sawed with one face practically free of defects, but permits unlimited sap.
- SAPONIFICATION** - A reaction between a fat or fatty acid and a metal component like alkali which forms soap. This soap is one of the constituents of grease.
- SAP STAIN** - See: Blue stain.
- SAPWOOD** - The outer portion of wood in a tree. It is the living portion of the tree through which the sap is transmitted to the leaves. The wood is less decay resistant than the heartwood and it generally lighter in color.
- SASH** - 1. The frame in which the glass in a window or a door is set. 2. The movable part of a window including glass and framing. 3. A frame with glass in it used to cover a hot bed.
- SASH BAR** - A wooden or metal bar in a sash or frame especially shaped to hold and support the glass as in a building window, a greenhouse, or a hotbed frame.
- SASH HOUSE** - A frame structure covered with window sash to provide an inexpensive hotbed or small greenhouse. It is commonly used to start plants for later transplanting.
- SATURATED AIR** - Air containing its maximum capacity of water vapor at any given temperature.
- SATURATED AMMONIA VAPOR** - Vapor of ammonia (NH_4) which contains an amount of heat energy to exactly vaporize every particle; there is no free liquid and no superheat.
- SATURATED SALT SOLUTION** - A salt solution containing all the salt it can hold in solution at a given temperature. Addition of salt to the solution will result in precipitation of salt.
- SATURATED SOIL** - A soil condition that exists when all of the pore spaces (the small openings between the soil particles) are filled with water.
- SATURATED STEAM** - All of the water is in the form of vapor and at a temperature such that lowering of the temperature would cause a condensation of part of the steam and raising it would cause superheat.
- SATURATION HUMIDITY** - Relative humidity of 100% which also refers to saturation vapor pressure.
- SATURATION PRESSURE** - See: Saturation vapor pressure.
- SATURATION VAPOR PRESSURE** - The maximum vapor pressure in air at a given temperature that can exist without condensation.
- SAUSAGE STUFFER** - A device which consists of a cylinder with a tubular outlet and a plunger used for forcing prepared sausage meat into casings.
- SAW** - 1. A strip of steel having sharp tooth projections, which when drawn back and forth is used to cut wood or metal. It is also made in circular disk form and in endless band form. 2. Teeth which project into and form the bottom of the ginning roll box of an air-blast cotton gin.
- SAW BUCK** - One or two X-shaped frames sometimes called a saw horse used for supporting poles and small logs to be sawed.
- SAW SET** - An instrument used to set or turn the teeth of a saw a little outward, that they may make a kerf somewhat wider than the thickness of the blade, to prevent clogging or friction.
- SAW TEETH** - The sharp projections on a saw. The angles of saw teeth vary with the work they have to do. The angles of the faces are from 80 to 85° for hard, 65 to 70° for soft wood, and the relief angle is 65 to 70° for hard, 45 to 50° for soft wood. The spacing and the set should be greater for soft than for hard wood. For cross cutting, the

- teeth are set farther back than for ripping.
- SAW TIMBER** - Standard trees large enough to be economically cut, and made into lumber.
- SAW-TOOTHED GRAIN BEETLE** - A type of insect causing damage to stored grains.
- SAYBOLT UNIVERSAL VISCOSIMETER** - A device which is used in measuring the viscosity of oil. It is a metallic funnel which permits oil to run through a small orifice under predetermined standard conditions.
- SAYBOLT VISCOSITY** - The time in sec. it takes 60 c.c. of oil to flow through a Saybolt Universal Viscosimeter under specified conditions.
- SCAB** - A short board or plank fastened to the side of the butt joint of two structural members. It keeps the members in line and gives strength to the joint.
- SCAFFOLD** - A temporary framework and platform erected adjacent to new structures to allow men to work on the elevated portions.
- SCALDING VAT** - A tank of very hot water for dipping of hogs, poultry, vegetables or fruits, causing hair, feathers or peels to loosen for easy removal.
- SCALE** - 1. Any instrument or device which is used to determine weight. 2. Either of the pans of a balance. 3. A measure of dimension, concentration or intensity. 4. An instrument or device on which graduated spaces for measurement have been stamped or attached. 5. An accumulation of minerals on the wall of a container or tube used for holding or heating water.
- SCALE FACTOR** - The number represented from the origin on the x-axis equal to the length of one cycle on the y-axis for a semi-logarithmic plot.
- SCALE WELDING** - A special purpose technique used in making fillet welds in which distortion or overheating of a thinner section becomes a problem. A puddle is created, some welding rod added and the puddle enlarged, and then the flame is withdrawn and the puddle allowed to solidify. A new puddle is created overlapping the first and the operation is repeated.
- SCALLOPED-EDGED ROLLING COULTER** - A rolling-type coultter with notched or scalloped edges which is designed for the cutting of heavy trash. Also called notched coultter. See: Coultter.
- SCALPER** - A machine or device used in flour or feed mills for the removal of the outer seed covering of grains.
- SCALPING SCREEN** - The top sieve on a cleaning or sorting machine. Its purpose is to take off large foreign objects from the material being cleaned or sorted so the lower screens can do a better job.
- SCANTLING** - A piece of lumber 2 to 5 ins. thick and less than 8 ins. wide.
- SCARF WELD** - A joint that is made by overlapping and welding together the scarfed ends or edges of metal rods, sheets, etc.
- SCARIFY** - In soil tillage, it pertains to loosening the top particles by means of machines equipped with a set of steel teeth. Designed to penetrate the soil when moved across the surface.
- SCATTERING DISKS** - Round metal plates with several bars across the top of the plates mounted in a horizontal position beneath the hopper on a seeder or end-gate lime spreader to distribute and spread the lime or seed as it falls from the hopper. This is done by rotating the scattering disks so that when material strikes them it is propelled out-ward.
- SCAVENGE** - To remove burned gases from the cylinder of an internal combustion engine after a working or power stroke.
- SCAVENGING CYLINDER** - An air pumping or compressing cylinder which supplies scavenging air to a 2-cycle engine. Not common in agricultural tractors.
- SCHEMATIC DIAGRAM** - A line drawing

- showing a system or process by the use of symbols to represent the sequence and relation of operations.
- SCIMITAR BONING KNIFE** - A knife of medium length with an upward curving (scimitar shaped) blade which is adapted to the boning, pelting and skinning of slaughtered animals.
- SCISSORS** - A cutting instrument resembling shears, but smaller, consisting of two cutting blades with handles; often called a pair of scissors.
- SCLEROSCOPE TEST** - A test measuring resiliency in which a small, standard-weight ball is dropped from a standard height to the surface of the specimen being tested; the height of rebound of the ball is a measure of resiliency.
- SCOOP** - 1. A bucket or vessel with a handle which is used for dipping, gathering, skimming, etc. 2. A shovel-like implement which is used for dipping, gathering, digging out, or shoveling; as a grain scoop, cranberry scoop, curd scoop, etc. 3. A small implement (usually curved) which is used for cutting, gouging, or removing an amount of material; as an ice cream scoop. 4. A mechanical implement with a large bucket which is used for the removal or conveying of earth, liquids, etc.
- SCOOTER** - A narrow plow with a short V-point which is used for opening furrows or breaking up soil between crop rows. Also called shovel, bull tongue, dolly.
- SCORE** - 1. To mark with cuts, notches, scratches or gashes; as, to score a log for hewing. 2. In founding, to split or burst a casting by unequal cooling.
- SCOUR** - In soil and water conservation it pertains to the removal of sand or earth from the bottom or banks of a stream by erosive action of flowing water.
- SCOURING** - Process of soil passing over the surface of the share and moldboard on a plow. A plow is said to scour well when the soil does not stick to the surfaces and is said to scour poorly when the soil sticks to the surfaces of the plow.
- SCRAPE IRON** - In turpentineing, an instrument which is used in gathering scrape from faces.
- SCRAPER** - 1. A blade on a bulldozer or grader which may be mounted on the front, rear or center. 2. Part of a disk plow being the small metal piece connected to the frame in such a way that it will scrape off any dirt sticking to the disk as it revolves. They may be of two types - stationary, bolted tightly so they can be moved and adjusted only slightly by slotted holes; oscillating type, held against the disk by springs and may be moved by a lever to clean the whole disk. 3. Part of a chain and flight conveyor. It is the bar crosswise of the channel which carries the material along. Also called flight.
- SCRAPER BLADES** - Part of an ice cream freezer. The purpose of the blades is to remove the frozen film of ice cream from the heat transfer surface of the freezer continuously and mix it with the body of the product being frozen.
- SCRAPER CONVEYOR** - A type of elevator that moves grain or other produce in a trough by paddles mounted on a chain or chains. These paddles drag the produce along.
- SCRAPER HILLER** - A blade or sweep attachment which is used on cultivators for piling the soil up around rows of crops.
- SCREEN** - 1. A sieve or grating, such as a frame covered with meshed wire or fabric, or a perforated plate, etc., which is used for separating the finer or coarser parts of soil, gravel, grain products in milling, seeds in cleaning, etc. 2. Any form of grating used to prevent invasion or escape of insects, reptiles, fish or other kinds of animals. 3. A construction or planting which is used to conceal an unpleasant sight. 4. A unit through which grain or other

- products are forced to break into smaller sizes.
- SCREEN GRADE** - Vibrating screens are used permitting smaller size fruit to fall thru each succeeding screen. For certain items a perforated revolving cylinder may be used.
- SCREENING** - 1. Crushed stone, including the dust of a size that will pass a 3/8 in. sieve. 2. Chaff and dirt filtered out of grain.
- SCREEN-TYPE PRECLEANER** - An air filter which cleans some of the dust out of the air before it gets to the air cleaner to reduce the load on the air cleaner. This type consists of a small mesh screen set in front of the passage to the air cleaner.
- SCREW AUGER** - Auger for conveying materials, designed on the principle of a rotating screw.
- SCREW CAP** - A screw-top closure, as for a bottle.
- SCREW CHASER** - A chuck used by wood turners, which saves the necessity either of attaching a driver to the work, or of chucking it on a plate. A small tapering screw point projects from a chuck, serving as the lathe center; the piece of wood to be turned is screwed upon this and is held fast in its proper position without bolts or clamps.
- SCREW CONVEYOR** - A mechanical contrivance consisting of a single plate or double plate helix which is formed about a shaft in a spiral and whose auger-like channels push materials along a trough or through a tube, as with grain, silage, etc. Also called spiral-auger conveyor.
- SCREW CONVEYOR FEED** - A type of feed used with bulk materials which consists of a screw conveyor placed in the bottom of the hopper to convey the material out. Above the conveyor is an agitator to keep the material from bridging. See: Screw conveyor.
- SCREW CRANK DEPTH REGULATOR** - A mechanical device consisting of a screw spindle with a crank on one end to permit the making of depth adjustments by turning the screw.
- SCREW PLATE** - A tool furnished with a graduated series of screwed holes whereby threads of small diameter, usually under 1/4 in., may be formed. Screw plates are made of different sizes and thicknesses according to the size and range of holes, with which they are provided, the smallest size made being capable of cutting threads on a fine needle. Corresponding taps are generally furnished with the plate.
- SCREW PUMP** - A pump having an inclined or vertical shaft with many propeller-like blades attached to the lower end of the shaft in a screw pattern. The shaft rotates in a cylindrical casing. The pump is particularly adapted to low-lift conditions, such as exist in some coastal drainage areas and organic soil areas.
- SCREW-SHANK NAIL** - A type of nail with a deformed shank with a high degree of resistance to withdrawal, especially suited to hold metal roofing. Larger shank sizes used for framing especially where preservative wood is used. The shank of the nail is formed with threads like a screw.
- SCREW VISE** - A clamping device, consisting usually of two jaws made to be closed together with a screw, and commonly attachable to a bench; used for grasping or holding a piece of work that is being operated upon.
- SCRIBE** - An awl or spike used by brick setters to mark bricks on back and front, so that they may be accurately cut to a proper taper for gaged work.
- SCRIBE AWL** - An awl used for marking lines to be followed in sawing or cutting out work.
- SCRIBE MARKS** - In a bulk milk tank, permanent marks placed on the inner or outer tank, usually at or near the four corners. The marks, if placed on the inner tank, are used

- to indicate a level plane of the bulk milk tank when the surface of a volume of water touches all four marks simultaneously. The marks are placed on the outside of the tank as a guide in placing a standard carpenter's spirit level.
- SCRIBER** - A steel tool for marking lines on work. The scriber used by machinists is usually pointed at both ends, one end being turned at a right angle to mark or test surfaces; other patterns have a point at one end and a hole at the other. The scriber used for marking timber has a point at one end for scratching and a knife at the other end for cutting the marks.
- SCRIBE SAW** - A saw designed for cutting meat and bone which is used for cutting up carcasses, especially for making the longitudinal cut through the vertebrae.
- SCROLL SHEAR** - A type of hand-operated shear designed for cutting intricate shapes.
- SCRUBBER** - A chamber containing a strong solution of sodium hydroxide or potassium hydroxide for the removal of carbon dioxide. Used in controlled atmosphere storage structures to prevent an excess accumulation of carbon dioxide in the air.
- SCUM BOARD** - A vertical baffle submerged below the surface of sewage in a tank to prevent the passage of floating matter.
- SCUTCHING MACHINE** - A machine or device which beats off the woody tissue (scutch) from flax or hemp and separates it from the long, unbroken fiber.
- SEALED CAN** - A metal container which has been closed by soldering, crimping, or other means, so as to prevent leakage or contamination of its contents.
- SEALED CLOSURE** - A tamper-proof closure or seal for bottles, etc., which cannot be removed and replaced without detection.
- SEA-LEVEL HORSEPOWER** - The horsepower developed by an internal combustion engine when it is operating under standard sea level conditions of 60° F. and 29.92 ins. Hg. barometer pressure.
- SEAL COAT** - A surface treatment, consisting of one application of bituminous material and aggregate passing a 3/8 in. sieve, used as a final coat on bituminous macadam or concrete to seal the surface.
- SEALED BEARING** - An antifriction bearing with leather, synthetic rubber or some other type of seals to keep dirt out of the bearing. This eliminates daily lubrication of the bearings.
- SEALING** - In soil and water conservation it pertains to a condition of bare soil that will not allow rain water to infiltrate the surface. This condition can be caused by the impact of the raindrops.
- SEALING WAX** - A mixture, as of shellac and turpentine with an added coloring matter that is fluid when heated but quickly solidifies on cooling, which is used for making seals, as on bottles, jars of preserved fruits, etc.
- SEAMING IRON** - In metal working, a tool for joining or working the edges of sheets of metal.
- SEAMING MACHINE** - An arrangement of appropriate rollers, used by sheet metal workers, to form seams, or joints, by bending the edges over, or doubling them; a power press.
- SEAMLESS TUBING** - Drawn tubing without joints, as distinguished from pipe or tubing with welded longitudinal joints.
- SEASONED WOOD** - Lumber which has been cured and dried and is suitable for building material.
- SEASONING** - The drying of green wood into seasoned wood.
- SEASONING DEFECTS** - Defects of lumber occurring because of poor drying conditions. They include: bow, crook, cup and warp.
- SEAT GUIDE** - A method of controlling cultivator gangs on a riding cultivator so as to follow the

- row and prevent plowing up of plants. The seat support is pivoted to the rear end of the tongue, and gangs are controlled by shifting sideways in the seat with an easy swaying motion of the body aided by pushing with the feet against the gangs. Also called wiggle tail, pivot pole, pivot frame.
- SECONDARY STRESSES** - Stresses, other than primary stresses, axial tension or compression, which act on a part of the structure.
- SECOND-FOOT-DAY** - The volume of water represented by a flow of 1 cu.ft. per sec. for 24 hr. The volume equivalent is 86,400 cu.ft., or nearly 2 acre-ft. (actually 1.9835)
- SECTION HARROW** - See: Spike-tooth harrow.
- SECTION MODULUS** - A property of a particular cross-section of a structural member which is equal to the moment of inertia of the cross-section divided by the distance from the center of gravity of the cross-section to the outermost fiber.
- SEDIMENT** - Material that settles in quiet or less turbulent liquid.
- SEDIMENTATION BASIN** - Any structure or reservoir that provides for sediment accumulation.
- SEDIMENT CONTROL STRUCTURE** - A control structure in open channel water flow to slow its movement and cause settlement of excessive amounts of soil particles.
- SEDIMENT-LOAD MEASUREMENT** - Periodic sampling of runoff water for determination of the concentration of soil particles in suspension.
- SEDIMENT-RATING CURVE** - A graphical plot showing the relationship between sediment load and discharge at a specific runoff point.
- SEDIMENT TRAP** - A manhole or catch basin providing for a storage volume below the tile line grade for collecting the sediment.
- SEDIMENT YIELD** - The sediment produced by a specific watershed normally measured as accumulated in a pond or stream.
- SEED ATTACHMENT** - 1. The attachment on a grain drill from which small forage seeds are sown at planting time. 2. A seed device that can be attached to a farm implement ordinarily used for some other purpose, such as a weeder.
- SEED BALL** - A group of seeds grown in one compact unit and which have to be mechanically separated to make single seed planting possible.
- SEEDBED LEVELER** - A mechanical device which is used to level the surface of a seedbed prior to seed, such as a roller or land plane.
- SEED BOX** - On a seed planter or drill, the box that holds the seed. It is equipped with adjustable outlets to regulate the quantity of seed to be sown. Also called seed hopper.
- SEED CELL** - The space left for a seed to fill in a seed metering device.
- SEED CLEANER** - Any of several devices which remove undesirable material from seed, especially one with screens and a fan used for the separation and removal of chaff, weed seeds, shriveled seed, dirt, etc., from seed. Also called a fanning mill.
- SEED-COTTON DRIER** - Any of several devices which removes moisture from seed cotton so that it can be successfully ginned.
- SEED CUT-OFF** - Part of a seed metering device in a planter, the object of which is to make sure only one seed passes through in each seed cell. It does this by knocking the top seeds off the revolving seed plate.
- SEED-DELINTER** - A machine which removes the short-staple fiber still adhering to cotton seed after ginning.
- SEED DRILL** - A machine that sows and covers grass and grain seed in spaced rows at a controlled depth. See: Grain drill.
- SEEDER** - Any device which is used for sowing grass and grain seed

- on the ground surface to be covered later if necessary by a separate machine. See: End-gate seeder, broadcast seeder.
- SEEDER ROLL** - A roll, composed of very fine circular saws, which operates against a revolving rubber roll and extracts the seeds from previously softened unseeded raisins in commercial raisin-seeding operations. See: Flicker roll.
- SEED FLOW REDUCER** - A wire or cast metal device which is used in the seed cups of grain drills (when seeding small seeds such as alfalfa) to reduce the rate of seed outflow. Also called wire reducer.
- SEED FURROW** - A furrow in which potatoes, etc., are planted and which is gradually filled by early cultivation.
- SEED-FURROW OPENER** - A double-pointed shovel, a runner shoe opener, or similar part of a planter, which opens up a furrow into which the seeds are deposited.
- SEED GRADER** - Any of several mechanical devices which is used to grade seed according to size, shape, weight or combination of these characteristics to eliminate inferior seeds and to obtain greater uniformity. See: Fanning mill.
- SEED HOPPER** - A box or hopper which holds the seed on a planter, drill or seeder, etc. The hopper often is equipped with a mechanical feeding device and a means of regulating the quantity of seed to be planted or sown.
- SEEDING LATH** - A device on drills which is used to get an even distribution of seed in the seedbed.
- SEED KNOCKOUT** - A mechanical device, usually actuated by a spring which knocks the seed out of the seed cell in a seed plate. The seed then travels down the tube to be planted.
- SEED PLATE** - A part of a seed metering device used in metering seed to the soil. The circular plate has holes, cells or notches around the outer rim, which will permit only a certain number of seeds to be metered at one time. The plate is rotated in contact with the seeds.
- SEED PROCESSING** - 1. Treatment of seed for removal of foreign materials, such as trash or unwanted seeds. 2. The act of cleaning, testing, treating and packaging of seed for sale.
- SEED SPOUT** - The part of a planter where the seed is released into the ground.
- SEED TREATER** - Any of several contrivances which is used for the treating of seeds with disinfectant in disease control, such as a mechanical cleaner-grader-duster, oil barrel treater, etc.
- SEED TUBE** - One of the tubes on a planter or seeder which conducts the seed from the hopper or feed cup down through the boot and furrow opener into the furrow.
- SEEPAGE** - Seepage from a canal or reservoir represents a loss conventionally expressed as a depth over the surface or wetted perimeter at a given time. Seepage into a body is referred to as influent seepage; that away from a body, as effluent seepage.
- SEEPAGE COLLARS** - Collars designed to project out radially a minimum of 2 ft. in all directions from a cylindrical conduit that carries water through an earthen fill. The line of seepage is parallel to the conduit. The number of collars and size of collars should be sufficient to increase the length of the seepage path by 20%.
- SEEPAGE METER** - Permeameter that consists of a calibrated reservoir, which meters water to a well of uniform diameter and definite depth. The water in the well is maintained at a constant level by a float device. The seepage is computed from the amount of water withdrawn from the reservoir over the period of measurement.
- SEEPAGE PIT** - A pit used in sewage

- disposal systems to allow the sewage to seep out of its sides into the soil. It is usually hooked up to the septic tank and completely covered with soil.
- SEGREGATED STORAGE** - Separate bin, room or building in which a product is stored because of low quality, different varieties, or being particularly susceptible to disease.
- SELECT** - A grade of oak flooring which may be quarter-sawed or plain-sawed and which may contain sap, and a few defects like pin worm holes or small tight knots. A grade of soft wood yard lumber which allows only limited blemishes and is suitable for a painted finish.
- SELECTIVE GEAR TRANSMISSION** - A transmission composed of gears of such design that the ratio of engine speed to final drive speed can be changed only with interruption of the availability of torque to the final drive.
- SELF-ALIGNING BEARING** - A type of bearing of ball and socket construction in which the bearing has a limited amount of movement in the shell which allows it to align itself with the shaft if it becomes twisted in the frame.
- SELF-ALIGNING DISK JOINTER** - A jointer which will swing to one side when an obstruction is encountered and then swing back again.
- SELF-DISCHARGE** - A characteristic of a battery whereby it discharges energy when left in storage or is not used for a period of time.
- SELF-FEEDER** - 1. Any feeding device which is used as a means for supplying feed to poultry or other livestock for the animals to eat at will; for example, a hopper which supplies feed by gravity to a box-like trough, etc. 2. Any self-acting mechanism which is used as a means for supplying materials to a given point in an operation.
- SELF-PROPELLED** - Denoting a machine which can move and operate under its own power and in which the power unit is a part of the tool. Many self-propelled units have interchangeable cutting or gathering attachments.
- SELF-PROPELLED COMBINE** - See: Self-propelled, combine.
- SELF-PROPELLED GARDEN-TYPE ROTARY PLOW** - A small implement designed to plow with a set of rotating knives. This implement works under its own power.
- SELF-PROPELLED TRAVELING SPRINKLERS** - Sprinklers that are activated by the force of water that runs through the drive mechanism so that they are automatically moved across the land.
- SELF-RAKE REAPER** - A reaper which has a rake attachment for sweeping off the platform a quantity of mowed grain sufficient to make a sheaf. (It was an implement which preceded the self-binding harvester for the harvesting of small grains.)
- SELF-STARTER** - A low voltage electric motor for cranking an automobile engine. It is attached on one side of the engine and receives its current from a storage battery. Usually 6 or 12 volts are used.
- SELF-TYING BALER** - A type of baler which ties the bales with its own knotter head and without human help.
- SEMI-ARID** - A term applied to a country or climate neither entirely arid nor strictly humid, but intermediate, with a shading to the arid side. A dry-farming country in which many crops may grow without irrigation, but in which far better yields result from irrigation. The term "semi-humid" has a similar significance, with a shading toward the humid side.
- SEMI-AUTOMATIC PLANTER** - A planter which requires a man to see that only one plant or seed is planted through each cell at a time. (Could be tree planter, corn planter, etc.)
- SEMI-BITUMINOUS** - A type of coal having most of the characteristics

- of anthracite or hard coal but having more volatile matter so that it burns more rapidly than hard coal.
- SEMI-LOGARITHMIC PAPER** - Graph paper with a logarithmic vertical scale and a regular cartesian horizontal scale.
- SEMI-MOUNTED IMPLEMENT** - A tool attached to a tractor along a hinge axis, rather than one single point, so that it responds directly to steering by the tractor but is never supported completely by the tractor.
- SENSIBLE HEAT** - The heat absorbed by a material which results in a change in temperature rather than a change of state.
- SENSITIVENESS** - When referring to engine speed the amount the speed must change before the governor will act. This is due to friction in the joints and lost motion in the parts to be moved. It may be defined as a percentage of the mean speed.
- SEPARATOR** - 1. Any of various machines, devices, or apparatuses for separating; for example, a cream-separator. 2. The threshing machine which separates grain from the head in which it grows.
- SEPARATOR BOWL** - A high speed, revolving part of a cream separator; the metal casing or bowl with its enclosed series of conical plates which revolve at high speed.
- SEPARATOR CHECK FLAP** - A canvas drape on a combine located right behind the cylinder to prevent the grain from flying out the rear of the combine as it comes from the cylinder.
- SEPARATOR DROPPER** - In cotton ginning, the apparatus for taking the seed cotton from the air in the belt distributor system. In general, it consists of a wire-mesh screen through which the air may pass but not cotton. Also called vacuum dropper.
- SEPARATOR HEAD** - The head on a combine which separates the grain from the chaff.
- SEPARATOR SPOON** - In commercial egg-breaking, a spoon just large enough to hold the yolk of an egg into which the opened egg is dropped. The white separates from the yolk and drops to the cup below.
- SEPTIC TANK** - A tank intended to retain the sludge in immediate contact with the sewage flowing through the tank for a sufficient period to secure a satisfactory decomposition of organic solids by anaerobic bacterial action. Part of a sewage disposal system.
- SERAILIAN PROCESS OF CONCENTRATES** - A method of concentrating juice by removing most of the moisture but still retaining the flavor. This is done by evaporating juices in a vacuum pan in such a way that the vapors are fractionally condensed. One of these fractions contains most of the flavor and this concentrate is kept and added back to the concentrated product.
- SERIES MOTOR** - A motor in which the field magnet coils, consisting of a few turns of thick wire, are connected in series with the armature so that the whole current supplied to the motor passes through the field coils as well as the armature. May be a.c. or d.c.
- SERIES PARALLEL DIMMING** - In wiring for lighting, a system of lights so wired that they may be connected in parallel with each other for full brightness and in series with each other for dimming.
- SERRATED KNIVES** - Knives on cutter bars which have grooved cutting edges to aid in cutting coarse-stemmed crops.
- SERRATED NAIL** - A type of nail used to hold metal roofing because of its high resistance to withdrawal. The shank is notched or toothed.
- SERVICE** - The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.
- SERVICE AISLE** - Any frequently traveled area in a building used in cleaning, beading, feeding, etc., animals.

- SERVICE BOX** - In the conduit system of electric distribution, a shallow metallic box placed at points of distribution to consumers. In this box the branch service cables are attached to the main cables and the space filled with an insulating compound and protected by a cover clamped over it. Service boxes are reached by hand holes.
- SERVICE CABLE** - Electrical service conductors made up in the form of cable.
- SERVICE CONDUCTOR** - That portion of the supply conductors which extends from the street main or duct or from transformers to the service equipment of the premises supplied. For overhead conductors this includes the conductors from the last line pole to the service entrance equipment.
- SERVICE CONNECTION** - That portion of the supply conductors which extends from the street main or duct or transformers to the service switch, switches or switchboard of the building supply.
- SERVICE COURSES** - Non-technical courses available to students who are not formally enrolled in the Agricultural Engineering or other technical curriculum.
- SERVICE COURT** - The open, work area generally in the center of a group of farm buildings forming a farmstead. Fields, highways and buildings should all be readily available from this area.
- SERVICE DROP** - Circuits that lead from the distribution lines to the individual houses or buildings.
- SERVICE ENTRANCE** - The point at which the feeder wires enter the building.
- SERVICE EQUIPMENT** - The necessary equipment, usually consisting of circuitbreaker or switch and fuses, and their accessories, located near point of entrance of supply conductors to a building and intended to constitute the main control and means of cutoff for the supply to that building.
- SERVICE LIFE** - The time required to wear out a machine or machine part.
- SERVICE RACEWAY** - The rigid metal conduit, electrical metallic tubing, or other raceway, that encloses service-entrance electrical conductors.
- SERVICE TUBE** - An insulating tube by means of which service wires are entered into a building.
- SERVICE WIRES OR CONDUCTORS** - In a system of electrical distribution, branch wires leading from the mains to a consumer's premises; service conductors.
- SERVICING** - Taking care of the machine and doing necessary repairs and lubrication.
- SERVO GOVERNOR** - A relay apparatus which supplements the primary control of engine speed.
- SET** - 1. The permanent change a material takes when subjected to a stress exceeding its elastic limit. 2. A tool used to flatten and shape rivet heads. 3. Process of the chemical hardening of freshly mixed and placed concrete.
- SET HAMMER** - 1. A smith's hand tool resembling a flatter, but much more substantial, used for setting or straightening flat bars or plates. 2. A hammer into which the handle is simply set or driven, instead of being wedged.
- SETTING VOLTAGE (OR CURRENT)** - The voltage (or current) necessary to seat the armature of a magnetic contactor from the position at which the contacts first touch each other, under conditions of normal operation.
- SETTLING BASIN** - An enlargement in a stream or conduit to permit the settling of debris carried in suspension; a form of sand trap.
- SETTLING TANK** - A sedimentation tank; a container for holding liquids so that they may be cleared by precipitation, gravity, etc.
- SEWAGE** - Any or all liquid waste from the bathroom, kitchen or laundry.
- SEWAGE PURIFICATION** - The removal or mineralization of all putrescible organic matter and the removal of all infectious and offensive matter.

- SEWAGE TREATMENT** - Any process to which sewage is subjected in order to remove or so alter its objectionable constituents as to render it less offensive or dangerous.
- SEWER** - A pipe or conduit, generally closed but normally not flowing full, which is used for carrying off sewage, runoff and other liquid waste.
- SHADE** - A shield or covering made of silk, paper, glass or other material used for decorative effects, and for the reducing of glare from bare lamps but without regard to predetermined redistribution of light. Also a condition in which the direct sun light is not allowed to touch a surface or object.
- SHADED BIN** - Storage bins which are shaded by some means from the sun to prevent moist material from getting too warm; i.e. underground bins.
- SHADED-POLE MOTOR** - A single-phase induction motor provided with auxiliary short-circuited windings displaced in a magnetic position from the main windings.
- SHADE HOLDER** - A device for supporting a reflector or shade from a lamp socket. The holder may be an integral part of the socket, or may be detachable.
- SHADING COIL** - In a split phase motor, and auxiliary coil used to split the phase in starting. The usual construction is to surround part of each field pole with a strap of copper which is a closed loop. In operation the flux in the unshaded part of the pole causing a phase shift and magnetic field rotation from the unshaded part of the pole toward the shaded part of the pole.
- SHAFTING** - A piece of material, usually steel, which is supported in bearings and is used to transmit energy and movement by rotation.
- SHAFT COUPLING** - A device employed to connect the different sections or lengths of which a line of shafting is composed. There are two classes, those that form permanent connections, such as flange, disk, plate or compression couplings, and those which effect engagement or disconnection between the various lengths at will, such as friction and jaw clutches.
- SHAKE** - 1. A defect of logs, trees or lumber which is a circular crack separating annual rings.
2. A split shingle.
- SHAKER** - See: Shaker screen.
- SHAKER GRATE** - A device for separating foreign material from a product, such as, the part of a horse drawn potato digger where the dirt is separated from the potatoes.
- SHAKER SCREEN** - Any of various forms of screen provided with a mechanical means for agitating during a cleaning or separating operation. It is commonly used as a part of grain or seed separators or cleaners and in machines used in milling cereals, grading devices, etc. Also called a shaker.
- SHAKER WASHER** - A machine used to wash fruits, vegetables and nuts to remove dirt, spray residues and other foreign materials. It uses a strong, vigorous, reciprocating motion for washing but cannot be used on easily damaged products. Also called shuffle washers.
- SHALLOW WELL** - A well from which a supply of water is obtained at little depth commonly 20 ft. or less below the surface. See: Deep well.
- SHANK** - That part of an implement which connects the acting part with the frame. Example - the metal chute on a corn drill which directs the seed from the hopper to the rear of the runner furrow opener or the part of a subsoiler between the frame and the point.
- SHARE** - That part which provides the front cutting-edge for a plow.
- SHARP-CRESTED WEIR** - A measuring weir with its crest at the upstream edge or corner of a relatively thin plate, generally of metal.
- SHATTER LOSSES** - Grain loss during

- harvest due to impact by the combine reel resulting in shelling out of grain on the ground.
- SHAVING KNIFE** - A knife used by a currier in bringing leather to a fine, smooth surface on the flesh side, and to a uniform thickness. This operation follows skiving or splitting.
- SHAWVER TRUSS** - A truss made of relatively light wood framing members, providing a large area free of obstructions.
- SHEAR** - The cutting effect of forces on a timber or metal bar, which when applied at right angle, tends to separate the piece.
- SHEAR CUT** - The action of a rolling coulter of a plow in cutting trash on the surface of the ground using the ground as one edge of the shear.
- SHEAR DIAGRAM** - A graph in which shearing forces are plotted with respect to the long axis of a member. Useful in determining points of maximum shearing forces and external bending moments.
- SHEAR MODULUS** - The ratio of stress to strain (n) coefficient of rigidity or the degree of internal friction of a material.
- SHEAR PIN** - A part of a mechanism to prevent an overload on a piece or part of a machine. The pin holding two parts together is so designed that it will fail under less pressure than the parts it holds thus preventing them from being broken.
- SHEARING COMB** - A comb which forms part of the cutting head of a sheep-shearing machine.
- SHEARING FORCE** - A force or load tending to cause two adjacent parts of the same material to slide in relation to each other.
- SHEARING MACHINE** - A machine which severs a material. Example - the device with a mechanically operated cutter for shearing sheep.
- SHEARING STRENGTH** - The ability of a material to withstand shearing forces. Maximum shearing strength is equal to the maximum shearing force that can be applied without shear taking place.
- SHEARING STRESS** - A stress caused by forces which try to make parallel planes or surfaces of a body slide in opposite directions.
- SHEAR PLATE** - A metal cutter bar or plate which forms the cutting edge for the knives on a cutter bar. Some shear plates are reversible and may have as many as four cutting edges.
- SHEARS** - Any of various cutting instruments or devices consisting of opposed cutting edges of metal which have a cutting action when their edges are caused to pass closely to each other.
- SHEATHING** - 1. The covering layer of material placed adjacent to studding or rafters of a structure. The material may be wood boards, plywood, wall board or metal. 2. Close-fitting boards placed horizontally along the sides of a trench, to hold back loose or wet soil.
- SHED** - A simple structure for shelter of livestock, storage of feeds, or both. It may be open on one or more sides and separate from or attached to another structure.
- SHED-ROOF HOUSE** - A roof that slopes only in one direction.
- SHED TYPE ROOF** - A roof having a single slope which would direct all the water in one direction
- SHEEP SHANK** - A method of shortening a rope if it is desired not to cut it. The rope is folded into three parts, a hitch taken over each bight with the standing part, and all pulled taut.
- SHEET EROSION** - The removal of soil in thin layers from sloping land. The erosive action of raindrops combined with overland flow of runoff causes the major portion of sheet erosion.
- SHEETING** - 1. Any material or fabric made so as to form a thin layer. 2. A lining of timber or iron work, for the protection of the banks of a waterway. It may consist of timber or iron sheet piling, or of guide or gage

- piles and planking, reinforced by bracing from the bank.
- SHEET IRON** - A sheet metal made of iron. Very widely used.
- SHEET METAL** - Any kind of metal less than 3/16 in. thick and processed into a square or rectangle sheet. It can be in small pieces if used for shop work or large sheets for roofing or siding.
- SHEET-METAL ROOFING** - A roof covering made of sheet steel or aluminum. Sheets are generally corrugated or crimped in some way to provide strength for spanning roof girts.
- SHEET-METAL SCREW** - A type of screw used to hold two sheets of metal together. It has widely spaced threads which bite into the metal as it is turned into place.
- SHEET-METAL SIDING** - Exterior siding for buildings made of sheet steel or aluminum. Sheets are generally corrugated or formed into some type of groove to provide added rigidity.
- SHEET-METAL WORK** - Work dealing with metal in the form of a sheet, usually less than about 1/4 in. (usually from 1/8 to 1/16 in.).
- SHEET-PILING** - Interlocking members of wood, steel, concrete, etc., driven individually to form an obstruction to percolation, to prevent movement of material, for cofferdams, stabilization or foundations, etc.
- SHELF TYPE HARDENING ROOM COILS** - The arrangement of cooling coils in a cold room that is designed to freeze ice cream. The coils form shelves on which the ice cream containers are placed.
- SHELL AND TUBE CONDENSER** - Part of a refrigeration system which cools the compressed gas to the saturation temperature and condenses it. It consists of a cylindrical drum with a series of water tubes inside located in the upper portion of the cylinder so that the condensing surface will not become covered with liquid.
- SHELL & TUBE EVAPORATOR** - An apparatus for cooling brine, water or other liquids where the fluid flows through tubes inside a shell with refrigerant around the tubes.
- SHELL AUGER** - An auger in which the cutting part is shaped as a semi-cylinder, similar to a spoon bit or gimlet; also called screw auger.
- SHELLING ATTACHMENT** - An attachment which separates kernels from their carrier. Example - an attachment to a corn picker which shells the corn as it is harvested.
- SHELLING LOSSES** - Loss for grain onto the ground, due to its shelling out of the husk or off the cob while being handled.
- SHELLING SHEELS** - The parts of a corn shelling machine where the corn is separated from the cob.
- SHIELD** - 1. A flat, metal plate or disk which is attached vertically or adjacent to the shovels of a cultivator to prevent soil from falling on small plants; of a similar part or parts used with shovel openers to prevent soil from falling back into the furrow before the seeds are deposited.
2. A metal or wooden part fastened around a rotating part to protect people from touching it and becoming entangled and hurt.
3. Metal or wood fastened around moving parts to prevent the crop from becoming entangled.
- SHIELDED BEARING** - A bearing usually ball-type which has dustproof-waterproof overlapping shield members attached to the inner and outer faces.
- SHIELDED RAIN GAGE** - A rain and snow gage which has a wind deflector collar so as to obtain a better catchment of precipitation by stilling the air over it.
- SHIFTING LEVER** - The lever by which clutches are engaged or disengaged, or by which a belt is moved from a tight to a loose pulley, or vice versa.
- SHIM** - A relatively thin piece of metal (brass, steel) used as a filler between two surfaces such as a footing that has been forced

- down by pretesting and the billet that formerly rested on it.
- SHIN** - The part of the plow bottom which separates the ground. It is the leading or vertical cutting edge of the moldboard, often replaceable.
- SHINGLES** - Roof covering made of asbestos, asphalt, wood, tile, slate or other material cut to stock widths, lengths and thickness. Applied in a pattern which causes them to overlap.
- SHIN SHARE** - A share that has an extension to form the cutting edge or shin for the moldboard of a plow.
- SHIPLAP** - Lumber edge-dressed to make a close rabbeted or lapped joint; is not as tight as tongue and groove. It is used for sub-flooring, rough siding or for decking a roof.
- SHOCK ABSORBER** - A device that will absorb the shock of a load applied to a machine element.
- SHOCK LOAD** - A suddenly applied load. It results in a greater strain than that produced by a slowly applied load of the same magnitude.
- SHOCK PAD** - See: Breaker strip or shock pad.
- SHOCK RESISTANCE** - Ability of a material to withstand a suddenly applied load.
- SHOE** - 1. A plate or rim of metal, usually iron, which is nailed to the underside of the hoof of a horse, mule, etc., as a protection from injury or to assist in obtaining footholds. 2. A part or parts of certain farm implements, particularly parts that travel in or through the soil, such as the metal plate on the bottom of a subsoil plow, furrow openers on certain seeders, etc. 3. The shoe-like runner which supports the inner and outer ends of the cutter bar of a mower. 4. Small pieces of the woody stalk of the hemp plant which result from the breaking process for removing the fiber or lint from the retter stalks. 5. Grain cleaning assembly on a thresher or combine.
- SHOE BRAKE** - A device for retarding or stopping rotation or movement by friction. The shoe (made of reinforced fiber) creates friction on the brake drum when applied with pressure.
- SHOE FURROW-OPENER** - A type of furrow-opener on certain grain drills, or planters, made from two flat pieces of steel welded together to make a cutting edge similar to the stub runner-opener used on a corn planter.
- SHOE LOSSES** - The loss of grain through the sieves in a combine due to too little or too much air flow over shoe sieve.
- SHOE SIEVE** - A sieve on a combine which separates the grain from the chaff. It has protruding teeth which are agitated to shake grain down to shoe and then to grain auger.
- SHOE SOLE** - The removable and adjustable steel plate which serves as the sole of the shoe-like runner at the inner and outer ends of the cutter bar of a mower.
- SHOOTING FLOW** - See: Supercritical flow.
- SHOP TOOLS** - Small tools and appliances provided for the general use of workmen. The term would not include machinery, but would comprise gages, large straight edges and squares, stocks, dies and taps, surface plates, ladders, sieves, shovel, etc., provided for the common use of all.
- SHORING** - Materials used to support the walls of a trench or other excavation against earth pressure
- SHORT** - A contraction sometimes used among repair men for short circuit.
- SHORT CIRCUIT** - Often caused by two wires touching, so that current does not flow through lamp or appliance, but takes an improper short cut to ground. When a short circuit occurs, a fuse "blows" or a breaker "opens" the circuit.
- SHORT CIRCUITING BRUSHES** - Brushes that ride on the commutator of a repulsion start electric motor until the motor reaches 75-80% of synchronous speed at which

- time they lift off the commutator and the motor runs on the induction windings.
- SHORT COLUMN** - A class of columns, used in design work, in which the length does not exceed 11 times the least radius of gyration.
- SHORT SHUNT DYNAMO** - A compound wound dynamo in which one terminal of the shunt field coil is connected between the armature and the series coil, as distinguished from long shunt in which the terminals of the shunt coil are connected at the outside terminals of the machine.
- SHORT-TIME DUTY** - A requirement of service that demands operation at a substantially constant load for a short and definitely specified time.
- SHORT-TIME, HIGH-TEMPERATURE PASTEURIZER** - A continuous flow system with heat exchanger for the pasteurization of liquid food products such as milk at relatively (as compared with batch methods) high temperatures and short times.
- SHOTCRETE** - A form of concrete. It consists of Portland cement and sand, applied by a pneumatic gun object.
- SHOVEL** - 1. A scoop or spade-like tool consisting of a broad metal blade attached to a handle which is used for lifting grain, soil, litter, etc. 2. A spade shaped, V-pointed soil working tool which is used for various plowstocks, cultivators, grain drills and soil scarifiers.
- SHOVEL COVERER** - A small shovel connected to one side and close behind the planting shoe on a lister corn planter to cover the seed.
- SHOVEL CULTIVATOR** - A shovel in front of the planting shoe on a planter used to dig a shallow furrow for the seed to fall in as contrasted to a disk opener.
- SHOVEL PLOW** - A row-crop cultivator with right and left hand shovels which throws soil to both sides, and to hill dirt around the plants.
- SHOVEL-TYPE TOOLS** - Implements using shovel shaped tools. See: Shovel.
- SHOW BARN** - A building which is used for quartering and displaying show animals, as at a fair or other public exhibition.
- SHREDDED SILAGE** - Silage which has been beaten and torn into long strips rather than chopped into small regular pieces.
- SHREDDER** - A machine which is used for tearing and cutting corn stalks and other forage crops into small pieces. See: Husker-shredder.
- SHEDDING CYLINDER** - The cylinder of a husker-shredder machine which has many knife-like blades on its perimeter and, when caused to revolve at a high rate of speed, tears up the corn stalks that are fed into it.
- SHREDDING MOWER** - A machine that shreds the weeds or grass being cut instead of leaving them in one piece.
- SHRINKAGE FIT** - In workshop practice, a type of force fit, in which the hub of the eye is so heated that it expands before the shaft can be inserted, as in fitting a tire on the wheel of a railway vehicle; the contraction of the external part as it cools, firmly grips the internal piece.
- SHRINKAGE RATIO** - The volume change of a grain per unit due to reduction of moisture content.
- SHRINKAGE LIMIT** - The moisture content at which the soil changes from a semi-solid to the solid state. A further reduction in moisture content does not affect the volume.
- SHRINK FIT** - A shop method of installing a starting ring gear in an engine flywheel, a steel band on a wooden wagon wheel, a wearing rim on a locomotive wheel, etc. The steel band or ring is made smaller than the wheel, then expanded by heating to permit easy mounting. As the steel band cools it shrinks, making a tighter fit than possible by other methods.
- SHUNT** - 1. In an electric circuit, a branch conductor joining the

- main circuit at two points and forming a parallel or derived circuit, so that the current is divided, a part passing through the branch and a part through the main circuit. 2. To introduce a shunt into an electric circuit.
- SHUNT COIL** - A coil joined in parallel to an electric circuit.
- SHUNT MOTOR** - A motor which has the windings arranged so as to divide the current and conduct a portion of it to the field coils without passing thru the armature circuit.
- SICKLE** - 1. An implement consisting of a sharp, curved blade on a short handle, which is used for cutting weeds, grass, etc. It is one of the earliest hand implements used for harvesting small grain. 2. The cutting section of a hay or grain-harvesting machine.
- SICKLE SECTION** - The individual teeth which are fastened to a bar to make up the sickle for a mowing machine, combine or similar machine.
- SIDEBOARD** - One of the boards which forms the long side of a wagon or truck box; an added board to raise the height of a wagon-box side, such as is used in corn husking to prevent overthrow. Sometimes called bang board.
- SIDE-CHANNEL SPILLWAY** - See: Lateral-flow spillway.
- SIDE CHISEL** - A chisel, used by machinists, having its cutting edge on one side of the end facet.
- SIDE-DELIVERY RAKE** - A farm implement that rakes hay to one side into loose, continuous windrows for convenience in bunching or gathering by mechanical hay harvesters. See: Cylinder type side-delivery rake.
- SIDE DRAFT** - The horizontal component of pull, perpendicular to the line of motion.
- SIDE ENTRY NOZZLE** - A hollow-cone nozzle in which the liquid is fed into a whirl chamber through a tangential side-entry passage, or through fixed spiral passages, to give it a rotating motion.
- SIDE-FRAME PLOW** - A type of trailing disk plow with the frame built to the side and below the top of the disk bottom.
- SIDE LATCH** - A type of quick-repair washer which opens to be slipped over a rod and then can be closed and fastened by a small rivet.
- SIDE LOADING** - A load or force applied to a column in such a way as to cause bending stresses in the member.
- SIDE PLAY** - Provision for longitudinal movement; as, of a shaft in its bearings, or of a working part on the shaft; it is advisable and necessary, so as to permit the parts to adjust themselves while running.
- SIDE RAKE** - In machine shop practice, the rake or inclination of the edges of a tool which cuts sideways, either to the right or left. Such rake may be side top rake or side bottom rake, according to whether it describes the slant of the upper surface or the angle of clearance or relief beneath the cutting edge.
- SIDE-ROLL LATERALS** - Laterals used in irrigating forage and low growing row crops. They are mounted on wheels with the pipeline as the axle. A length of flexible hose is used to make the connection to the main line. The lateral is rolled as a unit to a new setting commonly by a small engine.
- SIDE-SHAKE MILL** - A fanning mill which shakes the sieves or screens sideways to clean the grain.
- SIDE SLOPE** - The slope of the sides of a canal, dam or embankment; custom has sanctioned the naming of the horizontal distance first as 1.5 to 1 (or, frequently, $1\frac{1}{2}$; 1), meaning a horizontal distance of 1.5 ft. to 1 ft. vertical.
- SIDE WALL** - The walls of a dam structure which extends from head-wall downstream the length of the apron and which is used to prevent sloughing of banks

- or channels and to direct and confine overfall.
- SIDING** - The final covering of the exterior side of walls in a frame building. May be boards, shingles or other material.
- SIDING, BEVEL** - Boards with a thin top edge (3/16 in. thick) and a thicker bottom edge (7/16 to 11/16 in. depending on the width of board) used as horizontal siding. The thin edge is placed on the top side and the thick edge of the piece above is lapped over it to make a weather proof joint.
- SIDING, DROP** - A type of siding usually 3/4 in. thick and designed to be applied directly to the studding and thus serve as a combination sheathing and siding.
- SIEVE** - A frame of metal or fabric with openings of uniform size through which the finer particles or substances are passed to separate them from the coarser forms. Sieves of special types are used in the preparation of many food products and also in the screening of seed. The sieve is usually agitated back and forth. See: Screen.
- SIFTER** - Any device which is used to separate particles as to size in the milling process with grains. Usually consists of a metal or cloth sieve.
- "SIGHT" FEED** - A device to permit visual observation of oil feed in the gravity system of lubrication.
- SIGMOID ISOTHERM** - An S-shaped curve obtained when the moisture content of a grain is plotted against its equilibrium relative humidity.
- SILAGE** - Green or mature feed made into a succulent feed for livestock by fermentation.
- SILAGE CHUTE** - A vertical chute down which silage is conveyed to prevent scattering. It is a normal permanent part of a tower silo.
- SILAGE CUTTER** - See: Silo filler.
- SILAGE HARVESTER** - A field implement that harvests standing corn, cuts it into ensilage length, and elevates the chopped fodder into a truck or wagon box ready for transportation to and placement in the silo.
- SILENCER** - A device for silencing the noise of the exhaust from an internal combustion engine, by muffling and cooling the gases. Also called muffler.
- SILENT DRIVE CHAIN** - See: Chain belt.
- SILENT FEED** - In saw milling, a piece of mechanism by which the logs are fed forward to the saw in deal and timber frames. It is freedom from noise. It consists of an adaptation of a nipping lever carried at the end of a radial arm, whose length can be varied to suit different amounts of feed.
- SILKING MACHINE** - A machine equipped with revolving brushes and rolls which remove nearly all of the silk from sweet-corn ears in the commercial process of preparing sweet corn for canning.
- SILL** - 1. The lowest timber on which a building frame is supported.
2. The framing member across the bottom of a window or door opening on the outside of a structure.
- SILO** - A pie, trench, above-ground horizontal container, or vertical cylinder of relatively air-tight construction into which green crops, such as corn, grass, legumes or small grain and other feeds are placed and converted into silage to be used as a livestock feed.
- SILLO FILLER** - A machine consisting of a power-driven conveyer, a cutter, blower and a stand-pipe which is used to cut green crops into silage lengths and to elevate the material into the silo. This is a stationary machine located at the silo. Also called ensilage blower, ensilage cutter, silage cutter.
- SILLO STAVE** - One of the vertical members of a tower silo. Usually 13 ins. wide, 30 ins. high and 3 or 4 ins. thick.
- SILLO, UPRIGHT** - A type of silo usually round and built on top of

- the ground with its long axis perpendicular to the ground.
- SILT BASIN** - An enlarged construction or excavation to a deeper level in or beside a ditch or other drainage channel for the deposit of sediment carried by the water.
- SILT UP** - The disposition of sediment until the reservoir or stream is filled to such an extent that it will not hold water or water easily overflows the channel.
- SILT WELL** - An enlarged construction to a deeper level in a closed drain for the deposit of sediment carried by the water.
- SILVER BRAZING** - A low-temperature brazing process in which the filler material used is an alloy essentially of silver and copper. The alloy may contain as little as 10% silver. Sometimes called "silver soldering".
- SIMPLE BEAM** - A beam resting on two supports and carrying loads only between the supports.
- SINGING ARC** - An arc fed by direct current which is placed under suitable conditions near an alternating current of small intensity, so that the arc emits a sound corresponding to the oscillations of the alternating current, and the light of the arc produces equal vibrations.
- SINGLE ACTING ENGINE** - One in which the impulse is given on one side of the piston only; the usual type for internal combustion engines, and one sometimes employed for high speed steam engines.
- SINGLE ACTING HYDRAULIC CYLINDER** - A control on hydraulic systems that exerts force in only one direction.
- SINGLE-ACTION ATOMIZER** - A type of hand sprayer consisting of a pump and a receptacle for holding spray liquid which acts only on the stroke of the pump. See: Continuous-action atomizer.
- SINGLE-ACTION DISK HARROW** - Two gangs of disks placed opposite each other and which throw the soil in opposite directions.
- SINGLE AXIS HITCH** - A kind of attachment for a mounted implement in which the implement is attached to the tractor at one point beneath the body of the tractor. The tool is free to rotate about the hitch point in a vertical plane. Any points of attachment besides the primary one are merely to stabilize it laterally or to lift the tool.
- SINGLE-BAIL PLOW** - A frame plow which has a single U-shaped iron piece that attaches the beam to the frame of the plow. Its purpose is to allow the share to be raised to varying heights above the surface of the ground. See: Double-bail plow.
- SINGLE BATTERY** - A cotton gin which has one set of gin stands.
- SINGLE BELTING** - Leather belting made in one thickness of ply, such as is used for driving small machines. The thickness is usually taken as 4/32 or 1/4 in.
- SINGLE-BOTTOM PLOW** - A plow with only one bottom or furrow turning device as contrasted to a multiple bottom plow.
- SINGLE-BOTTOM WALKING PLOW** - One plow bottom that is attached to a beam with a clevis on its forward end for hitching to the pulling power and a pair of handles at the rear for guiding.
- SINGLE-BREAST GIN** - A type of cotton gin having a single gin breast which is only suitable for ginning clean cotton that has no boll, hulls or trash. See: Double breast.
- SINGLE-CENTER-MAIN-DUCT SYSTEM** - A duct system for a hay drying arrangement consisting of a single main duct down the center of the floor with smaller connecting lateral ducts.
- SINGLE CIRCUIT** - An electric circuit containing no branch circuits, as distinguished from a circuit with parallel elements.
- SINGLE CRIB** - A structure for storing ear corn, usually 5-8 ft. in width (of any desired length) rectangular in shape, which has open siding to permit circulation

- of air. See: Double crib.
- SINGLE CUT FILE** - A file having single lines of cutting teeth only, as distinguished from double cut files, or those with crossing rows of teeth.
- SINGLE-DISK** - Designating a farm implement which is equipped with one disk. For example, a single-disk plow, or a single-disk furrow opener.
- SINGLE-DISK FURROW OPENER** - A furrow opener, used on certain grain drills, which consists of one disk securely fastened to the boot and set to run at a slight angle. This leaves a very shallow furrow which the seeds fall in to be covered by the press wheels.
- SINGLE DISK OPENER** - See: Single-disk furrow opener.
- SINGLE GEARED LATHE** - One in which the spindle is attached to or driven directly by the cone, without any intermediate gearing to reduce the speed.
- SINGLE GUN AND QUAD HEAD** - A spray gun which has four nozzles attached to a single gun.
- SINGLE-HARPOON HAY FORK** - A hay fork having one long, iron bar with an enclosed barb on the end which when forced to a desired depth in a load or stack of hay may be sprung so as to grasp the hay for lifting. See: Double-harpoon fork.
- SINGLE PHASE MOTOR** - An induction motor designed for operation on a single phase A.C. power source.
- SINGLE-PLATE CLUTCH** - A device used to disconnect, and connect rotating inline shafts. A single-plate clutch has only one circular plate with usually two friction surfaces which transmits the torque and power from one shaft to another.
- SINGLE-RIB HULLER (GIN)** - See: Single-breast gin.
- SINGLE-ROD AGITATOR** - An axle placed within the seed box, to which paddles are attached at intervals. As the axle turns, the paddles agitate the seeds to keep them flowing evenly into the feed cups.
- SINGLE-ROLLER STRIPPER** - A machine which separates the cotton and burr from the plant. It consists of a single lightly fluted roller which operates with an adjustable stripper bar. As soon as the bolls are stripped from the revolving roller, they are carried to a side conveyor. They are then delivered by pin wheels to a right and left screw-type cross conveyor which delivers the bolls to a trailer elevator.
- SINGLE-ROW** - Designating a machine which plants, cultivates or harvests a single row at a time.
- SINGLE-SIDE-MAIN-DUCT SYSTEM** - The duct system for a barn hay drying installation. It consists of one large duct along the side of the mow with small laterals across the mow floor.
- SINGLE SPRAY GUN** - A spray gun which has only one nozzle.
- SINGLE STAGE** - A machine or process in which the complete operation is performed in one step. Refers to pumps, fans and compressors.
- SINGLE TANDEM STALL** - A milking parlor arrangement in which there are two or three stalls, one behind the other along one side of the operator's area in contrast to double tandem stalls.
- SINGLE THREADED SCREW** - In hardware, a screw consisting of one helix only, winding around the body. Ordinary wood screws are always single threaded, as are also attachment screws and set-screws.
- SINGLE THROW SWITCH** - One in which the blade can move from the off position to a live contact in only one direction.
- SINKER** - 1. In well boring, a long heavy bar, 2½ to 4 ins. in diameter, and often 30 ft. long, used in a string of drilling tools to give force to the blow. 2. The upper half is some times known as the sinker and the lower part as the auger stem.
- SIRUPING MACHINE** - A machine that automatically adds a measured amount of sirup to each can in commercial fruit-canning operations.

- Also called siruper.
- SIX ROLL MACHINE** - See: Husker-shredder.
- SIZE-GRADING OR SIZING** - The segregation of a product into several size categories by mechanically measuring a diameter of each item, by weighing each item, or by human judgement.
- SIZER** - 1. A device which sorts seeds, fruits, etc., according to size. Also called grader. 2. A machine which surfaces timbers to exact dimensions.
- SIZING TOOL** - A cutting tool with a gage clamped to it to determine the size of the wood turned. (Sometimes called sizing chisel.)
- SKEIN** - A tapered metal thimble embracing the end of a wooden axle to form a journal for a wheel, as in a wagon.
- SKEW GEARING** - Cog wheels with teeth placed obliquely, so as to slide into each other and avoid clashing. They serve to transmit motion from one shaft to another when the two form an angle, but would not intersect if prolonged.
- SKID** - 1. A plank, roller, frame, etc., on which something heavy may rest or on which it may be slid or pushed along. 2. In forestry, logs or poles which are used in pairs to form a skidway. 3. A platform elevated from the floor by legs, casters or other special attachments. It can be lifted and moved by hand or by power-lift equipment, but loaded skids cannot be stacked.
- SKIDDER** - A yarding machine which skids logs by a cable.
- SKIMMING** - Diverting surface water by shallow overflow to avoid diverting sand, silt or other debris carried as bottom load.
- SKINNING KNIFE** - A thin, sharp knife with upward-curving, 5 or 6 in. blade, which is adapted to the pelting and skinning of slaughtered animals. See: Scimitar boning knife.
- SKIVING MACHINE** - A leather worker's machine, used for splitting skins.
- SKIVING TOOL** - In machine shop practice, a tool resembling a turner's knife-tool, used in large boring mills to take a smoothing or finishing cut from an internal surface.
- SLACK CHAIN** - In rigging, the loop of chain which hangs below the pulley blocks in lifting tackle, and which diminishes in amount when a load is being lowered.
- SLACKER** - A yarding machine with slacking skyline.
- SLACK FILLED** - Designation given to a can in which the level of the contents is more than 10% below the top of the can, or with fruit, a container in which it is evident that more fruit could have been put without damage.
- SLACK FIT** - In shop practice, a fit is said to be slack when parts in contact have more freedom of play than is necessary or desirable for their free and easy movement. The term is relative, because what would be a slack fit in some portions of a machine, would be too tight a fit in another. A slack fit in many cases would more properly mean a bad fit, as in the case of the fitting of shafting into wheel bosses, which must be necessarily tighter than the fitting of the same shafting into its bearings.
- SLACK SCALD** - A method used in dressing market poultry in which previously bled birds are immersed in water heated to a temperature of 126° to 130° F. to facilitate the removal of feathers without cooking the skin. This method is commonly used in the preparation of broilers and fowls for the fresh-dressed trade. Also called semi-scald, soft scald.
- SLASH SAWN** - See: Tangential sawn.
- SLAT** - See: Scraper.
- SLAT CONVEYOR** - The same as an apron conveyor; one made of transverse wooden or metallic slats mounted on a traveling belt, thus constituting an endless travel platform for handling materials; widely used on grain harvesters.
- SLAT MOLDBOARD** - A type of moldboard

- that has sections cut out lengthwise of the moldboard, leaving only about half of the surface to come in contact with the furrow slice. These are used for soils that will not scour and are claimed to give better soil pulverization.
- SLATTED CRIB** - A crib for storing ear corn whose sides are constructed of long, narrow boards spaced to allow good ventilation.
- SLATTED DRUM** - A boot pulley for conveyors and elevators, so constructed of lateral, spaced slats that it will allow escape of residue materials which would otherwise build up between the belt and drum.
- SLATTED DUCT** - An air duct with sides made of lath or thin strips of board placed a certain distance apart to allow air passage for ventilation or drying of ear corn, etc.
- SLATTED FLOOR** - A rigid, supporting platform, deck or sub-structure having perforations which permit air, droppings or other materials to pass through its surface. For example, air for a drying system flows under a slatted floor and is forced up through openings in the floor into the product being dried.
- SLAUGHTER HOUSE** - A building or place where meat animals are butchered; an abattoir.
- SLED** - A low platform or vehicle on runners used to convey a load which is usually pulled by two horses and was much used on farms when horses were used for pulling farm implements.
- SLED CORN CUTTER** - See: Sled cutter.
- SLED CUTTER** - An implement which consists essentially of a sled, sometimes with low wheels, on one side of the sled or low platform to which is attached a long, sharp knife, sloping backward at an oblique angle to the row of the crop to be cut. The sled is driven close enough to the plant row for the slanting knife to cut the stalks with a sliding cut.
- SLEDGE HAMMER** - A heavy hammer wielded with both hands. That used by the blacksmith's helper is usually cross peened, and weighs from 5 to 14 lbs. The sledge used by a machinist or erector is usually double faced, as he uses it for driving work only.
- SLED HARVESTER** - See: Cotton sled.
- SLED LISTER CULTIVATOR** - A sled cultivator which consists of two oak runners to which are attached crusher boards near the front end. Just behind these, on each side are attached large side knives, to destroy weeds and level middles or ridges. Gangs of disks are coupled to the rear arch. This type of cultivator is adapted to the cultivation of a listed crop in its early stages of development. Also called go-devil.
- SLED STRIPPER** - An early type of cotton harvester which consisted of a sled-like box with comb-like teeth fastened on the front. These teeth combed the cotton from the plant. Much foreign material was obtained with the cotton. (Obsolete)
- SLEEPER** - 1. Any timber, stone, iron or steel, on or near the ground level used to support a superstructure, to steady framework, or to receive floor joists. 2. A wooden cross-member which supports railroad rails often called a tie. 3. The rafter forming the framework for a roof valley. 4. A member fastened to an old floor to which a new finished floor will be applied.
- SLEEVE VALVE** - A type of internal combustion engine valve which controls inlet and exhaust ports in the cylinder wall. It consists of one or two reciprocating sleeves, fitting inside the cylinder bore between the piston and cylinder wall. Reciprocating movement as the engine operates results in uncovering and closing the inlet and exhaust ports at the proper stages in the cycle. Not used on any agricultural engines today.
- SLEIGH** - A vehicle moved on runners, and used for transporting persons

- or goods on snow or ice. Also called sled.
- SLENDERNESS RATIO** - A factor used in column design which measures the effects of eccentricity or curvature, as the length of a column increases, in relation to its least dimension. It is the ratio of unsupported length of column to the least radius of gyration of the column cross section.
- SLEWING GEAR** - An arrangement of parts for effecting a slewing motion in a crane derrick, etc.; that is, swinging the jib from side to side on its pivot, so that it is brought fair with the hoist or the place of deposit. In hydraulic cranes, a pair of opposed cylinders one on either side of the pivot, are employed to slew the job through the required arc, thus obviating the use of guys, and accurate centering is assured by means of regulable stops on the valve gear.
- SLICING KNIVES** - The part of a hay baler which cuts the hay into slices before it is baled.
- SLICK SPOTS** - Small irregular areas of soils that correspond to "black alkali" soils. The soil may be highly alkaline in reaction, but does not contain excessive amounts of soluble salts.
- SLIDING COULTER** - A special attachment used on a plow to cut the furrow slice loose from the wall. This type consists of coulters that slide or cut through the soil instead of rolling and cutting.
- SLIDING GEAR** - A gear which may be slid axially along a shaft to engage another gear to effect a change in speed or direction. Term used as an adjective to define one type of automotive transmission, as "sliding gear transmission".
- SLIGHTLY STORAGE** - Designating a minor flavor defect of dairy products which is ascribed to staling during storage.
- SLIMLINE** - Hot cathode lamp that is normally longer and of smaller diameter for the same wattage than the fluorescent lamp.
- SLING PSYCHROMETER** - A simple device used for measuring the relative humidity. It consists of two thermometers, the bulb of one of which is covered with a wick. The wick is wet with distilled water and the psychrometer is spun through the air. If air is saturated, no water will evaporate from the wick and both thermometers will record the same temperature.
- SLING** - An arrangement of heavy ropes on the floor of a wagon and sometimes two other places in the load for removing loose hay from a wagon and transporting it to the loft of the barn. (Obsolete)
- SLIP** - 1. In an induction motor, the difference in speed between the armature and the rotating magnetic field of synchronous speed. This is a vital factor in the operation of an induction motor, since there must be slip in order that the armature inductors shall cut magnetic lines to induce (hence the name "induction" motor) currents therein so as to create a driving torque. 2. When referring to a wheel it is the percentage of travel reduction occurring when the wheel is pulling a load as compared to distance traveled with no load.
- SLIP CLUTCH** - A torque limiting device which permits slippage between rotating drive and driven members, when the applied torque exceeds a predetermined amount. Has no reference to sprockets.
- SLIP-NOSE SHARE** - A share whose point is detachable.
- SLIPPAGE** - Act or amount of slipping. Loss of work in the transmission of power. Frequently erroneously applied to the difference in forward travel speed between a moving tractor and the circumferential speed at the working radius of the tractor tire which is preferably termed "travel reduction", because it includes a number of factors other than slippage alone.

- SLIP RING MOTOR - An external resistance induction motor. A motor in which the starting torque and the starting current are under the control of the operator and may be varied at his will. The slip ring motor accordingly permits the heaviest loads to be started slowly and smoothly with no objectionable line disturbances. It is adapted to variable speed service. Wide variations of speed may be obtained without complicated arrangements.
- SLIP SCRAPER - A drag tool which is used for scooping up dirt and moving it by sliding. Also called drag pan, slip pan.
- SLIP SHACKLE - One whose pin or bolt is fitted with a trigger or leger, so that it may be suddenly withdrawn.
- SLIP SHARE - A share that has no extension to form the landside.
- SLIT-PLANTING - A method of mulch tillage. Two to four weeks prior to seeding time an area 12 to 20 ins. wide is thoroughly tilled by plowing, middle busting or disk tilling to form a conventional seedbed for each row. At planting time or at first cultivation the remaining living mulch material in the row middle is cut loose and killed or retarded.
- SLOPE AREA - A method of calculating the flow of an open channel by the use of Manning's formula.
- SLOPE GAGE - A staff gage placed on an incline and graduated to indicate vertical heights.
- SLOPE OF PILE - The deviation from a horizontal plane of boards in a pile, from front to back; for air-seasoning, usually about 1 in. to 1 ft. in length.
- SLOPE STAKE - A stake set at the point where the finished side slope of an excavation or embankment cuts the surface of the ground. It is usually placed on a line at right angles to the center line and passing through the station point.
- SLOT FILE - A thin narrow parallel file used to dress out cotter holes or slots known to the trade as a pillar file.
- SLOT GRADER - See: Notch grader.
- SLOTTED HOLDER - A drill holder which is slotted for the reception of the shank of a flat drill or packed bit.
- SLOTTING AUGER - A woodworking tool which bores a hole and then cuts it laterally into a slot, the work being fed against chisel shaped cutting edges on the sides of the bit.
- SLOTTING MACHINE - A machine tool for making mortises and the like; a modification of the shaping machine.
- SLOT VENTILATING SYSTEM - A ventilating system in which air is brought into the room at ceiling height through a long narrow opening or through a series of holes bored through the ceiling at the intersection of the ceiling with the wall.
- SLOW NEUTRON - In the measurement of soil moisture by the neutron method, the greater number of hydrogen atoms in the soil, the greater will be the number of slow neutrons. Most of the hydrogen nuclei occur in water, therefore the number of slow neutrons can be measured and correlated with the amount of water in the soil.
- SLOW OPEN-KETTLE PROCESS - The preparation of fruit preserves by heating in a steam-jacketed kettle for a short time on successive days in syrups of progressively increasing sugar concentrations. The method avoids undue injury to the color and flavor of the fruit.
- SLUICE - 1. A conduit which carries water at high velocity. 2. An opening in a structure for passing debris. 3. A water gate. 4. A channel which carries or drains off surplus water.
- SLUICING - Moving earth, sand, gravel, etc., by flowing water, hydraulic sluicing; colloquially, "hydraulick-ing".

- SLUMP** - The difference between the height of the 12 in. mold and the height of the vertical axis of the specimen (fresh concrete) immediately after removal of mold. The slump test is used to determine the consistency of freshly mixed concrete.
- SLUMPING** - The action of water erosion on valley slopes along main streams, side streams and tributaries causing the slopes to slide into the stream.
- SLUSH** - 1. A soft mixture of grease and other materials used for lubrication. 2. Soft mud; sludge; mixture of snow and water on roads.
- SMALL-DRUM FEEDER** - A cleaning feeder in a cotton gin.
- SMEAR** - In mechanics, to overspread with anything; as, with fat, or other oily substances.
- SMITH** - One who smiths, or works on metal with a hammer, such as a goldsmith, tinsmith, housesmith, etc. Without other qualification, the name denotes a blacksmith, who forges articles from wrought iron and steel, forming the heated plastic metal into the desired shape, by blows with and upon suitable tools, which reduce or draw it down to the desired shape or size.
- SMITH'S BRACE** - In blacksmithing, a hard brace used by smiths for drilling holes of moderate diameter. Its outline is very similar to that of the ordinary carpenters' brace, and it is turned in the same way, but the requisite pressure is imparted at the top, by means of a feeding screw, against whose end the top of the brace, which is formed into a hardened point, is centered.
- SMITH'S HAMMER** - In blacksmithing, smith's hammers embrace the sledge hammer, the ordinary hand hammer, and the various flatters and fullers, which, strictly speaking, are not hammers, but are nevertheless tools of a similar type.
- SMITHY** - The workshop of a blacksmith. In an iron works, it is the smith's shop for medium and small work, large and heavy operations with steam hammers or hydraulic presses being carried on at the forge.
- SMOKE BOX** - A chamber into which the tubes of a boiler deliver the heated gases and products of combustion, whence they are taken away by the chimney. In a locomotive it is usually a cylindrical prolongation of the boiler barrel, resting upon the saddle formed by the cylinder castings. Also called smoke arch.
- SMOKED** - Designating meat, fish, sausage or any other product that has been treated by exposure to the smoke of certain hardwoods, corncobs or the like, to prolong its keeping qualities and/or to obtain the distinctive flavor which smoke imparts to food products thus treated. Meat products commonly undergo a curing process before being smoked.
- SMOKE HOUSE** - A small, separate building which is so arranged and equipped that meat may be hung over a low, smouldering fire producing a dense smoke in the process of curing.
- SMOKE KILN** - A primitive type of kiln in which unseasoned lumber is exposed to the heat and fumes of an open fire to season it.
- SMOOTHING HARROW** - See: Spike-tooth harrow.
- SMUDGE-POT** - A type of open pot or vessel in which an oil fire is maintained to heat the air in orchards and vegetable plots in hopes to prevent frost damage.
- SNAIL** - A peculiarly shaped cam, used where an abrupt drop movement is required in certain machinery so called from its resemblance to a snail shell.
- SNAKE** - A long wire or steel tape with a hook at one end used when wiring a house to fish wires through walls, partitions, etc. Also called fish tape.
- SNAKEHOLING** - A method used for placing a quantity of explosives under rocks or other obstructions in order to disturb as little of

- the earth as possible before the explosion. A small hole is bored or dug under the obstruction into which the explosive is placed to chamber the opening.
- SLAKESTONE** - A kind of hone (sed.) slate or whetstone obtained in Scotland.
- SNAPPER** - A type of corn harvesting machine which removes the ears from the stalks but does not husk them.
- SNAPPING ROLL BEATER** - A cylindrical device on a corn picker located at the end of the snapping rolls. It has beater blades on it which knock the ears of corn off the plant missed by the snapping rolls.
- SNAPPING ROLLS** - The adjustable rolls, on a mechanical corn picker or on a husker-shredder, that snap the corn ears from the stalk.
- SNATCH BLOCK** - A wooden or iron block with half of one cheek working on a hinge, to enable ropes to be put in or taken out without unreeving; one having an opening on one side to receive the bight of a rope.
- SNIPPERS** - A small hand-tool which is used for cutting, as for cutting wire.
- SNIPS** - Small, stout, short lipped shears used especially for cutting metal.
- SNOW COURSE** - A course laid out and permanently marked on the drainage basin of a stream, along which the snow is sampled at appropriate times to determine its depth and density for the purpose of forecasting subsequent runoff.
- SNOW COVER** - The ins. depth of accumulated snow fall on a watershed as determined by measurements made on snow courses.
- SNOW DENSITY** - The water content of snow expressed as a percentage by volume. In snow surveys it is the ratio of the scale reading (ins. of water) to the length of the snow sample, in ins.
- SNOW-FENCE CRIB** - A temporary crib, made of a slat and wire fencing, used to store ear corn.
- SNOW-FENCE SILO** - A temporary silo made of slat and wire fencing usually lined with heavy paper to exclude air.
- SNOW LOAD** - The amount of snow that a building is designed to carry. See: Live load.
- SNOWPACK** - The snow that will melt and drain into streams. It is used to forecast volumes of streamflow for several months in advance for irrigation and other purposes.
- SNOW PLOW** - A machine for clearing a road of snow. It consists of a truck or tractor fitted with a sledged plow which is pushed through the drift to force an opening. One type of plow has a rotary cutter which scoops up the snow and throws it to one side of the road. A snow plow is also a large blade used to clear snow from roads, and on farms from feed lots, etc.
- SNOW SAMPLE** - A core taken from the snow mantle on a snow course, by means of a sampling pipe, from which the depth and density may be determined.
- SNOW SAMPLER** - An outfit consisting essentially of light-jointed tubes for taking snow samples, and a spring scale graduated to read directly the corresponding depth of water contained in a snow sample.
- SNOW SURVEY** - A set of measurements of the depth and density of snow, usually made to determine the water stored on a drainage area in the form of snow, as a means of forecasting the subsequent runoff.
- SNUBBING BLOCK** - 1. A part of the braking equipment on the rear gang of wheels on a farm wagon which consists of blocks placed in front of the wheels, controlled by a lever bar or brake handle and which act directly in applying a retarding force to the rim of the wheels. 2. A heavy plank or planks mounted on the back of a single dish harrow and attached by a lever system so they will force the inner ends of

- the front rows of disks down.
- SOAKER-TYPE WASHER** - A machine used to clean bottles for food products. The cleaning action is obtained by immersing the bottles continuously in a strong alkali solution for a period of 15 to 30 min., washing by mechanical brushes or jets and rinsing.
- SOCKET** - 1. A recess, or a piece furnished with a recess, into which some other piece may be inserted and securely held; as, a socket in the ground for the reception of a post or pole. 2. The enlarged and recessed end of a cast iron pipe, into which the opposite end of another pipe is inserted; the pipes are turned and bored, jointed with a rust joint and lead caulked in. 3. A lamp holder which connects the lamp to its circuit. A weather-proof socket is made of composition material and will not rust when used in damp places. It is also better insulated and safer for farm building use.
- SOCKET ADAPTER** - A connecting fitting which enables a tube having one type base to be connected to a socket made for a different type base.
- SOCKET BOLT** - A bolt passing through a thimble that is placed between the parts required to be connected by the bolt.
- SOCKET EXTENSION** - A device which makes it possible to use a lamp in a reflector which was designed for a lamp of longer light center.
- SOCKET JOINT** - A means of connecting pipe together, where a collar or socket of larger size, having an internal or female thread, is screwed on the end of the one pipe, and the next length is screwed into it, thus making a heavy and substantial joint.
- SOD BOTTOM** - A type of plow bottom whose moldboard is so constructed as to have a long, auger-like twist to turn the slice completely upside down covering all vegetable matter. It is designed to work in unbroken, prairie sod land. Also called sod plow, breaker bottom.
- SODBOUND** - 1. Designating a condition in which the roots are so restricted and form such a dense mat that growth of the plant is impeded. 2. Designating a condition of a grass, sod or turf in which the nitrogen supply in the soil has become depleted and which results in retarded, stunted vegetative growth.
- SOD CUTTER** - A tool for cutting a thin band of sod free from the soil which is used in connection with transplanting sod for sodding waterways, etc.
- SOD FLUME** - Water channel sections lined with sod for stabilization.
- SOD HOUSE** - A farm dwelling or other enclosure which was made of sod sections. Sections are laid brick-fashion, forming the walls of the structure. Such walls were then roofed over with poles and willow thatch or adobe-mud covering. The inner surface of the walls was usually shaved smooth and plastered with a natural clay plaster. The floors were either of hard-packed clay or wood boards.
- SODIUM-VAPOR LAMP** - A low-pressure lamp using sodium vapor and neon gas. When the lamp is lighted, the neon, ionizing more readily, gives off its characteristic orange-red color, but gives way to the golden-yellow color of the sodium as the sodium is vaporized by the heat of discharge.
- SOD PLOW** - See: Sod bottom.
- SOD STRIP** - 1. A band or narrow strip of sod which is used for checking erosion in waterways. 2. A narrow band of grass or other close-rooted crop which is placed across the channel of a gully to spread and retard the flow of water. 3. In strip cropping, a strip that is in sod.
- SOFFIT** - The underneath surface of a subordinate architectural feature in a building such as beams, lintels, arches, window and door heads, cornice, stairways, eaves and arch, etc.
- SOFT BRICK** - A brick that is relatively

- soft from under burning in the kiln, not of much value. Also called salmon brick and usually used as back up brick or as filler brick where it will not be exposed to the weather.
- SOFT CENTER SHARE** - See: Soft center steel.
- SOFT CENTER STEEL** - A type of steel used in the construction of plow shares and moldboards consisting of three plies, namely, a center-layer of low carbon and two outer layers of high carbon steel. The marking SC or SOFT CENTER is usually found on the shares and moldboards. This type of steel stands shock well.
- SOFTENED WATER** - Water that has been through a process to remove the calcium sulfates which cause the hardness in water.
- SOFTENER** - A unit used to remove the hardness (CaSO_4) from water by a process which varies with the specific conditioner.
- SOFT GRIT** - In tools, a grindstone of soft and porous texture.
- SOFT IRON** - In metals, iron which can be shaped with ordinary cutting tools or abraded readily with files.
- SOFT METAL** - A term expressive of the density of the particular metal in relation to the purpose for which it is required.
- SOFT PATCH** - A patch or covering over a leak or defect which is fastened with bolts, in contradistinction to a hard patch, which is riveted.
- SOFT SOAP** - In machinist work, soft soap is used for the lubrication of the wooden patterns of pipes and columns while turning in the lathe and supported by a steady, the soap being rubbed into the bearing of the steady to prevent heating and burning of the wood. Used also in the mixing of soap suds.
- SOFT SOLDERING** - Ordinarily soldering using a tin alloy as the fusible material.
- SOFT STEEL** - A tenacious, bending, equigrained alloy of iron; low-carbon steel.
- SOFT WATER** - Water relatively free from various hardening agents which are calcium and magnesium salts. The water may be impure but is soft if relatively free of the above mentioned minerals.
- SOFTWOODS** - Called gymnosperms, the softwood group of trees have needle-like leaves and are ever-green, with cypress, larch and tamarack being exceptions. The term has no reference to the actual hardness of the wood.
- SOIL AND WATER CONSERVATION** - The application of practices on the land that reduce soil erosion and increase water retention.
- SOIL CORE TUBE** - One of several types of soil-sampling tools, consisting of a metal cylinder driven or pushed into the soil to obtain a core sample.
- SOIL EROSION** - Removal of soil material from a land surface by wind or water, including normal soil erosion and accelerated soil erosion.
- SOIL MOISTURE CAPACITY** - The amount of water expressed in percentage of dry weight that a soil can retain against the pull of gravity. See: Field capacity.
- SOIL PIPE** - Any pipe which conveys the discharge of water closets or fixtures having similar functions.
- SOIL SAMPLING TOOL** - Any of various kinds of augers, metal tubes (driven and pushed into the soil), cutting spades, posthole diggers, narrow-blade trowels and other implements used for obtaining samples of soil for description, for laboratory determinations, and for exhibit.
- SOIL-SAVING DAM** - A dam of earth, concrete or other material which is placed across a gully or natural watercourse to impound runoff water and to collect eroded soil.
- SOIL SHEAR STRENGTH** - The ability of a specific soil type to withstand a load without breaking

- down or giving away.
- SOIL SHIELD** - A device on a cotton planter which prevents the soil from falling back into the furrow opening before the seed is deposited.
- SOIL SHREDDER** - A machine which is used in greenhouse culture for mixing soil ingredients, particularly for fining manure or organic matter.
- SOIL WATER PRESSURE** - The force per unit area exerted by soil water on a plane of any direction at the point in question. It may be negative or positive with reference to atmospheric pressure and is measured in millibars ($1 \text{um} = 10^3$ dyne cm^{-2}).
- SOLAR WAX-EXTRACTOR** - A glass-covered, insulated box which is used to melt beeswax by the heat of the sun.
- SOLDER, HARD** - Materials such as silver, bronze, etc. - brazing material.
- SOLDER, SOFT** - A solder that fuses at low temperatures (below 700° F.), such as various alloys of lead, tin, antimony, bismuth and cadmium.
- SOLDERING BIT, ELECTRIC** - A bit which is heated by current flowing through a heating unit placed within the bit, the heating unit generating sufficient heat upon the passage of an electric current to heat the bit to a proper temperature.
- SOLDERLESS-TYPE FITTING** - A type of fitting used on stainless steel pipe and fittings. The pipe passes entirely thru the fitting, and the joint between the pipe and the fitting is actually on the end of both the fitting and the pipe, out of direct contact with any liquid which passes through the pipe. The fitting is attached by rolling and compressing.
- SOLDER TOP** - The early type of metal can used for canning fruit and vegetables which was a can with a small opening in the top through which the can was filled. This was then sealed with a small metal disk soldered over this opening. (This can is largely obsolete.)
- SOLE** - 1. The bottom of the furrow on which the plow bottom slides; also the bottom of the body of a plow. 2. In structures, a member, usually a 2 x 4 on which partition and wall studs bear. Also called sole plate.
- SOLENOID** - An electro magnet with an iron core. Used to operate electric relays, hydraulic valves, etc.
- SOLE PLATE** - See: Sole.
- SOLID BEARING** - A one piece shaft bearing, with an uninterrupted journal surface. Frequently called "bushing". Note: Definition not dependent upon material or quality. One piece bearings or bushings, rolled from a strip of metal are termed "Split Bushings".
- SOLID CARBON DIOXIDE** - It is used for refrigeration and it passes from a solid to a gas without a liquid phase, absorbing heat as it does so. Can cool down to -109° F.
- SOLID-CONE NOZZLE** - A spray nozzle similar to the hollow-cone nozzle except that a solid cone of spray is emitted which, at short distances, deposits spray on the target in the form of a disk rather than a ring. The solid-cone nozzle is especially suited for close spraying, as with boom spraying of field crops.
- SOLID DISK** - Round, smooth-edged solid disks which are used on plain or standard types of disk harrows, as compared to the cut-away disks and the spading disks used on other types.
- SOLID DOOR** - A door made of solid wood whose grain all runs in the same direction except for top and bottom cross members. In contrast a panel door has edge boards and may have a hollow core.
- SOLID MOLDBOARD** - A moldboard which has no perforations, slots or sections cut out which would break the smooth surface of the plow. See: Slat moldboard.

- SOLID PLANTING** - Planting in which the rows or planting beds are not far enough apart to permit the operation of machinery between them for intertilling or other cultural operations.
- SOLID PULLEY** - A pulley cast in a solid piece, with set screws and keys to fasten it to the shaft.
- SOLID REAMER** - In machinist's work, a fluted tool used for finishing and turning cored and drilled holes; used in a socket or with a wrench.
- SOLID SHIELD** - A fender attachment for a cultivator which consists of a solid piece of metal in contrast to one made of spaced rods or wire. See: Shield.
- SOLID STEEL** - A high-carbon steel used for plowshares. It is approximately SAE 1080 steel. The marking "solid" is usually found on the share.
- SONIC VIBRATOR** - A device consisting of a blade mounted parallel to the flow of a jet of fluid from an orifice such that the blade vibrates at or near its natural frequency as the fluid impinges upon the blade. As the blade vibrates, powerful oscillations are set up in the fluid. This device has been used in emulsification and homogenization processes.
- SORGHUM PAN** - A large, rectangular pan made of copper, tin plate or galvanized iron which is used over a fire box for concentrating by boiling juice over a sap of sorghum to a sirupy consistency. The pan is divided crosswise into sections with thin strips of metal, and the sections are connected giving in effect a zigzag path which the juice follows during the boiling process.
- SORTER** - A person or machine which separates or grades products according to quality, size or other specifications.
- SORTING RACK** - A rack which is used for sorting onions, designed so that dirt and small bulbs fall through the slats, the thick-necks, injured or decayed bulbs being picked out by hand. It is often made so that the bulbs can be divided into two or more grades as they pass over the rack.
- SOUNDING** - A method of determining the cross section of a stream.
- SOWER** - A machine for sowing broadcast; that is, strewing the seed widely over the land.
- SPACED COLUMN** - Two or more individual structural members separated by spacer blocks and designed to function as a single column.
- SPACE DIAGRAM** - Cross sectional drawing of a structural frame showing the relationship between all parts and elements.
- SPACE WASHER** - In mechanics, a disk having a central hole put on a mandrel, or the line between objects that it is desired to maintain at a given distance apart.
- SPACING PUNCH** - 1. A machinist's tool consisting of two center punches whose distance apart may be regulated by a thumb screw, similar to spring dividers, enabling a series of dots to be punched at uniform distances, one point of the tool being placed in the dot last made. 2. A multiple punching machine provided with an adjusting motion, whereby the various punches can be instantly set to some desired uniform pitch.
- SPACING LEVER** - A lever on a cultivator which is used to change the distance between the gangs of shovels.
- SPACING SPOOL** - A spool on a gang bolt of a disk harrow which separates the disk blades at the desired distance.
- SPADING OPERATION** - The use of a hoe or spade to finish the surface of concrete wall or other concrete surface when the hoe can be inserted along the edge to force the coarse material in toward the stone.
- SPAN** - In construction it pertains to the distance between supports; such as columns, walls, piers, beams, girders and trusses.
- SPANNER RACK** - An angle bar placed

- in some convenient position and slotted to hold spanners or keys.
- SPARE PARTS** - In machinery, signifies the supply of duplicate parts of machinery together with the order to which they belong.
- SPARK** - A visible high tension electrical discharge used to ignite the combustible mixture within the combustion space of an internal combustion engine.
- SPARK ADVANCE** - The advancement of the timing of the spark in crankshaft degrees ahead of the top-dead-center position of the piston.
- SPARK ARRESTER** - A device used on the smoke stacks of steam engines and the exhaust pipes of internal combustion engines to prevent carbon sparks from escaping to the atmosphere. This device is important on farm tractors as the escaping sparks may cause fires in dry vegetation.
- SPARK IGNITION** - Ignition of the fuel-air mixture in an internal combustion engine secured by establishing an electric arc across the gap between the spark plug electrodes.
- SPARK IGNITION ENGINE** - An internal combustion engine of a type in which the ignition of the air-fuel mixture is accomplished by a spark inside the combustion chamber, but generated from a source outside the combustion chamber.
- SPARK COIL** - An induction coil to provide high voltage, as used for ignition with an internal combustion engine; also called induction coil, etc.
- SPARK PLUG** - A device fitting into the cylinder head, carrying two electrodes separated by an air gap across which the current from the ignition system discharges, producing the spark for the explosion of the charge of gasoline vapor.
- SPARK REGULATOR** - A device for controlling the spark advance. Higher speed requires an advance in the timing of the spark and vice versa. This is usually accomplished automatically.
- SPARK TIMING** - The amount of spark advance which depends on the throttle position and the engine speed, the compression ratio, mixture ratio, fuel distribution, valve timing and octane number of fuel used.
- SPECIFICATIONS** - A concise and complete description of workmanship, quality of materials, and the method of construction for a structure or machine, all of which are included in the contract between owner and contractor.
- SPECIFIC FUEL CONSUMPTION** - Specific fuel consumption is measured both as weight per unit of work and as work per unit volume of fuel. Distinction is made between specific fuel consumption at the engine, at the belt, at the pulley, at the take-off and at the drawbar. Conditions concerning accessories shall be as stated under "Belt power".
- SPECIFIC GRAVITY SEPARATOR** - A type of grain cleaner which feeds grain down a table while air is blown up through the table. Light chaff and foreign material is lifted and separated while the grain rolls off the end of the table into a separate container.
- SPECIFIC HUMIDITY** - See: Humidity ratio.
- SPECIFIC WEIGHT** - The weight of a liquid per unit volume at a specified temperature sometimes called density. Usually expressed in lbs. per cu.ft.
- SPECIFIC YIELD** - The amount of water which a rock or earth will yield after being saturated and allowed to drain under the conditions specified for determining specific retention. It is expressed as percent of volume. The sum of specific retention and specific yield equals the porosity of the material drained.
- SPEED CONE** - In shop practice, the stepped pulley of different diameters, by means of which the speed of a belt-driven machine is varied. Also called cone pulley,

- stepped pulley.
- SPEED DROOP** - The effect of speed drop-off with increase in load present in mechanical centrifugal governor, due to the necessity of a decrease in speed for the governor to open the throttle.
- SPEED INDICATOR** - 1. A device for showing the rate of speed at which a vehicle is proceeding, either by the height of a liquid column in a glass tube, the oil or water being forced up by means of a rotary pump driven by the axle of the vehicle or the height to which a small centrifugal governor will rise in the same circumstances, the sleeve pulling a needle around a graduated dial. The same as tachometer, the latter usually indicating revolutions and not distance. 2. A portable counter for revolutions. The observer thrusts the point of the spindle of the instrument into the center in the end of the revolving shaft, and the revolutions are registered by a train of gearing. By noting the figures at the beginning and end of a stated period, the rate of revolutions per min. is easily computed.
- SPEED LIMITING SWITCH** - On a rotary machine, a device for automatically opening the direct current circuit in case the speed becomes too high.
- SPEED OF APPLICATION** - The area covered per unit of time (e.g. acres per min. or sq. miles per hr.).
- SPEED OF IGNITION** - In gas engines, this has reference to the rapidity with which chemical combination takes place between the air and gas in a gas engine. The speed of ignition varies with the compression, temperature and quality of the mixture. The speed of ignition must always exceed the piston speed in order to obtain the best results.
- SPEED SPRAYER** - A blower type spraying machine that employs a very large volume of air to distribute concentrated spray mixtures on the tree. The typical sprayer of this type utilizes a low pressure, low volume pump which forces the spray droplets into the air stream. The air stream assists in further breakup into small particles and acts as a vehicle to carry these particles to the leaf surface.
- SPERM OIL** - A clear limpid oil found within a cavity in the skull of the sperm whale, and in other cavities in its body. It is used as a lubricant for fine and delicate machinery, for tempering steel springs, and other purposes.
- SPHERANGULAR** - A tapered roller bearing with barrel-shaped rolls and corresponding spherically ground races so as to allow self-alignment.
- SPHEROIDIZING** - A heat treatment for steel in which the steel is held very close to the lower critical temperature for a time sufficient to produce a microstructure consisting of globular particles of cementite in a matrix of ferrite, followed by cooling as desired. This treatment is used to put hypereutectoid steels in a condition for machining and subsequent heat treatment.
- SPIDER WHEEL** - In machinery, a wheel or pulley having open light arms of wrought iron or steel.
- SPIEFELEISEN** - A white cast iron containing 8 to 15% of manganese, used largely in connection with the Bessemer and open hearth process of making steel.
- SPIKE-TOOTH CYLINDER** - A cylinder whose teeth pass midway between staggered teeth on the concave, thus producing a combing action. The concave assembly is pivoted at the rear, whereas the front is adjustable vertically to control the amount of overlap of the cylinder and concave teeth. The lateral clearance is also changed slightly by the adjustment since the teeth are tapered. The teeth in the concave are mounted on perforated, removable sections, usually with two rows of teeth per section. Teeth with corrugated sides are sometimes installed for difficult

- threshing conditions.
- SPIKE-TOOTH HARROW** - A device which is used to smooth and level the soil directly after plowing. It is made up of a number of teeth resembling long spikes attached to bars which may be steel or wood. Each unit called a section is 4 or 5 ft. wide and has 25-35 teeth. When guard rails protect the end of the bars the harrow is called closed end.
- SPIKING STRIP** - See: Ledger strip.
- SPILE** - A short tube or small spout which is inserted through a hole in a ditch levee to carry water to an irrigation furrow; or into a hole bored in the outer body of the maple tree to aid in the collecting of the sap for maple sirup and sugar.
- SPILLWAY** - Any of several types of hydraulic structures used to convey water safely from an upper level to a lower level. It may be an overfall dam, an open channel chute, or a drop inlet tube.
- SPILLWAY CREST** - The highest elevation of a specific mechanical or vegetated spillway.
- SPINDLE DOFFER** - A rubber disk on a spindle-type cotton harvester which removes or doffs the cotton from the rotating steel spindles after they have pulled it from the plant.
- SPIRAL-AUGER CONVEYOR** - See: Screw conveyor.
- SPIRAL BEVEL GEAR** - A bevel gear having its teeth cut at an angle with its axis so that they form small portions of screws or spirals.
- SPARK GAP** - The distance or gap between the center electrode and ground electrode of a spark-plug. The amount of opening varies from about .020 to .045 in.
- SPIRAL-CONE SEED CLEANER** - A device that consists of basically two concentric, helical-shaped spirals in parallel. The seed is fed to the inside spiral through a divider at the top. As the seed flows down the spiral paths, the spherical-shaped seeds accelerate until enough centrifugal force is developed to cause them to roll over the edges of the inner spiral into the outer spiral. The elongated seeds never acquire enough velocity to cause them to leave the inner spirals. At the bottom, the inside spiral discharges into one container and the outside spiral discharges into another. It separates vetch and oats readily.
- SPIRAL CONVEYOR** - In grain and flour making machinery, one in which materials are transported by means of a helix or worm revolving within a trough.
- SPIRAL GEAR OR GEARING** - Either spur or bevel gears in which the teeth are on a spiral with contact progressing from one end of the tooth to the other and with more than one tooth in contact, as compared to straight tooth gears in which contact is simultaneous over the length. Stress and noise is reduced by spiral teeth.
- SPIRAL GRAVITY SEPARATOR** - A seed separator consisting of a spiral incline in which seeds travel downward by gravity. As the seeds flow down the spiral incline, the heavier or rounder seeds move faster, swing to the outside of the chute, and are separated from the lighter seed. Also called gravity separator, spiral cone, spiral separator.
- SPIRAL PUNCH** - One with a true spiral terminating in a point, the object being to punch the metal gradually, thus minimizing the distress caused by the operation of punching.
- SPIRAL REINFORCING** - Steel reinforcing rods placed spirally in round or square concrete columns. The continuous spiral rods are positioned to tie the vertical reinforcing rods together and designed to resist the lateral bending of the columns under load.
- SPIRAL SPRING** - In mechanics, a coil whose rounds have the same diameter, and which is generally utilized by compression or extension in the line of its axis. The balance spring of a chronometer is spiral, and is utilized by an expanding

- and contracting action in a plane at right angles to the axis.
- SPIRAL SPRING CLUTCH** - A friction clutch in which engagement is effected by the constriction of a helical, ribbon-like spring around a drum or pulley.
- SPIRAL WINGED VALVE** - A poppet valve, the wings of which, instead of being at right angles to the seat, are arranged as sections of a spiral of very long pitch. The advantage is that the valve is turned round on its seating to a slight degree at each lift, thus rendering the wear uniform.
- SPLASH EROSION** - Erosion resulting from the impact of rain drops directly on soil particles or on thin water surfaces or from water that has bounced off a hard surface.
- SPLASH LUBRICATION** - A system of lubrication, especially employed in engines, the moving portions being enclosed in a tight casing filled with oil to a level such that the cranks dip into the oil. The cranks splash the lubricant over the moving parts and also the cylinder walls, where no cover or stuffing box is fitted. Openings are made in the middle of the crankpin and crosshead bosses, so that the oil has free access to them.
- SPLASHPROOF MOTOR** - A motor in which the ventilating openings are so constructed that drops of liquid or solid particles falling on the motor or coming towards it in a straight line at any angle not greater than 100° from the vertical cannot enter the motor either directly or by striking and running along the surface of the motor.
- NEMA.**
- SPLICE** - In wiring, a connection between two or more conductors where the ends are twisted together and soldered or attached with a splicing device. A joint between two rope ends where the strands of each are interwoven among the strands of the other.
- SPLICE PLATES** - Short joining members placed over the ends of members in a butt joint; the plates provide reinforcement to the joint and a means through which stresses may be transferred from one member to another.
- SPLINE SHAFT** - The shaft which is grooved on the outside. It is the tractor PTO shaft which transmits power to a machine.
- SPLINT MACHINE** - A machine for making thin sheets or strips of wood, as for basket making; a slivering machine.
- SPLIT BEARING** - A bearing which is cut into two parts, either horizontally or at an incline, and the upper part is bolted to the lower part. (Also called cap bearing.)
- SPLIT DITCH** - A lateral ditch which is used in the sugar cane system of surface land drainage in Louisiana. Such ditches are usually parallel and spaced 100 to 250 ft. apart with rows of sugar cane parallel to them.
- SPLIT-HUB** - See: Split-hub pulley.
- SPLIT-HUB PULLEY** - A type of pulley which has a solid pulley face but a split hub. The split hub allows slight adjusting for different-sized shafts.
- SPLIT KEY** - In machinery, a key which is split on one end similar to a split pin, to lessen the tendency to work out of its bed.
- SPLIT PHASE MOTOR** - A single phase induction motor, with a squirrel cage rotor and a starting field winding. The starting winding is of smaller wire than the main winding, and in combination the two give a rotating field.
- SPLIT PIN** - A species of cotter used to prevent nuts and small parts working loose on an engine or machine. A piece of half-round wire, steel or copper, is bent to form a pin with an eye at one end; this is inserted into a drilled hole through the bolt just below the locknut; its end is opened to prevent it from working out, while it prevents the nuts from jarring off.
- SPLIT PULLEY** - A pulley which is

- divided into halves that are held together by bolts. The halves are built separately, fitted together, and then finished as a solid pulley.
- SPLIT RING** - A type of timber connector made of a narrow band of steel circular in shape. It is used to strengthen wood joints; the two pieces to be bolted or glued together are fitted equally for the ring by a bit which makes a narrow circular groove in each piece. The ring is pressed into the groove when the two pieces are joined together.
- SPLIT SHINGLE** - A rough flat wooden roofing shingle split from a shingle bolt, usually by a broadax; a shake.
- SPLIT TILE WALL** - Wall constructed of square tile in two adjacent rows and held together by mortar and steel reinforcing clips.
- SPOIL BANKS** - Banks of soil which have been dug out to form a ditch, pond, etc.
- SPONGE FILTER** - An apparatus for mechanically separating impurities from water, by passing the liquid through a chamber filled with sponge. Such filters are adapted for clearing large quantities of muddy water, for manufacturing purposes, etc. When the filter gets clogged, the stream is turned in the reverse direction and power is applied to the movable piston which forms the floor of the sponge chamber.
- SPONTANEOUS HEATING** - The increase in temperature of a stored product due to respiration and bacterial action. Often due to the product being too wet for safe storage. In hay this can result in spontaneous combustion.
- SPOOL** - 1. On disk harrows, one of the spool-shaped, cast-iron parts in the disk gang assembly which holds the disks equal distances apart. Also called spreader spool. 2. Any more or less round device on which wire, rope, etc., is rolled for easy handling.
- SPOTTING BOARD** - See: Dibble board.
- SPOT WELDING** - In electric welding, the process of joining or fusing together electrically two or more metals or parts without any preparation of the stock. The principle of spot welding is simple. Two electrodes or welding points are brought to bear on the plates where the weld is to be made and a heavy current at a low electrical pressure is passed through the electrodes. The metal plates, being much poorer conductors of electricity, offer so great resistance to the flow of current that they heat to a molten state, and by applying pressure on the electrodes, the metals are forced together and the weld is made.
- SPRAY BOOM** - On a spray rig, an assembly of several spray nozzles which are spaced on a long horizontal pipe and used to extend the area of coverage of a single operation, as for spraying several rows of potatoes, etc. Such an arrangement on a vertical pipe is used for spraying trees.
- SPRAY CARBURETOR** - A type of carburetor for internal combustion motors, in which the liquid fuel is atomized or sprayed through a nozzle. The device consists of a float chamber which the fuel enters from the supply source, the flow being regulated by a float valve maintaining the liquid at a given level and a mixing chamber containing a spray nozzle, the latter connected by a small passage-way to the float chamber, from which gasoline chamber has a primary air inlet and a secondary inlet which supplies additional air when necessary. The action is automatic. A throttle valve regulates the volume of the mixture supplied to the engine.
- SPRAY CONE** - A jet of spray discharged in the form of a hollow cone. See: Solid-cone nozzle.
- SPRAY CULTIVATION** - The destruction of weeds in growing crops by the use of chemical seed killers.
- SPRAY-DRIED SKIM MILK** - A milk product made by atomizing non-fat

- milk in a stream of dry, heated air thereby removing most of the moisture and forming a dry powder.
- SPRAY DRYER** - A machine used by the dairy industry to make powdered milk. The general principle of operation is that a stream of milk is very finely atomized and blown into a stream of heated air. The extremely large amount of surface presented by the droplets of milk causes evaporation of moisture, the fluids being left in the form of a dry powder.
- SPRAY DRYING PROCESS** - A process which employs currents of heated air for the drying of liquid products sprayed from an atomizing nozzle.
- SPRAY EGG DRIER** - See: Spray-drying process.
- SPRAYER** - A device or mechanism which breaks up a liquid or solution or a suspension of material into droplets of a predetermined size range and distributes it hydraulically, pneumatically or by gravity from an airplane, or by combinations of the above. It is used to sprinkle or treat with a spray.
- SPRAYER-COMPRESSED AIR** - A sprayer comprising a tank to contain the spray material; a manually operated air pump, or other source of air pressure, to compress air above liquid in tank; flexible discharge equipment through which spray material is forced by air pressure. Easily portable - carries over the shoulder, by hand, or mounted on a cart. Provides supply of spray material and energy for constant operation without need for continuous pumping.
- SPRAYER-CONTINUOUS** - A manually operated sprayer comprising a container for spray material; a pump which develops air under pressure to force the spray material through the liquid supply tube, and assist in atomizing the liquid at the nozzle as a continuous spray during the forward and backward strokes of the pump.
- SPRAYER-DUSTER** - A spraying machine of the fan or blower type in which a fan, propeller, or turbine is used to produce a blast of air of great velocity. Fishtail outlets are often used to direct the air blast in a band which will cover the trees on one or both sides of the equipment. Most machines of this type may be used to apply either sprays or dusts, and in some cases are applied in combination with liquids.
- SPRAYER-FLAME** - A sprayer comprising a tank to contain flammable liquid, a manually operated air pump or other source of air pressure to compress air above liquid in tank, a generator-burner through which flammable liquid is forced by air pressure and burned. Carried over the shoulder or by hand. Provides supply of flammable material and energy for constant operation without need for continuous pumping.
- SPRAYER-HOSE END** - An applicator attached to garden hose, operated by water pressure, which mixes liquid or solid spray materials in water stream and discharges the mixture.
- SPRAYER-INTERMITTENT** - A small manually operated sprayer comprising a container for spray material; a pump which develops air under pressure, the air being passed over a siphon tube which draws spray material through the siphon tube from container and atomizes the liquid as it leaves the siphon tube. Spray is discharged only on forward stroke or pump.
- SPRAYER - POWER, HYDRAULIC TYPE** - A sprayer with hydraulic pump (piston, gear, roller, etc.) driven by gasoline engine, electric motor, PTO. Comprises a tank or other container for spray material; a power driven pump which draws spray material into the pump and discharges the spray material under pressure through the discharge system.
- SPRAYER-KNAPSACK** - A sprayer carried on the operator's back, knapsack style. Comprises a tank to contain

- unpressurized spray material; a manually operated pump which develops hydraulic pressure within the pump; flexible discharge equipment through which spray material is forced by hydraulic pressure. Generally provides larger supply of spray material and constant high pressure from pumping while spraying.
- SPRAYER-SLIDE, OR SLIDE PUMP** - A manually operated hydraulic sprayer with telescoping plunger, operated by two hands. Draws spray material from attached or separate container and discharges it as a spray under pressure on either forward and back strokes of the plunger, or on forward stroke only. Provides higher pressures and greater spraying range.
- SPRAYER - WHEELBARROW** - A manually operated hydraulic sprayer mounted on frame with wheelbarrow type handles and one or two wheels. Comprises a container holding spray material; a manually operated barrel pump mounted within which draws spray material into the pump when plunger is operated and discharges it as a continuous spray through the discharge equipment. Provides portability, large capacity and high pressures.
- SPRAY GUN** - A short hollow, hand held rod with a nozzle and cut-off usually adjustable by means of a twining handle, which is used for directing sprays with a wide fog for nearby foliage or a closely compacted stream to reach high tree tops, in contra-distinction to a spray-rod which has non-adjustable fog type nozzles that are held into the tree tops by the length of the rod.
- SPRAY IRRIGATION** - Irrigation by means of spray from pipes or pipe projections above the soil surface. Also called sprinkler irrigation.
- SPRAY MACHINE** - Any of several types of machines used for applying spray material so that the material is delivered through the spray nozzle with force sufficient to achieve the desired break up. See: Compressed-air sprayer.
- SPRAY NOZZLE** - The attachment on the end of a sprayer extension tube that breaks up spray liquids into fine drops so that the material may be spread evenly on plants or other surfaces. See: Nozzle.
- SPRAY OR FOG FREEZING** - Spraying cold brine against metal containers full of food to freeze the food for preservation.
- SPRAY POND** - A pond used to cool condensing water by evaporation of a part of it for their principal cooling effect, although in cool weather a large part of the cooling may be done by direct contact with cool air.
- SPRAY PUMP** - Any pump which is used for pressurizing spray material so that the material is delivered through the spray nozzle with force sufficient to achieve the desired break up. See: Compressed-air sprayer.
- SPRAY RIG** - A complete, mobile spraying unit which consists of the necessary parts for distributing insecticides or other fluid material in the form of a spray. See: Compressed-air sprayer, sprayer-duster.
- SPRAY WASHER** - A jet or spray of water, or a series of jets or sprays of water, which is used for washing vegetables, poultry, and other products in preparation for marketing and processing.
- SPREADER** - 1. A device which is used for distributing water uniformly in or from a channel. 2. A device that scatters or spreads. For example, a manure spreader, a fertilizer spreader.
- SPREADER** - See: Manure spreader.
- SPREADER NOZZLE** - A nozzle used in sprinkler irrigation that applies water to the area close to the sprinkler head.
- SPREADER SPOOL** - See: Spool.
- SPREAD FOOTING** - A concrete footing shallow in relation to its width.
- SPREADING SYSTEM** - A system somewhat like an irrigation set-up which spreads the water diverted to it

- in time of excess runoff over a larger area and thereby increases the amount of water entering the soil. (Replenishes ground water.)
- SPRINGBACK** - In density determination of silage or forage as weight and depth measurements are made, the slight rise in height which occurs as some of the material is removed from the top of the pile.
- SPRING BALANCE** - An apparatus for measuring the intensity of the force applied to extend or compress a coiled spring. The spring is usually connected by suitable linkages to a pointer which moves on a graduated scale or dial. Applications of the spring balance are steelyards, testing machines, spring loaded safety valves, etc.
- SPRING BALANCE VALVE** - In steam engineering, a form of safety valve in which the lever is attached to the end of a spring balance, instead of receiving a weight. The graduations of the balance indicate the pressure.
- SPRING COTTER** - Properly a flat cotter or forelock split at the end remote from the head to secure it in its place. The term is sometimes applied to a round split pin.
- SPRING DRAWBAR** - A spring-loaded device which cushions a shock by allowing the tractor a few ins. of travel before it is stopped, with the wheels spinning.
- SPRINGER** - A mild swelling in a tin can of food caused by over filling or insufficient exhaustion.
- SPRING-FED** - A stream or ponded water that is supplied by springs.
- SPRING-FED INTERMITTENT STREAM** - Spring-fed intermittent stream or stretch of a stream, is one that flows only at certain times when it receives water from springs. The intermittent character of streams of this type is generally due to fluctuations of the water table whereby the stream channels stand a part of the time above the water table. This is the ordinary type of intermittent stream.
- SPRING OVERLOAD RELEASE HITCH** - A release hitch which attempts to combine the virtue of breakpins and simple drawbar springs. It allows an appreciable elongation of the hitch before release. See: Spring release hitch.
- SPRING PUNCH** - A punching apparatus provided with a spring for withdrawing the punch from the hole which it has made.
- SPRING-RELEASE HITCH** - A type of hitch used when plowing which will automatically disengage the plow from the tractor when the plow hits a large stone, roots, etc. A spring is linked to a claw which hooks on to a clevis connected to the plow. When something immovable is hit by the plow the spring gives way and the claw will slip out of the clevis. It is necessary to recouple the plow for further operation.
- SPRING-TINE WEEDER** - A device that can be operated directly over the rows to uproot small weed seedlings from among established crops. Small and pointed curved teeth made from spring steel attached to a frame make up the weeder.
- SPRING TOOTH** - One of the curved, spring steel, soil-working parts of the spring-tooth harrow or spring-tooth cultivator.
- SPRING-TOOTH ATTACHMENT** - An attachment secured for riding cultivators. They have a cultivator shovel at the end of a coiled spring.
- SPRING-TOOTH HARROW** - A harrow similar to the spike-tooth harrow but has long, curved teeth made from spring steel 1/4 to 3/8 in. thick and about 1 3/4 ins. wide. It is adapted to the cultivation of firm previously tilled soils to depths as great as 5-6 ins. Because of spring action and "give" of the teeth, this tool is suitable for rough and stony ground. Also called drag.
- SPRING-TOOTH ORCHARD HARROW** - A spring-tooth harrow which is designed in independent sections which are under spring tension, lever controlled, making it possible to regulate uniformly the depth

- of penetration in the soil. Each section is equipped with heavy, tempered, spring-steel teeth, which have a high throat for clearing heavy trash.
- SPRING TRIP** - A spring device on the shank of a cultivator or plow beam which allows the shovel to pivot back and pass over an obstruction without bending or breaking the shank or beam.
- SPRING WASHER** - A split washer, with ends bent to form a helix like a spring; used to prevent a nut from loosening.
- SPRING WATER** - Water which flows from a natural spring.
- SPRING-WIRE FINGERS** - That which is located on the cylinders and concaves of some threshing mechanisms to help separate pods from seeds.
- SPRINKLER** - 1. A device for spraying water on plants or lawn; a sprinkling unit which is attached to a water pipe or hose. 2. A sprinkling can. 3. In field irrigation, a water spraying device that has one or more nozzles that are rotated by the energy of the water of a gear drive.
- SPRINKLER IRRIGATION** - The application of water to the soil for the benefit of present or future crops. Water is projected outward through the air by above ground applicators to reach the soil in droplet form that approaches rainfall. Applicators commonly used are rotary or fixed sprinklers, oscillating pipe or perforated pipe.
- SPRINKLER IRRIGATION SYSTEM** - All of the equipment required to apply water to a given area, from the source of water supplying the system, to the revolving sprinkler, nozzles or perforated pipe.
- SPRINKLER LATERAL** - A line of portable pipe or tubing with sprinklers, nozzles or perforations along the line. It may be one of several operated from a common main supply line or a single line supplied directly from the water source.
- SPRINKLER NOZZLE** - A nozzle used for applying a spray of liquid.
- SPRINKLER, ROTARY** - A Y-shaped sprinkler with a rotating head used in irrigation. The rotary motion is caused by the action of the water as it leaves the nozzle.
- SPROCKET CHAIN** - A chain for transmission of power, whose links have openings to fit on the teeth of a sprocket wheel.
- SPROCKET WHEEL** - A wheel with cogs or projections which is arranged so as to engage the links of a chain, as on grain combines, manure spreaders, etc., to transmit power.
- SPRUNG HOLE** - A punched or bored hole which has been enlarged with a small explosive charge for the purpose of receiving a larger explosive charge required to complete the job.
- SPUD** - 1. In excavating, an implement similar to a chisel, with a long handle; somewhat like a carpenter's gouge. 2. In well boring, a tool shaped like a spade for freeing lost or broken tools by digging around them.
- SPUR DIKE** - A disk of rock or other material which is built from the bank into the channel for bank protection or for channel improvement. Also called jetty.
- SPUR GEARS** - Gears that have their shafts parallel and the teeth surfaces parallel to the shaft.
- SPUR TERRACE** - A short terrace in erosion control which is used to collect and hold or divert runoff.
- "SQUADRON" HITCH** - A special hitch for hitching two units together.
- SQUARE** - 1. A unit of measure consisting of 100 sq.ft. used in the measurement of roofing material. 2. A tool used by carpenters to measure lumber.
- SQUARE CENTER** - In machine shops, a tool for forming and enlarging the centers in the ends of a shaft or bar which has to be turned in a lathe; a center similar to those ordinarily fitted, but furnished with a hard pyramidal point, is

- placed in the tail center, and forced against the end of the rotating shaft, enlarging the previously drilled hole to a suitable cone for the reception of the turning center.
- SQUARE LOCK NUT** - A lock nut that automatically locks itself into place.
- SQUARE NUT** - A nut with four equal sides usually least expensive.
- SQUARE PACKING** - Gaskets made into a square sectional form. Used for packing piston rods and valve stems, also in pumps as a piston and plunger packing.
- SQUARE POINT CHISEL** - A wood turner's chisel having a square nose, not unlike a parting tool.
- SQUARE THREAD** - In machine practice, a screw thread of rectangular section; its pitch is usually twice that of a V thread for the same diameter, the thickness of each thread being equal to the width of the groove between the threads, while the depth is little less than half the pitch. These threads are not employed in fastenings, but are used where it is necessary to secure accurate movement and freedom from wear, as in the various controlling parts of engines and the operating shafts and wheel spindles of machines, where nuts have to continually travel on the threads.
- SQUARE TOOTH** - The shape of the teeth on some spike-tooth harrows.
- SQUAT PACK** - A method of packing dressed poultry for export trade in which 12 birds are packed with their backs up in a single layer, 6 on a side with feet doubled under the breasts and the necks extended between the birds on the opposite side of the box. Also called export pack.
- SQUIB** - In mechanics, a detonator; in well boring, a vessel containing the explosive and fitted with a time fuse which is lowered down a well to detonate the nitroglycerin used to torpedo it.
- SQUIRREL CAGE MOTOR** - An induction motor whose rotor windings are bars of copper or aluminum embedded in slots in the iron core of the rotor and connected together at each end by means of a copper or aluminum ring or whose entire rotor is die cast with end rings, rotor bars, and rotor fan all together. The name is derived from the fact that the cylindrical ring of bars resembles a squirrel cage.
- S-SHAPED ISOTHERM** - See: Sigmoid isotherm.
- STABILITY** - That property of a body which causes it, when disturbed from a condition of equilibrium or steady motion, to develop forces or moments which tend to restore the body to its original condition. A governor is said to be stable when it occupies a definite position of equilibrium for each speed within its working limits.
- STABLE LUBRICATION** - The region of operation in which the layer of lubricating oil film is thick enough to prevent metal to metal contact between two parts which move relative to each other.
- STACKER** - A threshing machine attachment for loading the straw on a wagon or depositing it in the form of a stack.
- STACKER FAN** - A fan used in a threshing machine which pushes the straw through a conduit with an outlet which builds a stack.
- STACK GASES** - Fumes and vapors coming out the exhaust system of a furnace.
- STACKING DERRICK** - A form of derrick which lifts hay on to a stack consisting of an upright mast with a swinging gaff or boom, usually swiveling completely around the mast.
- STACK STAND** - A platform to support a stack of hay or grain above the wet ground and free from vermin. Also called staddles.
- STACK TEMPERATURE** - The temperature of flue gas in a chimney or smoke-stack.
- STACK-VENT** - The part of the soil pipe above the highest horizontal drain.
- STACK VENTILATION SYSTEM** - A system

- employing air temperature difference as a means of inducing air flow for purposes of ventilation.
- STADDLE** - Anything which serves for a support; a prop.
- STAFF GAGE** - A graduated scale on a wooden staff, plank, metal-plate pier, wall, etc., by which the elevation of the water surface may be read.
- STAGE** - 1. The elevation of a water surface above its minimum; also above or below an established "low-water" plane; hence above or below any datum of reference; gage height. 2. A floor elevated for the convenience of mechanical work of the like; a scaffold; a staging. 3. A platform, often floating, serving as a kind of wharf.
- STAIR HORSE** - The support for the treads and risers in stair construction.
- STAKE** - A wooden or metal strip, usually pointed at one end for driving into the ground, which is used for marking a location in surveying, supporting a vine or plant, tethering an animal, etc.
- STAKE-BODY TRUCK** - A truck whose body, sides and end consist of removable panels that are affixed to vertical stakes. The ends of the stakes fit into stake sockets at the outer edge of the truck bed in order to hold the panels in an upright position. Locking clips and pins connect the panels together to complete the enclosure.
- STAKING DRAINAGE DITCHES** - Determination of the location of depth of a proposed drainage ditch in the field by placing stakes at regular intervals to indicate the center line of the ditch and by use of hub and guard stakes to indicate the exact depth of ditch in reference to the top of the hub stake which is usually driven flush with the ground surface. The guard stake indicates the location of the hub stake and the depth of cut is written in crayon on the guard stakes, as C 4.24.
- STAKING POND (DAM)** - The locating of a pond site including the dam and outlet and water's edge and the marking the location of each with stakes.
- STAKING TERRACE LINE** - Laying out terrace lines and placing stakes along each as markers.
- STALK CUTTER** - A machine used to chop or cut up stalks of crops so that they will be properly covered by plowing and not interfere with the proper operation of other machines.
- STALK HOOKS** - Hooks on stalk cutters which pull the stalks parallel to the row so that the knives can cut them.
- STALK SILAGE** - A silage made from the stems and leaves of corn after the corn ear has been removed.
- STALL BARN** - A barn which is used for sheltering dairy cattle in which the animals are confined to stalls by means of stanchions, straps, halters or chains (during part of the year) for milking, feeding and care. The feeds and bedding may also be stored in the structure. Box stalls or pens may also be included. Also called stanchion barn.
- STALL COCK** - A valve on the vacuum line of the milking machine which is placed at the stall of each cow for attaching the suction hose of the milking machine.
- STALLING TORQUE** - Commonly called "stall torque". Any torque applied to an engine crankshaft in excess of the maximum torque which can be maintained with the engine running. Such a torque causes the engine to stop or stall.
- STALLS ABREAST** - A milking parlor arrangement in which the stalls are placed so the cows are side by side and facing the same direction. They enter by one door and leave by another.
- STANCHION** - 1. A tying or controlling device which is used in barns to control animals, usually dairy cows. 2. An upright post supporting a roof.
- STAND** - A structure used in irrigation

- systems constructed from vertical sections of pipe or cast in place concrete. It provides an opening to the pipe line into which pump, gate or float valve may be installed. It may also help serve as a vent or sand trap.
- STANDARDIZATION OF MILK** - The practice of modifying normal cow's milk by the addition or subtraction of butterfat or non-fat solids to a certain desired standard.
- STANDARD LINE** - A complete line of equipment of predominant brand sold by a machinery dealer.
- STANDARD OF IDENTITY** - A regulation fixing and establishing for a food under its common or usual name, a reasonable definition of the food, acceptable ingredients, a reasonable standard of quality and/or reasonable standards of fill of container.
- STANDARD PACK** - Cans filled with smaller types fruit of imperfect color and which may be trimmed.
- STANDARD PITCH ROLLER CHAIN** - A roller chain which is satisfactory at linear speeds from less than 100 fpm up to 4,000 or 4,500 fpm and well suited for heavy loads requiring a compact drive. The side pitch is set up by American Standards Association (ASA).
- STANDARD RAIN GAGE** - A vertical, cylindrical container with top opening 8 ins. in diameter. A funnel-shaped hood is inserted to minimize evaporation losses.
- STANDARD ROD** - In shop practice, a rod of well-seasoned yellow pine which is used as a basis and reference for accurate measurement in a workshop. Such rods are usually made from 5 to 10 ft. long, the section of the wood being about 2 x 2 ins. Each 12 in. division is marked on a brass inlaid plate.
- STANDARD SPECIFICATION** - A model schedule or list of design criteria, qualities, control, dimensions and tests proposed as a basis for the mass production of similar articles, structures or mechanisms.
- STANDARD TRACTOR** - A general purpose 4-wheel tractor used on the farm.
- STANDBY GENERATORS** - Generators which can provide electricity when the power from normal sources has been interrupted.
- STAND GATE** - In irrigation, a gate located in a stand covering an inlet to a pipeline and controlling the flow into such a pipeline. It may be either a screw or slide type gate.
- STANDING CUTTER** - A stationary upright knife coulter placed on plows to cut the furrow slice loose from the furrow wall.
- STANDING WATER** - Any water that collects or stands for a period of time on the surface of the land following a heavy rainfall or fast melting snow.
- STANDISH STEAM "PLOW"** - A form of rotary pulverizer that plowed and seeded over 100 acres in the Diablo Valley in California.
- STAND-PIPE** - A pipe or tank connected to a closed conduit and extending to or above the hydraulic grade line.
- STAND PRESSURE GATE** - In irrigation a gate located in a stand covering an outlet from a pipeline. It is a screw type gate.
- STAPLE PULLER** - A heavy pliers which is designed for grasping and pulling staples, or an iron bar with a pointed projection at one end which is forced into the loop of the staple and used for pulling staples from fence posts.
- STAR DRILL** - A hand or machine drill for rock or concrete, having a point shaped like a cross or four pointed star; it is claimed to be more rapid than the chisel point pattern.
- STARTING BATTERY** - A group of brooding units for starting and growing chickens. Conventionally the units are wire cages arranged in tiers of two or more. Heat, food and water are supplied.
- STARTING CRANK** - The handle whereby the shaft of a gasoline motor is revolved until an explosion results

- and the engine starts working, also called starting handle.
- STARTING CURRENT** - The current passed through the armature and field magnets of a motor at the moment of starting in order to produce the required starting torque.
- STARTING HANDLE** - In machinery, the handle of a machine for shifting a belt from the idler to its power shaft.
- STARTING PUMP** - An air compressor and accumulator system used to start internal combustion engines. Not used on tractors or farm engines.
- STARTING TORQUE** - The torque or turning effort exerted by an electric motor, starting from rest.
- STARTING WINDING** - On a split phase motor a winding placed in slots at 90 electrical degrees from the main winding. The main winding and the starting winding are so proportioned that their respective currents are out of phase, the object being to produce a rotating field. This rotating field reacts with the rotor causing it to turn. The starting winding usually consists of a relatively small number of turns of fine wire. This gives a high resistance and low reactance and the current is nearly in phase with the applied voltage.
- STAR WHEEL** - A wheel with radial projections, either in the form of spokes, or of teeth. The former is much used on machine tools for applying or regulating the feed; the latter device is used in connection with repeating watches, meter, etc. This is also applied to some types of feeds for commercial fertilizers.
- STATIC COEFFICIENT OF FRICTION** - The coefficient of friction of two surfaces that are not in motion with respect to each other.
- STATIC HEAD** - The compressive stress at a point in a fluid. The pressure exerted by a fluid which is at rest. In a moving fluid it is equivalent to the pressure on a surface moving with the fluid or to the normal pressure on a stationary surface parallel to the flow. Total head is equal to the sum of the static head and the velocity head.
- STATIC LIFT** - The vertical distance that water must rise from water level in well to pump discharge level. The drawdown when pump is operating is included in dynamic lift.
- STATIC LOAD** - 1. A stationary load on structures. 2. An unchanging pressure supplied by a hydraulic system.
- STATIC PRESSURE** - Usually means environmental pressure minus atmospheric pressure; however may be measured on absolute basis.
- STATIC SUCTION HEAD** - The vertical distance from the center line of the pump to the force level of the liquid to be pumped.
- STATIC SUCTION LIFT** - The vertical distance from the centerline of a pump to the free level of the liquid to be pumped; the height of an equivalent column of fluid corresponding to the suction head.
- STATION** - A set-up point, that is, a marked point on the ground, over which an instrument is to be placed. Or, any point on a straight, broken or curved line, whose position is indicated by its total distance from a starting point, or zero point.
- STATIONARY BALER** - A stationary machine which bales hay and straw, powered by animals or by a belt from tractor or auxiliary power unit, to which the hay is delivered and placed on feeder table. See: Pick-up baler.
- STATIONARY ENGINE** - A steam engine or an internal combustion engine which is stationary when it is mounted and fixed in a permanent form.
- STATIONARY HEATED AIR DRYER** - A unit permanently situated in one area which is usually of considerably greater capacity than portable heated air dryers.

- STATIONARY-OPENING SEED-METERING DEVICE** - A seed-metering device used extensively for planting vegetables and to some extent for other row crops. A rotating plate has a series of metering holes of varying sizes around the outer part. The plate is turned by hand until the desired size of hole is within the hopper; it is then locked in position and remains stationary during planting operation.
- STATIONARY SPRAY PLANT** - A spray outfit that remains in a fixed place. Generally the plant consists of a large-capacity tank, a power unit and pump of sufficient capacity to force spray liquids through underground pipes to all parts of an orchard.
- STATIONARY THRESHER** - A threshing unit that is located in a fixed place to which harvested grain, beans, etc., are brought to be threshed, as contrasted to a combine harvester-thresher unit which threshes the crop as the unit moves over the field.
- STAVE JOINTER** - A device or machine tool which is used for turning the edges of barrel staves.
- STAVE SILO** - A large, round bin or receptacle made of narrow strips of wood or concrete staves, placed edge to edge and held together with steel bands, in which chopped green forage is stored. See: Silo.
- STAVE WALL** - A circular wall made of narrow vertical members placed side to side and held together, against lateral pressure, by tension bars or hoops. A tower silo.
- STAY** - 1. A guy rope, cable or wire that supports a vertical pole, mast or post. 2. A prop or tie piece that supports or holds parts together, or contributes to stiffness. An example is a timber, supporting the frame of a structure.
- STAY BOLT** - A rod connecting opposite plates as in a boiler or parts to stiffen or prevent separation.
- STAY-CHAIN** - 1. The chain on a wagon or truck box which prevents the sides from bulging when the box is loaded. 2. A chain on each end of the double tree of a wagon which ties the end of the doubletree to the front axle to lessen the swing of the doubletree.
- STAY LATH** - A temporary brace.
- STAY WIRE** - Any of the several vertical cross wires of woven wire fencing which are perpendicular to the line wires.
- STEADY FLOW** - A constant flow; that is, the same volume in equal units of time.
- STEADY REST** - A support in a lathe for long flexible objects, preventing them from springing under the cut of the tool. It is generally made as some form of adjustable bearing, in which the work revolves.
- STEADY STATE** - The condition which exists when the transmission of a substance past a fixed point is constant with the passage of time.
- STEAM BOILER** - 1. A closed vessel in which water is boiled and converted to steam by the application of heat; that part of the steam generator in which water is converted to steam. 2. A term loosely used to include all components of a steam generating unit; a steam generator.
- STEAMER** - A device for obtaining beeswax from old combs in which the combs are suspended in a closed tank and treated with steam.
- STEAM GENERATOR** - 1. A device for converting water to steam consisting of an integrated assembly of the boiler heating surface, furnace or combustion region, supporting and enclosing structure, and accessories; commonly called a "boiler" although the boiler is only a portion of the steam generator. 2. A modified type of automatic boiler containing a relatively small amount of water in relation to the surface area and can produce operating steam pressure within a few minutes; "flash" boiler.

- STEAM-HEATED PAN** - A pan, similar in principle to the sorghum pan, which is heated by steam used for concentration of juices, sap, etc. to a syrupy consistency.
- STEAM INJECTION** - A method of heating a product by adding steam directly to the product.
- STEAM JACKET** - A space formed in the walls of a vessel or chamber (as by an inner and outer casing) whereby steam may be circulated to heat the contents. Steam-jacketed kettles are commonly used by processors in the preparation of jelly, preserves, etc.
- STEAM THRESHING ENGINE** - A steam engine developed in the late 1850's to deliver power at the belt pulley especially for threshing operations. It was motivated by the pressure of steam on a cylinder which drove the wheels and belt pulley. (Obsolete)
- STEAM TRAP** - A device at the bottom of a steam radiator or other steam device to permit water but not steam to be removed.
- STEEL BELT LACING** - A name given to a metal belt fastener chiefly used in connection with cotton or other fabric belts. It is a small harrow-like plate of metal, whose tines are forced through the belt from the outside and clinched over the back.
- STEEL CHANNEL** - A steel structural member with a cross section shaped like a square U with very short legs.
- STEEL PLOW** - The common plow in which the share moldboard and land slide are made of hardened steel. It is universal in the United States but still rare in many parts of the world.
- STEEL REINFORCING** - Rods made of mild steel used in concrete to provide strength in tension.
- STEEL RULE** - A machinist's tool. Machinist's rules are made of steel, usually a foot long, and containing numerous subdivisions of the in., ranging from eighths to sixty-fourths.
- STEEL SECTION** - Any common type of cross-sections of steel structural members. They may be I's, H's, channels or angles.
- STEEL TIE** - A flat band of steel which is used to tie cotton bales, etc.
- STEEL TRACTION WHEELS** - Drive wheels on a tractor or other piece of machinery consisting of steel rims and steel lugs which provide the traction.
- STEEL WIRE** - Wire made of steel in all grades and tempered for springs, drills, etc.
- STEEL WIRE CABLE** - An assembly of six wire strands twisted about a central core of hemp rope. The core serves as a spacer and a wick for lubricating the strands. Each strand is made up from 7, 19, 37 or 61 wires twisted together.
- STEERING BAR** - A bar in a chain and bar hitch for a disk plow that will guide the front furrow wheel.
- STEERING LINKAGE** - The mechanism that transmits motion to and positions the steering elements or wheels of a vehicle.
- STEERING RIM** - An extension on the periphery of the front wheels of a steel wheeled tractor which provides directional movement.
- STEAM TANK** - A chamber heated by steam, used for various purposes such as rendering fats, etc.
- STELLITE** - A trade name for a very hard metal that contains 75-90% cobalt and 10-25% chromium. It may also contain other metals. It is applied to the cutting edge of a plow share with a welding torch.
- STEMMING** - The packing placed over an explosive charge for the purpose of confining the resulting forces in the desired area.
- STEP BEARING** - In millwrighting, a contraction of foot step bearing; one which supports the bottom of a vertical shaft, or that of a spindle of a millstone.
- STEP BOX** - In millwrighting, a case for the bearing surface at the lower end of a vertical spindle or shaft.
- STEPPED PULLEY** - A pulley of differing

- diameters, forming in conjunction with another corresponding one, the means for driving a machine by a belt at varying speeds.
- STEREOCOMPARATOR** - Photographic mapping: an instrument for measuring the three coordinates of a point by stereoscopic observation of two images of the same point contained in two overlapping photographs taken from two different exposure stations.
- STERILIZING SOLUTION** - Any chemical solution capable of destroying bacteria or other organisms.
- STICKING KNIFE** - A knife which is used for the slaughtering of livestock.
- STOCKY SOIL** - Soil that has high clay and silt content and the moisture content is normal. These soils will usually stick to different surfaces but will sometimes "scour" or "shed" on highly polished steel.
- STIFF-LEG DERRICK** - In rigging, an implement for hoisting or lowering heavy loads, which is equipped with a hoisting tackle suspended from the end of the boom to handle the load, and with a tackle connecting the boom and the mast for raising or lowering the boom. The mast is held in an upright position by inclined wood or steel struts, called stiff legs, extending from the top of the mast to the sill.
- STILE** - 1. A set of steps or ladder over a fence or wall which allows passage of a person but forms a barrier for livestock. 2. The vertical members of a built-up part, such as a door, window panel, etc.
- STILL** - A vessel in which liquid or semi-solid substance is submitted to distillation; that is, its more volatile constituents are evaporated and led to another vessel or apparatus in which they are condensed. Such devices are used by mint growers in the production of peppermint and spearmint oil. (Sometimes the term is used to include the whole apparatus.)
- STILLING BASIN** - An open-top structure or excavation at the foot of a water fall, drop structure or rapids which is used to dissipate the energy of the descending current.
- STILLING WELL** - A protected, miniature well beside and connected with a body of water which is used for accurately determining the changes in water level. It is usually used in connection with the measurement of discharge water in a canal, stream, river or flume.
- STILLSON WRENCH** - A wrench having adjustable serrated jaws to enable it to grip a pipe or round surface, thus fitting it to act as both pipe tongs and spanner.
- STIRRUPS** - U-shaped rods used as vertical reinforcing in concrete beams.
- STOCKWATER DEVELOPMENT** - The development of new or improved sources of stock water supplies, such as wells, springs and ponds, together with storage and delivery systems.
- STOCK WATER POND** - Pond that is automatically controlled by a number of outlets to maintain water at the desired level for stock.
- STONY LAND** - Land which contains enough stone, either fragments in or on the soil or rock outcrop, to interfere with or completely prevent tillage.
- STOCK** - 1. Domestic animals, usually meat cattle; the animals on a farm are termed live stock; the instruments of husbandry. 2. Rough material destined to be wrought into finished articles. 3. A handle for any appliance; the term is usually restricted in its employment. 4. The block part of a carpenter's plane, into which the plane iron is fixed. 5. Shares or holdings in a corporate business or enterprise.
- STOCK BARN** - A building used primarily for the housing of livestock.
- STOCK CAR** - A slatted freight car, which is arranged for the handling and shipping of livestock. Some

- are double-decked for handling hogs and sheep.
- STOCK FOUNT** - A watering device, (fountain) usually consisting of a small receptacle or water cup, which is automatically kept full by a float valve or filled when a valve is operated by the pressure of the muzzle or snout of the animal.
- STOCKINET** - A knitted, coarse, elastic, net-like type of cotton cloth similar to stocking material which is used as a protecting cover for fresh-killed meat to protect it from dirt, from drying out and from changing color. It is also used as a bandage material.
- STOCK OIL-EMULSION** - A fluid or paste containing more than 65% oil emulsified with a small amount of water which is diluted in water for use as an insecticide. Also called oil emulsion. See: Emulsion.
- STOCK PENNING** - An old way of manuring land, practiced in Florida and southern Georgia, in which livestock are kept in a small enclosure of an acre or two. When the land is sufficiently manured, the pen is changed to a new location.
- STOCK-RACK** - A type of rack on a truck, which is usually made of wood slats and used to enclose livestock when transporting them.
- STOCK TANK HEATER** - A small oil or coal heater that is placed in stock watering tanks to keep water above freezing point.
- STONE BOAT** - 1. A flat-bottomed, sledlike device which is used for short hauls and heavy loads over soft or wooded land not accessible to wagon or truck. It is commonly used for removing stones from fields. 2. A similar sled or drag on which stones of known weight are placed to test the pulling ability of a team of horses or tractors.
- STONE CRUSHER** - A machine for reducing rock into smaller pieces of varying sizes.
- STOOK** - A shock of grain (corn). British.
- STOOL** - A narrow flat horizontal part of the inside window trim which fits on top of the sill and against the lower rail of the sash.
- STOP** - 1. A wood or metal strip placed in casings to prevent the window or door from going beyond the closed position. The stop also seals the opening against drafts. 2. A short strip of wood, placed between adjacent rafters on top of the wall plate, to protect the interior of the building against the weather.
- STOP HITCH** - A device on a tractor which disengages the clutch on overload or when an obstruction is encountered by the implement.
- STOP PIN** - A pin mounted on a magneto frame that stops the shaft in the magneto, while the engine continues to turn, winding up the connecting spring. See: Impulse coupling.
- STORAGE** - A space or place for holding a product.
- STORAGE CAPACITY** - The amount of water a stream or reservoir will hold before the water will overflow the banks.
- STORAGE EGGS** - Generally, those eggs that have been held under refrigeration for more than 30 days. (Usually, spring eggs of good quality are held until late summer or fall for price advance, commonly for about 6 months. Eggs held under refrigeration for 30 days are sold according to their grade and are not regarded as storage eggs but are sometimes known in the egg trade as refrigerator eggs.)
- STORAGE FLAVOR** - A flavor resulting from poor ventilation, faulty temperature, or unsanitary conditions in which some food products are held.
- STORAGE HOUSE** - Any building which is used for the holding of farm products, implements or materials.
- STORAGE LIFE** - Length of time a product can be held and still meet consumer acceptance standards.
- STORAGE LOSSES** - The losses, including

- shrinkage, spoilage and rodent activity incurred by stored products.
- STORAGE PACKED EGGS** - Selected eggs which are packed especially for storage: ordinarily, eggs of good quality from which small, checked and washed eggs have been sorted out which are packed in new cases with new flats and fillers of the type prescribed by trade specifications.
- STORAGE RESERVOIR** - Reservoir which is operated manually so that only the desired amount of water is stored.
- STORAGE SPOT** - Certain shallow, sunken spots which appear on fruits stored under unfavorable conditions of temperature and humidity. The spots gradually turn brown, especially on exposure to warmer temperature.
- STORM DRAIN** - Drain that transports storm runoff water.
- STORM SEWER** - A sewer which carries storm and surface water.
- STOVE BOLT** - A rather short bolt having threads running down close to the head, which may be either flat or round. Most stove bolts also have a slot cut across the heads so that screw drivers may be used to prevent them from turning.
- STOW SHAFT** - A trade name for a flexible shaft for the transmission of power around angles, etc.
- STRAIGHT ACID** - A soldering flux for use on galvanized iron and zinc. It is a diluted hydrochloric acid solution.
- STRAIGHT-AWAY CAN WASHER** - A mechanical type of automatic washing device for milk cans in which the cans are carried straight through the washing process by means of a ratchet drive.
- STRAIGHT BLADED FAN** - A type of centrifugal fan where the air moves out of the fan perpendicular to the edge or end of the blade. The fan blades are straight and their axes perpendicular to the axis of rotation.
- STRAIGHT-DROP SPILLWAY** - A simple structure installed in gullies to establish permanent control elevations below which an eroding stream cannot lower the channel floor.
- STRAIGHT EDGE** - 1. A bar of metal carefully planed and scraped on one or more edges to serve as a gage or test for the accuracy of machine work or in adjusting of assembling machinery. 2. An engineer's steel rule, the edges of which are made straight for use as a gage or tester.
- STRAIGHT KNOT** - The knot that is formed by a knotter (tying mechanism). A needle brings the twine over the bundle, placing it in the twine-holder disk, which holds it securely while the bill hooks revolve, wrapping the twine around the bills, catching the ends of the band between them, and holding it while the twine is pulled from over and around the bill hook, tying the knot. As the knot is tied and the cord cut, the twine-holder disk retains the end of the twine for tying another knot.
- STRAIGHT-LINE RELATIONSHIP** - A direct proportion between two variables.
- STRAIGHT LIPPED TONGS** - Blacksmith's tongs for holding thin objects, the lips or gripping parts being near parallel and square with each other.
- STRAIGHT PEEN** - Hammer style when the peen is wedge or hatchet shaped and parallel with the handle; used for chipping.
- STRAIGHT-RUN FUEL** - Fuel that is a product of simple distillation. Each hydrocarbon has a definite specific gravity and boiling point. Hence crude oil is fed into the still, and the temperature is raised to a higher temperature than the high-boiling point constituents. The vapors pass up through the bubble or fractionating tower and "cuts" or fractions of specific boiling-point ranges are separated and subsequently condensed. After its separation, the fuel must be

- chemically treated to reduce the amount of impurities, chiefly sulphur and gum.
- STRAIGHT SHARE** - A plow share that is so named because it is stamped and shaped in one operation.
- STRAIGHT SHOVEL** - A type of cultivator shovel which is slightly curved and comes to a wide point.
- STRAIGHTWAY VALVE** - A valve whose two openings are in line with each other, as differentiated from an angle valve.
- STRAIN GAGE** - A fine piece of resistance wire mounted in an insulating medium and cemented to a specific spot on a machine member, to measure strain and enable calculation of the corresponding stress. Changes in the surface dimension due to load either compress or stretch the wire and change its electrical resistance, which is proportional to the strain in the piece under test.
- STRAIN GAGE TORQUEMETER** - A fine piece of resistance wire mounted in an insulating medium and cemented to a specific spot on a test shaft, whereby changes in stress are indicated or recorded electronically.
- STRAIN-SENSITIVE LACQUERS** - Lacquers used to study stress patterns and determine the proper location for the strain gages.
- STRAKE** - An iron band by which the felloes of a wheel are secured to each other, the felloes being not continuous, as the tire is, but made up of separate pieces.
- STRAP BRAKE** - A simple variation of the Prony brake for testing the horsepower of engines. A strap or piece of belt furnished with shoes is so disposed around the flywheel as to form a loop, the curve enclosing at least half the circumference of the wheel, while a steelyard is interposed between either end and the floor or foundation. An arrangement is made for adjusting the tension of the tight side of the strap, so as to insure a fair pull, and the product of the difference between the indications, on the two spring balances, multiplied by the linear velocity of the rim, in ft. per min., gives the power supplied by the engine.
- STRATIFICATION** - 1. A method of storing seeds at a temperature between 35° F. and 45° F. in alternate layers or mixed in moist sand, peat moss, or other medium, as a means of breaking the rest period. 2. Composed of, or arranged in, strata or layers, as stratified alluvium. (Strictly, the term is applied to geological deposits and not to soils proper.)
- STRAW CARRIER** - 1. An endless apron in a threshing machine, to lift the straw as it comes from the cylinder, and discharge it at the tail of the machine. The carrier being of open work, the grain and chaff are sifted out on the way. 2. A straw elevator at the end of the thresher, to lift the straw on to the rack.
- STRAW CHOPPER** - An attachment for the rear of a combine which chops the straw into lengths of 4 to 6 ins. as well as spreading it.
- STRAW FIRING** - The operation of burning straw under a boiler consists in the fuel being fed into the furnace only as fast as needed. When the straw is handled right, it makes a beautiful and very hot flame and no smoke is seen coming from the stack. The whole secret of getting the best results from this fuel is to feed it into the furnace in a gradual stream as fast as consumed.
- STRAW FORK** - A long tined, wide hand-operated fork used to handle loose straw.
- STRAW GOVERNOR** - A device on a threshing machine which controls the input of straw into the machine. It may consist of a steel roller or feeder actuated by a drive which is synchronized with the speed of the threshing cylinder.
- STRAW LOADER** - An attachment available for combines that will carry straw to a wagon trailing behind

- or beside. It operates similarly to a conveyor.
- STRAW RACK** - 1. A bunkerlike structure usually built in the open cattle yard where straw may be stored or placed for livestock feeding. 2. A shaker rack on a threshing machine which lifts the straw as it comes from the cylinder and discharges it at the tail of the machine. The rack being of lattice design, the grain and chaff are sifted through on the way.
- STRAW SPREADER** - A mechanical device attached on the rear of a grain combine which distributes threshed straw over the ground behind the combine.
- STRAWSTACKER** - An attachment on a threshing machine the function of which is to deliver properly the straw and chaff to the strawstack by means of a fan and a chute which may be directed to the desired position by one man.
- STRAW WINDROWER** - An attachment available for combines which discharge the straw in a narrow swath for easier baling. It consists of a chute which has a constrictive opening so that straw is forced to form a narrow swath.
- STREAM** - 1. Flowing water in a natural or artificial channel. It may range in volume from a small creek to a major river. 2. A jet of water as from a nozzle. 3. A continuous flow or succession of anything: air, gas, liquids, light, electricity, persons, animals, materials, etc.
- STREAM BANK** - The usual boundaries (not flood boundaries) of a stream channel.
- STREAMBANK EROSION CONTROL** - Vegetative or mechanical protection of erodible stream banks which is frequently used where valuable farm land or a highway is or may be affected.
- STREAMBANK STABILIZATION** - The construction of desirable side slopes and the establishment of cover on riverbanks.
- STREAM BED** - The natural bottom of any river or stream over which water flows.
- STREAM EROSION** - The erosion which occurs when the waterflow of a river or stream cuts into the natural banks of the stream. It is usually the result of excess volume or shift in stream current.
- STREAM FLOW** - That portion of the precipitation which finds its way into natural or artificial runoff channels.
- STREAM GAGING** - The quantitative measurement of stream flow using current meters, weirs or other devices at selected locations.
- STREAM SIZE-WETTED AREA** - The relationship reflected in the width of a stream flowing in a furrow.
- STREAM STABILIZATION** - The improvement of land-use treatment to prevent excessive and non-uniform flows.
- STRESS GRADED LUMBER** - Lumber sorted into grades according to the unit stresses it will withstand. These stresses take into account the non-uniform stress distribution at a certain kind of joint.
- STRETCHER** - 1. A hand manipulated mechanical device of several different types which is used in stretching fence, such as barbed wire or woven wire. It consists principally of the stretcher bar, a ratchet device, stretcher arms and a stretcher clamp which when attached to the anchor post and wire to be stretched bring the wire to the desired tautness. 2. A masonry unit laid with its longest dimension parallel to the horizontal axis of a wall.
- STRETCHER BAR** - The main iron of a fence wire stretcher.
- STRETCHER CLAMP** - The clamp which holds the wire in place while being stretched with a fence stretcher. See: Stretcher.
- STRICKLE** - See: Strike-off stick.
- STRIKING GEAR** - The bar with lever, forks and fittings, by means of which the driving belt of a machine is shifted from the tight to the loose pulley, or vice versa. The

- lever that operates the striking gear is sometimes known as the shifting lever.
- STRIKE-OFF STICK** - A straight, smooth, hardwood stick which is used in leveling off the grain in grain measuring or testing buckets. Also called strickle.
- STRIKING PAN** - In sugar making, the last of a series of evaporating pans in which the more concentrated liquor collects. Also called striking tache.
- STRIKING THE ARC** - 1. Producing an arc in an arc lamp by bringing the two carbon tips together and then separating them, so that the current causes a spark which, by volatilizing some of the carbon, maintains the passage of the electric current. 2. In electric welding, tapping the work lightly against the work to make temporary contact which permits the current to start flowing.
- STRING BINDER** - A harvesting machine which uses a stout twine to tie the cut grain into bundles or sheaves. See: Grain binder, corn binder.
- STRINGER** - 1. The inclined members of a stairway designed to support the treads and risers. 2. A support beam or girder for cross members or joists.
- STRIP HEATER** - A type of electric heater strapped on the outside of a container to be heated, or it can be used to heat air.
- STRING OUT TILE** - The placing of a number of tile laid end to end in the field prior to placement in the ground; as in a drainage tile.
- STRIP CROPPING** - A series of alternate strips of various types of crops laid out so that all tillage and crop management practices are performed across the slope or on the contour.
- STRIP FARMING** - Farming on land where large fields and long slopes are protected from water erosion by plowing on the contour and planting alternate strips to grasses and row crops. See: Con-
- tour farming.
- STRIPPER** - 1. Slats on a hay loader located at the bottom of the elevator in such a way that the teeth picking up the loose hay revolve through them and are forced to leave their hay. 2. A device or machine used for stripping cotton from the plant at harvest time. See: Cotton sled. 3. A hand-operated implement or a power-driven machine used for gathering grass seed by combing or stripping the seed from the plant stems. 4. A machine for clearing new ground.
- STRIPPER BAR** - Stationary curved strips of metal mounted in parallel positions on the frame of a side delivery rake to prevent hay from gathering on the tooth bars. Another function is to strip the hay off the teeth as they revolve.
- STRIPPER ROLLER** - An extra roller located at the upper end of the elevator in a binder. Its purpose is to convey the grain to the binder deck and to prevent the grain from following the elevator around.
- STRIPPER-TYPE COTTON HARVESTER** - A type of harvesting machine which removes the whole boll of cotton (the cotton and bur) from the plant by a stripping process. There are three types of these harvesters now in use; there are the double-roller, the single-roller and the combing tooth.
- STRIPPER WHEEL** - The part of a corn sheller that removes the corn from the cob.
- STRIP ROTATION** - A crop rotation for contour strip within a field using erosion-resisting crops alternating with cultivated crops.
- STRIP SODDING** - The laying of sod in strips separated by spaces not sodded.
- STROKE** - The linear distance traveled in one motion by a piston or ram in an engine or pump.
- STROKE-BORE RATIO** - The ratio of the length (in ins.) of stroke to the bore (in ins.).
- STRUCK VOLUME** - The capacity of a

- bucket elevator when it is full to top sides of the bucket.
- STRUCTURAL MEMBERS** - The beams, joists, studs, rafters and columns which provide structural strength to the frame.
- STRUCTURAL SHEATHING** - Sheathing of sufficient strength and applied in such a way that it strengthens the structural frame.
- STRUCTURAL STEEL** - Steel in the form of I-beams, angles, channels, tees, bars, round and square rods, tubes, plates or strips. The steel is made by either the Bessemer or open-hearth process and is used as the main supporting member of structures.
- STRUCTURAL TIMBER** - A class of soft wood lumber composed of joists, planks, posts and timbers more than 2 ins. thick and more than 4 ins. wide. Used where strength properties are important. The whole piece of lumber is used in establishing the grade.
- STRUT** - A member designed to carry compressive forces parallel to its length.
- STUB POLE** - A short pole (tongue) which has fittings for attaching a wagon or trailer to a truck or tractor.
- STUB-RUNNER FURROW OPENER** - A device placed on a planter just ahead of the planting mechanism to open a furrow-like trench in the soil to receive the seed as it is dropped by the planter. It is suited to rough and stony ground because its sloping forward edge causes residues to slide upward and off to either side.
- STUBBLE MOLDBOARD** - A type of plow with a moldboard which is broader and bent more abruptly along the top edge than a regular plow. This pulverizes soil better than other plow types and is used mostly for soils cultivated from year to year.
- STUBBLE MULCH** - A protective cover which is provided by leaving plant residues of any previous crop as a mulch on the soil surface when preparing for and planting the following crop. Stubble mulch "mulch culture" preferred.
- STUCCO** - An outside plaster used as a finish, it is composed of a cement-sand mortar in the proportions of 1 to 3. Lime may be added in the amount of 10% of the weight of the cement.
- STUD** - A slender wood or metal vertical structural member used in walls and partitions to support loads and provide a support for exterior and interior wall finishing.
- STUD BOLT** - A bolt, fixed in, and projecting from a base piece used to fasten other members usually to a floor.
- STUD LINK CHAIN** - A chain, each link of which is fitted with a transverse stud, usually of cast iron or cast steel, which keeps the sides apart and tends to prevent deformation of the link under strain. Chain cables are generally made on this plan.
- STUFFING BOXES (PACKING GLANDS)** - A fixture that prevents leaking along a moving rod or other part that passes through a container holding water, steam or other liquids or vapors. It consists of a box, ring or groove filled with a water-tight packing and compressed by a follower.
- STUMP PULLER** - An appliance (made in several forms) usually involving a cable and winch which is used for removing tree stumps from the soil.
- SUBFLOOR** - A covering usually of boards of sheet material laid on floor joists to be covered with a finished flooring. Usually a lower grade is used and covered with finish flooring.
- SUBIRRIGATION** - Water is supplied to the soil from ditches through underground tile lines or perforated pipe lines in sufficient amounts to maintain a water table sufficiently close to soil surface to supply adequate water quantities for crop needs.
- SUBLATERALS** - Drainage ditches, tile

- or irrigation lines that extend from a lateral line to reach the areas that are not accessible by the main or lateral lines.
- SUBMAIN** - 1. Electric conductors branching from mains, and themselves serving other branches.
2. Tile lines that carry water from a group of laterals into a main line or into a ditch.
- SUBMERGED ORIFICE** - An orifice which in use is drowned by having the tail water higher than all parts of the opening.
- SUBMERGED WEIR** - A weir which in use has the tail-water level equal to or higher than the weir crest.
See: Tail water.
- SUBMERGENCE** - The ratio of the tail-water elevation to the headwater elevation, when both are higher than the crest, the overflow crest of the structure being the datum of reference.
- SUBMERSIBLE MOTOR** - Waterproof electric motor that is set down a sump or well casing below the water level.
- SUBMERSIBLE PUMP** - A multistage centrifugal type of pump with submersible motor attached to form the pumping unit. The unit is suspended at the lower end of the drop pipe and is under water when pumping.
- SUBOPENER** - The part of a furrow opener which actually makes the furrow or trench into which the seed falls.
- SUBSOIL** - In common agricultural usage, that part of the profile which lies below the usual plow depth usually without any specific limitation in depth or kind of material; a B horizon, the first change with depth in texture or structure. For example, a clay layer underlying a sandy surface.
v. To plow deeply into the subsoil.
- SUBSOIL BOTTOM** - Special plow bottoms placed directly behind the regular plow bottoms so they will plow 2 to 4 ins. deep in the bottom of the furrow thus loosening the subsoil but not turning it up on the surface.
- SUBSOIL CULTIVATOR** - See Subsoil tillage.
- SUBSOILER** - A tractor drawn tool which has a long, narrow shank with a wedge-shaped point for deep penetration to break up stiff clay subsoils and hardpans.
- SUBSOILING** - Any treatment to loosen soil below the depth of normal tillage without inversion and with a minimum mixing of the soil. This loosening is usually performed by lifting action or other displacement of soil dry enough so that breaking or cracking occurs.
- SUBSOIL PLOW** - A special type of implement which is designed to penetrate hard or impervious soils so as to aid in water retention and better root penetration. There are several types consisting principally of one or more heavy, curved subsoil standards equipped with chisel-like plow points which penetrate deeply into the soil without turning the surface. See: Subsurface tillage.
- SUBSOIL TILLAGE** - The use in arid or semi-arid regions of specially designed implements, like the subsoil tillers, and field cultivators with duck-foot sweeps, which stir the soil below the surface but do not materially disturb the surface or surface cover. See: Subsurface tiller.
- SUBSURFACE DRAINAGE** - The removal of excess ground water from the crop root zone thru the use of tile drains, mole drains, stone drains, pole drains, stone drains and pumping.
- SUBSURFACE FLOW** - The movement of water, after it has infiltrated the soil, to streams, oceans, etc.
- SUBSURFACE IRRIGATION** - Irrigation by means of underground open joint tile, perforated pipes, or open ditch, to maintain the watertable at a desired distance below the ground surface. See: Subirrigation.
- SUBSURFACE LAND ROLLER** - An implement used to pack and firm the soil below the surface while leaving the surface relatively loose.

SUBSURFACE PACKER - See: Subsurface land roller.

SUBSURFACE TILLAGE - See: Subsoil tillage.

SUBSURFACE TILLER - A tool designed with narrow standards with some sort of sweep on the bottom of the standard to work under trash or to break up the subsoil.

SUBWATERSHEDS - Very small watersheds, a few hundred acres in size.

SUCKER - 1. A piston, as of a syringe or of a suction pump; used as the plunger or bucket of a deep well pump, of the kind used in pumping non-flowing oil wells, etc. 2. A tube or pipe used for suction.

SUCKER ROD - In bored wells, the jointed pump rod, which carries the plunger at its lower end.

SUCTION HEAD - The pressure on the intake or suction side of a pump, usually measured in ft. May be either positive or negative.

SUCTION LIFT - Vertical distance in ft. from the center line of pump to the water surface of the supply. Exists when source of supply is below the center line of the pump suction connection. Usually given in ft.

SUCTION PRODUCER - A type of gas producer, in which the air is drawn through the incandescent carbon by the suction caused by the engine piston on its charging stroke. In starting, the gas producer is brought up to its proper heat by a fan blast, hand or power driven, but as soon as the engine has had an explosion, the producer functions automatically. Also called gas producer.

SUCTION STROKE - The intake stroke of a compression ignition engine.

SUCTION SYSTEM - Air movement in which the air is moved through the duct or ducts which are at a pressure lower than atmospheric. Also called exhaust or vacuum systems of air movement.

SUCTION VENTILATOR - A drying system using wind movement to force air through a product. A cowl on top of the drying building is built with a fin so it will rotate the face away from the wind. Then wind will pull air out the ventilator and thus through the drying product by suction.

SUGAR-CANE PLOW - A type of plow used for bedding sugar cane land. It consists of a frame containing a middlebreaker followed by right and left hand bottoms followed by another middlebreaker. The front middlebreaker cleans off the bed and the side bottoms and back middlebreaker deepen and widen the cut.

SUGAR CANE SYSTEM - A ditch system for draining the land surface which employs lateral ditches, known as split ditches, that are constructed with the general slope of the land and are usually parallel. The spacing varies from 100 to 250 ft. The ditches are 18 to 36 ins. deep. Split ditches are extended to a point where the runoff from the field equals the ditch capacity. They are intercepted at that point by a cross ditch.

SUGARING OFF - The process of condensing maple sap into sugar.

SUGAR MILL - A machine for pressing out the juice of the sugar cane, usually consisting of two or more rollers, between which the cane is passed.

SUGAR PACK - Processed fruit with sugar added which is packed.

SULFUR STICK - A device used to detect leaks in an ammonia-charged refrigeration system. Sulfur sticks are made by dipping small pine or wood sticks in melted sulfur several times to build up a layer of sulfur on one end of the stick. This end is lighted and in the presence of ammonia will form a white smoke.

SULKY - 1. A very light, two-wheeled cart which is used in training and racing harness horses. 2. A heavy two-wheeled vehicle used in breaking horses. 3. See: Logging wheels.

SULKY DISK PLOW - A one-bottom disk

- plow which is provided with a seat for the driver.
- SULKY PLOW** - A one-bottom, horse-drawn plow mounted on wheels which is provided with a seat upon which the operator rides.
- SULKY SEAT** - A type of easy, comfortable seat suspended by springs to the frame of a plow or other implement on which the operator may ride.
- SULPHUR DIOXIDE** - A chemical spray used to fumigate storages for the purpose of destroying molds and fungi. Chemical formula SO_2 .
- Corrosive and has pungent odor.
- SUMMER FALLOW** - A method of storing moisture in the soil by cultivation through the summer months. No crop is grown during this period on fallow land and the stored moisture is used for a crop the following year. Widely used in semi-arid or dry agricultural areas.
- SUMMER-RANGE SHELTER** - A small, low, well ventilated, portable structure which has a roof, wire sides and floor. Commonly one of several such shelters is provided for growing chicks on summer range to furnish protection from heat and storms and from animals that may prey on them.
- SUMMER-WOOD** - The portion of the annual growth ring formed during the last half or summer portion of the yearly growth period. Usually darker in color, more dense and stronger than spring-wood.
- SUMP** - A depression or excavation in which water is collected for pumping.
- SUN DRYING** - The drying and preserving of a product, especially peaches, apricots and raisins by placing them in trays exposed to solar heat without controlled conditions of temperature, humidity or air flow.
- SUPER-CHARGER** - As used in gasoline engines, it consists of a charge booster or form of blower for increasing the pressure of the mixture in the manifold in order to increase the amount of mixture entering the cylinders during the period of admission.
- SUPERCritical FLOW** - 1. A flow condition in an open channel in which the velocity is greater than critical velocity, determined by formula for turbulent flow. 2. Flow at a turbulent rate.
- SUPERHEAT** - Degrees of temperature above the temperature of saturated steam or ammonia.
- SUPERHEATED STEAM** - Steam whose temperature is higher than that of saturated steam at the same pressure is said to be superheated.
- SUPERHEATED VAPOR** - Vapor with a pressure less than the saturation pressure corresponding to its temperature. Vapor containing more heat than is required to maintain the gas at the given temperature.
- SUPERSATURATED** - A condition when air holds more water than it would under ordinary conditions. The condition is very unstable and the excess vapor can be expected to condense out of the air quickly.
- SUPERSTRUCTURE** - The upper part of a building above the foundation walls.
- SUPPLEMENTAL HEAT** - That heat added to a high relative humidity atmospheric air for a limited temperature rise, usually less than 20° F., to accomplish drying within the maximum permissible drying time to prevent spoilage.
- SUPPLEMENTAL HEATER** - A unit designed to give the drying air a limited temperature rise. Up to 20° F. above normal outside temperature.
- SUPPLEMENTAL IRRIGATION** - The artificial watering of crops in areas where rainfall is normally depended upon for crop production.
- SUPPLY PLUMBING** - The pipe, etc., which carries the water from the source to the points of use.
- SUPPRESSED WEIR** - A measuring weir notch whose sides are flush with the channel, thus eliminating (suppressing) end contractions of the flowing water. A weir may be

- suppressed on one end, two ends, bottom or any combination of them.
- SURCHARGE** - Excess load on a retaining wall caused by piling fill materials higher than the top of the wall, or supporting heavy loads on a horizontal fill next to the wall.
- SURFACE CARBURETOR** - In an internal combustion engine a type or carburetor in which air is rapidly brought into surface contact with a "puddle" of gasoline maintained by a float feed. Sometimes called puddle carburetor.
- SURFACE COEFFICIENT** - A constant in equations of heat flow by convection. The heat transfer coefficient or surface conductance of a surface, which takes into account radiation, convection and conduction between the surface and the adjacent fluid (generally air). The rate of heat transfer is affected by temperature and emissivity of the surface, air velocity and temperature difference.
- SURFACE CONDENSER** - An apparatus for condensing steam, or refrigerant, by bringing it into contact with metallic surfaces cooled on the other side by water or air.
- SURFACE CREEP** - A type of soil movement in wind erosion where the soil particles move in almost continuous contact with the soil surface.
- SURFACE CRUST** - The essentially impervious layer on bare soil after the impact of raindrops and slaking.
- SURFACE CULTIVATOR** - A cultivator equipped with long blades set at an angle and with sufficient pitch to slice off weeds and stir up the surface of the soil while not penetrating deeply.
- SURFACE CURVE** - 1. A longitudinal profile assumed by the surface of a stream of water flowing in an open conduit; the surface curve is the curve of equilibrium of all forces acting on the flowing water. 2. The hydraulic grade line. See: Back water curve.
- SURFACE DETENTION** - That part of the rain at a given storm which still remains on the ground surface for a given time.
- SURFACE-FED INTERMITTENT STREAM** - One that flows during protracted periods but not year around when it receives water from some surface source. Generally the gradual and long-continued melting of snow in a mountainous or other cold tributary area. The term may be arbitrarily restricted to streams or stretches of streams that flow continuously during periods of at least one month.
- SURFACE FILM** - The thin layer of liquid next to a heating or cooling surface. This layer has a large effect on heat transfer from the heating or cooling surface into the liquid.
- SURFACE FLOAT** - A float on a water surface used to indicate velocity, direction of flow or height of water.
- SURFACE GAGE** - A measuring device for determination of liquid surface elevations consisting of a stationary indicator, and a movable, graduated element designed to be moved into contact with the liquid surface from above.
- SURFACE HEAT EXCHANGER** - A heating or cooling medium is carried in tubes. The product to be heated or cooled falls by gravity over these tubes and is cooled by a heat exchange.
- SURFACE INLET** - An opening in the ground surface usually at the lowest elevation in a field which is curbed with tile, metal pipe or concrete and connected to a subsurface drain. It permits runoff water that would normally accumulate in this depressional area to be removed through this drain. Also called catch basin.
- SURFACE IRRIGATION** - Irrigation distribution of water over the soil surface by flooding or in furrows for storage in the soil for plant use.
- SURFACE PACKER** - A type of implement used to crush clods and firm the top layer of soil prior to planting.

- Included in this type are the U-shaped pulverizer, the combination T-shaped and sprocket-wheel pulverizer, the surface roller and the flexible sprocket-wheel pulverizer.
- SURFACE ROLLER** - A round metal cylinder which rotates on an axle and is used to firm the soil surface, crush clods and remove air spaces and pockets from the surface soil.
- SURFACE RUNOFF** - That portion of the total precipitation which leaves a field by surface flow.
- SURFACE SCALING** - A condition of concrete when the surface scales off due to frost action and/or salts used to de-ice the concrete.
- SURFACE SEAL** - The rapid reduction in the rate of intake of water through the surface of the soil accompanied by the formation of a thin compact layer on the surface. This seal is the result of a breakdown of structure due to the beating action of raindrops and to an assorting action of the water flowing over the surface.
- SURFACE SLOPE** - The inclination of the water surface expressed as change of elevation per unit of slope length.
- SURFACE SOIL** - The upper part of soil that is commonly stirred by tillage implements. See: Top soil.
- SURFACE-SOWN** - Designating seed which is sown on the surface of the ground.
- SURFACE STORAGE** - 1. The storage of water in surface reservoirs, such as constructed reservoirs, ponds, swamps and lakes to reduce flood flow, increase low-water flow and retain runoff for irrigation. 2. The retention of water in minute depressions on the soil during a period of runoff. Also called depression storage.
- SURFACE TILLAGE** - Cultivating or working the soil to a shallow depth or barely below the surface.
- SURFACE WATER** - Water on the surface, as lakes and rivers, in contrast to that underground. Surface water properly includes snow and ice.
- SURFACE-WATER POND** - Reservoir that depends on the runoff of surface water for replenishment.
- SURFACING MATERIALS** - Siding, sheathing, flooring, wall board, etc., used to finish the surface of a structure.
- SURGE BLOCK** - A block used in developing a well by being pumped up and down adjacent to the water-bearing strata to remove the fine material from the formation near the well screen, thereby opening up the passages so that the water can enter the well more freely.
- SURGE TANK** - A tank or chamber installed in the discharge line of a pump to absorb or cushion uneven flow, and to prevent sudden variations in pressure.
- SURGING** - In developing a newly drilled well, the rapid up and down movement of a plunger or surge block to wash the fine sand, silt and clay out of the water bearing formation which surrounds the screen. See: Backwashing.
- SUSPENDED CEILING** - A ceiling hanging below and supported by the floor or roof construction above it. Also called clipped ceiling.
- SUSPENDED MATTER** - Particles which do not settle out easily in a liquid.
- SUSPENDED MILKER** - See: Swing milker.
- SUSPENSION METHOD** - A means of obtaining the center of gravity of a vehicle. The vehicle is lifted free of the ground and a line drawn or tied from the lift point straight down towards the ground. The vehicle is then lifted by another hitch point and the operation repeated. The point where the two lines cross is the center of gravity of the vehicle.
- SUSTAINED FLOW** - A flow that is continuous over long periods of time as the melted water from higher snowfields.
- SURVEYING INSTRUMENTS** - Those instruments such as a transit, level, measuring tape, rod, range pole, etc. that are used in the operation

- of making a survey.
- SWAGE** - A tool, variously shaped or grooved on the end or face, used by blacksmiths and other workers in metals for shaping their work, whether in sheet metal or forging, by holding the tool upon it, or the work upon the tool, and striking with a sledge.
- SWAGE TOOLS** - The grooved and furrowed tools between which a blacksmith draws down, smooths and finishes work; the top swage is held by the smith himself, the bottom swage fits in the hardy hole of the anvil.
- SWAGING MACHINE** - A power forging machine, fitted with a number of pairs of swages, each worked by a crank or eccentric. Dies of various shapes and sizes may be tilled to the swages, thus affording means for rapidly producing a number of uniform forgings.
- SWALE** - A small, shallow, wet sag in land surface; a natural drainage way which does not necessarily contain a water course or permanent stream.
- SWAMP** - A natural area which has standing water on the surface for all or a considerable period of the year and which has a dense cover of native vegetation. See: Bogs.
- SWATH** - 1. The continuous layer or row of material or the actual path as left by a mowing machine, combine or other machine when it passes through a field. 2. The strip covered by materials deposited in a single pass of a sprayer, airplane or any other distributing device.
- SWATH LOADER** - See: Fork loader.
- SWEATING** - A method of soldering in which the surfaces to be joined are cleaned, heated, fluxed and covered with a film of solder. The soldered surfaces are then placed together and heated either with a soldering iron or soldering copper or torch until the solder melts and unites the two surfaces. During the heating and cooling operation the surfaces should be held firmly together with clamps or other means.
- SWEATING PROCESS** - A process which hay undergoes after it is placed in the mow which may increase its temperature to 120° F. The increase in temperature is caused from the heat produced by respiration and bacterial activity.
- SWEAT ROOM** - A room in which fruit is artificially degreened with ethylene.
- SWEDISH GANG MILL** - A gang saw mill for round logs which has a carriage permitting adjustment of sawing to the curvatures of the log.
- SWEEP** - 1. A type of cultivator shovel which is wing-shaped. It is used principally for weed control. 2. An implement with long narrow standards with wing-shaped tools attached on the lower ends; much used for subsurface tillage because it does not disturb surface trash. 3. A long lever pole attached to a gear box. Horses are hitched to this and walk around and around to supply power to a hay baler or other stationary implement.
- SWEEP RAKE** - 1. An implement used to pick up a mass of loose windrowed hay by means of a set of long teeth extending in front of the machine. These teeth are slid under the windrow and pushed along until sufficient hay is gathered to make a load. When this occurs the teeth are raised off the ground and the hay is carried to a place to be stacked. 2. A rear-hitch sweep rake is one that is pushed from behind. 3. A side-hitch sweep rake is one pulled by a horse on each side of the machine. 4. The two-wheel sweep rake has a sliding seat which can be moved forward or backward to help the operator balance the rake teeth and the load. 5. The three-wheel sweep rake has a seat mounted on a rear wheel which swivels in any direction. Also called buck rake, bull rake, bunching rake.
- SWEET POTATO HARVESTER** - This usually consists of two separate machines;

- one which cuts the vines above ground and removes them and another which plows the tubers to the surface. These two machines can be combined to form one.
- SWEET POTATO LIFTER** - A tool with a bed which slides under the sweet potatoes and lifts them to the surface. Notched coulters are attached on each side to cut the vines and keep them from becoming tangled in the lifting mechanism.
- SWEET WATER** - A term used in the dairy industry to designate refrigerated water having no salt content.
- SWEET WATER COOLING SYSTEM** - A type of cooler for milk cooling using fresh water instead of brine. This system can be used when the temperature of the product does not need to be brought below 34° to 36° F.
- SWELLED CAN** - A metal container whose ends are bulged by gas formed by microorganisms in the container.
- S.W.G.** - Abbreviation for standard wire gage.
- SWING AROUND STACKER** - A hay stacker which can be raised and swung around to the side where the hay or straw may be dropped at any place desired. Also called swinging stacker.
- SWINGING DRAWBAR** - 1. A bar of steel with a pivot at one end which is attached to a tractor. The other end is attached to a plow, wagon, etc. 2. A wooden bar which may be removed from a fence in lieu of a gate.
- SWINGING VANE METER** - A device used to measure the static pressure of a moving quantity of air. The moving air hits an air vane connected to a calibrated static pressure scale where the pressure is read.
- SWINGING WATERGATES** - Gates placed in outlet ditches where a fence crossing is required. They will open up when the water rises. This prevents excessive collection of debris and siltation which tend to clog waterway.
- SWING MILKER** - The milking unit which is suspended from the body of the cow by a strap or surcingle. Also called suspended milker.
- SWIRLING-JET NOZZLE** - A nozzle, used on knapsack sprayers for insect control, that emits a coarse, spattering spray.
- SWIVEL** - A link or connection in a chain to permit twisting and prevent kinking; it consists of a stirrup shaped link in the cross piece of which a small eye is free to revolve, although the end of its shank is riveted or otherwise secured. Another pattern is a hook, whose shank is similarly secured within the stirrup.
- SWIVEL DISK JOINTER** - A concave disk swivel-mounted on a plow; a self-aligning jointer that swings to one side when an obstruction is encountered and automatically swings back after the obstruction has been passed. Also called self-aligning disk jointer. See: Jointer.
- SWIVEL HANGER** - The ordinary ball and socket hanger for shafting. It derives its name from its peculiar arrangement by which it adjusts with the varying motion of the shaft which it supports.
- SWIVEL HITCH** - A type of hitch on a tractor which extends from a king-pin so that it will swing within a restricted arc. Also called swinging drawbar.
- SWIVEL PLOW** - The hillside plow which is a reversible moldboard plow. See: Hillside plow.
- SWIVEL SPOUT** - A spout mounted in a bearing which enables it to rotate a full 360° or as desired within certain limits.
- SWIVEL TYPE HITCH** - Swivel type hitch allows harrow to follow the contour of ground. See: Swivel hitch.
- SWORD RUNNER OPENER** - A blade type of device used to wedge open ground for planting seed or transplanting.
- S WRENCH** - A double-ended spanner curved like the letter S in order that a semi-inaccessible nut may

be turned, in two stages by reversing, through a sufficiently wide angle so that the wrench may again engage the nut for further turning.

SYNCHRONIZED - To bring two or more alternators into such relation to each other that their pressure waves shall be of equal period and corresponding phase. Chronological arrangement of events, happenings or taking place at the same time.

SYNCHRONOUS MOTOR - One which rotates in unison or in step with the phase of the alternating current which operates it. A motor whose operating speed is exactly proportional to the frequency of the supply circuit.

SYRUP HYDROMETER - A floating instrument with a calibrated scale for measuring the specific gravity of concentrated sugar solutions.

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- TABLE SYSTEM OF SORTING - A system of sorting tomatoes, etc., in small canneries, in which the fruit is placed on a table and hand sorted for size, blemishes, etc.
- TACHOMETER - 1. In hydraulics, a device to show the swiftness of a current by its effect upon a submerged paddle or paddle wheel; a current meter having a rotating screw for driving clockwork, indicating the speed in miles per hr. 2. An indicator, to show at a glance the speed of rotation.
- TACK HAMMER - A light hammer, used for driving tacks; instead of a peen, it is usually furnished with a claw for drawing them. The head is often magnetized, to hold the tack.
- TACK WELD - A preliminary weld used to align the pieces to be welded together. This promotes more uniform expansion due to heat of the final weld.
- TAIL BLOCK - A wooden pulley block which is provided with a tail or line for lashing it to any object, instead of the thimble generally provided.
- TAILBOARD - The gate at the rear end of a wagon or truck which can be let down or removed to facilitate loading or unloading. Also called end board, end gate, shoveling board.
- TAIL GATE - See: Tailboard.
- TAILING - The material which is unthreshed in the first time through the cylinder and concaves and which is recirculated into the thresher by means of the tailing elevator.
- TAIL PIPE - A suction pipe on a pump, used for irrigation, drainage or other purposes.
- TAILRACE - A channel which conducts water away from a water-wheel; an after bay.
- TAIL WATER - The water just downstream from a structure.
- TAINTOR GATE - Pivoted gate for regulating the flow of water.
- TAKE UP BOX - In grain machinery, a device for taking up the slack on conveyer or elevator belts which is made in various patterns: the principle in each case being a shifting bearing for the shaft of a conveyer pulley which can be moved to and fro in its frame by means of a screw to alter the tension of the belt.
- TAMPERPROOF CLOSURE - A cap or closure for a bottle which cannot be removed and replaced without showing evidence of its removal. Also called tamperproof bottle closure; sealed bottle closure.
- TANDEM - 1. One after another. 2. The term originally meant two horses harnessed in line, a play on the Latin word tandem = at length. As applied by engineers, it signifies that two or more pistons are attached to the same piston rod; a plan followed in designing large gas and steam engines.
- TANDEM DISK HARROW - See: Double-disk harrow.
- TANDEM HITCH - See: Tandem.
- TANDEM TRACTOR - Two or more tractors with all front wheels removed, attached together one behind the other and operated as a single unit or the front wheels of the front tractor may be left in place and used to guide the tractors of a semi-tandem arrangement.
- TANGENTIAL SAWN - A method of sawing boards from a log whereby adjacent pieces are cut in parallel slices.
- TANGENT SCREW - The worm in spiral gearing is sometimes so called, as its thread is tangent to the circumference or pitch circle of the wheel.
- TANKER - 1. A specialized truck which carries a large, specially built tank for transporting of bulk milk. 2. A specialized truck with a large tank of water, a power pump, and base which is used to fight forest fires. 2. Any vehicle equipped with a tank for the transport of a fluid or

produce suspended in a fluid, such as cherries in water.

TANKING - A method used to prepare livestock feed stuff from animal tissue.

TANK-MIX OIL - Any spray which is prepared immediately before use by adding oil the emulsifier and spreader separately to the water in the spray tank and emulsifying by agitation and pumping.

TANK ROOM - Room in a meat processing plant in which tankage is prepared.

TANK SPRAYER - Any sprayer that is equipped with a supply tank or reservoir, as contrasted to the atomizer.

TANK TRUCK - A truck or trailer which is equipped with a large tank to transport liquid products, such as milk. See: Tanker.

TAP - 1. In wiring, the connection of the end of one wire to some point along the run of another wire. There are many kinds of tap, as: plain; aerial; knotted; cross (double and duplex); wrapped. 2. A tool for cutting female or internal screw threads. It is made from a steel rod in which are cut the screw threads and has four flutings for clearance of chips in cutting. (This does not apply in the case of H. S. steels.) The steel is hardened to the correct temper.

TAP BOLT - A bolt with a head on one end and a thread on the other end, fitted to be screwed into some fixed part at one end, and to receive a nut at the other.

TAP BORER - A boring instrument, shaped like the half of a hollow cone, used by coopers for making bung or tap holes in casks, or by plumbers for making or enlarging holes in leaden pipes.

TAPE GAGE - See: Chain gage.

TAPER - For leading or trailing side of lug. The angle the side of the lug makes with a line parallel to the radius from the center line of the lug to the center of the wheel.

TAPERED ROLLER BEARING - Bearings with tapered rollers designed to take both radial and end thrust loads; the relative capacities depending upon the amount of taper.

TAPERED SINGLE-SIDE-MAIN-DUCT SYSTEM - A system of ducts used in barn drying hay. In this system there is one main duct along one wall which gradually diminishes in size from the end the fan is on. The lateral ducts may or may not diminish in size.

TAPPET - A short axially movable shaft which takes the thrust and eccentric loading of a cam and transmits the force to the push rod. See: Cam follower.

TAPPET CLEARANCE - The clearance between the end of the valve stem and the valve lifter.

TAPPET MOTION - In machinery, the feed motion derived from the action of a tappet, as distinguished from that of a pawl or other agency.

TAPPET VALVE - 1. A disk or mushroom valve operated by some device with which it is not positively connected; as, a cam or trip lever. The valves of an internal combustion engine are generally of this type. 2. A valve moved on its seat by means of a top or blow from some other part of the mechanism.

TAP REMOVER - A tool for gripping a broken tap in order that it may be backed out of the hole in which it was broken.

TAP WRENCH - A key or spanner to operate a tap for threading holes. The usual pattern has a handle on either side of the socket for the square on the tap shank.

TAPER DRILL - A long taper reamer or fluted cutter for forming conical holes under a drilling machine. A long countersink.

TAPER PIN - A conical dowel, fitting in a suitably shaped hole formed in two pieces of work, securing them together. The Pratt and Whitney standard of taper is 1/4 in. per ft., their pins being made in 10 sizes, from 3/32 in. to 11/16 in.

TAPER REAMER - One designed to enlarge tapered holes; they are usually made to suit one of the standard tapers, either for taper

- pins, twist drills or the cock taper.
- TAPER TAP** - The first or entering tap of the three which constitute a set for the formation of internal threads. It is generally a straight taper from a diameter below that of the tapping hole up nearly to the finished size. Gas taper taps are usually over-size at the large part of the taper.
- TAR PAPER** - A heavy paper, coated or impregnated with a bituminous derivative which is used as a temporary covering or an under-covering for siding and roofing, the top half of drainage-tile joints or to cover a frame, as a tar-paper shack.
- T BAR IRON** - A rod or iron with a cross section in the shape of a T.
- TEAT CUP** - 1. The receptacles of a milking machine that hold the rubber inflations. 2. A cup which is used to apply remedial solutions to a cow's teat.
- TEDDER** - A device consisting of a wheel-mounted frame which has a series of small forks attached to a crankshaft. It is used to stir and loosen hay in the swath for more even and quicker drying.
- TEE SCRAPER** - A spring loaded scraper shaped like the letter "T" which is used on disk implements to keep the concave side of a disk clean.
- TELESCOPING ACTION** - The action of any shaft, beam, etc. in which the length is adjustable by means of one section sliding inside the next.
- TELESCOPING DUCT** - An air tunnel for a drying system starting as a large duct and then reducing it in size in steps as less air is needed along the duct length.
- TELLTALE THERMOMETER** - A thermometer used in the canning industry which operates like a clinical thermometer in that the mercury does not automatically descend from the maximum. It is used in cans during sterilization to record the highest temperatures reached.
- TEMPERATURE GRADIENT** - The rate of variation (increase or decrease) of temperature or in a given direction. It may be expressed as an equation where temperature gradient = $\frac{t_1 - t_z}{L}$, where t_1 and t_z represent the temperature at two points in a body and L is the distance between these points.
- TEMPERATURE-ENTROPY PLANE** - A plane having absolute temperature as the ordinate and the entropy changes as the abscissa, on which the temperature-entropy diagram is drawn. Called a T-S diagram.
- TEMPERATURE INVERSION** - A temperature condition in the atmosphere in which the temperature is progressively greater with increased elevation above ground level. A level is reached beyond which the air temperature again decreases with elevation.
- TEMPERED MARTENSITE** - The microstructure produced by heating martensite to a temperature in the range of 300 to 1300° F. Martensite is hard and strong, but is brittle. Reheating martensite (tempering or drawing) lowers the hardness, strength, and elastic limit but raises the ductility and toughness.
- TEMPERING** - 1. The equalization of temperature and/or moisture throughout a kernel or product. 2. The process of bringing grain to a desired moisture and/or temperature for processing.
- TEMPLATE (TEMPLET)** - 1. A header or brace over an opening to distribute weight over the wall. 2. A pattern usually flat adapted to the purpose of shaping something.
- TEMPLET EXCAVATOR** - An excavating machine in which there is a guide frame shaped to the dimension of the width of the ditch. A bucket with a cutting edge at either end, moves back and forth on the underside, cutting out the earth on an

- endless chain with buckets which cut out and remove the soil.
- TEMPORARY CORN CRIB** - Structure used to house ear corn for one season. Usually made of snow fence.
- TEMPORARY DAM** - 1. A dam which is constructed of temporary material, such as brush, wire, or loose rock, for erosion control. 2. An easily removable dam made of metal, wood, or soil which is used in irrigation to divert small flows of water.
- TEMPORARY HARDNESS** - Water having calcium salts in solution. This is called "temporary" hardness because calcium is not as soluble in water as magnesium which is the other water hardening agent. The calcium salts precipitate readily when heated and are deposited as a lime scale.
- TEMPORARY SILO** - Any structure built of snow fence, baled straw, etc., within which the crops of one season may be ensiled. These structures usually last until the stored material is fed after which they are no longer useful. (Trench silos are frequently quite permanent.)
- TENON** - A projecting part of a member cut down to fit into a socket or mortise of another member to form a tenon and mortise joint.
- TEN ROLL MACHINE** - A size of a husker-shredder designated by the number of husking rolls with which the machine is equipped.
- TENSILE STRENGTH** - The cohesive power by which a material resists an attempt to pull it apart in the direction of its fibers; this bears no relation to its capacity to resist compression.
- TENSION HOOP** - A metal band placed around the outside of the staves in a silo to hold the silo together by resisting lateral forces.
- TENSION MEMBER** - A structural member designed to resist tensile forces.
- TENSION-METER CHECK-WIRE ANCHOR STAKE** - A check-wire anchor stake which has a gaging device that aids in obtaining uniform tension in the wire each time the stake is set.
- TERMINAL ELEVATOR** - The reservoir of the grain trade which makes possible an orderly, year-round distribution of grain supplies from the farm to the table. It provides storage space where grain may be held between harvest time and the time it will be needed by industry. It prepares grain for storage by conditioning and cleaning it. This conserves the value of the grain and improves its quality for milling, processing or feeding purposes. It acts as a wholesale distributor, prepared to sell grain in car lots and boat-loads whenever buyers of grain need supplies.
- TERMITE SHIELD** - A shield, usually of sheet metal, which is placed in or on a foundation wall or other mass of masonry or around pipes to prevent the passage of termites.
- TERNE PLATE** - A sheet or plate of iron or steel, coated with an alloy of lead and tin in the proportion of 4 parts lead and 1 part tin; it is the union of these 3 metals - iron, lead and tin - that gives rise to the word terne plate.
- TERRACE CROWN** - The highest part of the terrace ridge; the top of the terrace. Channel and the crown of the terrace ridge at adjacent points.
- TERRACE INTERVAL (HORIZONTAL)** - The horizontal distance in ft. from the center of one terrace line, ridge or channel to the same point on an adjacent terrace.
- TERRACE INTERVAL (VERTICAL)** - The vertical distance in ft. from the center of one terrace line, ridge or channel to the corresponding point on an adjacent terrace. (The interval of the first terrace is the vertical distance from the top of the hill to the terrace line of the terrace.)
- TERRACE OUTLET** - The water channel usually vegetated at the end of the terrace into which the flow from one or more terraces is discharged and conveyed from the field.
- TERRACE OUTLET STRUCTURE** - A structure, usually of concrete which

- is installed in or at the end of a terrace outlet to prevent gullying.
- TERRACER** - Any of several earth moving machines used to build terraces. See: Slip scraper, V-drag, grader, carry all, motor patrol, plow.
- TERRACE RIDGE** - That part of the raised embankment of earth which extends above the original surface of the soil and serves as a dike in diverting the run-off from its natural course.
- TERRACE WIDTH** - The combined width of the terrace channel and ridge as measured horizontally from the edge of the cut slope on the upper edge of the channel to the foot of the lower slope of the terrace ridge.
- TERRACING** - A practice of constructing a ditch or channel, with a ridge below, across the slope at various vertical intervals to intercept runoff. The channel and ridge are usually constructed to a cross section which will permit contour operations with farm equipment.
- TERRACING MACHINE** - A machine that ranges in size from a small walking plow to the large road-building machine powered by an engine of more than 100 horsepower. Included are V-drags and ditchers, ditcher-graders, elevating graders and a number of special machines. These machines push, scrape and lift dirt to form ridges on a predetermined grade on hillsides which prevent excessive erosion on such.
- TERRA COTTA** - A compound of pure clay, colorless sand and pulverized potsherds, is molded, dried in air, and baked in a kiln, and thus is harder than bricks or tiles and said to be more durable than most stone.
- TERRAZZO** - A finish for a concrete floor. It is composed of cement, sand and marble chips mixed almost dry and compacted in a 1-in. thick layer on top of the concrete floor by rolling. The rolling exposes the aggregate and gives the floor its characteristic appearance. The terrazzo is usually systematically divided into rectangles with brass or zinc alloy strips. It is given a finished surface by grinding.
- TEST PIT** - A hole which is dug in the ground to determine the character of the subsoil and substratum prior to ditching, laying footings, etc.
- TEST PROBE** - A sample device for ear corn. See: Iowa ear corn probe.
- TEXAS STOCK** - A single-bottom, walking plow consisting of a beam, handles and a shank whose handles are attached ahead of the shank on the beam so that braces go from the rear of the beam to the handles.
- TEXAS SWEEP** - A triangular shaped cultivator blade with a curved face which cuts under the surface of the soil and lifts it.
- THEORETICAL EFFICIENCY** - The ratio useful work output/total energy x 100.
- THERMAL** - A state of a body depending on temperature.
- THERMAL ABSORPTION** - The assimilation of heat or light rays by a solid or liquid which the rays are passing through.
- THERMAL CAPACITY** - The quantity of heat needed to raise the temperature of a body from one given temperature to another.
- THERMAL CONDUCTANCE** - The quantity of heat that will pass through a unit area of a material in unit time when the difference in temperature between the 2 sides of the material is 1°.
- THERMAL CONDUCTIVITY** - The ability of a material to transmit heat through itself. Usually given in Btu per hr. per sq.ft. per in. thickness per degree difference in temperature.
- THERMAL CUTOUT (NEC)** - An electrical overcurrent protective device which contains a heater element in addition to and effecting a renewable fusible member which opens the circuit. It is not designed to interrupt a short circuit.
- THERMAL DIFFUSIVITY** - A quantity which measures the rate of temperature change and indicates the speed

- at which temperature equilibriums will be reached in a product. It is the ratio of the thermal conductivity to volumetric heat capacity, i.e. $= \frac{CP}{K}$, where C = specific heat, P = density, K = thermal conductivity.
- THERMAL EFFICIENCY** - The amount of heat utilized for a given process divided by the amount of heat put into the process multiplied by 100.
- THERMAL-FOG APPLICATOR** - Any device in which oil solutions are finely atomized by a blast of heated air or gas.
- THERMODYNAMIC MEDIUM** - A substance (gas, liquid or solid) composed of a very great number of particles, which has a characteristic equation relating its temperature, entropy, pressure and volume.
- THERMODYNAMIC PROCESS** - A process which involves a change in heat energy.
- THERMODYNAMIC PROPERTIES** - Heat and energy properties of a material usually described in terms of temperature, entropy, pressure and volume.
- THERMOSIPHON COOLING** - A method of liquid cooling of an engine; water circulates due to a decrease in specific gravity as it is heated in passing through the engine.
- THERMOSTAT** - An automatic control for regulating temperature by turning heater, ventilating systems or other devices on or off in response to certain temperature limits. It operates on the unequal expansion of different metals, liquids and gases in response to temperature changes.
- THERMOSTATICALLY CONTROLLED** - Denoting an instrument or machine controlled by a unit that responds to temperature changes and turns the machine on and off at certain temperature limits.
- THERMOSTATIC EXPANSION VALVE** - An automatic device controlling passage of a liquid according to temperature changes. Often used in refrigeration systems to control the passage of the refrigerant to the evaporator coils.
- THICK-FILM LUBRICATION** - A condition when a bearing is operating in an oil layer thick enough to prevent metal to metal contact with the housing. Also called stable lubrication.
- THILL** - Either of the shafts between which a horse or other animal is hitched to a vehicle.
- THIN-FILM LUBRICATION** - The condition when a bearing is operating in an oil layer that does not prevent metal to metal contact with the housing. Also called unstable lubrication.
- THIN LAYER DRYING** - Drying a thin layer of grain which permits different air flows and air pressures than thick layer drying.
- THINNED** - The condition of fruit trees or a continuous row of plants when part of the fruit, limbs or plants have been taken out by machine or hand.
- THIRD BRUSH** - An early type of generator designed only to supply energy for lights. Field current is supplied through the third brush which controls the maximum output of the generator.
- THREE A (3A) STANDARDS** - A list of detailed requirements, specifications, recommendations, etc. formulated by the International Association of Milk and Food Sanitarians, The United States Public Health Service and the Dairy Industry Committee to cover most pieces of dairy machinery.
- THREE-HINGED TYPE** - A rafter system referring to having three joints in the system. One at each wall plate and one at the ridge where the rafters join.
- THREE-POINT IMPLEMENT HITCH AND LINKAGE** - An implement hitch consisting of two lower links converging toward the front and free to swing laterally within limits, and a top link, used to regulate depth of implement.
- THREE-WHEEL SWEEP RAKE** - A sweep rake that has a seat mounted on a rear

- truck consisting of one wheel which castors in any direction. A lever raises and lowers the teeth.
- THRESHER** - See: Threshing machine.
- THRESHING CYLINDER** - A mechanical device of several types which consists principally of a rapidly rotating cylinder with teeth, rasp bar or rubber-edged angle bar on its surface rotating in close proximity to a concave or shell where it knocks the grain from the heads. See: Cylinder.
- THRESHING MACHINE** - A combination machine, whereby grain, beans, peas, grasses, etc., are threshed and separated from straw and chaff. The stalks are fed into a rotary cylinder or drum, provided with beater bars, which rub out the seed from the pods or seed heads against a concave screen of alternate bars and mesh. The straw is taken away for stacking by means of a conveyor or "elevator". The seed is further subjected to the process of winnowing in the same machine by means of an air blast, which rids it of dust and chaff, finally delivering the clean seed into the weigher and thence into sacks or a wagon.
- THRESHOLD** - A stone, wooden or metal piece placed under a doorway, or a thin beveled strip meeting the bottom of the door to form a weather tight seal.
- THROAT** - 1. An entrance or a passageway into a machine. 2. The curved edge of a plow share extending from the point to the wing.
- THROAT OF A PLOW** - The space behind and above the share up to the horizontal portion of the beam that gives room for handling the furrow slice and trash.
- THROAT OF A WELD** - The distance from the root to the face of a weld. See: Root of a weld.
- THROTTLE** - 1. The control which regulates the flow of fuel to an engine. 2. Any device which narrows a passageway.
- THROTTLE GOVERNOR** - A device which varies the air and fuel charge to an engine and thus regulates the speed of the engine.
- THROTTLE PLATE** - A round disk which can be opened and closed to control the amount of air and fuel mixture entering the manifold of an engine.
- THROTTLING-BAR CUSHION HITCH** - A cushion hitch built like a gun hydraulic recoil cylinder in which the size of the orifice of the piston is regulated by taper bars placed inside the cylinder.
- THROW-IN** - A turning inward of the disks of a disk listed crop cultivator or weeder so as to cause the soil to be moved toward the row. See: Throw-out.
- THROW-OUT** - A turning outward of the disks of a disk listed crop cultivator, so as to cause the soil to be moved away from the row. See: Throw-in.
- THROWS** - The crank arms on a crankshaft to which the connecting rods are attached.
- THRUST** - A pushing force.
- THRUST BEARING** - A bearing designed to receive the axial thrust of a shaft by means of collars or shoulders machined into the shaft. It may be a simple ball and machined seat located on the shaft centerline, an anti-friction washer located between collars or a ball or taper roller bearing held in a cage located between two races.
- THUMB CAPPING** - The seating of the cardboard milk bottle closure by hand instead of by machine.
- THUMB NUT** - A nut fitted with projecting wings, so that it may be loosened or tightened by hand. Sometimes termed a wing nut.
- THUMBSCREW** - A screw having a flat-sided or knurled head, so that it may be turned by the thumb and forefinger.
- THUNDERSTORM** - High intensity storm that covers a small area. Classified as a frontal storm with cold-front precipitation or as an air mass storm.
- TIDE GATES** - Gates installed in smaller streams which are opened

- to permit the outflow of fresh water at low tide and closed to keep out sea water at high tide.
- TIE** - 1. A string, rope, metal band or wire which encircles a bale of cotton, hay, etc., holding the material in a limited space and form and making for ease of handling, storage, and transportation. 2. A beam, post, rod or angle holding two pieces together; a tension member in construction.
- TIE BAR** - A bar used as a tie rod in steering systems; a rod used to assure parallel operation of two mechanisms.
- TIED COLUMN** - A concrete column reinforced with a system of vertical rods banded together at appropriate intervals with small diameter, horizontal rods to resist lateral forms.
- TIE-IN CHAINS** - Chains which are used in multi-hitches along with buckback straps so that each individual animal is held in place and so that the entire team can be handled by two lines.
- TIE ROD** - 1. A long threaded bolt or stay passing from one wall of a building to another; the nuts on the tie rod hold plates or bars against the masonry, thus affording mutual support between the parts it binds together. 2. One of the rods which support the jib or lifting arm of a crane; also termed tension rod. 3. Adjustable linkage between steering crank and wheel arm of an Ackerman steering system.
- TIGHT BOTTOM SPREADER** - A type of manure spreader which has a solid bottom with a conveyor on it. The conveyor moves the manure to the back of the spreader where it is spread by beaters.
- TIGHTENING PULLEY** - A spring loaded idler pulley which pushes against the belt in order to tighten it, to increase its frictional adhesion to the pulleys over which it runs.
- TIGHT PULLEY** - That one of a pair of fast and loose pulleys which is keyed to the shaft, while its mate is free to revolve. The belt runs idly on the loose pulley, and being shifted sidewise to the tight one, sets the shaft in motion.
- TIGHT SOIL** - A soil that is compact, relatively impervious and difficult to plow; usually a clay.
- TILE DRAINAGE** - Drainage of low depressional areas and/or flat heavy wet soil areas by means of a series of tile laid in a continuous line at a specified depth and grade below the ground surface so that free water entering the tile line at the joints or thru perforations can flow to an outlet by gravity.
- TILE DRAINAGE SYSTEM** - Any of several different arrangements of tile drains for removing excess water from the soil profile.
- TILE HOOK** - An (L) shaped rod with wooden handle which is used to lower tile into a trench and to place it adjacent to and in line with previously laid tile.
- TILE LINE** - A line of tile after placement and covering with soil to provide for the removal of excess subsurface water.
- TILE SCOOP** - A semi-cylindrical shaped metal scoop with a rake type wooden handle used to remove thin layers of soil in the bottom of a trench to place the tile at proper depth and to give a rounded bottom to the trench for proper bedding of the tile. Usually made to fit tile sizes of 4 to 8 ins. internal diameter.
- TILE SPADE** - A spade used by drainage contractors which has a long, narrow blade and a short handle. The blade may be the solid or open type.
- TILE-TRENCHING MACHINE** - A machine used to excavate a trench from 1.5 ft. to 3.0 ft. wide and up to 5½ ft. to 7 ft. deep for the purpose of laying tile in the trench for sub-surface drainage. The cutting mechanism is usually a digging wheel or inclined endless chain both equipped with cutting teeth and buckets for collection of the excavated soil.
- TILLABLE ACRES** - That part of the

- farm land that can be used for cropping without additional drainage, clearing or irrigation.
- TILLAGE** - The work done such as plowing, disking, dragging, etc. in the preparation of a seed bed.
- TILLAGE EQUIPMENT** - Field tools and machinery which are designed to lift and invert soil, stir or pack soil or reduce size of clods and control weeds, i.e. plows, harrows, disks and cultivators.
- TILLAGE PAN** - A compaction of the soil that restricts the root development of plants resulting from tillage.
- TILLAGE TOOLS** - See: Tillage equipment.
- TILLER** - An implement which stirs up the ground through the use of a rotor which consists of a power-driven, transverse shaft on which knives or tines are mounted to cut the trash and soil.
- TILLER PLOW** - See: One-way disk plow.
- TILT ANGLE** - The angle the disks are tilted from the vertical on a disk or disk harrow.
- TILTING LEVER** - A lever found on a cutter-bar mower which controls the position of the cutter-bar relative to the ground surface.
- TIME OF CONCENTRATION** - Time necessary for runoff to travel from the most remote point of a watershed to the outlet or point under consideration.
- TIMBER** - Lumber with a minimum least dimension of 5 ins.
- TIMBER CONNECTOR** - A device used to fasten lumber together in lap joints usually being a ring of some type pressed between two adjacent pieces and held by a bolt. There are three main types; split ring, toothed ring and shear plate.
- TIME CLOCK** - A control unit connected to a piece of equipment and so set that it will turn the equipment on and off at designated times or to turn equipment on or off during a preset time interval, e.g. lights in a poultry house.
- TIME OF DRYING** - The elapsed time from the start of the drying process to the instant the drying front arrives at any point or place in the product previously designated.
- TIME OF RESPONSE** - The time required to reach the ratio $\frac{M-M_e}{M_o - M_e}$ when
- M_o = initial moisture content at time observation begins, M = moisture content at any time, and M_e = the equilibrium moisture content; e.g., the time or 1/2 response means the time required to reduce the ratio $\frac{M-M_e}{M_o - M_e}$ from 1.0 to 1/2.
- TIME OF RETENTION** - See: Time of response.
- TIMER** - A revolving switch forming a part of the spark ignition system of internal combustion engines. It consists of a rotating cam operated by the engine which causes the electrical contacts in the primary circuit to open and close at the proper time to cause a spark properly timed in the various engine cylinders.
- TIME RATING** - A required qualification on the name-plate of an electric motor which indicates whether it may be run continuously or intermittently at rated load.
- TIME-TEMPERATURE** - The time and temperature relationship for specific process. A curve showing time-temperature relationships may be a heat-penetration curve. A term usually related to the thermal processing of foods.
- TIMING** - 1. In mechanics, the regulation of the parts of a machine so that all the motions shall take place in correct time. 2. The system or process by means of which the moment of ignition is regulated, in internal combustion engine. 3. An analogous expression to valve setting in regard to a steam engine.
- TIMING GEAR** - The gear on an engine which drives the cam shaft so the

- valves open and close at the proper time.
- TIMING LEVER** - A lever fitted to spark ignition engines by means of which the time of ignition is advanced or retarded, or, as it is frequently termed, the spark lever, because it controls the timing of the electric spark.
- TIMING VALVE** - A valve controlling the passage between the combustion space and the igniter of internal combustion engines using hot tube ignition. The valve is opened, usually by a cam on the half speed shaft, at the time the piston reaches the end of its compression stroke, thus effecting communication between the charge and the igniter.
- TINE** - A tooth, prong, or spike which is a long slender projection of a rake, pitch fork, etc.
- TIN PLATE** - A thin sheet of rolled wrought iron or mild steel covered with a protective coating of tin by dipping in the molten metal, thus forming an alloy with it.
- TINNING** - 1. The process whereby a coating of tin is placed over a metal surface. It may be done by dipping the sheet in molten tin or by electrolytic deposition. Small areas may be coated by hand soldering. 2. The process of coating a soldering iron with a tin alloy to promote easier and more efficient soldering.
- TINSMITH** - One who makes articles out of tin plate, the parts being united either by soldering or by crimping the meeting edges into a seam, which may be soldered afterwards, if required.
- TIPPING BUCKET** - A type of mechanism used in some recording rain gages, consisting of two balanced buckets which tip and empty alternately after catching rainfall equivalent to .01 in. of precipitation.
- TIRE** - The outer covering of a wheel on a wheeled vehicle which may be rubber, steel, etc.
- TIRE BENDER** - A machine provided with adjustable cylindrical rolls, for bending iron bars into a circular form for hoops or for tires of vehicles.
- TIRE BRAKE** - A brake which presses upon the surface of the tires, usually by means of rollers or a spoon shaped shoe.
- TIRE HORSEPOWER (NET) OR OUTPUT HORSEPOWER** - Total force output times speed in ft. per min. divided by 33,000 $\frac{(p + r_w) \times \text{ft. per min.}}{33,000}$
- $\frac{P \times \text{ft. per min.}}{33,000}$ for units having no non-driving wheels (test cars, four-wheel drives, tracks, etc.)
- TIRE OR TRACK EFFICIENCY** - Tire or track efficiency = $\frac{\text{Net tire or Drive Axle track horsepower}}{\text{Horsepower}}$
- TIRE SECTION (NEW)** - The width of a new tire, including normal growth due to inflation and including normal side walls, but not including protective side ribs, bars or decorations (T & R).
- TIRE SECTION HEIGHT** - The height of a new tire including normal growth due to inflation, measured from the rim to the highest point on the tread of the tire.
- TIRE SHRINKING** - The operation of placing steel tires upon the wheels of vehicles. The tire inside diameter is bored or made slightly less than the felloe or rim outside diameter and is expanded by heat to make it large enough to be pressed or driven on, the subsequent cooling making it tightly pressed on its wheel.
- TIRE PUMP** - A portable plunger air pump used for inflating pneumatic tires.
- TIRE SLEEVE** - A sleeve for protecting the injured portion of a pneumatic tire; it covers a greater length of the circumference than a tire band.
- TIRE WIDTH (NEW)** - The width of a new tire including normal growth

- due to inflation, and including protective side ribs, bars and decorations.
- T IRON** - See: T bar iron.
- TOBACCO BARN** - A barn designed for curing tobacco. Tobacco leaves are suspended in the curing barn after removing them from the field. See: Open-fire curing.
- TOBACCO-HOEING ATTACHMENT** - An attachment for a cultivator which consists of two gangs each having three points for close-in cultivation of tobacco plants.
- TOBACCO SPEAR** - A spear-like device which is fitted over the end of a lath or stick to aid in piercing the butt ends of tobacco plants and in spacing them on the lath before hanging in the barn for curing.
- TOBACCO STICK** - A lath on which tobacco leaves or plants are hung for curing.
- TOE** - The lowest downstream edge of a dam.
- TOE DRAIN** - A drain located in the downstream side of a dam that will lower the seepage line until it intersects with the drain.
- TOENAIL** - The process of fastening a board or other lumber to another member by driving a nail or spike diagonally through the end or side of one piece into another piece. Studdings are conventionally toenailed to the sill.
- TOE-IN** - Condition of a wheel on a vehicle when it is set so the front of the wheel is closer to the center line of the vehicle than the rear of the wheel.
- TOE SCRAPER** - A metal scraper which is used to remove the dirt from the convex side of a disk of a single-disk furrow opener. See: Tee scraper.
- TOE WALL** - 1. A vertical wall built around the apron of a structure to prevent undercutting. 2. A low retaining wall, as might be used to support the embankment of a cut.
- TOGGLE-JOINTED** - A joint consisting of a bar pivoted at its midpoint to a supporting bar so that the former may be turned to any position and hence be used for lifting tanks, etc., by inserting the bar through a constricted opening and allowing it to assume a position normal to the supporting bar.
- TOLUENE DISTILLATION** - A method of moisture determination of a product in which finely ground grain is placed in an apparatus with toluene. Since toluene boils at 233° F. all the water is evaporated before the toluene boils. The evaporated water is caught and condensed.
- TONGS** - A tool which is commonly used for grasping hot objects consisting of two flat, curved bars pivoted about a common center.
- TONGUE** - 1. The wooden or metal pole which acts as a steering lever and is fastened to the front end of an animal-drawn vehicle or implement or machine which separates the members of a team of draft animals. The eveners for pulling the implement may also be attached to the tongue. 2. The part of a vehicle, implement or machine which is attached to another vehicle, implement or machine or tractive device for towing and steering. 3. The shortest leg of a steel square.
- TONGUE AND GROOVE** - A type of lumber which is milled with a tongue on one edge of the board and a groove on the opposite edge so that adjacent boards will match. Abbreviation T & G.
- TONGUE SUPPORT STIRRUP** - A stirrup on a one-row pull type corn picker which is used to hitch on a wagon so that the wagon spout can direct corn into it.
- TONGUE TRUCK** - 1. A small wheel attached to a plow or two-wheeled vehicle at or about the point of hitch which is used to help support the weight of the plow, etc. 2. A pair of small, steerable wheels attached to the end of a stub-tongue on a binder, disk, mower, etc., used to remove weight from the horses' necks and provide easier steering.

- TOOL BAR - A heavy frame on a tractor or carrier to which tools can be attached for various tillage operations.
- TOOL BAR LISTER - A lister that is mounted on a tool bar. See: Middlebreaker, tool bar.
- TOOL GRINDER - An emery wheel, or grindstone, specially constructed and mounted for the grinding of machinists' tools, rests and guides being generally provided so that the various tools may be ground at a uniform and proper angle.
- TOOL KIT - A small portable container for holding hand tools.
- TOOL REST - That part of a lathe which holds and directs the tool, having several adjustments, and being movable by hand or automatically either along the bed or transversely to it.
- TOOL SHED - A building used for the storage of tools and repairing of farm implements. See: Machine shed.
- TOOL STEEL - A steel prepared especially for making machine tools, such as lathe cutters, etc.; is extremely hard and rough.
- TOOTH - 1. The cutting portion of a saw. 2. One of the projecting or piercing points or prongs of a comb, a rake, a harrow or a card.
- TOOTH ADJUSTING LEVER - A lever which adjusts the pitch of the teeth on a spike-tooth, or spring-tooth harrow.
- TOOTHED RING - A metal ring or bracelet type timber connector with teeth on both edges. It prevents slipping between members when pressed halfway into each piece, a bolt through the center of the rings holding the members together.
- TOOTH PLATFORM - The long bars or teeth comprising the platform upon which hay is pushed in a sweep rake.
- TOP-DELIVERY FEED - Part of a fertilizer attachment on a planting device. It meters out the amount of fertilizer spread. A hopper revolves and turns a screw which raises the hopper bottom so that from one to four stationary adjustable-delivery blades in the hopper head scrape off a uniform amount of fertilizer into the fertilizer tubes. The fertilizer application rate can be changed by changing the rotational speed of the hopper.
- TOP DOOR FREEZER - A chest-type insulated box opening from the top and designed to lower the temperature of the products enclosed below freezing so they will keep for an extended period of time.
- TOP FULLER - The forging tool with which a blacksmith makes furrows in a piece of red hot iron when drawing it down. It is usually held by means of a twisted osier or hazel rod and is struck by the sledge.
- TOPOGRAPHIC MAP - A scale representation, by means of conventional symbols, of a part of the earth's surface, showing the culture, relief, elevations above a datum, hydrography and frequently the vegetation.
- TOPOGRAPHY - The configuration of a surface, including its relief, the position of its streams, lakes, etc., as a map showing the topography of a given area; lay of the land.
- TOP PLATE - See: Plate.
- TOPPING - The process of removing the vegetative portion of root crops and that portion of the corn plant above the ear, etc.
- TOPPING COURSE - Finishing layer on a two course concrete floor of a comparatively thin (approximately 1 in.) layer of cement-sand mortar. It may be laid while the lower course is still plastic or after it has hardened.
- TOP SOIL - A general term applied to the surface portion of the soil, including the average plow depth (surface soil) or the A horizon, where this is deeper than plow depth.
- TOP SWAGE - The upper half of a set of swaging tools by means of which a smith dresses off smooth

- cylindrical work. It is held in the smith's hand by means of a twisted osier or cane and is struck by the hammerman with his sledge.
- TORQUE** - The force exerted on an object which tends to cause that object to rotate. Torque is expressed in units of force x distance, as lb.-ft.
- TORQUE CONVERTER** - Torque converter is a hydrodynamic drive which transmits power, with the torque output being a function of the speed ratio of input speed/output speed.
- TORQUE CURVE** - A line resulting from a graphic plot of engine torque against engine speed.
- TORQUE INPUT** - The moment measured in lb.-ft. without loss between the drive wheel and its axle. This may be either a drive wheel on wheel type units or the drive sprocket on a track type vehicle.
- TORQUEMETER** - A meter which measures the lbs.-ft. of torque on a shaft as it rotates (such as PTO shafts).
- TORSIOMETER** - An instrument to measure the stress to which a bar is subject when in torsion, or under twisting strain.
- TORSION** - 1. In mechanics, that force with which a thread, wire or rod of any material returns or tends to return to a state of rest after being twisted. 2. The act of turning or twisting or the state of being twisted.
- TORSIONAL STIFFNESS** - In mechanics, that amount of rigidity of a shaft by which it is enabled to resist, not simply such strains as would produce actual twisting off, but also such excessive vibration as would prevent it from doing its work with due steadiness.
- TORSIONAL STRAIN** - The deformation which occurs in a body subject to an applied torque.
- TORSIONAL STRENGTH** - Resistance to being twisted or wrenched off, in a direction about its axis; as, in case of shafting.
- TORSION BALANCE** - A weighing machine for delicate work, in which the beam is pivoted on fine wires instead of knife edges. As the connection is rigid, the displacement of the beam puts a torsional force on the wire, hence the name.
- TORSION DYNAMOMETER** - An instrument which measures work and power put out by a rotating element, usually the tractor power take off (PTO).
- TORSION SPRING** - A spring which aids in turning or twisting a device.
- TOTAL DYNAMIC HEAD** - A quantity used in determining pump sizes. It is the vertical distance in ft. between the free level of the source of supply and the point of free discharge or to the level of the free surface of the discharge, plus velocity head and friction losses.
- TOTAL POROSITY** - A term describing the relative proportion of solids, water and air in a soil specimen. It is the fraction of a volume of soil not occupied by the oven dry solids. Also called "porosity".
- TOTAL STATIC HEAD** - A quantity used in determining pump sizes. It is the vertical distance between the free level of the supply source and the point of free discharge or the level of the free surface of the discharge water.
- TOTAMETER** - A device used to measure flow rates of liquids or gases consisting of a tapered glass tube fitted with inlet and outlet connections, and containing a metering float with a diameter less than the inside diameter of the tube. The tube is placed in a vertical position and the fluid to be measured is admitted at the bottom of the tube and discharged from the top of the tube, as the fluid flows in the annular aperture. Between the float and the glass the float is elevated to a height where the forces acting on it are in equilibrium. The flow rate is then read from the calibration on the glass tube opposite the float.
- TOUCH CONTROL SYSTEM** - A tractor

- hydraulic system which controls the position of implements throughout the working range of the implement.
- TOUGHNESS** - The characteristic of a material to resist rupture under impact loading. It can be expressed as an index number representing the amount of work done on the material per sq.in. when loaded to failure.
- TOWER** - 1. A hydraulically operated, telescoping mast capable of elevating to a height of 26 to 30 ft. high in which there are furnace, heating pipes, and cabinets for trays of produce to be dehydrated. The trays are stacked one on top of the other. 2. A platform attached to and above a sprayer from which a man sprays the tops of tall trees.
- TOWER SPRAYMAN** - The person who sprays in orchards from a tower mounted on a power sprayer.
- T PLANE** - A plane used by carriage makers and coach builders. Its stock is shaped like a letter T, the foot holding the iron; this permits it to be used in routing out a groove or furrow in the work.
- TRACE** - 1. The line or curve on the face of an oscilloscope cathode ray tube. 2. The part of the horse harness connecting the horse to the evener.
- TRACE ELEMENT** - Any of certain chemical elements which are necessary in minute quantities for optimum growth and development of plants and animals.
- TRACER** - A radioisotope which is mixed with a stable substance, by means of which material can be traced as it undergoes physical and chemical changes. In agricultural research, for example, radioactive isotopes of phosphorus in a chemical fertilizer can be traced through the plant as it is absorbed by the roots.
- TRACK** - An endless belt running around sprocket wheels which provides ground support for the vehicle. Belt is usually made of steel sections hinged together with steel pins. The steel sections are called track shoes, and often have raised lugs, called grousers, to aid in traction.
- TRACK DRIVER** - A power unit equipped with tracks instead of wheels as a traction device.
- TRACK HANGER** - A hanging support for an overhead rail, upon which a traveling crane or similar appliance may run. It is generally used in connection with a monorail on which run carrier trolleys, by means of which materials are transported.
- TRACK-LAYING TRACTOR** - A tractor which travels on tracks, or treads, which as in a track layer, are laid down from an endless belt running around sprocket wheels, as species of track-type tractor. Also called crawler tractor, creeper tractor, etc. See: Track.
- TRACK ROLLER** - Also runway or runway rail - An overhead track upon which a movable crane or hoist operates.
- TRACTION** - The driving force developed by a wheel or other means as it acts upon a surface.
- TRACTION CONTROL** - A mechanical linkage which increases dynamic loading on the tractor drive wheels without adding weight. This is obtained by a variation in the angle of pull. This also includes a combination of articulated sockets for the implement to maintain a uniform depth in a field of uneven contour.
- TRACTION DEVICE** - A unit for converting torque-input into total force output.
- TRACTION DUSTER** - A dusting machine which derives the power for blowing or spreading dust from the ground wheels on which it is mounted.
- TRACTION EFFICIENCY** - The ratio of drawbar horse power to the horsepower input to the rear axle. It is a measure of the efficiency with which the driving wheels transform the torque of the rear axle into linear drawbar pull.
- TRACTION ENGINE** - 1. A self-propelled

- agricultural engine, capable either of hauling vehicles along common roads, or of driving machinery, such as, threshers, etc. 2. A locomotive for drawing vehicles on highways.
- TRACTION MACHINE** - A complete self-contained machine made up of one or more traction devices and the necessary supporting units.
- TRACTION RATIO** - Drawbar pull divided by the total weight of the complete traction machine (for tractor the total weight includes ballast and a driver).
- TRACTION SPRAYER** - A sprayer mounted on wheels which receives the power to operate the sprayer from the wheels on which it is mounted. See: Power sprayer.
- TRACTION WHEELS** - Wheels which transmit power, through friction between the wheel and the ground surface.
- TRACTIVE EFFORT** - 1. (Use as tractive force) Force exerted by the weight and velocity of water, which tends to cause erosion. 2. Force exerted by a power unit in moving.
- TRACTIVE POWER** - In mechanics, the power of pulling.
- TRACTOR** - An automotive type vehicle which is used to supply power to other machines by: pulling at the drawbar; belt power from the belt pulley; rotary power from the power take-off shaft; hydraulic power for the operation of hydraulic cylinders or other positioning mechanisms; or electric power when a generator is mounted on the tractor.
- TRACTOR BINDER** - A grain binder that is drawn by a tractor.
- TRACTOR-CARRIED PLOW** - See: Integral mounted plow.
- TRACTOR CHASSIS** - The framework of a tractor, usually including transmission case and differential housing, on which the engine, power train, wheels and auxiliary machinery are mounted.
- TRACTOR DISK HARROW** - A disk harrow pulled by and controlled from the tractor, usually of a heavier construction than the horse-drawn disk harrow.
- TRACTOR-DRAWN** - Refers to any machine, pulled by a tractor, which may or may not receive power from the tractor.
- TRACTOR LIFT** - A forklift attachment, either on the front or rear of a tractor, designed to lift and transport loaded boxes or weights.
- TRACTOR-MOUNTED** - Denoting any tool which can be supported entirely by the tractor and obtains its power supply from the tractor.
- TRACTOR-MOUNTED LOADER** - A bucket mounted either on the front or rear of a tractor which is operated hydraulically; used for loading manure, gravel, etc. on a spreader or wagon, truck, etc.
- TRACTOR-MOUNTED PLOW** - See: Integral-mounted plow.
- TRACTOR SWEEP RAKE** - A sweep rake mounted on a tractor and powered by the tractor.
- TRADE-MARK** - An identifying mark or device placed on all goods sold by a manufacturer to identify them as his product.
- TRADE NAME** - A name given to an article by the manufacturer to distinguish it as one sold by him. It is different from the trade mark in that the trade mark applies to all products sold by a company while each product has a different trade name.
- TRAIL** - 1. A pathway which is made either by repeated passage of men or animals or constructed for easier passage. It is sometimes usable for vehicles. 2. A condition of a disk plow when the disk is parallel to the line of travel.
- TRAILED IMPLEMENT** - An implement that is pulled and guided from a single hitch point and is never completely supported by the power unit.
- TRAILER** - A one, two or four-wheeled vehicle which is designed to be pulled behind and by another vehicle. For agricultural purposes it is used to carry loads.
- TRAILERETTE** - A one-wheeled trailer.

- TRAILER HITCH** - A device for attaching a trailer to a pulling vehicle which often consists of a ball and socket joint to which is affixed a set-screw or other safety device to prevent a loosening of the hitch.
- TRAILER MOWER** - A mower which is designed for attachment to the tractor drawbar; hence, it operates behind the tractor.
- TRAILING IMPLEMENT** - See: Trailed implement.
- TRAILING DISK PLOW** - A complete disk plow unit in itself pulled by a tractor or horses and usually supported by two or three wheels.
- TRAILING PLOW** - A complete plow unit in itself usually supported by two or three wheels and pulled by a tractor or horses.
- TRAINING WALL** - An embankment used in the process of directing the spread of runoff water over the land surface to replenish ground water.
- TRAMPER** - 1. A device used in baling cotton; it may consist of a cylinder, operated by steam pressure, which presses every minute or so to compress the loose cotton in the press box. 2. A heavy weight, usually hydraulically-operated, which loosely presses lint cotton preparatory to baling.
- TRAMPER SIDE** - 1. Either of two press boxes in a cotton gin, arranged side by side and supported by a center column, which can be revolved. 2. When lint cotton is falling into a box it is the tramper side.
- TRANSDUCER** - A device for translating a signal from one form into another.
- TRANSFER HOSE** - A flexible hose, usually of plastic, which is used to convey the milk from the bulk milk cooling tank to the pump of the bulk milk tanker. Also milk hose and pump out hose.
- TRANSIENT HEAT TRANSFER** - A change in amount of heat going through a product with time.
- TRANSIT STADIA SURVEY** - A survey in which the stadia man follows each conventional terrace line giving readings at each stake. The transit man takes only the stadia interval and the azimuth. At one stake of each terrace, the vertical angle is taken to determine the elevation at that station. After a map of the above data is plotted, the elevation at any point along the terrace line can be determined, and the average slope between terraces may be found at any location.
- TRANSITION** - A short conduit connecting two other conduits having unlike flow characteristics. It is designed to provide a minimum of flow disturbance.
- TRANSMISSION-DRIVEN POWER-TAKE-OFF** - A power distribution system used on tractors in which the transmission and power-take-off operate only when the master clutch is engaged and cease to operate at any time it is disengaged.
- TRANSMISSION DYNAMOMETER** - An instrument which will measure work and power of a power unit while transmitting the power and work to a tool.
- TRANSMISSION ROPE** - Rope specially made to resist the severe strains imposed upon it when transmitting power. It may be either manila or steel wire, according to circumstances.
- TRANSPIRATION** - 1. The process by which water vapor leaves the living plant body and enters the atmosphere. It includes circular transpiration, or direct evaporation into the atmosphere from moist membranes through the cuticle; and stomatal transpiration, or outward diffusion into the atmosphere through the stomata and lenticels of water vapor previously evaporated from imbibed membranes into gas spaces within the plant. 2. The process by which plants dissipate water from their leaf and body surfaces in the plant body.
- TRANSPLANT** - A seedling that has been moved from one growing location to another.
- TRANSPLANTER** - Any equipment for

- placing growing plants in the soil.
See: Dibble, transplanting machine.
- TRANSPLANTING MACHINE** - A wheeled machine which has a furrow opener, a tank for water supply, disks for closing the furrow, and seats low to the ground for operators to sit on while placing the transplants in the furrow.
- TRANSPORTATION TANK** - A tank which is used for transportation of products from one location to another, such as fluid milk from farm to dairy or cherries in water from orchard to processing plant.
- TRANSPORT TRUCK** - 1. A vehicle having two or more wheels which is used to haul or transport material. 2. A large truck for hauling loads on the highway.
- TRANSVERSE AREA** - The area used in the design of a ditch. A suitable reach is determined from which the transverse area is found by measuring the area that the reach encloses.
- TRAP EFFICIENCY** - A percentage index which indicates the effectiveness of a reservoir to remove silt or sediment from an entering stream.
- TRAPEZOIDAL WEIR** - A liquid flow measuring device with a trapezoidal notch; a Cipolletti weir is a trapezoidal weir of definite shape, i.e. a notch with horizontal crest and sides that slope outward at a ratio of 1 horizontal to 4 vertical.
- TRASH FARMING** - See: Subsurface tillage.
- TRASH GUARD** - An attachment, usually a rod or wire, for a moldboard plow which drags trash into the furrow for covering.
- TRASH RACK** - A grid or screen placed across a stream and designed to catch floating debris.
- TRASH ROLLS** - Rolls located to the rear of the snapping roll beater on a corn picker. They gather excessive trash from corn stalks and deposit it on the ground.
- TRASH SHIELD** - A part of a plow; a piece of sheet metal which is shaped so as to form a hood over the top side of the furrow slice as it is turned over. Thus, the trash is placed in the bottom of the furrow in the form of a roll which covers one-third to one-half of the trench bottom.
- TRASHY CULTIVATION** - Tillage which leaves the major portion of crop residues on the soil surface. Also called trashy tillage.
- TRAVELING SIEVE** - A sieve or "riddle" in a combine which carried the coarser refuse over to fall upon the ground. (Obsolete.)
- TRAVELING SCREEN** - 1. A diaphragm, usually of canvas in a frame moved by water in the direction of flow, for purpose of measuring directly the mean velocity only useful in regular channels where the frame is shaped to the channel cross section and nearly fills it. 2. A revolving trash screen.
- TRAVEL RATIO** - Distance traveled with a drawbar pull load divided by the distance traveled with zero pull for the same angular rotation of the torque input unit. Revolutions or rotation counts for a drive unit when there is no drawbar pull divided by the revolution or counts for the same distance with a drawbar pull load.
- TRAVEL REDUCTION** - The percentage of distance traveled by a vehicle pulling a load as compared to the distance traveled without a load.
- $$\text{Travel reduction} = \frac{\text{Distance traveled pulling load}}{\text{Distance traveled no load}} \times 100.$$
- TRAVEL REDUCTION** - See: Slip.
- TRAVERSE** - A land surveying term indicating a series of connected straight lines and their bearings (or angles between the lines). It is the practice of closing back in on the starting point as a check on accuracy.
- TRAVERSE DRILL** - 1. A drill for boring slots. The drill or the work has a lateral motion after the depth is attained. 2. One in which the drill stock has a

- sideways travel for adjustment.
- TRAVERSE TIME** - The time it takes from the instant a particle of air enters a quantity of grain until it leaves the grain following a particular path. This time is usually expressed in seconds.
- TRAY** - 1. A wide, flat-bottomed, topless, shallow container which is used for picking, carrying, handling, drying or storing produce. 2. A short piece of heavy wrapping paper on which seedless grapes are sun-dried.
- TRAY DRYER** - A drying device using cars of trays which are slowly moved through a heating chamber.
- TREAD** - 1. The exterior surface of a wheel or tire which provides the ground traction. 2. That endless belt on which a crawler tractor moves. Usually called track. 3. The horizontal stepping of a stairway surface.
- TREADER** - A rotary hoe pulled backwards to give more compaction of the surface soil than when it is pulled forward. The same effect may be produced by reversing the wheels of the rotary hoe and pulling it in a forward direction.
- TREAD RADIUS** - See: Crown radius or thread radius.
- TREAD WIDTH** - The distance from shoulder to shoulder of a tire.
- TREE LIFTER** - A mechanical device which is used for loosening the soil prior to pulling so that seedlings and transplants may be taken up without excessive damage to the roots.
- TREE PRUNER** - A long rod to which is attached a sharpened hook, a blade and a rope. The blade is fixed to the hook. When the hook is placed over a small limb and a rope or rod attached to the blade is pulled, the limb is cut off.
- TREMBLER** - A vibratory device used in connection with the jump spark method of electric ignition for gasoline engines.
- TRENCHER** - Any of several types of machines which dig trenches, as for tile drainage.
- TRENCHING MACHINE** - See: Trencher
- TRENCH PLOW** - 1. A long-winged plow which is used to start the excavation or trench for placing tile for subsurface drainage. Sometimes called a ditcher. 2. A plow with a U-shaped blade to loosen the soil in trenches.
- TRENCH SILO** - An excavated earthen trench for storage of silage. They may be from 15 to 25 ft. wide, 6 to 8 ft. deep and as long as desired. They are sometimes floored with concrete and lined with wood or concrete.
- TRIANGLES** - A means of transmitting power between two points not close together. A rocker arm or cross arm is placed at the source of power and one at the delivery point. A wire is then fastened from the top of each rocker arm to the bottom of the other causing the two wires to cross halfway between the two arms.
- TRIANGULAR TOOTH** - See: Harrow teeth.
- TRIANGULAR WEIR** - A contracted measuring weir notch with sides that form an angle with its apex downward; the crest is the apex of the angle, usually 90° ; a V-notch weir.
- TRICKLE CHARGER** - Apparatus for charging storage batteries at a very low rate being usually arranged to automatically start charging each time the power consumer appliance is turned off.
- TRICKLING FILTER** - A bed of crushed stone, gravel or cinders of relatively large size and usually about 5 ft. or more thick. Sewage is applied at the surface and the solids precipitate out during their descent through the bed. Aerobic bacteria decompose the solids.
- TRICYCLE-TYPE TRACTOR** - A power unit or tractor with the two front wheels located side by side in the front center of the tractor on opposite sides of the same vertical post or with one front wheel located in the center.
- TRIER** - A probe which is used to

- obtain a representative, small sample of produce without cutting or untying the container as a cheese or grain trier.
- TRIM** - The finish materials used in a building to give it its final appearance such as moldings around openings (window trim, door trim) or moldings applied at the juncture of floors and ceilings with walls, (baseboard, cornice, picture molding).
- TRIMMER** - A beam or joist receiving a header. Usually a reinforced joist or stud running parallel to the studs or joists as the support for an opening.
- TRIMMER CHISEL** - A blacksmith's cutting tool not unlike a hot-set, but with its handle welded to it, making it resemble a hatchet. The edge is made convex, so that it can be slid easily over the work; if the edge be concave, the tool is known as an arched chisel.
- TRIP** - An attachment to a cultivator shovel, plow bottom, middlebuster or mower bar, which allows it to bend back and then return to normal position after hitting an obstruction. There are three types: the break pin, the friction trip and the spring trip.
- TRIP ARM** - See: Trip hook.
- TRIP DOG** - 1. The part of a grain weigher which controls the amount of each trip usually $\frac{1}{2}$ or 1 bu.
2. A part of a trip linkage system of a plow hitch equipped with a trip mechanism.
- TRIP HOOK** - A part of the binding and tying mechanism on a grain binder. When sufficient grain has been collected, the pressure against the trip hook forces it back, releasing the trip dog to start the operation of the binding mechanism. The trip hook can be adjusted to increase or decrease the size of bundle. Also called trip arm.
- TRIPLE BARREL PUMP** - A pump having three barrels connected with a common suction pipe. The pistons are operated by a three throw crank, the cranks being at an angle of 120° , so that each piston is always at a different part of the stroke from either of the others, and being double acting, produces an almost uniform flow. Also called triplex pump.
- TRIPLE EFFECT** - A distilling apparatus, worked in three stages under varying degrees of vacuum. The vapor from the first vessel vaporizes the contents of the second chamber, which in turn vaporizes the liquid in the third effect; all drains going to the condenser. Has greater efficiency than a single effect unit.
- TRIPLE SPRAY GUN** - A portable spray gun with three nozzles extending from one pipe.
- TRIP LEVER** - A lever which, when operated, will cause a sudden release or emptying.
- TRIPLEX BLOCK** - A powerful pulley block, invented by Weston, who introduced the differential block. When the load is lifted through triple spur gearing which is quicker than worm or differential gearing, this descent is controlled by a brake, the strain on the chain pressing these against each other and the casing. This permits the weight to be lowered with great delicacy and entirely at the will of the operator. Utilizes epicyclic train.
- TRIPLEX PUMP** - A heavily constructed pump used for the homogenization process. This pump is especially suited for use in homogenization because of the uniformity of pressure developed through the overlapping of the pressure strokes of its three plungers.
- TRIPOD BEARING** - More generally known as three point bearing. A method of attaching machines to their foundations, etc., so that they are resting upon three points only, thus preventing rocking, which is liable to take place if the object rests on more than three points.
- TRIPOD JACK** - In tools, a screw jack which is supported on a tripod of

- three iron legs, and often used in locomotive shops.
- TRIPOD STACKER** - A device consisting of three poles arranged as a tripod with a pulley suspended from the top of the tripod used for elevating hay to the top of a stack.
- TRIP PIN** - A pin on a grain weighter around which the trip lever and spring operate to actuate the trip.
- TRIP ROPE** - Rope, string, chain, etc., attached to a trip which is used to activate the trip on a mechanism.
- TROLLEY CONVEYOR** - An overhead I-beam track with trolleys fastened together by chain. The direction of motion is extremely flexible since it can be designed to make horizontal turns up to 180°, as well as making turns resulting in a change in elevation.
- TROMBONE DOUBLE-ACTING HIGH-PRESSURE SPRAY PUMP** - A spray pump which may use knapsack tanks for its water supply. It is used for fire fighting and it will generate a pressure of 200 lbs. per sq.in. and throw a stream of water 60 to 70 ft.
- TROOSTITE** - Old term for tempered martensite produced by tempering in the lower tempering range (300-750° F.). Preferably called tempered martensite in the interest of simplified nomenclature.
- TROUBLE LIGHT** - A device made up of a lamp and two leads used for locating blown fuses or testing for the presence of electricity.
- TROUGHING ROLLER** - In a belt conveyor, a concave assembly of individual rollers to permit concavity of the belt carrier surfaces.
- TROUGH SCRAPER** - A hoe-shaped tool which is used to clean feed troughs.
- TROWEL** - 1. A short-handled tool which has a relatively narrow, concave and pointed blade. It is used for transplanting, planting bulbs, etc. 2. A hand tool which is used in concrete work and handling mortar in brick-laying.
- TRUCK** - 1. A strong vehicle, especially one with four wheels, a wagon or an automotive vehicle which is used for transporting machinery, freight and other heavy articles. 2. A low vehicle similar to a wheelbarrow with two small, stout wheels in place of one and a forward lip which is used in moving barrels, boxes, etc., by hand; a barrow-truck.
- TRUE POINT OF HITCH** - See: Center of pull.
- TRUE SOLUTION** - A solution where solid particles smaller than 10^{-6} mm mean diameter are dispersed in the solvent.
- TRUING TOOL** - A device for turning the face of a grindstone or any other surface for which it may be adapted.
- TRUNK** - 1. The main body or stock of a tree. 2. A conduit or rectangular section, built of planking or thin metal, to serve as a passage for air.
- TRUNK PISTON** - A long cylindrical piston into which the cross head of the connecting rod is secured, thus eliminating a piston rod. Such pistons are used in single acting steam and gas engines, their outer ends being much prolonged to serve as guide shoes.
- TRUNNION** - One of two cylindrical projections on the sides of anything, serving as supports for it, and also permitting it to rock, or be moved through a vertical angle.
- TRUNNION BEARINGS** - See: Trunnion box.
- TRUNNION BOX** - A self aligning bearing for shafting, mounting on trunnions like a cannon, instead of being fitted with a ball and socket joint.
- TRUSS** - A roof frame consisting of a series of triangles formed by wood or metal members joined together. The stable triangular shapes and rigid joints provide an acceptable capacity for

supporting loads over wide spans.

TRUSSED ARCH - An arch-shaped truss.

TRUSSED BEAM - A beam braced against sagging by one or more vertical posts in its center position. The vertical posts are supported by tension rods or cables attached to the ends of the beam.

TRUSSED SHAFT - (In machinery) a long light shaft rendered rigid by truss rods arranged around it.

T SLOTS - (In machinists' work) slots or grooves cast in the tables of planing, shaping, slotting and drilling machines for carrying the heads of T-headed bolts.

T SQUARE - A rule having a cross piece or head on one end, used for making parallel lines, so called from its shape.

TUBEAXIAL FAN - A type of axial flow fan where the air moves through the fan nearly parallel to the impeller shaft. Its distinctive features include large hubs and short blades, to minimize feedback along axis. It is distinguished from the vane axial fan by its lack of guide vanes.

TUBE IGNITION - An early form of ignition used for gas engines and oil engines. A closed tube of platinum, porcelain or lately nickel alloy is exposed to the heat of a bunsen flame, which makes it red hot. A passage communicates from the clearance space of the cylinder to the interior tube; this passage is closed by the timing valve, which opens when the charge is compressed, thus firing the latter.

TUBE WELL - A small well for obtaining water from shallow strata which consists of a pointed pipe driven into the ground without boring. See: Driven well.

TUBULAR SAW - A cylindrical saw with teeth around its base, after the manner of a crown cutter. It is employed for sawing wood to a curvature corresponding to that of the saw.

TUCKER - A device on a hay baler which makes the ends square.

TUMBLER BEARING - A support for long revolving shafts; as, in a shafting lathe or a traveling gantry.

TUNGSTEN LAMP - A type of metallic filament incandescent lamp employing a filament composed of the metal tungsten.

TURBINE - A machine in which a rotary motion is obtained by transference of the momentum of a fluid, gas or liquid broadly speaking; the fluid is guided by fixed blades, attached with a casing, and impinging on other blades mounted on a drum or shaft, causing the latter to revolve.

TURBINE DUSTER - A duster which generates wind through use of an axial flow blower.

TURBINE PUMP - A multiple centrifugal pump, with several impellers in series, which is suitable for pumping against high heads. Also called series pump; multistage centrifugal pump.

TURBINE WHEEL - The rotor or rotary part of a turbine, as distinguished from the casing, shrouding or stator.

TURBULENCE - A collection of a large number of eddies causing a violent disturbance in a fluid or air mass.

TURBULENT FLOW - 1. That type of flow in which any particle may move in any direction with respect to any other particle, and in which the head loss is approximately proportional to the second power of the velocity. (Sometimes designated as "sinuous flow" or "Tortuous flow".) 2. Flow in which the fluid particles move in an irregular random manner.

TURBULENT VELOCITY - That velocity above which, in a particular conduit, turbulent flow will always exist, and below which the flow may be either turbulent or laminar, depending on circumstances.

TURKEY HOUSE - A shelter designed for housing turkeys. It may be an open building only for roosting or a closed type. Must be dry.

TURNBUCKLE - 1. A device for tightening or drawing together two parts of a rod, consisting of a sleeve having an interior

- right-hand thread at one end and an interior left-hand thread at the other. This sleeve engages the threaded ends of the two pieces of rod, so that a turning thereof in one direction screws up on the rods and in the reverse direction unscrews them. 2. A loop or eye of metal with a nut at either end, one being screwed with a left-hand thread, the other right-handed. Used to tighten stayrods or similar tension members in many structures.
- TURNED BOLTS** - In machinery, they are used on all good machine and engine work, their holes being drilled or bored to make a good fit. The employment of turned bolts is necessary to prevent the displacement of parts due to vibration.
- TURNING** - 1. The process of moving grain through air from one storage structure or bin to another or back to the same storage to prevent spoilage because of heating or moisture migration. 2. Plowing land so the surface is turned down. 3. Bringing a piece of work to a circular form in a lathe.
- TURNING CHISEL** - In turning, an obliquely ground, double-beveled chisel used for turning smoothly or finishing the surfaces of wood-work in the lathe.
- TURNING CAGE** - An instrument to assist in setting over the tail-stock of the lathe, so that a given taper in a certain length of work may be obtained.
- TURNING RADIUS** - The turning radius of a wheel type tractor is that of the minimum circle described by the center of the tire tread of the outermost wheel when the tractor turns through 360° , on a horizontal surface.
- TURNING SHOVEL** - See: Moldboard hiller.
- TURNING SPACE** - The minimum circle described by the outermost point of the tractor when the tractor turns through 360° , on a horizontal surface.
- TURNING UNDER** - The covering or burying of the surface soil, trash, a green manure crop, etc., by plowing.
- TURNOUT** - Water-control structure that provides a means of delivering water from the ditch to the area to be irrigated or into a temporary ditch.
- TURN PLOW** - See: Moldboard plow.
- TURNROW** - A relatively narrow strip of uncultivated land at the margin of a field on which the plow or other equipment may be turned.
- TURN SPOUT** - A discharging spout for grain elevators, etc., which is mounted on a swiveling socket or support so that it may be turned to any desired angle to discharge grain.
- TURNWAY** - A grassed or vegetative strip at the ends of a terrace or stripcropped field which is used for turning during the process of tillage. Sometimes called a grassed headland.
- TURNWREST PLOW** - A plow with a shifting moldboard which is designed so that the furrow slice is always thrown the same way (Scotland and England). Also called Kentish plough. See: Reversible plow.
- TURPENTINE HACK** - A tool used for barking and cutting the face on the pine trees from which the crude resin is collected.
- TURTLE BACKING** - Preparation of a wide bed, in the form of a low rounded ridge, bordered on each side by furrows; a tillage method which is used in the planting of sugar cane on flat, wet lands.
- TWENTY DEGREE FULL DEPTH** - A gear system with long and short addendum. The use of modified addendum - dedendum gears is necessary to prevent tooth interference, to strengthen the pinion and to improve the mating action of the gears.
- TWIBIL** - 1. A mattock whose blade has one end like an ax, the other like an adz. 2. A mortising tool. 3. A reaping hook used for cutting beans and peas (England). Also called twibill, twybill.
- TWIN DITCH** - Two single, parallel

- drains that are located next to each other. These ditches are shallow and have flat enough side slopes for implements to cross; used in field drainage. See: Ditch.
- TWINE** - 1. A string of some fiber composed of two or more threads or strands twisted together; as, binder twine; any coarse strand or small cord; a string of several strands; especially, if of hemp or manila. 2. A strong hempen thread used in sewing sails.
- TWINE TENSION** - A special apparatus on a tying device such as is used on a hay baler which keeps the twine in tension so the bales can be tied without fouling the knotter heads. There are three kinds used; the single-roller, the double-roller and the spring. In all three types, the tension is regulated by a spring held by a bolt. When the nut is turned down on the bolt the twine is pinched, causing it to pull much harder and thus creating tension on the twine.
- TWIST** - Spiral deformation in lumber.
- TWIST BIT** - A boring tool for wood, with a cutting part like the twist drill used for metals.
- TWIST DRILL GRINDER** - In tools, since so much of the efficiency and satisfactory working of twist drills depends on the angle of their cutting lips being maintained intact, grinding machines have been devised, by which this constant angle is maintained, the drill being held in a socket or clip against a rapidly revolving emery wheel.
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- TWISTED BELT** - In millwrighting, driving belts are sometimes twisted to secure their better adhesion, and so save the trouble of tightening up. But, as commonly understood, twisting refers to the turning of a belt through a definite angle, to drive pulleys whose axes are not on the same plane, or to drive a machine in opposite directions.
- TWISTED SHOVEL** - A cultivator shovel which is used for general work. The shovel is cut off higher on one side than the other with the result that most of the soil is shed off the high side. The shovels on a gang are mounted at a slight angle so that the soil shed by one shovel covers the trough cut by the preceding shovel.
- TWITTER BIT** - The bottom of the countersink which receives the head of the screw; as, the one uniting the halves of a pair of scissors.
- TWO-BOTTOM PLOW** - See: Two-furrow plow.
- TWO CYCLE** - (Properly two-stroke cycle.) A type of internal combustion engine in which the four operations of charging, compression, explosion and expulsion are carried out during two strokes of a piston.
- TWO-FURROW PLOW** - A plow having two bottoms which turn furrows the same way; for example, two right-hand or left-hand bottoms. Also called two-bottom plow.
- TWO-HINGED ARCH** - A continuous single-membered arch having joints only at the wall plates.
- TWO-HORSE** - 1. Designating a vehicle, plow, cultivator, wagon, etc., which is drawn by a team of two horses. 2. A power unit capable of doing as much work as two horses.
- TWO-JAWED CHUCK** - A self-centering chuck, usually employed to hold a twist drill or the like.
- TWO-MAN** - Designating a tool, implement, etc., which is operated by two men, as a two-man saw.
- TWO-MAN BALER** - See: Two-man pickup hay baler.
- TWO-MAN PICKUP HAY BALER** - A hay

- baler requiring one man to drive the tractor and one to tie the bales. Also called two-man baler.
- TWO-PHASE MOTOR** - An A.C. motor which, instead of having a single field winding, is furnished with two distinct windings, each supplied with a single phase alternating current of the same frequency but differing in phase $\frac{1}{4}$ of a period; a diphas motor.
- TWO-POLE MAGNETO** - A spark magneto which utilizes a two-pole rotor. The breaker points open every 180° .
- TWO-ROW** - Designating a farm implement which works two rows at a time, as a two-row corn planter.
- TWO-ROW CHECK-ROW PLANTER** - A precision corn planter capable of planting two rows at a time. These rows are planted in hills 38 to 42 ins. apart. Usually 2, 3 or 4 kernels are planted in each hill. Precise spacing of the hills is obtained by using a wire with buttons spaced 38 to 42 ins. apart on it. The wire is stretched from one end of the field to the other. The wire is attached to the planter and as the planter is pulled the buttons on the wire trip a mechanism that releases the seed. The accurate placement of the seeds along the rows results in rows in two perpendicular directions, and allows cross-cultivation for better weed control.
- TWO-ROW CULTIVATOR** - A cultivator which cultivates two rows of a crop simultaneously.
- TWO-ROW FRONT-MOUNTED CORN PLANTER** - A corn planter mounted just behind the front wheels of a tractor and capable of seeding two rows of corn at a time.
- TWO-ROW MOUNTED TYPE CORN PICKER** - A corn picker mounted on a tractor and designed to pick two rows of corn at a time.
- TWO-ROW PLANT THINNER** - An implement used to thin two rows of drilled crops to a desired stand. This is done by mounting knives on a hub and adjusting the knives so that as they turn, they will cut out only portions of the drilled crop.
- TWO-ROW PULL TYPE CORN PICKER** - A corn picker which will pick two rows of corn at a time while being pulled by a power unit.
- TWO-ROW REAR-MOUNTED LISTER CORN PLANTER** - A corn planter which is a drill planter designed to plant corn in listed furrows. It is mounted directly on the tractor, and the height of the planter may be controlled from the tractor seat.
- TWO-ROW RIDING DRILL PLANTER** - A planter which drops one seed at a time in each row from $4\frac{1}{2}$ ins. to more than 2 ft. apart. The machine has facilities for the operator riding on it.
- TWO-ROW TRAILING CORN PLANTER** - A type of corn planter capable of planting two rows at a time while pulled by a power unit.
- TWO-RUN PROCESS** - A process used in the manufacture of vinegar in which the freshly fermented liquid is passed through a generator to become as acetified as desired. See: One-run process.
- TWO-STAGE COMPRESSOR** - A system made up of a booster compressor and a standard compressor unit. The booster compressor draws refrigerant on a low-temperature evaporator and discharges its gas into an inter-cooler which pipes the gas to the standard compressor for final compression.
- TWO-STAGE HOMOGENIZER** - A high pressure hydraulic machine in which the product passes thru two successive homogenizing valves before being discharged. Usually used for dispersing and breaking up fat globules in milk products. Also used for treating other fluid products.
- TWO-STROKE CYCLE ENGINE** - See: Two cycle.
- TWO TO ONE GEAR** - 1. Two gears having a 2:1 tooth ratio. 2. In four-cycle gas engines, the system of bevel or spur gearing driving the half speed shaft,

which revolves once to every two revolutions of the crank shaft.

TWO-WAY PLOW - Any plow having right and left bottoms that can be used interchangeably so no dead furrow is left in a field.

TWO-WAY SULKY - A sulky plow which has both a left-hand and right-hand bottom. Only one plow is used at a time. The furrows are turned in the same direction when plowing back and forth across the field to avoid dead furrows.

TWO-WAY TRACTOR-DRAWN PLOW - A tractor-drawn plow having both right and left-hand bottoms. The right-hand bottoms are used going one way and the left-hand bottoms going the other way. With this type of plow, no dead furrows are left in a field. There are two types of these plows: the power-lift plow has a left and a right gang mounted on one frame; either or both gangs can be raised; and the roll-over or jump plow has the bottoms mounted on a rotating frame so that when one plow is being used, the second plow is above it and in an upside-down position. When a lever is pulled the plow turns over and plowing can be done with the other.

TWO-WAY TIE - An arrangement of reinforcing rods in concrete columns that provide horizontal binding in two directions.

TYLER SCREEN - A screen, for example, having a mesh with 0.046 in. openings. Other mesh sizes are 0.371, 0.185, 0.093, 0.0232, 0.0116 and 0.0058.

TYLER SIEVES - A set of standard screens adopted by the U.S. Bureau of Standards for sizing of screened materials used in processing. The screens are usually placed on top of each other in sieves of decreasing opening sizes starting from the top. The openings in the screens are square and the holes have dimensions in the ratios of $4\sqrt{2}$ or 1.189 in comparison with the next larger or smaller screen.

TYPE F INFILTROMETER - A rectangular,

6 ft. x 6 ft., metal barrier surrounds the soil area to be studied. Water is applied through a set of sprinklers expressly designed to simulate rainfall conditions. A protecting tent may be used to minimize the effect of wind. The rate of water application is determined by collecting all the water falling on a calibration pan in a given time. Water is then applied directly to the soil at the same rate, and runoff is measured.

U

- U-BOLT** - A rod bent in the shape of the letter U with threads and nuts on the ends.
- ULTIMATE COMPRESSIVE STRESS** - Used in reference to concrete. It means the most strength the concrete will gain which occurs 28 days after the start of curing.
- ULTIMATE STRENGTH** - Unit stress when a material is carrying its maximum load before rupture.
- ULTRAVIOLET RADIATION** - Radiant energy produced by a hot surface or special fluorescent lamp but of such short wavelength that the radiation is invisible to the human eye. 4×10^{-5} to 10^{-8} cm wavelength.
- UNCONFINED GROUND WATER** - Ground water not under hydrostatic pressure; the water is under atmospheric pressure and the water table rises or falls as the volume of stored water changes.
- UNDERDRAINAGE** - That drainage consisting of drain tiles placed in trenches deep enough so that the covering soil can be cultivated and the profile adequately drained.
- UNDERDRAINED SAND FILTER** - A method of disposing of sewage by filtering it through sand after it leaves a septic tank.
- UNDERFLOW** - 1. The water flowing beneath the dry beds of rivers, especially in arid regions. 2. The rate of flow or discharge of subsurface water.
- UNDERGROUND RESERVOIRS** - Saturated coarse gravel wells beneath the ground surface.
- UNDERGROUND RUNOFF** - Water which flows toward stream channels after infiltration into the ground. See: Subsurface flow.
- UNDER IRRIGATION** - 1. Supplied with water for crop production entirely or in part by means of irrigation. See: Subirrigation. 2. Supplied with an inadequate amount of irrigation water.
- UNDER REAMER** - In well boring, a tool having two legs or cutters, spread open by a spring, which is used to ream or enlarge the borehole underneath the casing.
- UNDER RUNNER** - A grinding mill in which the lower of the two stones revolves, the upper remaining stationary. This form is especially useful in grinding oats, corn, chalk, clay, etc. The material rests on the revolving stone, and is moved out from the center by centrifugal force.
- UNDERSERRATED KNIVES** - The ledger plates on a mower are serrated on the under side to aid in cutting coarser stems. See: Serrated knives.
- UNEVEN SPAN HOUSE** - A building having one side or span of the roof longer than the other which is used largely for side-hill construction. See: Even span house.
- UNHEATED AIR DRYER** - A drying system forcing unheated atmospheric air through a product to dry the product.
- UNIFORM LOAD** - A load spread evenly over a supporting member.
- UNIFORM PITCH** - In mechanics, a screw is said to be of uniform pitch when there is an equal distance between the helices, or blades, as distinguished from increasing pitch.
- UNION** - A three-piece fitting for joining together two threaded pipes without turning either pipe.
- UNION COUPLING** - A term sometimes applied to a right- and left-handed turnbuckle or sleeve nut whereby two parts may be connected and drawn together without turning anything but the coupling.
- UNION WRENCH** - In tools, a "tommy shaped" wrench used for tightening up the joints of union screws. It partially embraces the circular nut and a hole drilled in the wrench slips over one of the horns on the side of the nut.
- UNIT CONDUCTANCE** - See: Film coefficient.
- UNIT-COOLER SYSTEM** - A method of distributing refrigeration in cold-

- storage rooms in which air is forced through coils containing a refrigerant. The coils are continuously defrosted by a brine spray or intermittently by water spray. The air is discharged at the top of the unit and returned at the bottom.
- UNIT DRAFT** - The draft of plows in terms of pounds per square inch of furrow cross-section.
- UNIT STRESS** - Load per unit area, e.g., lbs. per 1 in², lbs. per 1 ft.² etc.
- UNIVERSAL CHUCK** - A chuck having movable dogs on a face plate, so operated as to move radially simultaneously to adapt them to grasp objects of varying sizes.
- UNIVERSAL COUPLING** - See: Universal joint.
- UNIVERSAL JOINT** - A contrivance used for joining two shafts or parts of a machine endwise so that the one may transfer rotary motion to the other when forming an angle with it or may move freely in all directions with respect to the other; as, by means of a cross connecting the two forked ends of the two shafts.
- UNIVERSAL MOTOR** - A series wound electric motor that will operate on either d.c. or single phase a.c. of the proper voltage.
- UNLOADING BARS** - Bars attached to the dasher of a batch type ice cream freezer. They are spiral in shape and are used to remove the ice cream from the freezer quickly.
- UNRODDED** - Designation of a building not equipped with lightning rods.
- UNSUPPORTED LENGTH** - A factor in determining the slenderness ratio of columns. It depends on the end conditions of a column. If the column is pin-ended the unsupported length is the distance between ends of the column, if the column is fixed at one end and hinged at the other the unsupported length is equal to two-thirds of the distance between ends of the column, and if the column is fixed at both ends the unsupported length is equal to half the distance between column ends.
- UNSUPPORTED WIDTH** - The width of a plate between the nearest points of lateral restraint.
- UPLIFT** - 1. The upward force on the base of a structure due to water pressure. 2. Upward force on a structure due to air movement across the surface as occurs on airplane wings.
- UPPER PLASTIC LIMIT** - The percentage moisture content (dry basis) at which soil will barely flow when jarred by a blow.
- UPRIGHT SILO** - A vertical cylindrical tank-type structure used for storing chopped forage in the form of silage. Usually it is made of concrete staves, concrete or tile blocks or metal sheets, held together by tension bands or reinforcements. Diameter and height vary with capacity desired. Also called vertical silo.
- USAGE FACTOR** - A numerical value which represents the portion of total tank capacity used. The usage factor for a 300 gallon tank in which 200 gallons are cooled is 2/3 or 66.7%.
- U.S.P.H.S.** - United States Public Health Service.
- UTILITY BUILDING** - A farm building which is designed to house miscellaneous equipment, machinery and supplies.
- U-TUBE MANOMETER** - See: Manometer.

- VACREATOR** - A multiple unit consisting of steam jets and vacuum chambers which is designed to remove undesirable odor from milk and/or cream or to remove moisture from products.
- VACUUM DRYER** - A device used for evaporating moisture from a product in a partial vacuum. In milk processing, this device is commonly used for the dehydration of milk where a coating of milk is spread on a revolving steam-heated drum located in a vacuum and is scraped off as a solid.
- VACUUM GAGE** - An instrument resembling a steam gage in construction, for measuring the unbalanced pressure of the atmosphere upon condensers, etc. Generally measures pressure in ins. of mercury less than atmosphere.
- VACUUM LINE** - A tube, part of a milking machine, which is attached to the teat cup and the vacuum pump. As the vacuum pump exhausts the air in the vacuum line, milk is drawn from the cow.
- VACUUM OVEN METHOD** - A method of moisture determination for grain. For example, the product is ground and dried to a constant weight at 98° to 100° C. at a pressure 25 mm of mercury or less. Five to sixteen hrs. may be required, depending on accuracy desired.
- VACUUM PACKING** - A method of placing food in small containers in such a way that all or most of the air is removed. This retards enzymic and micro-organism growth.
- VACUUM PAN** - 1. Any of several devices which is used to concentrate milk, maple sirup, etc., under partial vacuum. The unit consists usually of a jacket or body, heating surface, a condenser and trap, and a vacuum pump. 2. In sugar making, a closed vessel heated by steam, in which sirup is evaporated at a lower temperature than the ordinary boiling point, in consequence of a partial vacuum produced in the vessel by the condenser.
- VACUUM PASTEURIZATION** - Milk or cream is heated to 230° F. then flashed into one or more vacuum chambers. The sudden pressure reduction causes certain volatile elements to pass off, thereby eliminating objectionable odors.
- VACUUM RELIEF VALVE** - An inverted safety valve, fitted to certain boilers, so that, if the pressure falls below that of the atmosphere, the valve will open and restore equilibrium.
- VACUUM TANK** - 1. Processing tank in which the product being treated is held under sub-atmospheric pressure. 2. A tank in a vacuum line used to "store" vacuum.
- VACUUM TYPE FILLER** - A type of bottle filling machine operating under reduced pressure. Filling is done by a suction on the bottle end tube, the bottle acting as a trap which fills with liquid.
- VALLEY** - The internal angle formed by the junction of two roof slopes when the angle is less than 180°.
- VALLEY FLASHING** - Sheet metal inserted between the shingles to make the valley gutter water-tight.
- VALLEY RAFTER** - A rafter at the inside angle of the intersection of two roof planes.
- VALVE CHAMBER** - The casing, chest or chamber attached to a cylinder or pump body, in which a valve or valves operate.
- VALVE-CONTROLLED HYDRANT** - In irrigation, a hydrant fitted with a small valve which is connected by a short riser to the underground lateral.
- VALVED OUTLETS** - Manually controlled outlets located on a main line as connections for lateral lines in irrigation work. Each lateral line may then be controlled by a valve.
- VALVE FACE** - That part of a surface on the valve which comes in contact with the seat.
- VALVE GEAR** - The mechanism which controls the motion of the valves

- admitting to and exhausting from the cylinders of an engine.
- VALVE GRINDING** - The operation of removing pits, corrosion and other marks from the faces and seats of disk or poppet valves. The surfaces may be smeared with an abrasive and rotated in contact with each other, the high places being worn away, leaving two smooth corresponding faces.
- VALVE-GRINDING COMPOUND** - Very fine emery powder mixed with grease or any other viscous lubricant meant for grinding valve seals is called valve-grinding compound.
- VALVE LIFTER** - A device used to raise a valve from its seat to allow passage of an exhaust or intake charge.
- VALVE ROPE KNIFE** - An emergency tool which is used in well boring on the cable system consisting of a cylinder with a knife balanced in it like a valve in a pump. The tool is lowered around the rope until the desired depth is reached, when an upward pull engages the knife and severs the rope.
- VALVE ROTATION** - In a gasoline engine the valve is turned slowly as it operates to prevent prolonged exposure to local hot spots.
- VALVE SEAT** - The round ring of hardened metal in an engine against which the valves seat when closed.
- VALVE-SPRAY CONTROL** - A manually operated valve or cut-off located in the discharge line of a sprayer which permits one to start or stop the flow of spray material from a sprayer.
- VALVE SPRING** - A spring which fits around each valve to force it to return to a closed position each time after being forced open by the valve lifter.
- VALVE STEM** - The shank of a valve which extends to a valve lifter device which causes the valve to open and close at the desired time.
- VALVE TIMING** - The timing of the intake and exhaust valves of a spark ignition or compression ignition engine which is a function of engine speed. With an increase in speed the intake valve should be closed later and the exhaust opened earlier.
- VALVING** - The process of covering selected portions of a bin of grain, as with paper or canvas, to control air flow through the grain. Enables more equal air distribution for drying and cooling partially filled bins of grain.
- VANE** - A blade of a windmill, fan, centrifugal pump or similar apparatus.
- VANE-AXIAL FAN** - A type of axial flow fan in which air moves through the fan parallel to the impeller shaft. It is distinguished from other axial flow fans by large hubs, and short blades plus stationary straight vanes on the discharge side of the fan to prevent rotation or swirling of the air leaving the fan.
- VANE CHURN** - One of several types of churns which is used in the commercial production of butter. Has no rollers, but uses shelves.
- VANE PUMP** - A rotary pump in which the rotor and case are eccentric, the rotor having movable vanes which are kept in contact with the casing board by springs, centrifugal force or hydraulic pressure. The vanes force the fluid through the pump.
- VANE TYPE ANEMOMETER** - An instrument for making air flow measurements. An appropriately mounted propeller, with a connecting revolution counter is inserted into the moving air. The rate of revolution is calibrated to indicate velocity.
- VAPOR BARRIER** - A sheet-type, or air film material which is impervious to the passage of water vapor under normal vapor pressure differences between inside and outside of farm livestock and storage structures.
- VAPOR ENGINE** - Aero steam engine; alcohol engine; ammonia engine; gas engine; etc.
- VAPOR GAS** - Atmospheric air saturated with the vapor of gasoline, used for an illuminant in large isolated buildings, where a small automatic apparatus for the generation of

- this gas is easily installed and worked.
- VAPORIZATION** - The process of causing a change of state from the liquid to the gaseous form by the application of heat.
- VAPORIZER** - The device, attached to an oil engine, which vaporizes the fuel. It must be heated by means of a lamp to start the engine, but is thereafter kept at its proper dull red heat by the heat of the exhaust gases.
- VAPORIZING BURNER** - A type of burner commonly used in a heater when the fuel is vaporized before being burned.
- VAPOR LOCK** - Condition occurring when the vapor pressure in a line at a point where the vapor can collect is higher than the differential pressure which causes the liquid to flow, thus stopping any further flow of liquid past that point.
- VAPOR PERMEABILITY** - The ability of a material to transfer vapor through itself, generally measured in grains/(hr.) (ft.²) (in.).
- VAPOR-PERMEABLE CONSTRUCTION** - A combination of materials that offer little resistance to the transmission of vapor.
- VAPOR PRESSURE** - The pressure exerted by a gas on the walls of a closed container or on the air.
- VAPOR-PRESSURE BOMB** - A small compact unit which is used to measure the vapor pressure of fuels.
- VAPOR PRESSURE GRADIENT** - Vapor pressures throughout a wall decrease from the side of high vapor pressure to the side of low vapor pressure according to some graduated pattern. This is referred to as vapor-pressure gradient of a wall.
- VAPOR-PROOF LIGHTING FIXTURE** - This is a type of lighting equipment in which the bulb and connections are completely enclosed so that they are gas and water tight. They are used in damp and explosive atmospheres.
- VAPOR RESISTANCE** - The opposite of permeability. It is a measure of a material or combination of materials in a wall to resist the passage of water vapor.
- VAPORTIGHT** - A container which will not permit the transmission of vapor through its shell.
- VARIABLE CUT-OFF** - A device which is actuated from the governor, so as to be brought into action according to the load on the engine. It consists of a valve which is linked to the governor in such a way that when the engine speeds up beyond the governor setting, the valve will cut off the flow of steam earlier in the cycle thus reducing pressure on the piston and engine speed.
- VARIABLE-DEPTH ATTACHMENT** - A planter attachment for planting seeds at variable depths below the surface of the soil.
- VARIABLE DROP** - A device on a planter which varies the speed on the plate in the hopper and thus changes the number of seeds in the hills, or the spacing of the seed in the row.
- VARIABLE-PITCH FAN** - A type of fan which has blades whose pitch may be adjusted as desired for varying volumes and pressures.
- VARIABLE SPEED DRIVE** - A type of power transmission system which permits a change in the speed ratio by small increments over the entire control range while the drive is under load. This may be accomplished with V-belts and variable pitch sheaves or variable speed hydraulic drives.
- VARIABLE-SPEED ENGINE** - An internal combustion or steam powered engine designed to operate satisfactorily over a wide range of speeds. Most of these engines will produce useful power when operated at any speed between idle and maximum R.P.M. Machinery requiring sudden variations in operating speed can be controlled by changing the output speed of the engine.
- VARIABLE SPEED GEAR** - A device comprised of stepless speed cones or expanding pulleys by means of which the speed ratio existing between

- two shafts may be modified without the necessity of shifting the belt, etc. A round or rope belt, riding over guide or tension pulleys, is usually employed on expanding pulleys, a flat sewed one on plain speed cones.
- VARIABLE-SPEED HYDRAULIC GOVERNOR** - A type of governor which will regulate engine speed.
- VARIABLE SPEED PULLEY** - A grooved sheave having the distance between the sides adjustable, thus varying the pitch diameter.
- VARIABLE SPEED REDUCER** - A type of speed reducer attached to the drive shaft of the motor that permits the operator to vary the output speed as the motor is in operation.
- V-BELT** - Belt made of rubber and other reinforcing materials that fit into pulleys which have V-shaped grooves.
- V BLOCK** - In machine shop practice, a carefully planed block of steel or cast iron with a V on one side, intended to be used in pairs to support shafts or other cylindrical objects on the marking off plate, or, on the table of a planing machine, etc.
- V-DRAG** - A type of scraper in which the land side and cutting blade are fastened together so as to resemble the letter V. The hitch is usually made at or near the apex. It is used in the construction of small terraces and shallow water channels.
- VEGETABLE OILS** - Oils usually prepared from the seeds of plants. Used only to a limited extent as a lubricant because they cannot stand heat and oxidize readily, becoming waxy or gummy.
- VEGETABLE PLANTER** - Any type of planter designed to drill or plant vegetable seeds.
- VEGETATED CHANNEL** - A natural or artificially constructed waterway having a grass bottom which is used to conduct the accumulated run-off from cultivated land, terraced land, diversion, or from fields in a contour strip crop system.
- VEGETATED SPILLWAY** - A spillway usually constructed for emergency use that will safely bypass flood runoff that exceeds the temporary storage capacity of the reservoir.
- VELOCITY HEAD** - The dynamic head due to velocity; it is usually computed from the mean velocity at the section considered. ($h_v = \frac{v^2}{2g}$).
- VELOCITY OF APPROACH** - The mean velocity in the conduit immediately up stream from a weir, dam, Venturi throat, orifice or other structure.
- VELOGRAPH** - A type of tachometer or speed indicator which makes a permanent record of the speeds and times which it indicates.
- VENEER** - Thin sheet material, usually wood, which has more desirable surface characteristics than the base to which it is fastened.
- VENEER PUNCH** - A sort of punch for cutting out oval, circular or ornamental pieces of veneer, for inlaying purposes.
- V-ENGINE** - A type of engine in which the cylinders or rows of cylinders are placed at an angle forming the letter V.
- VENT** - 1. An outlet, usually small, for the passage of fluid from a confined space. 2. In plumbing, an upright pipe carried above the roof of a house, for the purpose of ventilating soil pipes, drains, etc. 3. In founding, an opening to a mould to permit air and gases to escape. 4. In irrigation, an opening placed on top of a pipe line which permits release of air from the line.
- VENTILATED BALE** - A bale with perforations, as through the bale in the long axis direction, to provide ventilation for drying.
- VENTILATING FLUES** - The passages or conduits used to conduct fresh air in a ventilating system.

- VENTILATION FRONT** - The locus of all points of equal traverse time in the product being conditioned.
- VENT STACK** - Continuation of the soil stack from the highest plumbing fixture which extends through the roof. It carries off gases, and aids in maintaining a water seal in the trap of a sewage disposal system.
- VENTURI FLUME** - A type of open flume with a contracted throat that causes a drop in the hydraulic grade line; used for measuring flow. See: Control flume.
- VENTURI METER** - A measuring device, consisting essentially of a Venturi tube, and a special form of flow-registering device. Named after G. B. Venturi, an Italian physicist, and developed and patented by the late Clemens Herschel, past-president and honorary member of the Am. Soc. C. E. See: Venturi tube, the generalized term for this apparatus.
- VENTURI NOZZLE** - 1. A spray nozzle with a Venturi outlet which spreads dust. 2. A Venturi mounted under an aircraft used for dusting. The Venturi action pulls dust into the throat of the nozzle and discharges it at the rear.
- VENTURI TUBE** - A closed conduit which is gradually contracted to a throat causing a reduction of pressure head and increase of the velocity through the throat. The contraction is generally followed, but not necessarily so, by gradual enlargement to original size. Piezometers connected to the pipe above the contracting section and at the throat indicate the drop in the pressure head which is an index of flow.
- VERGE BOARD** - An edgewise board perpendicular to the ground covering the roof timbers which project over the cables. Also called barge board.
- VERNIER CALIPERS** - An instrument for accurate measurement, consisting of two L-shaped pieces, one sliding on the other.
- VERTICAL CUP-TYPE ELEVATOR** - An elevator which consists of a continuous series of cups attached to a belt or chain. See: Centrifugal-discharge elevator.
- VERTICAL DRAINAGE** - The disposal of excess water through surface inlets or wells into a pervious subsoil or substratum.
- VERTICAL GRAIN** - 1. Another term for edge grain. 2. Lumber that has been quarter-sawed.
- VERTICAL HITCH** - 1. The vertical coordinate of the point of attachment of an implement to its power source. 2. The mechanical means by which the vertical hitch is adjusted.
- VERTICAL LIFT** - A lift for a cutter bar on a mowing machine which raises the cutter bar to a vertical position.
- VERTICAL OR UPRIGHT BIN** - See: Vertical storage.
- VERTICAL PROJECTION** - The foreshortened view of the height of a sloping surface as though the object were perpendicular to the earth's surface, e.g. the area of a sloping surface on the vertical projection would be the vertical distance from the top of the slope to a horizontal line through the bottom of the slope multiplied by the width of the slope.
- VERTICAL-ROTOR SEED-METERING DEVICE** - A seed metering device consisting of a vertical plate with cells on the periphery that carry seeds from the hopper past a cut-off and down into the seed tube, or with seed cups that move up through a shallow layer of seeds, picking up seeds and carrying them over the top.
- VERTICAL SHEAR** - Shear perpendicular to the longitudinal axis of a beam or other horizontal member.
- VERTICAL SILO** - See: Upright silo.
- VERTICAL STORAGE** - A storage structure whose height is greater than its width or diameter. See: Silo, bin.
- VERTICAL SUCTION** - The downward bend of the point of the share on a plow to make the plow penetrate the soil to the right depth when

- the plow is pulled forward.
- VERTICAL WELDING** - Welding done on work that is in a vertical position. It is commonly done from the bottom up and with the electrode at an angle of 45° with the horizontal.
- V-FLAT DRIVE** - The driving of a relatively large flat pulley with V-belts from a smaller, grooved sheave.
- V-GEAR WHEEL** - In machinery, a duplex arrangement of skew gearing in which each tooth is of a shape of the letter V.
- V-HOOK** - An eccentric rod grab having V-shaped jaws.
- VIBRATOR** - A spring mounted tongue or blade which is actuated by the magnet of an induction coil, and by its vibration produces a rapid succession of breaks in the primary winding circuit which results in a series of sparks instead of a single one to produce ignition in an internal combustion engine.
- VIBRATOR COIL** - A secondary coil used in high tension ignition having a vibrator connected in series in the primary circuit so as to give a series of sparks for each ignition instead of only one. The vibrator consists of a flat steel spring secured at one end with the other free to vibrate. At a point about midway between its ends, contact is made with the point of an adjusting screw, from which it springs away and returns in vibrating.
- VIBRATOR FEED** - A fertilizer meter which shakes out fertilizer with a vibrator arm operated by a detachable gear on the main axle.
- VINER** - 1. A machine used to shell canning peas which consists of a metal cylinder inside which are beaters attached to a central axis. While the cylinder revolves slowly, the beaters revolve rapidly hulling the peas. Also called vining machine. 2. A machine to harvest peas.
- VINE TURNER AND SHAKER** - An attachment for a potato digger that shakes the dirt off the harvested potatoes and drops them along with the vines in a neat row.
- VINEYARD PLOW** - A plow especially designed to use in vineyards which has adjustable offset handles to allow the plow to work close to the vines without injuring them.
- VISCOSIMETER** - An instrument which is used for measuring the viscosity of liquids either by noting the time it takes drops to traverse an inclined glass or porcelain slope or by observing the time required for a measured quantity to run out of a standard orifice into another vessel.
- VISCOSITY** - The measure of the internal friction or cohesion of a fluid tending to resist flow.
- VISCOSITY INDEX** - A measure of the variation in viscosity with a change in temperature for various oils. Oils with high viscosity indexes have less change in viscosity with temperature change than oils with a low viscosity index.
- VISCOSITY-INDEX IMPROVERS** - Oil additives which permit the oil to maintain more "body" or viscosity at high temperatures yet allow the oil to be more fluid at low temperatures.
- WISE** - A clamping device consisting usually of two jaws made to be closed together with a screw, sometimes by a toggle or lever, and commonly attachable to a bench; used for grasping or holding a piece of work that is being operated upon.
- WISE CLAMP** - A supplementary jaw, to hold pieces of peculiar shape, tender material or a very thin size, in the jaws of a vise.
- V-NOTCH WEIR** - A triangular notch in a wall built across a stream used to measure the discharge of the stream.
- VOIDS** - The empty spaces between particles of a material or substance.
- VOLATILE FUEL** - A liquid hydrocarbon of low specific gravity; such as, benzine, gasoline, naphtha, petrol, etc., all of which vaporize readily.
- VOLTAGE DROP** - Is that loss in

- electrical pressure in a conductor which results when current flows through a conductor. It varies with the resistance of the wire and the amount of current flowing, being greater when either or both of them are greater, and vice versa.
- VOLTAGE REGULATOR** - A control device which limits the voltage to safe values in a generator. It has two windings: the current winding carrying the generator field current directly to ground when the contact points are held closed by springs; the voltage winding carrying full battery voltage whenever the cut-out relay is closed. As the battery nears full charge the line voltage increases and the two windings overcome spring tension and separate the points. The generator field current then goes through the resistance to ground, the magnetic field collapses, and the springs draw the points together again. This cycle of point opening and closing may be repeated from 50 to 200 times per sec. holding voltage to a constant value.
- VOLUME-FILL PACK** - The pack which results from fruit fed directly into a container from a belt. The container is vibrated during the filling operation to settle fruit into a tight pack. Accurate sizing on a volume basis makes it possible for each pack to contain same number of fruit.
- VOLUMETER** - An instrument for measuring the volumes of gases, liquids or solids by introducing them into a vessel of known capacity.
- VOLUMETRIC EFFICIENCY** - The ratio between measured output under specified conditions and the actual geometric displacement. Usually expressed as percent.
- VOLUMETRIC STANDARD** - A container which is used to calibrate the bulk milk cooling tank and other volumetric measuring devices. The containers are usually checked and sealed by "weights and measures" agencies to deliver a precise volume of liquid. (Measuring can, standard measure, standard cup.)
- VOLUTE WHEEL** - A spiral shaped shell, that in revolving presents its open mouth to the air, which is thus gathered into a tube and discharged through a hollow axis. It is a common and effective form of blower.
- VORTEX** - A cavity or vacuum in the center of a mass of air or liquid having a circular motion. It tends to draw toward the vortex, the bodies subject to its action.
- V-SHAPED RING** - A V-ring; a gasket ring with cross-section in the shape of a "V" which is used on pistons and plungers for sealing against liquid and pressure losses in pumps and hydraulic equipment.
- V-THREAD** - 1. A screw thread formed by means of a sharp-pointed tool, as contrasted with a square thread. 2. A standard thread for pipes, tubing, etc., with an angle of 60° between the sides.

W

- WAGON BOX DRYER - A grain or hay heated air dryer for drying the product while on a wagon. A canvas is placed over the wagon and heated air is either forced up under a perforated floor or down through the product and the floor.
- WAGON DRAG - A skid, shoe, or drag which is used to check the speed of a wagon on a downgrade.
- WAGON HAMMER - The pin which attaches the doubletree to the tongue of a wagon and serves as a wheel wrench. Also called evener pin.
- WAGON HAY LOADER - A machine attached to the rear of the wagon and driven over the windrow or along the swath from which it gathers hay, loading it onto the wagon. See: Cylinder hay loader.
- WAGON HITCH HINGE - The type of hitch hinge which is used on a one-row pull type corn picker. This hinge supports the hitch at the same elevation as the tractor drawbar to provide for easy connections.
- WAGON HOIST - A lifting device for wagons for unloading into elevators or conveyors.
- WAGON JACK - A lift used to raise the axle of a wagon, etc., sufficiently to admit removing a wheel for axle greasing or repairs. A device to lift one end of a wagon to facilitate unloading.
- WAGON SPOUT - The spout at the end of a corn picker elevator which directs the snapped corn downward into the wagon. Also used on a forage chopper.
- WALING - A horizontal timber which holds poling boards against the side of open trenches by means of struts braced against it. See: Poling boards.
- WALK-IN COOLER - A refrigerated room with a normal or larger sized door for passage of a person.
- WALKING PLOW - The first type of plow developed successfully. It is horse-drawn and is called walking plow because the operator walks behind the plow.
- WALK THROUGH - Designating a building or milking room so designed that the traffic moves in one door or gate and out another, rather than in and out the same door.
- WALL BEARING - In machinery, a bearing for receiving a shaft when entering or passing through a wall.
- WALL BOARD - A type of sheet material made of plaster, cellular fiber, wood fiber, etc., which is used as a lining for walls.
- WALL CRANE - A light crane for shop use pivoted upon bearings which are affixed to the wall of the building.
- WALL DRILL - A portable drilling machine without pillar or standard which may be attached to a wall or to any upright post for temporary work, or to suit special circumstances.
- WALLOW WHEEL - A bevel wheel upon a vertical shaft with the teeth downward; the reverse of a crown wheel.
- WALL PANEL - A prefabricated section attached to the framing of a building as part of the wall for prefabricated buildings.
- WALL PLATE - See: Plate.
- WAREHOUSE TRUCK - A hand two-wheeled truck which consists of a frame of two stout pieces of wood braced with metal cross pieces and having wheels at one end and handles at the other. It is used to transport heavy objects for short distances.
- WARM AIR HEATING SYSTEM - A warm air heating plant consists of a heating unit (fuel-burning furnace) enclosed in a casting, forming a heat exchanger from which the heated air is distributed to the various rooms of the building through ducts.
- WARM HOUSE - A house or unit of a range of greenhouses which is maintained at a day temperature of about 75° and night temperature of about 60°. Rose, poinsetta,

- gardenia and many other plants do well in these temperatures. Also called warm greenhouse.
- WARM UP** - To operate an engine at no load for a short while to bring up to a satisfactory operating temperature before placing it under load.
- WARP** - Any variation from a true or plane surface. Warp includes bow, crook, cup and twist, or any combination thereof, such as a warp in wood or warp stream bank where sides are not straight.
- WARREN HOE** - A garden hoe with a heart-shaped blade which is especially used for making furrows.
- WARREN TRUSS** - A wide span truss with top chords parallel to bottom chords. Can be used with flat roofs.
- WASHER** - 1. Any of many various mechanical devices which cleanses produce. Usually uses water and often a cleaning agent, together with brushes and turbulent water action. 2. A ring of various materials (metal, leather, etc.) used to secure tightness of joints (also refers to shims, thrust bearings, packing rings, etc.)
- WASTE BANK** - The ridge of excavated earth which parallels a drainage ditch. Also called spoil bank.
- WASTE FILTER** - A filtering device using rags, cotton, wool threads, fiber, etc., as the filtering agent.
- WASTE PIPE** - An exhaust pipe from an engine.
- WASTE PLUMBING** - Plumbing which carries the waste water, after use, to a disposal area.
- WATER APPLICATION EFFICIENCY** - The percentage of water applied that can be accounted for as moisture increase in the soil occupied by the rooting system of the crop.
- WATER APPLICATION RATE** - The rate in ins. per hr. that irrigation water is applied to fields.
- WATER-CEMENT RATIO** - Gal. of water used per sack of cement which gives an indication of ultimate strength.
- WATER-CONTROL STRUCTURES** - Structures such as drop spillways, embankments, reservoirs, etc. that control or channel the movement of water.
- WATER COOLING SYSTEM** - A cooling system in which water is utilized as the cooling medium. In internal combustion engines the cylinders are surrounded by cooling jackets through which water circulates by means of pressure from special pumps.
- WATERCOURSE** - 1. A channel, usually natural, through which a stream of water flows and which may be dry during drought periods. 2. Legally, a natural stream flowing in a well defined channel (the stream still retains its character as a watercourse where it floods its banks).
- WATER CYCLE** - The climatological events making a cycle thusly: heat of the sun evaporates water from land and water surfaces. This water vapor (a gas), being lighter than air, rises until it reaches the cooler upper air levels where it condenses into clouds. Further condensation produces precipitation which falls to the earth as rain, sleet or snow. Some of this water is retained by the soil and some runoff returns to the rivers, lakes and oceans.
- WATER DISPOSAL SYSTEM** - The water routing system of a given area, a system of grassed waterways and terraces on cultivated land for the removal of excess gravity water as surface runoff.
- WATER-DISTRIBUTION PATTERN** - The variation in volume or depth over a specific area as wetted by sprinkler irrigation.
- WATER ELEVATOR** - 1. Any mechanism which is used for raising water, especially to a considerable height above ground. 2. A vertical or inclined conveyor whose buckets dip up water from a source of supply and deliver it into a conduit or elevated receptacle, thus fulfilling the functions of a pump. See: Chain pump.
- WATER FALLOW** - The maintenance of a

- rice field under a cover of water for one or two years during which a crop of fish may be produced.
- WATERFLOAT** - A float device in a cistern, boiler, tank, waterer, etc., which when water is removed to a low level actuates a valve to permit inflow of water to restore the desired level.
- WATER FURROW** - A shallow trench or depression between two raised soil beds in which irrigation water or surface drainage water can flow.
- WATER GAGE** - 1. A staff gage which is used to indicate the water level in an open channel above a specified datum. 2. A pressure gage which is used to indicate the pressure in a closed water system.
- WATER HARDENING** - In blacksmithing, the hardening of steel effected in water as opposed to oil hardening. In water hardening, the steel becomes more brittle and acquires a harder texture than when oil is used.
- WATER HEAD** - 1. A pond which is created to furnish irrigation for a small plot or to furnish limited power for a mill. 2. The pressure which is created by the depth of water in such a pond.
- WATER-HOLDING CAPACITY** - The amount of water a specific soil can hold per unit volume under specific conditions.
- WATER INTAKE** - 1. The ingestion of water. 2. A point or place in a pond, reservoir, etc., where the water flows into the pond. 3. The point where water flows into a structure.
- WATER LEVEL** - 1. The surface of water which is used in measurement of water depth. 2. The free water level in the soil. 3. See: Water table.
- WATER LINE** - 1. The contour of contact between a free water surface and the land above water as in a lake or stream. 2. In a steam boiler, the height of the water or true working level.
- WATERLOGGED** - 1. A condition of lands where the ground water stands at a level that is detrimental to plants. It may result from over-irrigation, flooding, seepage or lack of drainage. 2. Designating a condition of water saturation of a product.
- WATER-LOSS** - Indicates the amount of water lost by evaporation, surface runoff and deep percolation beyond the zone of plant and tree roots.
- WATERMAN** - 1. A person who is officially designated to supervise or actually to control the release of irrigation water from ditches, mains, etc., usually for irrigation in irrigation districts. 2. An official who is in charge of the equitable distribution of water from irrigation canals (Western United States). See: Ditch rider.
- WATER MARK (HIGH)** - A mark of some sort, such as stain from suspended sediment, which indicates the level to which surface water has risen.
- WATER-OVEN** - A type of oven used in drying samples of grain or hay. Hot water is circulated through a water jacket surrounding the oven to obtain a desired temperature.
- WATER PUMP** - 1. A pump, so designed as to circulate water or cooling fluids through the radiator and water jackets of an engine. See: Pump. 2. A pump of any type which is designed to handle a free flowing non-corrosive fluid such as water.
- WATER REQUIREMENT** - The quantity of water, regardless of its source, which is required by a crop in a given period of time for its normal growth under field conditions, including surface evaporation and other economically unavoidable wastes. Usually it is expressed as depth (volume per unit area) for a given time. See: Evapotranspiration, consumptive use.
- WATER RESOURCES** - The supply of water in a given area or drainage basin which is usually interpreted in terms of availability of surface or underground water.
- WATER RIGHT** - A legal right to use the water of a natural stream or water which is furnished by a canal for general or for specific purposes,

- either to its full capacity, to a measured extent, or for a definite period of time; and the right to change the place of diversion, storage, or use of water as long as the rights of other people are not injured. In some states the rights to water may be sold and transferred separately from the land on which it has been used.
- WATERSHED** - The region or area which contributes to the supply of a river, or lake, a drainage area, catchment area, or drainage basin. (Strictly the watershed is the drainage divide.)
- WATER SICK** - Designating land which has become unproductive because of high concentrating of various residual salts from irrigation water.
- WATER SOFTENER** - (Zeolite type) A tank containing a mineral which softens water by exchanging its base materials without changing its physical properties. As water is softened the mineral changes from NaZ to CaI₂ and the softened water contains Na carbonate instead of CaI carbonate. Regeneration of the softener is by passing through it a brine or NaCl to change the mineral back to NaZ and form CaI Chloride as a waste.
- WATER SPREADING** - 1. The artificial application of water to lands for the purpose of storing it in the ground for subsequent withdrawal by irrigation pumps for crops.
2. The diversion of runoff water from gullies or water courses and its distribution on adjacent, gently sloping, grazing lands needing additional water. The volume of water flowing down the waterways is reduced, and the moisture absorbed by the spreading area increases the growth of vegetation.
- WATER STAGE RECORDER** - A recorder that keeps a continuous record of the water level in a stream or reservoir.
- WATER SWIVEL** - In well boring, a combined universal joint and hoist coupling which form the connection between the water supply pipe and the drill rods permitting complete rotation of the tools.
- WATER SYSTEM** - The complete installation that delivers water for use. Includes the well, the pump and its parts, the pipe in the well, the storage tank, the distributing pipes, reservoirs, valves, controls, pipe fittings, etc.
- WATER TABLE** - The upper boundary of the zone of saturation except where it is bounded by an impervious stratum. A surface where the hydrostatic pressure is equal to the atmospheric pressure, as determined by the water level in open wells that barely penetrate the zone of saturation.
- WATER TROUGH** - A long, shallow container from which horses, cattle and other kinds of livestock drink water.
- WATER-VAPOR PRESSURE** - See: Vapor pressure.
- WATERWAY** - A natural or artificially constructed commonly vegetated course for the concentrated flow of water.
- WATER YEAR** - A special grouping of the periods of the year to facilitate water supply studies. The United States Geological Survey used October 1, to September 30.
- WATER YIELD** - The total outflow of a drainage basin through either surface channels and/or subsurface aquifer.
- WATT HOUR** - A unit of electrical work, equal to a rate of one watt expended for one hour.
- WATT HOUR METER** - A meter that will register the watt hr. expended during a period of time.
- WAUKESHA METAL** - A special copper-alloy metal used in the construction of dairy plant equipment. It contains 55% copper and 28% zinc.
- WEAR(ING) PLATE** - Metal plates which support the rear side of the knife on the cutter bar of a mower or binder.
- WEB** - 1. The portion of a girder between and connecting the flanges, its function being principally to

- resist shear. 2. The metal column separating the flutes of a twist drill. 3. That portion of an ordinary anvil which is of reduced size between the head and the base.
- WEBBING PLIERS** - A form of pliers with winged or extended toothed jaws, so made as to grip a wide surface of webbing; as used by saddlers, upholsterers, etc.
- WEB GEAR** - In machinery, a toothed wheel which is formed as a plain disk instead of having its rim supported from the hub by means of spokes or arms.
- WEB HAY LOADER** - See: Cylinder hay loader.
- WEB MEMBER** - The interior members of a truss consisting of diagonals and verticals.
- WEED AND BRUSH BAR** - A specially constructed cutter bar on a mowing machine with stub guards and extra-heavy knives for cutting heavy weeds and underbrush.
- WEED AND BRUSH BURNERS** - Portable burners which are used for burning weeds and brush about the farmstead. They consist of a tank and conduit to an outlet which has many shapes.
- WEED ATTACHMENT** - A wheel placed at the outer end of the cutter bar to carry it some 6 to 12 ins. off the ground so that the weeds may be cut without undue strain upon the mower parts.
- WEED BOOM** - A boom on a spray rig which is designed for the application of herbicides. See: Boom 2.
- WEEDER** - 1. A light spring-tooth harrow which has long, flexible teeth. 2. A hand tool used to remove weeds from flower beds which consists of a short handle and several curved prongs. Specifically a light, spring-tined machine which cultivates lightly over the entire field regardless of rows when weeds are small and easily dislodged without undue damage to crop plants. 3. A rotary hoe.
- WEEDER HOE** - See: Sickle.
- WEEDER-MULCHER** - A piece of equipment used for breaking the soil crust over germinating seeds and for controlling and destroying young weeds just after the field-crop plants have begun to grow. It consists of pointed spring steel tines mounted on a frame which may be on wheels or mounted on tractor.
- WEED TOOTH** - A long, flexible harrow tooth.
- WEED HOOK** - A rod attached to a plow beam extending back and parallel to the plow moldboard so as to bend weeds over in such a fashion that they will be completely buried in the furrow.
- WEEDING HOE** - A special hand tool with a broad blade used for weeding.
- WEED KNIFE** - A curved tooth for a harrow which is used to cut weeds below the soil surface. Also called knife harrow.
- WEED HOLES** - Openings left in retaining walls, apron linings, foundations, etc., to permit drainage, reduce pressures, etc.
- WEEVILY ODOR** - A smell given off by grain when infested with insects.
- WEIGHER** - A mechanism on a grain thresher, combine, etc., which automatically weighs a quantity of grain and automatically records each unit weighed. The mechanism then automatically dumps the grain, and it is augered to a gin, bagger or wagon or truck box.
- WEIGHING LYSIMETER** - A method of determining consumptive use of crops by means of tanks which are weighed. These tanks are placed in surrounding of natural growth of the same species that are planted in the tank.
- WEIGHT DISTRIBUTION** - The location of center of gravity to find the point at which all weight can be acting.
- WEIGHT, DYNAMIC** - W_d - Total force exerted by the traction or transport device perpendicular to the plane of the surface on which it

- is operating.
- WEIGHT GRADES** - See: Weight sorter.
- WEIGHT PANS** - Boxes provided on disk harrows or other tillage implements so that weight can be placed on the harrow if penetration cannot be secured otherwise. These boxes may consist of a solid pan or a skeleton-like box, and they are ordinarily placed directly above the gangs of the harrow.
- WEIGHT SORTER** - A machine that is usually used on large size products (apples, oranges, canteloupe, etc.) to sort on the basis of weight. The product falls into pockets at the end of the machine and then is sorted by one of two ways: either the pockets run along a long iron strip that acts as a fulcrum and tips when the weight of the apple becomes great enough so the apple falls off or else the pockets are indexed with spring-loaded trips. The spring tension becomes progressively weaker from beginning to end of travel, so the heavier units overcome the spring reaction early and are discharged at the beginning of travel. The place or position of dropping is the basis of sorting.
- WEIGHT, STATIC** - W - Total vertical force exerted on the supporting media by the traction or transport device when stationary.
- WEIGHT TRANSFER** - A term which expresses the change in soil reactions on a tractor as the result of the action of the drawbar pull. The soil reaction supporting the rear wheels increases as drawbar pull increases and the soil reaction supporting the front wheels decreases.
- WEIR** - A notch of regular form through which water flows when stream flows are being measured. See: Measuring weir.
- WEIR BASIN** - A small basin on the upstream side of a weir which serves to reduce the velocity of the stream at the weir. See: Approach channel.
- WEIR HEAD** - The depth of water flowing over the weir crest as measured at a point at least 2.5 and preferable 4 times the depth of water flowing over the weir, upstream from the weir. The zero point of the measuring scale should be placed at the exact level of the weir crest.
- WEIR NOTCH** - The opening in a weir for the passage of water.
- WELD** - To unite two pieces of metal by fusing them together.
- WELDING DOWNHAND** - Welding in a position in which the welding rod is deposited from the upper side of the joint and the surface of the work is approximately horizontal. The opposite of an overhead welding position.
- WELDING SWAGE** - A block or fulling tool for assisting the closure of a welded joint. An appliance used by blacksmiths.
- WELL** - 1. A hole in the earth down to an underground supply of water.
2. A spring or natural upflow of water. See: Artesian well, dug well, driven well, drilled well.
- WELL CASING** - The outer pipe, protecting the well, generally made of metals.
- WELL CURBING** - The enclosing frame for a dug well to keep soil from caving in.
- WELL DEVELOPING** - The pumping, backwashing, and surging of a new well to pump out the fine sand, silt, and clay so as to achieve maximum flow and better quality of water through the remaining coarser material.
- WELL DRAINED** - Designating a soil (in humid regions) that normally contains only capillary moisture, in contrast to a swampy or waterlogged condition.
- WELL HOUSE** - A small house, shed or the like which is built over a well to protect it from the weather.
- WELL POINT** - Perforated pipe covered with a sand screen which is sunk into sand to permit the pumping of ground water and the exclusion of sand.

- WELL VENT - A vent in an air-bleed carburetor which is a restricted air orifice which permits some air to pass through the main discharge jet and restricts full flow from the main jet by reducing the suction.
- WELL WATER - Water which is drawn or pumped from a well, in contrast to ditch water, creek water, rain water, spring water, etc.
- WELT - The strip of iron, steel or wood laid over a butt joint as a lap and to which both members of the butt joint are joined.
- WET BASIS - A representation of moisture content used for commercial designation. It is obtained by dividing the weight of water present in the material by the total weight of the material including the water and dry matter.
- WET BULB DEPRESSION - The difference between the dry bulb and wet bulb temperatures.
- WET BULB TEMPERATURE - The temperature obtained by a thermometer when its sensing bulb is covered by a thin layer of water and it is moved through the air at a prescribed velocity until a steady temperature is obtained.
- WET COMPRESSION - In ammonia refrigeration, a small amount of liquid ammonia injected into the suction pipe or returned from the refrigerator, just sufficient in quantity to absorb the superheat of compression by being evaporated.
- WET DOWN - 1. To water a plant so that the soil surrounding its roots is soaked. 2. To bring soil to field capacity by rain, as it wet down 6 ins.
- WET LAND - 1. Land that is swampy or marshy in contrast to that which is naturally well drained or dry. 2. In an agronomic sense, land which is temporarily excessively wet.
- WET POCKET - A low area in a field, woods, etc., in which water collects and remains for considerable periods of time.
- WET SEASON - 1. The season or time of year during which most of the precipitation occurs. 2. A season in which the precipitation is greatly in excess of normal.
- WET STEAM - Water vapor containing small droplets of water; a mixture of dry saturated steam and water particles at the same temperature as the steam.
- WETTED PERIMETER - The length of the wetted contact between a stream of water and its containing conduit, measured along a plane at right angles to the direction of flow; that part of the periphery of the cross-sectional area of a stream in contact with its container.
- WET YEAR - A year in which the amount of precipitation is considerably above normal.
- WHEAT-LAND HARROW-PLOW - A type of plow representing a combination of the principles of a disk harrow and a conventional disk plow. It has a frame, wheel arrangement, and depth adjusting device similar to a disk plow, but all disks are mounted on a single shaft, and turn as a unit, and throw the soil in one direction. Also called one-way, wheatland plow, disk tiller, tiller plow, etc.
- WHEATLAND PLOW - See: One-way disk plow.
- WHEEL AND AXLE - One of the elementary "simple machines" consisting of a wheel fixed to an axle used for raising great weights by applying the power to the circumference of the wheel, and attaching the weight by a rope or chain to that of the axle.
- WHEELBARROW BROADCAST SEEDER - A seeder which is composed of a wheelbarrow frame with a long seed box and feeding mechanism mounted just behind the wheel.
- WHEEL BASE - The horizontal distance between the front and rear axles of a wheeled vehicle.
- WHEEL EXCAVATOR - Any of several different kinds of excavators which consists generally of a frame, a power unit and a large wheel. On the rim of the wheel are fastened buckets with cutters

- so that as the wheel is turned a trench is dug. It is commonly used in trenching for tile drain installation.
- WHEEL HARROW** - A wheeled farm implement which is dragged over the ground for leveling or pulverizing the soil or covering seed, as distinguished from the harrow that slides on the ground.
- WHEEL-HOE CULTIVATOR** - See: Garden cultivator.
- WHEEL HUB** - In mechanics, the boss or nave of a wheel from whence the spokes radiate to the rim, and which is bored out for the reception of the axle.
- WHEEL HUB LINER** - A disk of brass or bearing metal fitted onto the inside of a hub to form a wearing surface where it works against the journal box.
- WHEEL-MOUNTED - IRRIGATION LATERAL** - Tractor-towed lateral irrigation lines that have wheels placed at certain intervals along the line to provide easier movement of the whole line.
- WHEEL PLOW** - Any plow which is mounted on wheels.
- WHEEL SCRAPER** - A flat piece of metal set close to the back-side of the outer rim of a steel wheel which scrapes excessive dirt from it.
- WHEEL SLIPPAGE** - Occurs when the relative velocity between the wheel and the ground at the contact is greater or less than zero. Powered wheels have positive slip while unpowered wheels have negative slip. Occurs when the soil fails in shear or the tire surface slips on the soil surface.
- WHEEL TYPE DISK HARROW** - A disk harrow with wheels located between the front and rear gangs which are used for leveling and depth control, for raising the harrow at the end of the field, and for transport on roads and highways.
- WHEEL TYPE TRENCHING MACHINE** - A machine that carries the soil out of the trench on a wheel which has buckets attached at certain intervals.
- WHEEL VALVE** - A stop or gate valve opened by means of a hand wheel and screw, as distinguished from those patterns of gate valves in which the valves are opened or closed quickly by means of levers, or the many types of butterfly and other throttle valves.
- WHEELWRIGHT** - One who makes wooden wheels for vehicles; by extension, a maker or repairer of commercial road vehicles, or those not included in the art of the carriage builder.
- WHETSTONE** - A stone used for sharpening cutlery or edge tools by friction. It is usually a siliceous slate, and the finer varieties are used with oil or water, in such case being termed oilstones or hones. The whetstone, in its modern acceptance, denotes the spindle-shaped stone, used to sharpen scythes, sickles, etc.
- WHIFFLETREE** - The wooden, pivoted bar on the doubletree of a horse drawn vehicle, or implement to which the traces are attached and by which the vehicle is drawn or pulled.
- WHIPSAW** - A kind of narrow pit saw, tapering from butt to point, with hook teeth, and averaging from 5 to 7½ ft. in length, used by one or two men.
- WHIRLWIND SEEDER** - A device for broadcast sowing of small seeds and light grains. It consists of a fabric hopper from which the seeds drop into a horizontal disk. A hand crank revolves the disk rapidly and throws the seed in all directions.
- WHIRLWIND TERRACER** - A terracer that consists of a shortened moldboard plow with a vertical power-driven auger located to the right of the moldboard. The furrow slice is lifted up into the rapidly revolving auger which throws the soil to the side.
- WHITWORTH THREAD** - The standard thread for screws, employed in England and her colonies, and on the European continent. The angle of the thread is 55°, 1/6 being rounded off at top and bottom.

- WICK CARBURETOR** - A variety of surface carburetor, for gasoline motors, in which the volatile fuel is drawn up through a system of wicks. The large surface area facilitates the absorption of the gasoline.
- WIDESPREAD DEVICE** - A device attached to the rear end of a manure spreader consisting of steel or curved spiral blades which rotates rapidly. One-half is set to throw to the right, one-half to the left. It scatters the manure on and to the sides of the area traversed.
- WIDE-TRACK SEEDER** - A type of broadcast seeder which has the wheels set far apart or at each end of the seed box. See: Narrow-track seeder.
- WIGGLE-TAIL** - A gathering auger attached by universal joint to a boot stub shaft of an auger. It is usually provided with a handle for lateral sweeping of bin floors.
- WILDFLOODING** - Irrigation water released in a field without controlled distribution.
- WILTED HAY** - Hay as it is partially dried in the field, before being taken in for artificial drying. Usually at a moisture content of 35 to 40% wet basis.
- WILTING POINT** - The percentage of water in the soil (based on dry weight of soil) when permanent wilting of plants occurs. It refers to that moisture content at which soil cannot supply water at a rate sufficient to maintain the turgor of a plant and it permanently wilts. Also called wilting coefficient.
- WIND BEAM** - A beam connecting adjacent roof trusses for support against wind forces.
- WIND BLOWER** - 1. An attachment to a grain thresher which consists of a funnel, intake device, large fan, and a long discharge pipe for distributing the straw in a stack. See: Wind stacker, strawstacker. 2. A mechanical fan and air tunnel used in hay barns for distributing air through the hay for drying purposes.
- WIND DRIFT** - The action of wind on the water that leaves the sprinkler in irrigation work. The spray water will drift in the direction wind is blowing.
- WIND EROSION** - Soil erosion due to the action of high velocity winds which causes the soil to move in suspension, by saltation or as surface creep.
- WINDER** - A turn in a stairway using steps in the turn as opposed to a turn using a flat landing.
- WINDLASS** - A horizontal drum for winding, or for hoisting by winding.
- WIND LOAD** - A kind of live load on a structure consisting of forces caused by wind.
- WINDMILL** - A device which utilizes wind to pump water or generate electricity. It consists of a horizontally mounted fan with propeller-like blades. The fan is attached to a gear head on a vertical central shaft. A rear vane guides the fan into the wind. The wind causes the propeller-like blades to turn the shaft.
- WINDMILL GOVERNOR** - A coiled, steel spring located in the base of the wind-directing vane of a windmill. It is adjusted to hold the fan into the wind under ordinary conditions. At high wind pressures it yields and turns the fan out of the wind.
- WINDMILL PUMP** - A reciprocating type well pump connected to the lower end of the vertical shaft of a windmill.
- WINDMILL SAILS** - The propeller-like blades of a windmill. They are usually approximately rectangular with a length of five times their breadth. The total amount of surface is about 1/4 the area of the circle described by their motion.
- WINDOW SASH** - See: Sash.
- WINDOW STOOL** - The inside finishing piece located immediately beneath the sill.
- WINDOW TRIM** - See: Trim.
- WIND POWER** - The force of atmospheric air in motion exerted upon the

- blades or sails of windmills and other fans to develop power.
- WINDROW** - Hay or straw which has been gathered into uniform rows for drying and pickup.
- WINDROW BALER** - A hay baler which picks up hay from the windrow, bales it and delivers bales to a truck, or rack onto the ground.
- WINDROWER** - A field machine designed to gather cut hay or grain from the swath and deliver it into a windrow.
- WINDROWING ATTACHMENT** - An attachment for a cutter bar designed to gather the cut swath of hay or grain into a windrow. The attachment consists of a series of metal bars trailing the cutter bar. The bars decrease in length from one side from about 8 ft. to 3 ft.
- WINDROW LOADER** - See: Cylinder hay loader.
- WINDROW PICK-UP ATTACHMENT** - An attachment for a harvester which consists of a series of metal fingers on an endless belt. The belt is guided into and under the windrow so the fingers pick up the crop and elevate it to the machine. Also, the fingers may be eccentrically located in a rotating cylinder so that they protrude at the gathering (lower) position and recede at the discharge (upper) position.
- WINDROW PICKUP BALER** - See: Windrow baler.
- WINDROW SPREADER** - An attachment on a combine which spreads the straw from the straw racks. It usually consists of a horizontal whirling plate with radial upset fins. The straw hits this plate and is spread out in a radial direction.
- WINDROW TURNER** - Any of several different machines which turns over windrowed hay to assist in uniform curing.
- WIND SHIELD** - 1. The vertical board or canvas mounted behind the platform canvas on a grain binder. It keeps the wind from affecting the fall of cut grain onto the platform canvas. 2. A sheet of transparent material located in a cab in front of the driver.
- WIND STACKER** - An attachment on a grain thresher which consists of a blower and a tube-like stacking pipe. The fan receives the straw and blows it through the pipe which can be extended and moved in both the vertical and horizontal plane to aid in stacking the straw.
- WIND BEARING** - The flat surface on the wing of the plow share. The amount varies from negligible to 1.5 ins. It is the portion of the plow share in contact with the ground.
- WING DAM** - A water deflecting structure, such as a wall, crib, dike, row of piles, or other barrier which projects streamward from the shore; a spur dike.
- WINGED-WHEEL FEED** - A type of a feeding device for fertilizer distributors which consists of a series of horizontal disks with prominent radial ridges. These disks revolve at high speeds, as the fertilizer falls on them.
- WING FINISHER** - A mechanical device for removing feathers from the wings of birds which consists of a revolving drum to which rubber fingers are attached.
- WING HILLER** - A type of cultivator attachment which is used for hilling crops or for barring-off cotton before chopping.
- WING NUT** - A nut fitted with long projections or wings so that it may be operated without need of a spanner. The nuts used to fasten a mud box or valve box cover are usually wing nuts; a thumb nut is much the same thing, only smaller.
- WING SHOVEL** - See: Sweep.
- WING VALVE** - A valve fitted with three or four wings which guide it in its seat, as distinguished from a spigot valve which is guided by a central spigot.
- WING WALL** - A lateral projection from the apron side wall of an erosion control structure which limits water movement around the downstream end of the structure.
- WINNIPEG TRACTOR TRIALS** - First held in 1908; they permitted the public

- an opportunity to compare field operations of steam and of gas tractors.
- WINTER IRRIGATION** - The application of water to soil in late fall, winter or early spring to store available water in the soil for subsequent use by plants.
- WIPE JOINT** - A lead joint in which the molten solder is poured upon the desired place, after scraping and fitting the parts together, and the joint is wiped by hand with a moleskin or cloth pad while the metal is in a plastic condition; it makes a neat and reliable connection in the pipe.
- WIPE CLOTH** - A fabric made of wire; the size of the wire, the shape and sizes of the meshes, is adapted to the uses of the completed screen, sifter or sieve, or the character of the machine in which it is to be used. Besides the purpose of separating materials of different finenesses, screens are used in hot forming machines and bran dusters; also fire and window screens and guards, kiln floors, etc. One of the most important uses of wire cloth is in paper-making machines.
- WIRE COB RACK** - An endless, eccentric sprocket agitated belt of wire mesh which is a part of a corn sheller. Shelled corn cobs, husks and silks drop onto it and the corn passes through to the cleaning sieves below. The cobs and foreign matter pass over the cob rack to the hopper of the cob stacker.
- WIRE CRAWL** - The undesirable, side-wise movement of the check wire in planting corn or other crops with a checkrow planter.
- WIRE DAM** - A temporary type of gully control dam which has a head wall constructed of woven wire.
- WIRE DOFFER** - A device on a checking head of row-crop planters which releases wire from the checking head.
- WIRE GAGE** - 1. A gage measuring the diameter of round wire, according to an arbitrary standard; generally a long graduated plate with a series of slots of various widths or holes of various diameters.
2. A standard system of sizes for wire.
- WIRE GRIP** - A heavy metal hook or clamp which is fastened to a stretch-er clamp and to a block and tackle, etc., in stretching fence wire.
- WIRE-MESH FILTER** - A filter used in air cleaning operations. In an oil bath air cleaner, air passing through the cleaner is first drawn into the oil cup at the bottom and then reverses its direction to go up through the fine wire-mesh filter. Oil is carried from the oil cup up into the filter where it is caught and falls back into the cup, carrying particles of dust with it.
- WIRE ROPE** - A rope made by twisting together strands of small wires.
- WIRE SHIELD** - A special attachment for a cultivator, composed of a frame and seven or eight stiff wires parallel to the ground which is used to prevent the covering of young plants by soil during cultivation.
- WIRE-STRETCHER** - Any of several devices which is used to draw fence wire taut before the fence is fastened to posts.
- WISCONSIN RAKE** - A long-handled scoop which has teeth so arranged that a worker can comb cranberry or blueberry vines, take off the berries, and drop them in a box-like compartment behind the teeth. Also called Wisconsin scoop.
- WISCONSIN SCOOP** - See: Wisconsin rake.
- WOOD BREAK PINS** - Wooden pins used as safety devices to prevent undue stresses on working member. The pin breaks before any other more expensive member.
- WOODEN FLOAT** - A land plane constructed with flat boards used as a drag for the removal of minor undulations.
- WOODEN FOLLOWER** - In brick cheese-making, a wooden board which is shaped to fit a wooden form. After the curd is placed in the form, the wooden follower is placed on it and weighted down with bricks to compress

- the cheese.
- WOODEN STAVE SILO** - A type of vertical silo which is made from wooden staves and steel hoops to form a circular structure.
- WOOD SCREW** - A screw nail, having a flattened right-handed thread to give good grip, a gimlet point to enter the wood and a head shaped for the reception of the screw driver.
- WOOD SHINGLE** - A rectangular piece of wood tapered from one thick end (approximately $\frac{1}{2}$ in.) to a thin end. They come in various widths and lengths. The thick ends of one row overlap the thin ends of the previous row in roof coverings.
- WOOD TRUSS** - See: Truss.
- WOOL CLEANER** - A machine which is used for beating, shaking and cleaning wool previous to scouring and dyeing.
- WORK DIAGRAM** - A force-displacement diagram set up in such a way that the area within the diagram is equal to the amount of work done on or by a specific machine.
- WORKING DRAWING** - Any drawing showing all the parts and dimensions with other information pertinent to construction, so that whatever is shown can be built without other drawings or instructions.
- WORKING PRESSURE** - The safe internal pressure to which a boiler is subjected; this is usually estimated to be $\frac{1}{6}$ of the bursting pressure.
- WORKING STRESS** - The stress a material or member can stand in ordinary usage.
- WORKING STROKE** - The stroke of the engine cycle during which combustion occurs and the piston is pushed down as a result. Also called power stroke.
- WORM** - 1. An auger-like tool used in boring rock. 2. A spiral coil; as, of a pipe; a coil used for condensation in connection with a distilling apparatus; a worm pipe. 3. The threaded cylinder operating a worm wheel in the gearing known as worm and worm wheel.
- WORM GEARS** - Gears that have screw-like threads which run spirally around a shaft.
- WORM WHEEL** - A disk having teeth on its periphery of such a form that they mesh with the teeth of a worm whose axis lies in the plane of the disk; this combination of gearing converts motion about one axis to motion about an axis perpendicular to the first; usually the helix angle of the gear teeth is small, so that there is a large gear ratio and only the worm may be the driving member.
- WOUND-ROTOR MOTOR** - An A.C. motor with a rotor that has windings somewhat resembling the windings on the armature of a D.C. motor. The single-phase repulsion-type motor uses a wound rotor, known as an armature. The terminals of the wires for the windings for the wound armature are brought out to one end of the rotor and are connected to a commutator. This motor has high starting torque.
- WOVEN-COTTON BELT** - A power transmission belt which is woven somewhat in the manner of an ordinary lamp wick. It is made in various widths and weights, proportional to service required. It is treated with a special material to withstand friction, dirt and atmospheric conditions.
- WRENCH** - A tool for turning nuts, bolts and pipes, consisting of a bar or handle having jaws to fit the nut, bolt or pipe.
- WRIST** - In machinery, a stud or pin which forms a journal.
- WRIST PIN** - The pin which connects the pitman of a cutter bar to the pitman wheel. It has a flattened head to secure the pitman. In machinery, a stud or pin which forms a journal in a cross head or piston.
- WROUGHT IRON** - A nearly pure corrosion resistant iron, with some slag. The carbon content ranges from 0.05 to 0.10%. It is readily welded and easy to work in a

forge. It can be worked cold.
WROUGHT IRON PULLEYS - In machinery,
these have largely superseded
cast iron pulleys, because of their
superior lightness and reliability.
The rims are formed of wrought iron
or steel and the arms are of the
same material, each being made
distinct from the other; they are
put together in halves and are,
therefore, split pulleys.

WYE - A tile junction having the
shape of a Y which is designed
to connect tile lines that meet
at other than a right angle.

XYZ

X-RAYS - Those rays in the region of 10^{-6} to 10^{-10} cm wavelength that include radiations of wavelengths between ultra-violet and gamma rays. They are produced by bombarding a heavy metal target with high speed electrons.

X-SPRING - A carriage spring, composed of two superimposed laminated springs, forming a letter X.

YIELD POINT - That point or intensity of stress at which the rate of stretch of a piece begins to increase rapidly and becomes permanently distorted without an increase in load. If the load is continued or increased the piece will rupture.

YOKE - 1. A variously shaped wooden frame which is placed on the necks of a team of oxen to which the traces are attached. 2. A clamp which unites two pieces. 3. A wood or steel bar placed at the end of a tongue connected by rings and leather straps to the hames of the harness of a pair of horses. It holds up the tongue and aids in holding back a vehicle on a downhill slope.

YOUNG'S MODULUS - See: Modulus of elasticity.

ZEOLITE - An artificial substance used in water softener units to remove the calcium salts from water. Its chemical composition consists principally of aluminum and sodium. In a water softener the sodium ions of the zeolite exchange with the calcium ions of the water to form sodium salts in the water which will not cause hardness of the water.

ZEOLITE METHOD - A system for removing hardness (magnesium and calcium) from water. It consists of a tank containing a bed of quartz gravel. The zeolite takes up the magnesium and calcium and gives off sodium which combines with the sulfate and bicarbonate, separated from the magnesium and

calcium, to form harmless baking soda.

ZEOLITE TREATMENT - See: Zeolite method.

ZERO TORQUE ROLLING CIRCUMFERENCE -

The distance traveled in feet per revolution of the traction device when it is operating with no torque between it and the axle. Its true value can be found by determining the rolling circumference for the unit with low plus and negative torque loads and plotting to find the value for no torque.

PART II

HANDBOOK SECTION

TABLE 1
SURFACE EQUIVALENTS

Sq. Mm.	Sq. Cm.	Sq. Meter	Sq. In.
1.	0.01	0.000001	0.00155
100.	1.	0.0001	0.15500
1,000,000.	10,000.	1.	1,550.00
645.16	6.4516	0.000645	1.
92,903.6	929.036	0.09290	144.

Sq. Ft.	Sq. Yd.	Sq. Mile	Acre
0.0000108	-----	-----	-----
0.00108	0.000119	-----	-----
10.7638	1.1960	-----	-----
0.00694	0.00077	-----	-----
1.	0.11111	-----	-----
9.	1.	-----	0.000206
-----	3,097,600.	1.	640.
43,560.	4,840.	0.00156	1.

TABLE 2
GRAVIMETRIC EQUIVALENTS

Gram	Kilogram	Ounces	Pounds	Tons
1.	0.001	0.03527	.0022046	.0000011
1,000.	1.	35.2736	2.2046	.0011023
28.350	0.02835	1.	.0625	.00003125
453.60	0.45360	16.	1.	.0005
907,180.	907.18	32,000.	2,000.	1.
-----	1,000.	-----		1.1023
				.9842 gross ton

1 grain troy or avoirdupois = 0.0648 gram
 1 ounce troy = 31.1035 grams
 1 pound troy = 0.3732 kilogram
 1 gram = 15.432 grains troy or avoirdupois
 1 gram = 0.03215 ounce troy
 1 kilogram = 2.679 pounds troy

TABLE 3

METRIC EQUIVALENTS

Capacity

1 U. S. fluid ounce - 29,573 milli-
 liters
 1 U. S. liquid quart - .946 liter
 1 U. S. dry quart - 1.101 liters
 1 U. S. gallon - 3.785 liters
 1 U. S. bushel - .3524 hectoliters
 1 cubic inch - 16.4 cubic centi-
 meters
 1 liter - 1,000 milliliters or
 1,000 cubic centimeters
 1 millimeter - .034 U. S. fluid
 ounce
 1 liter - 1.057 U. S. liquid quarts
 1 liter - .908 U. S. dry quart
 1 liter - .264 U. S. gallon
 1 hectoliter - 2.838 U. S. bushels
 1 cubic centimeter - .061 cubic
 inch

Metric length

1 inch - 2.54 centimeters
 1 foot - .305 meter
 1 yard - .914 meter
 1 mile - 1.609 kilometers
 1 fathom - 6 feet
 1 knot - 6,086 feet
 3 knots - 1 league
 1 centimeter - .394 inch
 1 meter - 3.281 feet
 1 meter - 1.094 yards
 1 kilometer - .621 mile

Metric weight

1 grain - .065 gram
 1 apothecaries' scruple - 1.296 grams
 1 avoirdupois ounce - 28.350 grams
 1 troy ounce - 31.103 grams
 1 avoirdupois pound - .454 kilogram
 1 troy pound - .373 kilogram
 1 gram - 15.432 grains
 1 gram - .772 apothecaries' scruple
 1 gram - .035 avoirdupois ounce
 1 gram - .032 troy ounce
 1 kilogram - 2.205 avoirdupois
 pounds
 1 kilogram - 2.679 troy pounds

TABLE 4
COMMON EQUIVALENTS

1 square mile equals 2.59 square kilometers.
 1 cubic foot equals 0.0283 cubic meter.
 1 cubic foot equals 7.48 gallons; equals 0.804 bushel.
 1 cubic foot of water weighs 62.5 pounds.
 1 cubic yard equals 0.7646 cubic meter.
 1 gallon equals 3.7854 liters.
 1 gallon equals 8.335 pounds of water.
 1 imperial gallon equals 1.20 U. S. gallons.
 1 gallon equals 231 cubic inches (liquid measure).
 1 pound equals 0.4536 kilogram.
 1 avoirdupois pound equals 7,000 grains.
 1 troy pound equals 5,760 grams.
 1 meter equals 39.37 inches.
 1 meter equals 3.280833 feet.
 1 meter equals 1.093611 yards.
 1 kilometer equals 3,281 feet.
 1 square meter equals 10.764 square feet; equals 1.196 square yards.
 1 cubic meter equals 35.314 cubic feet; equals 1.308 cubic yards.
 1 liter equals 1.0567 quarts.
 1 gram equals 15.43 grains.
 1 kilogram equals 2.2046 pounds.
 1 foot per second equals 1.097 kilometers per hour.
 1 foot per second equals 0.68 mile per hour.
 Acceleration of gravity equals 32.16 feet per second every second.
 1 horsepower equals 76 kilogram-meters per second.
 1 horsepower equals 746 watts.
 1 horsepower equals 1 second-foot falling 8.80 feet.
 1 atmosphere equals 14.7 pounds per square inch at sea level.
 1 atmosphere equals 33.947 feet of water at 62° F.
 1 atmosphere equals 30 inches of mercury at 62° F.
 1 atmosphere equals 29.92 inches of mercury at 32° F.
 1 atmosphere equals 760 millimeters of mercury at 32° F.
 1 atmosphere equals 1.033 kilograms per square centimeter.
 1 pound per square inch equals 2.0416 inches of mercury at 62° F.
 1 pound per square inch equals 2.0355 inches of mercury at 32° F.
 1 pound per square inch equals 27.71 inches of water at 62° F.
 1 pound per square inch equals 2.309 feet of water at 62° F.
 1 pound per square inch equals 0.0703 kilogram per square centimeter.
 1 foot of water at 62° F. equals 0.433 pound per square inch.
 1 inch of mercury at 62° F. equals 0.491 pound per square inch.
 1 inch of mercury at 62° F. equals 1.132 feet of water at 62° F.

Cubic feet of water	X	62.5	= pounds avoirdupois.
Cubic inches of water	X	0.03617	= pounds avoirdupois.
12 U. S. gallons of water			= 1 hundredweight.
240 U. S. gallons of water			= 1 ton.
1.8 cubic feet of water			= 1 hundredweight.
35.88 cubic feet of water			= 1 ton.
U. S. bushel	X	0.0495	= cubic yards.
U. S. bushel	X	1.2446	= cubic feet.
U. S. bushel	X	2150.42	= cubic inches.

Courtesy John Wiley & Sons, Inc., Engineering for Dairy and Food Products.

TABLE 5
CUBIC FOOT EQUIVALENTS

1 cubic foot - 1,728 cubic inches.
1 cubic foot - 0.037037 cubic yard.
1 cubic foot - 0.803564 U. S. bushel.
1 cubic foot - 3.21426 U. S. pecks.
1 cubic foot - 7.48052 U. S. liquid gallons of 231 cubic inches.
1 cubic foot - 6.42851 U. S. dry gallons of 268.8025 cubic inches.
1 cubic foot - 29.92208 U. S. liquid quarts.
1 cubic foot - 25.71405 U. S. dry quarts.
1 cubic foot - 59.84416 U. S. liquid pints.
1 cubic foot - 51.42809 U. S. dry pints.
1 cubic foot - 239.37662 U. S. gills.
1 cubic foot - 0.26667 flour barrel.
1 cubic foot - 0.23748 U. S. liquid barrel of 31 1/2 gallons.

TABLE 6
COMPARATIVE TOXICITIES OF CERTAIN GASES AND VAPORS

Parts per Million Parts of Air			
Gas Vapor	Slight Symptoms after Several hours	Dangerous in 30-60 Minutes	Rapidly Fatal
Chlorine (Cl ₂)	1.0	---	1,000
Hydrogen Sulphide (H ₂ S)	100	500	1,000
Carbon Monoxide (CO)	100	1,500	4,000
Sulphur Dioxide (SO ₂)	10	400	---
Ammonia (NH ₃)	100	2,500	5,000
Methyl Chloride (CH ₃ Cl)	20,000	60,000	150,000

From U.S. Bureau of Mines, Chemical
Trades Journal and Chemical Engineer,
Sept. 11, 1936.

TABLE 7

DECIMAL EQUIVALENTS
in Inches

1/32	1/64	.015625	17/32	33/64	.515625
		.03125			.53125
	3/64	.046875		35/64	.546875
1/16		.0625	9/16		.5625
	5/64	.078125		37/64	.578125
3/32		.09375	19/32		.59375
	7/64	.109375		39/64	.609375
1/8		.125	5/8		.625
5/32	9/64	.140625	21/32	41/64	.640625
		.15625			.65625
	11/64	.171875		43/64	.671875
3/16		.1875	11/16		.6875
	13/64	.203125		45/64	.703125
7/32		.21875	23/32		.71875
	15/64	.234375		47/64	.734375
1/4		.25	3/4		.75
9/32	17/64	.265625	25/32	49/64	.765625
		.28125			.78125
	19/64	.296875		51/64	.796875
4/16		.3125	13/16		.8125
	21/64	.328125		53/64	.828125
11/32		.34375	27/32		.84375
	23/64	.359375		58/64	.859375
3/8		.375	7/8		.875
13/32	25/64	.390625	29/32	57/64	.890625
		.40625			.90625
	27/64	.421875		59/64	.921875
7/16		.4375	15/16		.9375
	29/64	.453125		61/64	.953125
15/32		.46875	31/32		.96875
	31/64	.484375		63/64	.984375
1/2		.5	1.		1.

TABLE 8

EQUIVALENT VALUES OF ELECTRICAL, MECHANICAL, AND HEAT UNITS

Unit	Work Units	Unit	Power Units	Unit	Heat Units, Work
	Equivalent Value in Other Units		Equivalent Value in Other Units		Equivalent Value in Other Units
1 kw-hr. =	1,000 watt-hours 1.34 hp-hr. 2,654,200 ft-lb. 3,412 heat units (B.t.u.) 367,000 kg.-meters 3.52 lb. water evap. from and at 212°F.	1 kw. =	1,000 watts 1.34 hp. 2,654,200 ft-lb/hr. 44,240 ft-lb./min. 737.3 ft-lb./sec. 3,412 heat units/hr. 56.9 heat units/min. 0.948 heat unit/sec.	1 heat unit =	1 B.t.u. 253 calories
				1 heat unit B.t.u. =	1,055 watt-sec. 780 ft-lb. 107.6 kg-meters 0.000293 kw-hr. 0.000393 hp-hr.
1 hp-hr. =	0.746 kw-hr. 1,980,000 ft-lb. 2,545 heat units (B.t.u.) 2.64 lb. H ₂ O evap. from and at 212°F. 17.0 lb. water raised from 62° to 212°F.	1 hp. =	746 watts 0.746 kw. 33,000 ft-lb./min. 550 ft-lb./sec. 2.545 heat units/hr.	1 lb. carbon oxidized at perfect efficiency =	14,544 heat units 1.11 lb. anthracite coal, oxidized 21 cu.ft. illuminating gas 4.26 kw-hr. 5.71 hp-hr.
1 ft-lb. =	0.000000377 kw-hr. 0.001285 heat unit (B.t.u.) 0.0000005 hp-hr.	1 watt =	1 joule sec. 0.00134 hp. 3.412 heat units/hr. 0.7373 ft-lb./sec.	1 lb. water evap. from and at 212°F. =	0.283 kw-hr. 0.379 hp-hr. 970 heat units 751,300 ft-lb.

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Courtesy John Wiley & Sons, Inc., Engineering for Dairy and Food Products.

TABLE 9

STANDARD MEASUREMENTS

<u>Measure of length (linear measure)</u>	<u>Dry measure</u>
4 inches - 1 hand	2 pints - 1 quart
9 inches - 1 span	8 quarts - 1 peck
12 inches - 1 foot	4 pecks - 1 bushel
3 feet - 1 yard	36 bushels - 1 chaldron
7 feet - 1 fathom	
5½ yards - 16½ feet - 1 rod	<u>Liquid measure</u>
- 1 pole	2 cups - 1 pint
40 poles - 1 furlong	4 gills - 1 pint
8 furlongs - 1 mile	16 fluid ounces - 1 pint
5,280 feet - 1,760 yards - 320 yards	2 pints - 1 quart
- 1 mile	4 quarts - 1 gallon
3 miles - 1 league	31½ gallons - 1 barrel
	2 barrels - 1 hogshead
<u>Measure of surface (area)</u>	1 gallon - 231 cubic inches
144 square inches - 1 square foot	1 cubic foot - 7.48 inches
9 square feet - 1 square yard	1 teaspoon - .17 fluid ounce (1/6 oz.)
30½ square rods - 1 rood	3 teaspoons (level - 1 tablespoon (½ oz.))
4 rods - 1 acre	2 tablespoons - 1 fluid ounce
160 square rods - 1 acre	1 cup (liquid) - 16 tablespoons (8 oz.)
43,560 square feet - 1 acre	1 teaspoon - 5 to 6 cubic centimeters
640 acres - 1 square mile	1 tablespoon - 15 to 16 cubic centimeters
36 square miles - 1 township	1 fluid ounce - 29.57 cubic centimeters
<u>Surveyor's measure</u>	<u>Troy weight</u>
7.92 inches - 1 link	24 grains - 1 pennyweight
25 links - 1 rod	20 pennyweights - 1 ounce
4 rods - 1 chain	12 ounces - 1 pound
10 square chains - 160 square rods	
- 1 acre	<u>Apothecaries' weight</u>
640 acres - 1 square mile	20 grains - scruple
80 chains - 1 mile	3 scruples - 1 dram
1 Gunter's chain - 66 feet	8 drams - 1 ounce
	12 ounces - 1 pound
<u>Cubic measure (volume)</u>	27-11/32 grains - 1 dram
1,728 cubic inches - 1 cubic foot	16 drams - 1 ounce
27 cubic feet - 1 cubic yard	16 ounces - 1 pound
2,150.42 cubic inches - 1 standard bushel	2,000 pounds - 1 ton (short)
231 cubic inches - 1 standard gallon (liquid)	2,240 pounds - 1 ton (long)
1 cubic foot water - 7.43 gallons or 62½ pounds	
231 cubic inches - 1 gallon	
1 cubic foot - 4/5 of a bushel	
128 cubic feet - 1 cord (wood)	
7.48 gallons - 1 cubic foot	
1 bushel - 1.25 cubic feet	

Courtesy Mich. State Univ., Fact Sheet, Pp. 219-220.

TABLE 10

MENSURATION OF SURFACES AND VOLUMES

Area of rectangle = Length X Breadth.
 Area of triangle = Base X 1/2 perpendicular height.
 Diameter of circle = Radius X 2.
 Circumference of circle = Diameter X 3.1416.
 Area of circle = Square of diameter X 0.7854.
 Area of sector of circle = $\frac{\text{Area of circle X Number of degrees in arc.}}{360}$

Area of surface of cylinder = Circumference X Length + Area of two ends.
 To find the diameter of circle having given area: Divide the area by 0.7854, and extract the square root.
 To find the volume of a cylinder: Multiply the area of the section in square inches by the length in inches to find the volume in cubic inches.
 Cubic inches divided by 1,728 = Volume in cubic feet.
 Surface of a sphere = Square of diameter X 3.1416.
 Volume of a sphere = Cube of diameter X 0.5236.
 The area of the base of a pyramid or cone, whether round, square, or triangular, multiplied by one-third of its height is the volume.
 Radius X 6.2832 = Circumference of a circle.
 Length of arc = Number of degrees X 0.017453 radius.
 Degrees in arc whose length equals radius = $57^{\circ} 29' 58''$.
 Length of an arc of 1° = Radius X 0.017453.

Lineal feet	X	0.00019	= miles.
Lineal yards	X	0.0006	= miles.
Square inches	X	0.007	= square feet.
Square feet	X	0.111	= square yards.
Cubic inches	X	0.00058	= cubic feet.
Cubic feet	X	0.03704	= cubic yards.
Circular inches	X	0.00546	= square feet.
Feet	X	1.5	= links.
Cubic feet	X	7.48	= U. S. gallons.
Cubic inches	X	0.004329	= U. S. gallons.
U. S. gallons	X	0.13367	= cubic feet.
U. S. gallons	X	231.	= cubic inches.
Cubic feet	X	0.8036	= U. S. bushel.

Courtesy John Wiley & Sons, Inc., Engineering for Dairy and Food Products

TABLE 11
HEAT VALUE OF VARIOUS FUELS

Fuel	B. t. u. per Lb.
Anthracite coal	14,000 - 16,000
Semi-anthracite coal	14,700 - 15,500
Semi-bituminous coal	15,500 - 16,000
Bituminous eastern coal	14,800 - 15,700
Bituminous western coal	13,000 - 14,800
Lignite	11,000 - 13,500
Oak wood	8,316
Pine wood	9,153
Oil, Texas Beaumont	19,060 1 gal. oil = 8 lb.
Gas, natural Pittsburgh	899 B. t. u. per cu. ft.
Gas, artificial	500 B. t. u. per cu. ft.

Courtesy John Wiley & Sons, Inc., Engineering for Dairy and Food Products.

TABLE 12
SOME PROPERTIES OF SATURATED STEAM

Gauge Pressure	Temp. F.	Total Heat Btu/lb.*	Gauge Pressure	Temp. °F.	Total Heat Btu/lb.*
0	212	1,150.3	60	307.3	1,181.0
5	227.2	1,155.9	70	316.0	1,183.3
10	239.4	1,160.2	80	323.9	1,185.3
15	249.7	1,163.7	90	331.2	1,187.1
20	258.8	1,166.7	100	337.9	1,188.8
25	266.9	1,169.3	120	350.1	1,191.6
30	274.1	1,171.5	140	360.9	1,193.9
40	286.7	1,175.3	160	370.7	1,195.9
50	297.7	1,178.4	180	379.7	1,197.7

*Above that contained at 32°F.

Courtesy John Wiley & Sons, Inc.
Engineering for Dairy and Food Products.

TABLE 13

COMPARISON OF THERMOMETER READINGS

Centigrade	Fahrenheit	Centigrade	Fahrenheit
-40	-40.0	28	82.4
-36	-32.8	32	89.6
-32	-25.6	36	96.8
-28	-18.4	40	104.0
-24	-11.2	44	111.2
-20	- 4.0	48	118.4
-16	+ 3.2	52	125.6
-12	10.4	56	132.8
- 8	17.6	60	140.0
- 4	24.8	64	147.2
0	32.0	68	154.4
4	39.2	72	161.6
8	46.4	76	168.8
12	53.6	80	176.0
16	60.8	84	183.2
20	68.0	88	190.4
24	75.2	92	197.6
28	82.4	96	204.8
		100	212.0

TABLE 14
WEIGHT AND SPECIFIC GRAVITY OF METALS

Metal	Specific Gravity, Approximate Mean Value	Weight per cu.ft., lbs.	Weight per cu.in., lbs.
Aluminum	2.67	166.5	0.0963
Antimony	6.76	421.6	0.2439
Brass, % Cu % Zn			
80 20	8.60	536.3	0.3103
70 30	8.40	523.8	0.3031
60 40	8.36	521.3	0.3017
50 50	8.20	511.4	0.2959
Bronze % Cu 95 to 80 % Sn 5 to 20	8.853	522.0	0.3195
Cadmium	8.65	539.0	0.3121
Gold, pure	19.258	1,200.9	0.6949
Copper	8.853	552.0	0.3195
Iron, cast	7.218	450.0	0.2604
wrought	7.70	480.0	0.2779
Lead	11.38	709.7	0.4106
Magnesium	1.75	109.0	0.0641
32 °	13.62	849.3	0.4915
Mercury 60 °	13.58	846.8	0.4900
212 °	13.38	834.4	0.4828
Nickel	8.8	548.7	0.3175
Platinum	21.5	1,347.0	0.7758
Silver	10.505	655.1	0.3791
Steel	7.854	489.6	0.2834
Tin	7.350	458.3	0.2652
Zinc	7.00	436.5	0.2526

Courtesy John Wiley & Sons, Inc., Engineering for Dairy and Food Products.

TABLE 15

BAROMETRIC DATA

1 standard atmosphere (by definition) = 760 mm. of mercury at 0° C. =
 29.921 in. mercury at 32 F. = 30.000 in. mercury at 58.4 F. = 33.90 ft.
 water at 32 F. = 14.696 lb. per sq. in.

Pressure conversion factors at 32° F.

	Inches Mercury	Feet Water	Pounds per Square Inch	Atmos- pheres
Inches mercury	1.000	1.133	0.491	0.0334
Feet water	0.8827	1.000	0.434	0.0295
Pounds per sq. in.	2.037	2.308	1.000	0.0680

TABLE 16

PHYSICAL PROPERTIES OF DAIRY PRODUCTS AND MATERIALS USED IN DAIRY INDUSTRY.

Product	Specific Heat	Specific Gravity
Air	0.243	0.0012
Aluminum	0.218	2.56
Butterfat	0.56	0.86 to 0.87
Cheese (Cheddar)	0.64	
Copper	0.093	8.93 to 8.95
Evaporated milk 50° F.	0.92	1.0662
40% Cream	0.58 to 1.105	0.995
Gelatin	----	1.27
Ice cream mix	0.80	1.06 to 1.09
Iron	0.119	7.85 to 7.88
Nickel	0.109	8.60 to 8.90
Plain condensed milk	0.94	1.16
Skim milk	0.95	1.037
Sugar	0.27	1.61
Water	1.00	1.00
Water vapor at 212° F.	0.47	0.000596
Whole milk	0.93 to 0.94	1.028 to 1.035
Wood (oak)	0.42	0.60 to 0.90

Courtesy John Wiley & Sons, Inc.
 Engineering for Dairy and Food
 Products.

TABLE 17

STANDARDS FOR WIRE GAUGE IN USE IN THE UNITED STATES

Dimensions of Sizes in Decimal Parts of an Inch

Number of Wire Gauge	American or Brown & Sharpe	Birming- ham or Stubs Wire	Imperial Wire Gauge	Stubs Steel Wire	U.S. Standard for Plate	Number of Wire Gauge
000000	.....	.....	0.464	.....	0.46875	000000
00000	.....	.....	0.432	.....	0.4375	00000
0000	0.46	0.454	0.400	.....	0.40625	0000
000	0.40964	0.425	0.372	.....	0.375	000
00	0.3648	0.38	0.348	.....	0.34375	00
0	0.32486	0.34	0.324	.....	0.3125	0
1	0.2893	0.3	0.300	0.227	0.28125	1
2	0.25763	0.284	0.276	0.219	0.265625	2
3	0.22942	0.259	0.252	0.212	0.25	3
4	0.20431	0.238	0.232	0.207	0.234375	4
5	0.18194	0.22	0.212	0.204	0.21875	5
6	0.16202	0.203	0.192	0.201	0.193125	6
7	0.14428	0.18	0.176	0.199	0.1875	7
8	0.12849	0.165	0.160	0.197	0.171875	8
9	0.11443	0.148	0.144	0.194	0.15625	9
10	0.10189	0.134	0.128	0.191	0.140625	10
11	0.090742	0.12	0.116	0.188	0.125	11
12	0.080808	0.109	0.104	0.185	0.109375	12
13	0.071961	0.095	0.092	0.182	0.09375	13
14	0.064084	0.083	0.080	0.180	0.078125	14
15	0.057068	0.072	0.072	0.178	0.0708125	15
16	0.05082	0.065	0.064	0.175	0.0625	16
17	0.045257	0.058	0.056	0.172	0.05625	17
18	0.040303	0.049	0.048	0.168	0.05	18

TABLE 18

PRESSURE UNIT CONVERSION FACTORS to 5 significant figures.

	lb/in. ²	oz/in. ²	lb/ft. ²	in.H ₂ O	ft.H ₂ O	in.Hg.	g/cm. ²	cm.H ₂ O	m.H ₂ O
1 Pound /sq.in.	= 1.0000	16.000	144.00	27.680	2.3067	2.0360	70.306	70.306	0.7031
1 Ounce /sq.in.	= 0.0625	1.0000	9.0000	1.7300	0.1442	0.1272	4.3941	4.3942	4.3942
1 Pound /sq.in.	= 6.9445 x10 ⁻³	0.11111	1.0000	0.19223	1.6019 x10 ⁻²	1.4139 x10 ⁻²	0.4882	0.4882	4.8825 x10 ⁻³
1 Ton /sq.in.	= 2000.0	32000.	2.8800 x10 ⁵	55361.	4613.4	4072.0	1.4061 x10 ⁵	1.4062 x10 ⁵	1406.2
1 Inch Water 39°F.	= 3.6127 x10 ⁻²	0.5780	5.2022	1.0000	8.3333 x10 ⁻²	7.3554 x10 ⁻²	2.5399	2.5400	2.5400 x10 ⁻²
1 Inch Mercury 32°F.	= 0.49116	7.8586	70.727	13.596	1.1330	1.0000	34.532	34.532	0.3453
1 Gram /sq.cm.	= 1.4224 x10 ⁻²	0.2276	2.0482	0.3937	3.2809 x10 ⁻²	2.8959 x10 ⁻²	1.0000	1.00003	1.00003 x10 ⁻²
1 Kilogram /sq.cm.	= 14.724	227.58	2048.2	393.71	32.809	28.959	1000.0	1000.03	10.0003
1 Cm. Water at 4°C.	= 1.4223 x10 ⁻²	0.2276	2.0481	0.3937	3.2808 x10 ⁻²	2.8958 x10 ⁻²	0.99997	1.0000	0.0100
1 Meter Water 4°C.	= 1.4223	22.757	204.81	39.370	3.2808	2.8958	99.997	100.00	1.0000
1 Mm. Hg. at 0°C.	= 1.9337 x10 ⁻²	0.3094	2.7845	0.53525	4.4605 x10 ⁻²	3.9370 x10 ⁻²	1.3595	1.3595	1.3595 x10 ⁻²

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ENGLISH

METRIC

TABLE 19

WATERSHED AREAS DRAINED BY TILE DRAINS
(3/8 inch depth of water in 24 hours)

Size of tile (inches)	Fall per 100 feet							
	5/8" (0.05')	1-1/4" (0.1')	2-3/8" (0.2')	3-5/8" (0.3')	4-3/4" (0.4')	6" (0.5')	9" (0.75')	12" (1')
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
4	-----	4	6	8	9	10	12	14
5	6	8	11	14	16	18	22	26
6	9	13	19	23	27	30	36	42
8	20	29	41	49	57	64	79	91
10	37	52	74	90	104	117	143	165
12	60	85	120	147	170	189	223	268

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Mich. State Univ. Coop. Extension Service, Fact Sheet.

TABLE 20

MAXIMUM LENGTH OF TILE LINES AT MINIMUM GRADES

Size of tile (inches)	Minimum grade foot per 100 feet	Maximum length, feet
4	0.10	1,300
5	.07	2,000
6	.05	3,000

Mich. State Univ. Coop. Extension Service, Fact Sheet.

TABLE 21

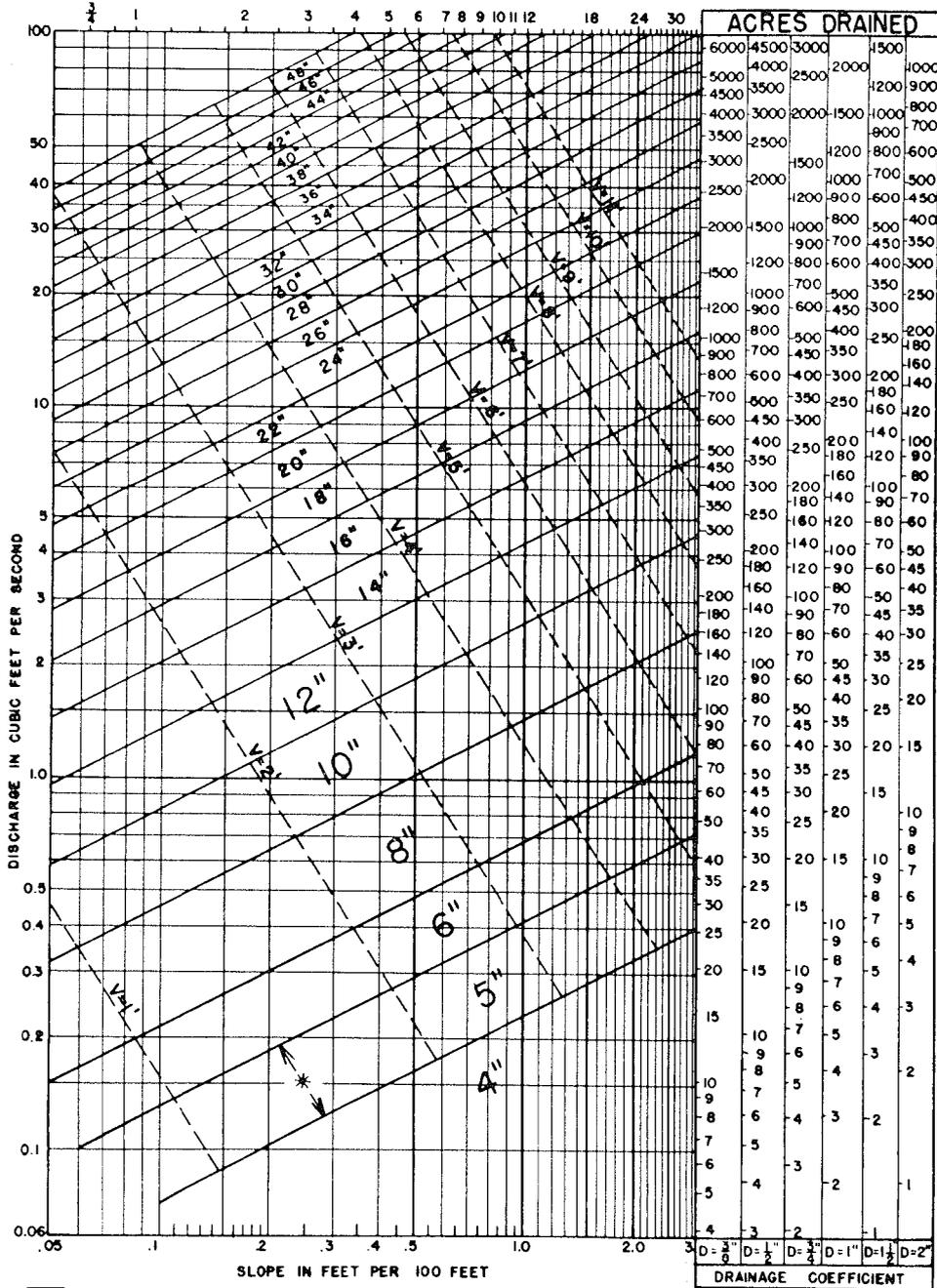
SPACING OF PARALLEL LATERALS FOR FIELD CROPS
WITH RESPECT TO SOIL TEXTURE

Soil	Permeability	Spacing
Clay and clay loam	Very slow	30 to 70 ft.
Silt and silty clay	Slow to moderately slow	60 to 100 ft.
Sandy loam	Moderate to rapid	100 to 300 ft.
Muck		50 to 200 ft.

From Agr. Engineering Yearbook, 1963

TILE DRAINAGE DESIGN CHART

SLOPE IN INCHES PER 100 FEET



*Space between lines is the range of tile capacity for the size shown between lines

TABLE 23

PROPERTIES OF COMMON REFRIGERANTS

	"Freon-12", CCl ₂ F ₂	Carbon Dioxide, CO ₂	Ammonia, NH ₃	Methyl Chloride, CH ₃ Cl	Sulfur Dioxide, SO ₂
Boiling point, F. (Sea level atm. pres.)	-21.7	-108.4	-28.0	-10.6	14.0
Gage pressure, lb./sq.in., 86 F.	93.2	1024.3	154.5	80.83	51.75
Gage pressure, lb./sq.in., 5 F.	11.81	319.7	19.57	6.19	5.87*
Heat content of saturated vapor in 5 F. evaporator, B.t.u./lb.	78.79	102.14	613.35	195.3	183.49
Heat content of liquid leaving 86 F. condenser, B.t.u./lb.	27.72	45.45	138.9	46.6	42.12
B.t.u. refrigerating effect/lb.	51.07	56.59	474.45	148.7	141.37
Lbs. of refrigerant/min./ton	3.916	3.528	0.4215	1.345	1.414
Cu. ft. of liquid/lb., 86 F.	0.0124	0.0267	0.02691	0.01793	0.01184
Cu. in. of refrigerant/min.	83.9	162.8	19.6	41.7	28.9
Cu. ft. of vapor/lb., 5 F.	1.485	0.2673	8.150	4.529	6.421
Cu. ft. piston displacement/min.	5.815	0.943	3.436	6.091	9.084
B.t.u. refrigeration/cu.ft. piston displacement	34.4	212.0	58.2	32.8	22.0

*Inches of mercury below atmosphere.

John Wiley & Sons, Inc.
Engineering for Dairy and Food Products

TABLE 24

HEAT CONDUCTIVITY AND DENSITY OF VARIOUS
INSULATING AND BUILDING MATERIALS*

Material	Thermal Con- ductivity, Btu per square foot, per inch per hour per Degree F.	Density, pounds per cubic foot	Description of Material
Air	0.175	0.08	Ideal air space
Air cell, 1/2 in.	0.458	8.80	Asbestos paper and air spaces
Air cell, 1 in.	0.500	8.80	Asbestos paper and air spaces
Asbestos mill board	0.830	61.0	Pressed asbestos
Asbestos wood	3.700	123.0	Asbestos and cement
Balsa wood	0.350	7.5	Light and soft across grain
Brick masonry	4.0-5.0		
Calorax	0.221	4.0	Fluffy, finely divided mineral matter
Cement mortar	2.0		
Cork	0.337	5.3	Granulated 1/8-3/16 in.
Cork	0.330	10.0	Regranulated 1/16-1/8 in.
Corkboard	0.279	6.9	No artificial binder--low density
Corkboard	0.308	11.3	No artificial binder--medium density
Cotton wool	0.292	....	Loosely packed
Fibrofelt	0.329	11.3	Felted vegetable fibers
Fire felt sheet	0.583	26.0	Soft flexible asbestos sheet
Fire felt wool	0.625	43.0	Asbestos sheet coated with cement
Flaxlinum	0.329	11.3	Felted vegetable fibers
Foamglas	0.35	9.0	
Hair felt	0.246	17.0	
Hard maple wood	1.125	44.0	Across grain
Infusorial earth	0.583	43.0	Natural blocks
Insulite	0.296	11.9	Pressed wood pulp--rigid
Kapok	0.238	0.88	Vegetable fiber--loosely packed
Keystone hair	0.271	19.0	Hair felt combined with building paper
Linofelt	0.300	11.3	Vegetable fiber combined with paper
Lithboard	0.379	12.5	Mineral wool and vegetable fibers
Mineral wool	0.275	12.5	Medium packed
Mineral wool	0.288	18.0	Felted in blocks
Oak wood	1.000	38.0	Across grain
Planer shavings	0.417	8.8	Various
Plaster	3.0-6.0		
Pulp board	0.458	....	Stiff pasteboard
Pure wool	0.263	5.0	
Rock cork	0.346	21.0	Mineral wool and binder--rigid
Slag wool	0.750	15.0	
Stone concrete	6.0-9.0		
Styrofoam 22	0.28	1.6-2.0	
Styrofoam HD-2	0.24	4.0-4.7	
Tar roofing	0.707	55.	
Virginia pine wood	0.958	34.	Across grain
White pine wood	0.791	32.	Across grain
Wool felt	0.363	21.	Flexible paper stock

* Adapted principally from National Bureau of Standards tables.

TABLE 25

STORAGE PROPERTIES OF FOODS

Adapted from the American Society of Refrigerating Engineers' Refrigerating Data Book, for 1937-1938

Commodity	Storage Temperature, °F.	Relative Humidity, %	Approximate Storage Life	Water Content, %	Average Freezing Point, °F.
Apples	31-32	85-88	2-8 mos.	84.1	28.4
Asparagus	32	85-90	3-4 wks.	93.0	29.8
Beans, green or	32-40	85-90	3-4 wks.	88.9	29.7
snap lima	32	85-90	3-4 wks.	66.5	----
Beets, topped	32-35	95-98	3-6 mos.	87.6	26.9
bunch	32	90-95	7-10 days	----	----
Blackberries	31-32	80-85	7-10 days	85.3	29.1
Broccoli (Italian)	32	85-90	10-12 days	89.9	29.2
Cabbage	32	90-95	3-4 mos.	92.4	31.2
Carrots, topped	32	95-98	2-4 mos.	88.2	29.6
bunch	32	90-95	7-10 days	----	----
Cauliflower	32	85-90	2-3 wks.	91.7	30.1
Celery	31-32	95-98	2-4 mos.	93.7	29.7
Cherries	31-32	80-85	10-14 days	83.0	27.8
Cocoanuts	32-35	80-85	1-2 mos.	milk 95.2 kernel 46.3	----
Corn (sweet)	31-32	85-90	-----	73.9	29.0
Cranberries	35-40	90-95	1-3 mos.	87.4	27.3
Cucumbers	45-50	85-90	6-8 days	96.1	30.5
Eggplant	45-50	85-90	10 days	92.7	30.4
Endive	32	90-95	2-3 wks.	93.3	30.9
Garlic	32	70-75	5-6 mos.	74.2	25.4
Grapefruit	32-33	85-90	8-10 wks.	88.8	28.4
Grapes, European	30-32	80-85	4-6 mos.	81.6	24.9
American	30-32	80-85	8-14 wks.	81.9	28.2
Horseradish	32	90-95	4-6 mos.	73.4	26.4
Lemons	50-55	80-85	2-12 wks.	89.3	28.1
Lettuce	32	90-95	2-3 wks.	94.8	31.2
Melons,					
watermelons	35-40	80-85	1-3 wks.	92.1	28.8
muskmelons	50-55	80-95	1-3 wks.	92.8	28.5
honeydew-					
honeyball	40-50	80-85	3-4 wks.	----	28.8
Casaba and					
Persian	35-40	80-85	4-6 wks.	----	----
Nuts	32-35	65-70	8-12 mos.	pecans 3.2 English walnuts 2.5	Italian chestnuts 23.8 Walnuts 20.0
Onions and					
onion sets	32	70-75	5-6 mos.	87.5	30.1

Oranges	34	80-85	1-2 mos.	87.2	*
Parsnips	32-34	90-95	2-4 mos.	78.6	28.9
Peaches	31-32	85-90	2-4 wks.	86.9	29.4
Pears	30-32	85-90	3-8 mos.	82.7	*
Peas (green)	32	85-90	1-3 wks.	74.3	30.0
Peppers, sweet	32	85-90	4-6 wks.	92.4	30.1
Chili (dry)	32-50	70-75	5-9 mos.	----	----
Plums	31-32	85-90	1-2 wks.	85.7	28.5
Potatoes	36-60	85-90	6-8 mos.	77.8	28.9
Pumpkins	55-60	70-75	2-6 mos.	90.5	30.2
Quinces	31-32	80-85	3-4 mos.	85.3	28.1
Raspberries, black	31-32	80-85	7-10 days	80.7	28.8
red	31-32	80-85	7-10 days	83.4	30.4
Rhubarb	32	90-95	2-3 wks.	94.9	28.4
Squash (winter)	55-60	70-75	2-6 mos.	90.4	29.3
Strawberries	31-32	80-85	7-10 days	90.0	29.9
Sweet potatoes	50-55	80-90	4-6 mos.	68.5	28.4
Tomatoes, ripe	50-55	80-85	7-10 days	94.1	30.4
mature green	55-70	80-85	1-6 wks.	94.7	30.4
Turnips (including rutabagas)	32	95-98	2-4 mos.	90.9	30.5
Dried fruits	32-50	70-75	1-2 yrs.	----	----
Frozen-pack fruits	10-18	-----	6-12 mos.	----	----
Frozen-pack vegetables	0-18	-----	6-12 mos.	----	----

* The figures for oranges are Florida (Valencia), 28.26°, California (Washington Navel), 27.9°. For pears: Bartlett, 28.46°; Winter Nelis, 27.25°; Anjou, 26.93°. For Persian (English) walnuts, 20°.

Adapted from A. S. R. E. Refrigerating Engineers' Data Book for 1937-38.

TABLE 26

COPPER WIRE SIZES--OUTDOOR--TYPE WP WIRE

120 Volts with 2% Voltage Drop at 5 to 50 Amperes Length of Run in Feet--(1 Way)								
Amps	<u>50</u>	<u>100</u>	<u>150</u>	<u>200</u>	<u>250</u>	<u>300</u>	<u>400</u>	<u>500</u>
5	10	10	10	10	8	8	6	4
10	10	10	8	6	6	4	4	2
15	10	8	6	6	4	4	2	2
20	10	6	4	4	2	2	1	1/0
25	8	6	4	2	2	1	1/0	2/0
30	8	4	4	2	1	1/0	2/0	2/0
40	6	4	2	1	1/0	2/0	3/0	4/0
50	6	2	2	1/0	2/0	3/0	4/0	---

120/240 Volts with 2% Voltage Drop at 10 to 200 Amp. ³								
10	10	10	10	10	8	8	6	6
25	10	8	6	6	4	4	2	2
50	8	6	4	2	2	1	1/0	2/0
75	6	4	2	2	1/0	1/0	2/0	3/0
100	6	2	1	1/0	2/0	3/0	4/0	--
125	4*	2	1/0	2/0	3/0	4/0	---	---
150	2*	1	1/0	2/0	4/0	4/0	---	---
175	1*	1	2/0	3/0	4/0	---	---	---
200	1*	1/0	2/0	4/0	---	---	---	---

Notes:

1. No. 6 copper wire minimum strongly recommended. Code requires No. 10 minimum for overhead spans up to 50 ft; No. 8 for spans over 50 ft.
2. Where larger than 4/0 is required special study should be made.
3. Assumed 120/240 volt load balanced across 240 volt.
*Type TW, use next larger size conductor.

Courtesy Delaval Co.

TABLE 27

CURRENT DATA FOR ELECTRIC MOTORS. MOTOR TERMINAL AMPERES AT FULL LOAD.*
Average Values for All Speeds and Frequencies (1959 N.E.C.)

HP	Single-Phase A-C			Polyphase A-C (induction type) Squirrel-Cage and Wound Rotor								Direct Current	
	115 Volts	230 Volts	440 Volts	110 Volts		220 Volts		440 Volts		550 Volts		115 Volts	230 Volts
				3-Ph	2-Ph 4-Wire	3-Ph	2-Ph 4-Wire	3-Ph	2-Ph 4-Wire	3-Ph	2-Ph 4-Wire		
1/4	5.8	2.9	---	---	---	---	---	---	---	---	---	3.0	1.5
1/2	9.8	4.9	---	4	4	2	2	1	1	.8	.8	5.4	2.7
3/4	13.8	6.9	---	5.6	4.8	2.8	2.4	1.4	1.2	1.1	1	7.4	3.7
1	16	8	---	7	6.4	3.5	3.2	1.8	1.6	1.4	1.3	9.6	4.8
2	24	12	---	13	11.2	6.5	5.6	3.3	2.8	2.6	2.2	17	8.5
3	24	17	---	---	---	9	8	4.5	4	4	3.2	25	12.5
5	56	28	---	---	---	15	13	7.5	7	6	6	40	20
10	100	50	26	---	---	27	24	14	12	11	10	76	38
15	---	---	---	---	---	40	34	20	17	16	14	112	56
20	---	---	---	---	---	52	45	26	23	21	18	148	74
30	---	---	---	---	---	78	67	39	34	31	27	220	110
40	---	---	---	---	---	104	88	25	44	41	35	292	146

*The values of full-load current are for motors running at speeds usual for belted motors and motors with normal torque characteristics. Motors built for especially low speeds or high torques may require more running current, in which case the nameplate current rating should be used. It is always safest to check actual nameplate data for a specific motor.

Adapted from 1959 N.E.C.

TABLE 28
SEPTIC TANK*

For each locality obtain information from the state or local health department. The septic tank should have a minimum of 500 gallons of liquid capacity and have a baffled outlet. The inside dimensions usually recommended are given below. Where a garbage disposal unit is used, the capacity of the tank should be increased 50% over that shown below.

Number of bedrooms	Maximum number of persons served	Liquid capacity of tank in gallons	Width Ft.	Length Ft.	Liquid depth Ft.	Total depth Ft.
2 or fewer	4	500	3	6	4	5
3	6	600	3	7	4	5
4	8	750	3½	7½	4	5
5	10	900	3½	8½	4½	5½
6	12	1,100	4	8½	4½	5½
7	14	1,300	4	10	4½	5½
8	16	1,500	4½	10	4½	5½

*From "Safe Sewage Disposal for Rural Homes," H. L. Garver, Water, Yearbook of Agriculture, USDA

TABLE 29
NUMBER OF POUNDS TO THE BUSHEL

Alfalfa	60	Kafir Corn	56
Barley	48	Lime	80
Beans (White)	60	Malt	38
Bran	20	Millet Seed, Common	50
Buckwheat	48	Oats	32
Blue Grass Seed	14	Onions	57
Clover Seed	60	Orchard Grass	14
Clover (Sweet)	60	Peas	60
Corn (Shelled)	56	Potatoes	60
Corn (In ear)	70	Red Top Seed	14
Coal, Hard	80	Rye	56
Hubam Seed	60	Timothy Seed	45
Hungarian Grass Seed	45	Wheat	60

Courtesy--Farm Electric Sales Handbook, Edison Electrical Institute

TABLE 30

TABLE 31

MILES TRAVELED IN PLANTING AN ACRE 3'6" ROWS		ACRES PLANTED IN TRAVELING ONE MILE 3'6" ROWS	
1-Row Planter	2.34 miles	1-Row Planter	.42 acres
2-Row Planter	1.17 miles	2-Row Planter	.84 acres
4-Row Planter	.58 miles	4-Row Planter	1.68 acres

There are 10,677 stalks in an acre planted in 3'6" rows, three stalks to the hill, hills 3'6" apart, or drilled one stalk every 14 inches.

There are 3,556 hills in an acre planted in 3'6" rows, hills 3'6" apart.

Michigan State Univ. Coop. Extension Service, Fact Sheet.

TABLE 32

TABLE 33

MILES TRAVELED IN PLOWING AN ACRE		TO MEASURE CORN IN CRIBS
Width of Furrow	Miles	Ear corn of good quality, measured when settled, will occupy 2-1/2 cubic feet to the bushel. Allowance should be made for snapped corn, corn that is poorly husked, or otherwise inferior in quality, which will occupy more than 2-1/2 cubic feet per bushel.
10 inches	9-9/10	
11 inches	9	
12 inches	8-1/4	
13 inches	7-1/2	
14 inches	7	
15 inches	6-1/2	
16 inches	6-1/6	Rule: at 2-1/2 cubic feet to the bushel, divide the cubic feet in crib by 2-1/2, or multiply by 2 and divide by 5.

Mich. State Univ. Coop. Extension Service, Fact Sheet.

TABLE 34

CUBIC FEET PER TON OF HAY

Kind of Hay	Length of time in stack	
	30 to 90 Days	Over 90 Days
Timothy	640 cu. ft.	625 cu. ft.
Clover-Timothy	580 cu. ft.	515 cu. ft.
Wild	600 cu. ft.	450 cu. ft.
Alfalfa	485 cu. ft.	470 cu. ft.
Chopped Alfalfa (Cut 3/8 in. lengths)		150 cu. ft.
Chopped Alfalfa (Cut 1/2 in. lengths)		260 cu. ft.
Chopped Alfalfa (Cut 1 in. lengths)		300 cu. ft.
Chopped Alfalfa (Cut 2 in. lengths)		370 cu. ft.

Courtesy De Laval Co.

TABLE 35

SPECIFIC HEAT OF GRAIN AND GRAIN PRODUCTS

Material	Moisture content per cent (wet basis)	Temperature range, deg. F.	Specific heat
Wheat*	9.55	71.6 to 122	0.39
"	21.25	71.6 to 123.8	0.51
Soybeans**	17.72	75.2 to 129.2	0.47
"	21.72	73.4 to 190.4	0.49
Flour, wheat			0.397

*From unpublished report by U.S. Bur. of Standards on thermal conductivity and specific heat of hard red spring wheat.

**The respiration and storage behavior of soybeans. Ramstad and Geddes. Minn. Agr. Expt. Sta. Bul. 156, 1942.

Courtesy, The Agr. Engineering Yearbook, 1964.

TABLE 36

RELATIONSHIP OF CORN PLANTS PER ACRE TO PLANT SPACING IN ROW

The term, Row-Inches per Acre, means the length of row, in inches, necessary to be equivalent to one acre of ground for any specified row width. This can be calculated from the following equation:

$$\frac{\text{Square feet per acre} \times \text{inches per square foot}}{\text{Row width (inches)}} = \text{Row-inches per acre}$$

Example: Assuming 40-inch row width:

$$\frac{43560 \times 144}{40} = 156,816 \text{ row-inches per acre}$$

Where the plant spacing in the row is known, the planting population (kernels per acre) can be obtained by dividing the Row-inches per Acre by the plant spacing in the row.

Example: Assuming an 8-inch kernel spacing is desired, with 40-inch row width:

$$\frac{\text{Row-Inches per Acre}}{\text{Plant spacing in row (inches)}} = \frac{156,816}{8} = 19,602 \text{ kernels per acre planting rate}$$

Mich. State Univ., Coop. Ext. Service. R. G. White, Fact Sheet.

TABLE 37

NUMBER OF PLANTS TO AN ACRE

Distance Apart	No. of Plants	Distance Apart	No. of Plants	Distance Apart	No. of Plants
3 x3 in.	696,960	4 x 4 ft.	2,722	13 x13 ft.	257
4 x4 in.	392,040	4½x 4½ ft.	2,151	14 x14 ft.	222
6 x6 in.	174,240	5 x 1 ft.	8,712	15 x15 ft.	193
9 x9 in.	77,440	5 x 2 ft.	4,356	16 x16 ft.	170
1 x1 ft.	43,560	5 x 3 ft.	2,904	16½x16½ ft.	160
1½x1½ ft.	19,360	5 x 4 ft.	2,178	17 x17 ft.	150
2 x1 ft.	21,780	5 x 5 ft.	1,742	18 x18 ft.	134
2 x2 ft.	10,890	5½x 5½ ft.	1,417	19 x19 ft.	120
2½x2½ ft.	6,960	6 x 6 ft.	1,210	20 x20 ft.	108
3 x1 ft.	14,520	6½x 6½ ft.	1,301	25 x25 ft.	69
3 x2 ft.	7,260	7 x 7 ft.	881	30 x30 ft.	48
3 x3 ft.	4,840	8 x 8 ft.	680	33 x33 ft.	40
3½x3½ ft.	3,555	9 x 9 ft.	537	40 x40 ft.	27
4 x1 ft.	10,890	10 x10 ft.	435	50 x50 ft.	17
4 x2 ft.	5,455	11 x11 ft.	360	60 x60 ft.	12
4 x3 ft.	3,630	12 x12 ft.	302	66 x66 ft.	9

Courtesy De Laval Co.

TABLE 38

NUMBER OF PLANTS PER ACRE (ROW CROPS)

Average No. of Plants in 6 Feet of Row	Average Distance Between Plants in Row	Distance Between Rows (in inches)						
		36"	38"	40"	42"	44"	46"	48"
2	36"	4,800	4,600	4,400	4,100	4,000	3,800	3,600
3	24"	7,300	6,900	6,500	6,200	5,900	5,700	5,400
4	18"	9,700	9,200	8,700	8,300	7,900	7,600	7,300
5	14.4"	12,100	11,500	10,900	10,400	9,900	9,500	9,100
6	12"	14,500	13,800	13,100	12,400	11,900	11,400	10,900
8	9"	19,400	18,300	17,400	16,600	15,800	15,200	14,500
10	7.2"	24,200	22,900	21,800	20,700	19,800	18,900	18,200
12	6"	29,000	27,500	26,100	24,900	23,800	22,700	21,800

Courtesy De Laval Co.

TABLE 39

RATE OF SEEDING AND WEIGHT PER BUSHEL OF FARM CROPS

Crop	Rate of Seeding per Acre (Pounds)	Pounds per Bushel
Alfalfa	10-20	60
Barley	72-96	48
Beans, field	40-75	60
Bermuda grass	6-8	40
Birdsfoot trefoil	8-12	60
Bluegrass, Kentucky	20-40	14
Bromegrass, smooth	10-20	14
Broomcorn	2-4	44-50
Buckwheat	36-60	48
Buffalo grass (burs)	15-20	---
Clover, Alsike	4-8	60
Clover, Crimson	15-25	60
Clover, Red & Mammoth	8-12	60
Clover, Strawberry	4-6	60
Clover, Sweet (White)	12-15	60
Clover, White & Ladino	5-7	60
Corn, shelled	6-10	56
Corn, on cob	---	70
Cotton	24-40	28-30
Cowpea (drilled solid)	75-120	60
Crotalaria	10-25	60
Fescue	10-40	10-30
Flax, for seed	28-56	56
Flax, for fiber	75-85	56
Gramma grass, Blue	10-15	---
Kafir (drills)	15-45	56
Kafir (rows)	3-6	56
Lespedeza, common	25-30	25
Lespedeza, Korean	20-25	40-45
Lespedeza, Sericea	30-40	35
Millet, Foxtail	10-30	50
Millet, Proso	15-35	56
Millet, Pearl	16-20	---
Milo (rows)	2-5	56
Oats	48-128	32
Orchard grass	20-25	14
Pea, field, large	120-180	60
Peanut	20-40	20-30
Potato	600-1000	60
Rape (drills)	3-6	50
Redtop	10-12	14
Reed canary grass	8-12	44-48
Rice	67-160	45
Rye	28-112	56
Sorghum, sorgo (drills)	15-75	50
Sorghum (rows)	4-8	50

Soybean (drills)	60-120	60
Soybean (rows)	15-45	60
Sudan grass (drills)	20-30	40
Timothy	3-12	45
Vetch, Common	40-80	60
Vetch, Hairy	40-45	60
Wheat	30-120	60
Wheatgrass, Crested	6-12	20-24

Courtesy De Laval Co.

Handwritten calculations:

$$\begin{array}{r} 439 \\ 20 \\ \hline 21950 \\ 220 \\ \hline 22170 \\ 7400 \\ \hline 9120 \\ 988 \end{array}$$

$$\begin{array}{r} 100 \\ 100 \\ \hline 200 \\ 70 \\ \hline 270 \\ 10690 \end{array}$$

10 acres/ha
106.20
106.20

TABLE 40

FIELD MACHINERY EFFICIENCY GUIDE

Field efficiency will vary considerably from one operation to another, and from one machine to another. The following table will serve as a guide in determining lost time and field efficiency for most field machines.

<u>Machine</u>	<u>Typical Field Efficiency</u>
Plow	85%
Disk	85%
Harrow	80%
Cultivator (4-row)	80%
Corn planter (4-row)	65%
Grain drill	70%
Combine	70%
Corn Picker	65%
Mower	80%
Raker	85%
Baler	65%
Chopper	65%
Sprayer	65%

The number of acres which can be covered in one hour with any field machine can be calculated from the following formula:

$$\frac{\text{Machine width in.} \times \text{Speed mph} \times \text{Field Efficiency}}{100} = \text{Acres per hr.}$$

Example: Plowing with a 5-bottom, 16-inch plow at 4.5 mph, with 85% field efficiency:

$$\frac{(5 \times 16) \times 4.5 \times .85}{100} = 3.06 \text{ Acres per hour}$$

mph = miles per hour.

Mich. State Univ. Ext. Coop. Service.
R. G. White--Information Series 100.

TABLE 41

COST OF REPAIRS AND MAINTENANCE SELECTED FARM MACHINES*

Machine	Repair and Maintenance Cost, Percent of New Cost, Average per 100 hours use**
Tillage Tools:	
Cultivator	6.0
Disk Harrow	6.5
Moldboard Plow	7.0
Springtooth Harrow	6.0
Planting Equipment:	
Grain Drill	8.0
Corn, Bean, or Beet Planter	7.0
Harvesting Equipment:	
Combine, small, pull-type	4.5
Combine, self-propelled	2.7
Corn Picker	4.2
Forage Harvester, auxiliary engine	2.4
Forage Harvester, power take-off	2.9
Forage Blower	2.5
Baler, auxiliary engine	2.2***
Baler, power take-off	3.1***
Hay Conditioner	4.0
Mower	12.0
Side Delivery Rake	7.0
Windrower, self-propelled	4.0
Sugar beet harvester	3.5
Tractors:	
Track type	0.65
Wheel type	1.0

*From the 1963 Agricultural Engineers Handbook.

**Repair and maintenance costs include daily servicing and lubrication of all machines except tractors. It does not include cost of fuel or engine oil.

***Does not include cost of twine or wire.

TABLE 42

CORN HANDLING

MATURE CORN (RIPE CORN)

Corn where the kernel moisture is 35% moisture or less before frost. Kernels continue to add dry matter until they drop to 35% moisture. Corn is considered to be mature after it has added all of the weight possible. Fifty per cent moisture corn is dented and in medium soft stage, but is not mature. A few hybrids will mature at 40% moisture but not many. Twelve to 16 days is required to mature corn from 50 to 40%. The yield increases at a rate of 1/2 to 3/4 a bushel per acre per day during this time.

RECOMMENDED STORAGE MOISTURES

High moisture shelled corn--ideal kernel moisture is 28%, the recommended range from 25 to 30%, and the limits are from 25 to 33%.

High moisture ear corn--ideal ear moisture is 32%, recommended range from 30 to 35% ear moisture, limits from 28 to 40%.

Ear corn (natural ventilation)--recommended kernel moisture 20%, limits up to 24% , 6-foot wide cribs or round cribs with 6 feet of corn, air to air space using at least a 2-foot cross sectional center duct.

Ear corn (forced air ventilation, unheated air)--recommended kernel moisture 24%, limits up to 30%.

Shelled corn, short-time storage--14% moisture or below.

Shelled corn, long-time storage--13% moisture or below.

Aeration should be provided for storages having over 3,000 bushels of shelled corn and are desirable in many storages above 1,500 bushels of shelled corn.

RULES OF THUMB FOR HARVESTING, DRYING, AND STORING CORN

1. Corn adds 1/2 to 3/4 of a bushel per acre per day when drying from 50 down to 40 or 35% moisture.
2. Mature corn with 35% moisture or less will dry in the field at the rate of approximately 1/2 point of moisture per day.
3. Harvesting losses are less when corn is harvested at higher moisture. Field losses increase at the rate of approximately 1 bushel per acre per day after the middle of October.
4. 20 kernels of corn in a 40" x 40" square equal a loss of 1 bushel per acre. One good sized ear of corn per 133 feet of row (43 paces) or in each 40 hills in 40-inch check row corn, equals 1 bushel per acre loss.
5. Ear moisture can be determined approximately by taking the kernel moisture and adding 5%. If the kernel checks 28% moisture, then the average ear moisture would be approximately 33%.
6. The cob is equal to approximately 20% by weight of the ear.
7. Market standards for No. 2 corn is 15.5% kernel moisture and 70 pounds per bushel--56 pounds of grain and 14 pounds of cob.

TABLE 42 continued

8. Standard 56-pound bushel of No. 2 shelled corn is made up of 47.3 pounds of dry matter and 8.7 pounds of water.
9. Removal of moisture from kernels takes place at temperatures 60° or above and at humidities of 70% or less. Almost no drying takes place when the temperature is 50° or below or the humidity of the air is 80%.
10. Increasing the air temperature 20° by heating will double its capacity to carry moisture and will cut the humidity approximately in half.
11. About .9 or 9/10 pound of water is removed for each percentage point that the corn is dried.
12. One bushel of ear corn equals 2 baskets and requires 2.5 cu. ft. of storage space. To find the number of bushels of ear corn in a crib, divide the number of cu. ft. by 2.5 or multiply by .4.
13. One bushel of shelled corn requires 1.25 cu. ft. To find the number of bushels, divide the number of cu. ft. by 1.25 or multiply by .8.
14. Crib volume in cubic feet.
 Rectangular cribs--length x width x height.
 Round cribs--radius (1/2 of diameter) x radius x 3.14 x height.
15. One ton of No. 2 ear corn = 28.57 bushels and requires 71.4 cu. ft. of storage space.
16. One ton of No. 2 shelled corn = 35.71 bushels and requires 44.64 cu. ft. of storage space.

Courtesy Mich. State Univ. Ext.
Service. R. L. Maddex--Information
Series 49.

TABLE 43

CRIB CAPACITIES IN BUSHELS FOR EAR CORN
PER FOOT OF LENGTH

Width in feet	Height in feet			
	8	10	12	14
5	16	20	24	28
6	19.2	24	28.8	33.6
8*	25.6	32	38.4	44.8

*Not recommended for Michigan Mich. State Univ. Coop. Ext. Service
R. L. Maddex

TABLE 44

TOTAL BUSHELS CAPACITIES, CRIBS 6 FEET WIDE

Height in feet	Length in feet							
	10	12	14	16	18	20	40	60
8	192	230	268	307	345	384	768	1152
10	240	288	336	384	432	480	960	1440
12	288	345	403	460	518	576	1152	1728
14	336	403	470	537	604	672	1344	2016

Mich. State Univ. Coop. Ext. Service
TABLE 45 R. L. Maddex

CAPACITY PER FOOT OF DEPTH FOR ROUND BINS AND WIRE CRIBS

<u>Diameter</u> feet	<u>Cubic feet</u>	<u>Small grain</u> bushels	<u>Ear Corn</u> bushels
8	50.2	40.1	20.1
10	78.5	62.8	31.4
12	113.0	90.4	45.2
14	153.9	123.1	61.5
16	201.0	160.8	80.4

Mich. State Univ. Coop. Ext. Service
R. L. Maddex

TABLE 46

CAPACITIES OF ROUND BINS AND WIRE CRIBS

Diameter	Height	Cu. ft.	Capacities	
			Small grain	Ear corn
feet	feet		bushels	bushels
8	6	301	241	120
8	8	400	320	160
8	10	502	400	200
10	8	628	502	251
10	10	785	628	314
10	12	942	753	376
12	10	1130	904	452
12	12	1356	1084	542
12	14	1582	1265	632
14	12	1846	1476	738
14	14	2154	1723	861
14	16	2462	1969	984
16	14	2814	2251	1125
16	16	3216	2572	1286
16	18	3618	2894	1447
16	20	4029	3216	1608

To find the capacity of a circular grain bin in bushels, multiply the radius ($\frac{1}{2}$ diameter) times the radius times 3.1416 times height times 0.8 for small grain and shelled corn.

For a circular crib, use 0.4 in place of 0.8 to find bushels of ear corn. (All measurements must be in feet).

Mich. State Univ. Coop. Ext. Service
R. L. Maddex

TABLE 47

CAPACITIES OF SQUARE GRAIN BINS

Size	Capacity per	Capacity of
	foot of depth	bin 10' deep
	bushels	bushels
5' x 5'	20	200
6' x 6'	28.8	288
8' x 8'	51.2	512
10' x 10'	80	800

To find the capacity of a square or rectangular grain bin in bushels, multiply length times width, times height, times 0.8. (All measurements must be in feet.)

Mich. State Univ. Coop. Ext. Service
R. L. Maddex

TABLE 48

WEIGHTS OF COMMODITIES AND MATERIALS:
GRAINS, FEEDS AND SEEDS

Commodity	Common measure	Weight, pounds	Pounds per cu. ft.
Alfalfa meal	Bushel	19	15.2
Alfalfa seed	Bushel	60	48
Barley	Bushel	48	38.4
Blue grass seed	Bushel	14	11.2
Brome grass seed	Bushel		
Buckwheat	Bushel	50	40
Buckwheat bran	Bushel	29	23.2
Castor beans	Bushel	46	36.8
Clover seed	Bushel	60	48
Corn (husked ear)	Bushel	70	28
Corn (shelled)	Bushel	56	44.8
Corn meal	Bushel	50	40
Corn and cob meal	Bushel	45	36
Cottonseed meal	Bushel	48	38.4
Cotton seed	Bushel	33	26.4
Field beans			
(navy and kidney)	Bushel	60	48
Flax seed	Bushel	56	44.8
Linseed meal	Bushel	29	23.2
Millet seed	Bushel	50	40
Molasses	Barrel	650	
Oats (whole)	Bushel	32	25.6
Oats (ground)	Bushel	22	17.6
Rye	Bushel	56	44.8
Soybeans	Bushel	60	48
Soybean oil meal	Bushel		
Timothy seed	Bushel	45	36
Vetch	Bushel		
Wheat	Bushel	60	48
Wheat bran	Bushel	16	12.8

Mich. State Univ. Coop. Ext. Service
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TABLE 49

WEIGHTS OF COMMODITIES AND MATERIALS:
BUILDING AND OTHER MATERIALS

Commodity	Common Measure	Weight	Pounds per cu. ft.
Brick	1,000	2.7 tons	
Cement	Barrel (4 bags)	376 lb.	99
Coal	Ton	2,000 lb.	
Coal	Bushel	80 lb.	64
Cotton	Bale	500 lb.	
Cream	Gallon	8.4 lb.	62.9
Eggs	30-dozen crate	55-60 lb.	
Ice	Cubic foot		56
Kerosene	Barrel	385 lb.	
Lime	Barrel	320 lb.	
Lime	Bushel	75 lb.	60
Linseed Oil	Barrel	400 lb.	
Milk	Gallon	8.6 lb.	64.4
Milk	46.5 quarts	100 lb.	
Oil (fuel)	Barrel (42 gal.)	336 lb.	
Oil (fuel)	Gallon	8 lb.	
Salt	Barrel	280 lb.	
Sugar	Barrel	350 lb.	
Turpentine	Barrel	432 lb.	
Turpentine	Gallon	7.2 lb.	53.9
Vinegar	Barrel	400-500 lb.	
Water	Gallon	8.33 lb.	62.5

Mich. State Univ. Coop. Ext. Service
R. L. Maddex

TABLE 50

WEIGHTS OF COMMODITIES AND MATERIALS:
FRUITS AND VEGETABLES

Commodity	Common Measure	Weight, pounds	Pounds per cu. ft.
Apples	Northwest box (10½ by 11½ by 18)	44	38
	Eastern box (11 by 13 by 17)	54	
	Bushel	48	
Beets	Bushel	60	48
Carrots	Bushel	50	40
Onions	Bushel	57	45.6
Peaches	Bushel	48	36.4
Pears	Bushel	50	40
Peas	Bushel	60	48
Potatoes (Irish)	Bushel	60	48
Potatoes (sweet)	Bushel	50	40
Tomatoes	Bushel	60	48
Turnips	Bushel	55	44
Cherries	Box (3 ¾ by 11½ by 14 1/8)	15	
	Bushel	64	51

Mich. State Univ. Coop. Ext. Service
R. L. Maddex

TABLE 51

APPROXIMATE WEIGHTS PER GALLON OF MILK AND CREAM
AT VARIOUS TEMPERATURES

Degrees F.	40 lbs.	60 lbs.	80 lbs.	100 lbs.	120 lbs.	140 lbs.
Skim Milk	8.660	8.640	8.620	8.580	8.530	8.480
4 % Milk	8.610	8.590	8.565	8.520	8.475	8.430
20% Cream	8.540	8.480	8.420	8.370	8.325	8.280
25% Cream	8.500	8.435	8.370	8.310	8.270	8.230
30% Cream	8.470	8.390	8.315	8.250	8.205	8.160
35% Cream	8.450	8.350	8.270	8.200	8.155	8.110
40% Cream	8.420	8.320	8.230	8.150	8.100	8.050

Courtesy De Laval Co.

TABLE 52

SPACE REQUIRED FOR BEEF CATTLE

	Feed Bunk Length	Height	Self Feeders Length	Height	Shelter Space	Paved lot area in addition to shelter
Calves	18"	24"	6-8"	24"	20 sq.ft.	20 sq.ft.
Yearlings	18"	30"	10-12"	30"	35 sq.ft.	30 sq.ft.
2-year-olds	18"	30"	14-16"	30"	45 sq.ft.	40 sq.ft.

Courtesy De Laval Co.

TABLE 53

SAFE BEAM LOAD, UNIFORMLY DISTRIBUTED LOADING

Size of Beam (Wood)*	Span in Feet					
	6	8	10	12	14	16
(inches)	(load in pounds)					
10 x 12	23,200	23,200	20,800	17,350	14,950	13,000
8 x 12	18,560	18,560	16,640	13,880	11,960	10,400
6 x 12	13,920	13,920	12,480	10,410	8,970	7,800
4 x 12	9,280	9,280	8,320	6,940	5,980	5,200
10 x 10	19,500	18,250	14,600	12,100	10,300	9,000
8 x 10	15,440	14,600	11,680	9,700	8,240	7,200
6 x 10	11,580	10,950	8,760	7,280	6,180	5,400
8 x 8	12,320	9,200	7,400	6,160	5,280	4,600
6 x 8	9,240	6,900	5,550	4,620	3,960	3,450

Courtesy Mich. State Univ. Coop. Ext. Service
Circ. 743

*No. 1 Commercial Grade

TABLE 54

SAFE JOIST LOADS, UNIFORMLY DISTRIBUTED LOADING

Size of Joist* in Inches	Span In Feet					
	6	8	10	12	14	16
2 x 12	4640	4640	4160	3470	2990	2600
2 x 10	3860	3650	2920	2420	2060	1800
2 x 8	3080	2300	1850	1540	1320	1150
2 x 6	1730	1300	1040	860	740	
2 x 4	770	578	462	385		

Courtesy Mich. State Univ. Coop. Ext. Service

*No. 1 Commercial Grade or
full dimension home grown lumber.

Circ. 743

TABLE 55
SAFE LOADS ON SOLID WOOD COLUMNS. (thousands of pounds)

Nominal Column Size (inches)	Cross Sectional Area (sq. inches)	UNSUPPORTED LENGTH IN FEET									
		6		8		10		12		14	
		A	B	A	B	A	B	A	B	A	B
4 x 4	13.14	17.0	12.6	9.6	7.0	6.1	5.5	4.2	3.2	3.1	2.3
4 x 6	20.39	26.4	19.6	14.9	10.9	9.5	7.1	6.6	4.9	4.9	3.6
4 x 8	27.19	35.2	26.1	19.8	14.5	12.7	9.4	8.8	6.6	6.4	4.8
6 x 6	30.25	40.4	29.1	40.4	29.1	35.2	25.5	23.6	17.7	17.4	13.0
6 x 8	41.25	55.1	39.7	55.1	39.7	46.6	34.8	32.2	24.1	23.6	17.7
6 x 10	52.25	69.8	50.3	69.8	50.3	60.7	44.0	40.8	30.5	30.0	22.4
6 x 12	63.25	84.5	60.9	84.5	60.9	73.5	53.4	49.4	37.0	36.3	27.1
8 x 8	56.25	75.1	54.1	75.1	54.1	75.1	54.1	75.1	54.1	62.2	42.7
8 x 10	71.25	95.1	68.5	95.1	68.5	95.1	68.5	95.1	68.5	79.4	54.1
8 x 12	86.25	115.2	83.0	115.2	83.0	115.2	83.0	115.2	83.0	96.2	65.5
10 x 10	90.25	120.5	86.6	120.5	86.6	120.5	86.6	120.5	86.6	120.5	86.6
10 x 12	109.25	146.0	105.0	146.0	105.0	146.0	105.0	146.0	105.0	146.0	105.0
12 x 12	132.25	176.7	127.0	176.7	127.0	176.0	127.0	176.0	127.0	176.7	127.0

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A Heavy wood, e.g., dark fir; elm; oak
B Light wood, e.g., white fir; pine; spruce

Courtesy Mich. State Univ. Coop. Ext. Service
Circ. 743

TABLE 56
STUD SPACING FOR BINS HOLDING SMALL GRAINS

Size of Studs (in inches)	Spacing center to center	Length of Stud	Depth of Grain
	inches	feet	feet
2 x 4	24	8	5
2 x 4	16	8	6
2 x 4	12	8	7½
2 x 6	24	8	8
2 x 6	16	10	9
2 x 6	12	10	10

Courtesy Mich. State Univ. Coop. Ext.
Service. R. L. Maddex

TABLE 57
GRAIN DEPTHS CARRIED BY DIFFERENT SIZES
OF JOISTS--24-INCH SPACING
(Grain can be twice as deep if joists
are spaced only 12 inches apart.)

Size of Joist (inches)	Depth of Grain for--			
	6-foot joist	8-foot joist	10-foot joist	12-foot joist
Joists Supported at Ends Only				
2 x 6	3½ ft.	---	---	---
2 x 8	5	3½ ft.	---	---
2 x 10	6	4½	3½ ft.	---
2 x 12	7½	5½	4½	3½ ft.
Joists Supported at Each End and at Center				
2 x 4	3½ ft.	---	---	---
2 x 6	6	4½ ft.	3½ ft.	3 ft.
2 x 8	8	6	4½	4
2 x 10	10	7½	6	5
2 x 12	12	9	7	6

Courtesy Mich. State Univ. Coop. Ext.
Service. R. L. Maddex

TABLE 58
PIPE COLUMNS

Size		Allowable load (thousands of pounds)				
Diameter (inches)	Weight (pounds per foot)	Unbraced length (feet)				
		6	8	10	12	14
3	7.58	33.0	30.0	26.0	21.0	18.0
4	10.79	50.0	47.0	44.0	40.0	34.0
5	14.62	70.0	68.0	64.0	61.0	56.0
6	18.97	92.0	90.0	86.0	82.0	79.0
8	24.70	121.0	120.0	118.0	115.0	112.0

Courtesy Mich. State Univ. Coop. Ext. Service. Circ. 737
TABLE 59

WEIGHT OF COMMON MATERIALS STORED IN FARM BUILDINGS

Material	Pounds per cubic foot	Material	Pounds per cubic foot
Barley	39	Baled Hay	8
Corn, ear	28	Chopped Hay	8
Corn, shelled	45	Long Hay	4 to 5
Oats	26	Potatoes	46
Rye	45	Apples	38
Pea Beans	48		
Soy Beans	48	Driveways- up to 10-ton load limit;	
Wheat	48	150 lbs. per square foot of floor	
		area.	

Courtesy Mich. State Univ. Coop. Ext. Service
Circ. 743

TABLE 60
AMERICAN STANDARD I BEAMS

Allowable load in thousands of pounds for beams laterally supported										
Beam size (inches)	Weight (pounds per foot)	Length of Span (feet)								
		6	8	10	11	12	13	14	15	16
4	7.7	6.7	5.0							
	9.5	7.3	5.5							
5	10.0	10.7	8.0	6.4	5.8					
	14.75	13.3	10.0	8.0	7.3					
6	12.50	16.2	12.2	9.7	8.8					
	17.25	19.3	14.5	11.6	10.5					
7	15.3	23.0	17.3	13.9	12.6	11.6	10.7	9.9	9.2	
	20.0	27.0	20.0	16.0	14.5	13.3	12.3	11.4	10.7	
8	18.4	32.0	24.0	18.9	17.2	15.8	14.6	13.5	12.6	11.8
	23.0	36.0	27.0	21.0	19.4	17.8	16.4	15.2	14.2	13.3
10	25.4	54.0	41.0	33.0	30.0	27.0	25.0	23.0	22.0	20.0
	35.0	65.0	49.0	39.0	35.0	32.0	30.0	28.0	26.0	24.0
12	31.8	80.0	60.0	48.0	44.0	40.0	37.0	34.0	32.0	30.0
	35.0	84.0	63.0	50.0	46.0	42.0	39.0	36.0	34.0	32.0

Beams must be set so they cannot tip sideways when the load is applied.

Courtesy Mich. State Univ. Coop. Ext. Service
Circ. 737

TABLE 61
 AMERICAN STANDARD I COLUMNS

Size		Allowable load (thousands of pounds)				
Depth (inches)	Weight (pounds per foot)	Unbraced length (feet)				
		5	6	7	8	9
3	5.7	18	13.4	9.9	7.3	
	7.5	23	17.2	12.6	9.1	
4	7.7	26	22.0	16.6	12.7	9.5
	9.5	33	26.0	20.0	15.2	11.4
5	10.0	37	32.0	26.0	20.0	15.3
	14.75	54	46.0	36.0	28.0	22.0
6	12.5	49	44.0	38.0	31.0	25.0
	17.25	66	58.0	48.0	38.0	31.0

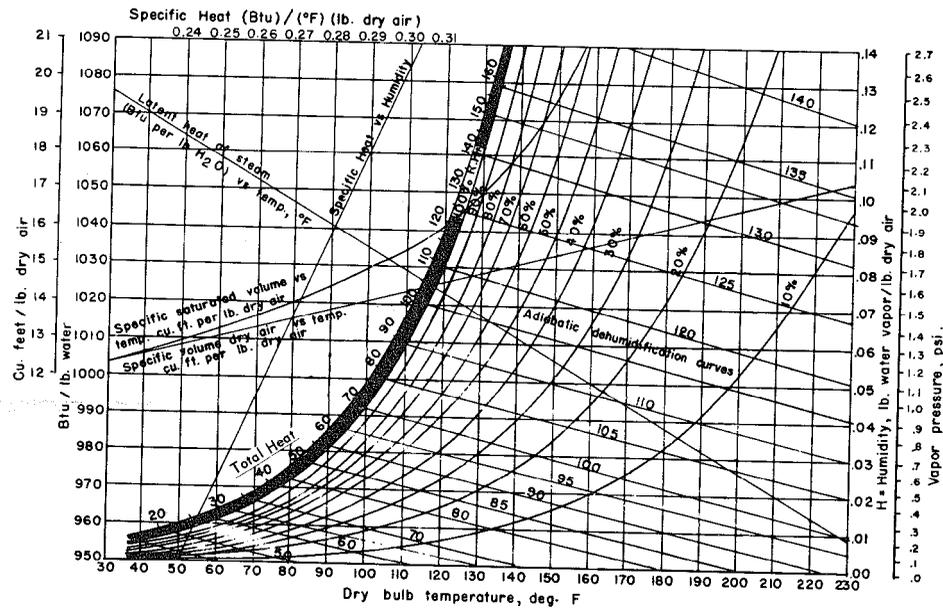
Courtesy Mich. State Univ. Coop. Ext. Service. Circ. 737

TABLE 62
 CONDITION OF HAY AT VARIOUS MOISTURE CONTENTS

Per Cent Moisture Wet Basis	Condition
75	Freshly cut
50	Wilted, very heavy to handle
40	Heavy to handle
35	Handles like hay
32.5	Leaves still hang on
30	Tough, leaves rattle
27.5	Would heat in ordinary storage
25	Slightly tough, leaves shatter
20	Right for baling

From M.S.U. Circular Bul. 219 Agr. Exp. Station, by Sheldon, Wiant, Kleis and Dexter.

TABLE 63
PSYCHROMETRIC CHART



Courtesy, Carl W. Hall, Drying Farm Crops, Edwards Brothers,
Ann Arbor, Mich. Pg. 275, 1957

Selected Books for Further Reading on Agricultural Engineering

1. Anderson and Heyer, Wood-Frame House Construction Handbook 73, USDA.
2. Bainer, Roy, et al., Principles of Farm Machinery, John Wiley and Sons Publishing Company.
3. Barre, Henry J. and L. L. Sammet, Farm Structures, John Wiley and Sons Publishing Company.
4. Brown, Robert H., Farm Electrification, McGraw-Hill Publishing Company.
5. Carter, Deane G., Farm Buildings, John Wiley and Sons Publishing Company.
6. Cook, Scranton and McColly, Farm Mechanics, Interstate Printers and Publishers.
7. Farrall, A. W., Engineering for Dairy and Food Products, John Wiley and Sons Inc.
8. Gray, Harold E., Farm Service Buildings, McGraw-Hill Publishing Company.
9. Hall, C. W., Agricultural Engineering Index, Edwards Brothers.
10. Hall, C. W., Processing Equipment for Agricultural Products, Edwards Brothers, Ann Arbor.
11. Henderson, S. M. and Perry, R. L., Agricultural Process Engineering, John Wiley and Sons Inc.
12. Hinton, Truman E., Wiant, D. E., and Brown, O. A., Electricity in Agricultural Engineering, John Wiley and Sons Publishing Company.
13. Israelsen, O. W., Irrigation Principles and Practices, 3rd edition, John Wiley and Sons Inc.
14. Jones, M. M., Shop Work on the Farm, McGraw-Hill Publishing Company.
15. McColly and Martin, Introduction to Agricultural Engineering, McGraw-Hill Book Company.
16. Moses, Ben D., and Frost, Kenneth R., Farm Power, John Wiley and Sons Inc.
17. Phipps, Lloyd James, McColly, H. F., Scranton, L. L., and Cook, G. C., Farm Mechanics Text and Handbook, The Interstate Printers & Publishers.
18. Richter, H. P., Wiring Simplified, Park Publishing Company.
19. Schwab, Glen O., et al., Elementary Soil and Water Engineering, John Wiley and Sons Inc.
20. Smith, H. P., Farm Machinery and Equipment, McGraw-Hill Publishing Company.

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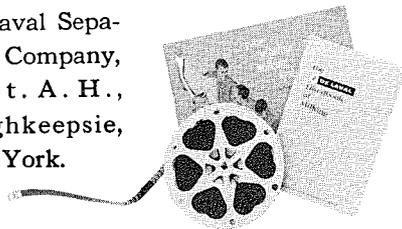


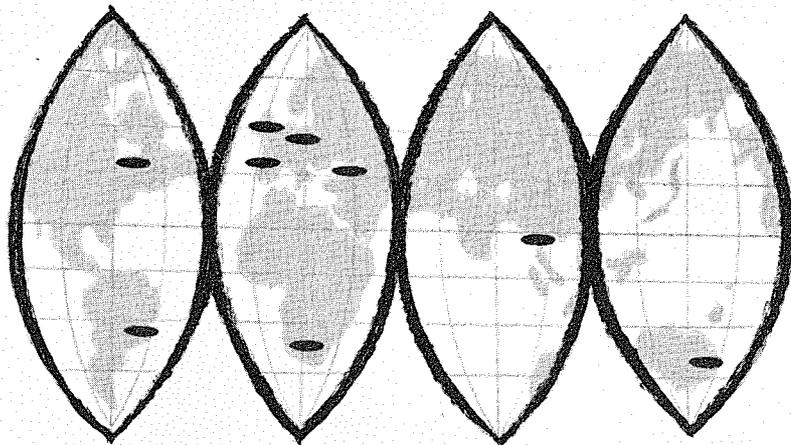
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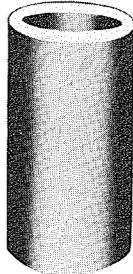
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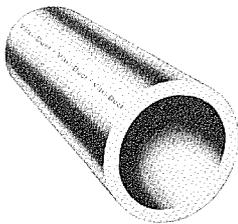
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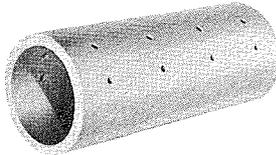
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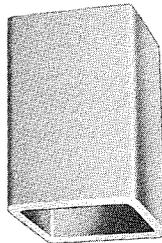
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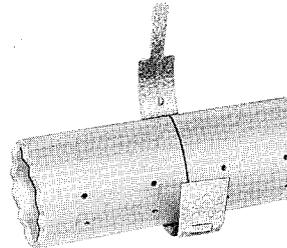
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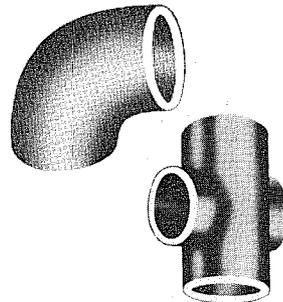
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