

**Case No. 626.** ATLANTIC GIANT POWDER CO. V. RAND ET AL.  
[16 Blatchf. 250; 4 Ban. & A. 263; 16 O.G. 87; Merw. Pat. Inv. 173]<sup>1</sup>

Circuit Court, S. D. New York.

May 5, 1879.

PATENTS                      FOB                      INVENTIONS—WHAT                      CONSTITUTES  
INFINOMENT—REISSUE—GIANT POWDER—PBIOP PATENT.

1. The reissued letters patent, No. 5,799, granted to the Giant Powder Company, March 17th, 1874, for 17 years from the 26th of May, 1868, for an “improved explosive compound, (the original patent having been granted to Julius Bandmann, as assignee of Alfred Nobel, as inventor, as No. 78,317, May 26th, 1868.) are valid.

{See note at end of case.}

2. The claim of said patent, namely, “The combination of nitro-glycerine with infusorial earth, or other equivalent absorbent substance, as a new explosive compound,” is infringed by an explosive compound known as “rendrock powder,” and containing, in 100 parts by weight, 34.71 parts of nitro-glycerine, 52.68 parts of nitrate of potash, 5.84 parts of sulphur and 6.77 parts of woody fibre, charcoal and resin, in nearly equal proportions. Said reissued patent is not for a different invention from the said original patent. The specifications of the original and the reissue examined and compared.

{See note at end of case.}

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3. Where a defendant has always been notified that it was claimed he infringed, and has not been misled, by any action of the plaintiff, into making investments, and has no peculiar equity as against the plaintiff, an injunction will not be withheld because the plaintiff, having sued the defendant for infringement, permitted the suit to rest until a recovery was had on the patent in other suits, and then discontinued it and brought a new suit against the defendant.
4. A description in a prior patent, to invalidate a subsequent patent, must show how the article can be certainly made, and its making must be the result of directions in the description, and not of accident.

[Cited in Atlantic Giant Powder Co. v. Parker, Case No. 625: Atlantic Giant Powder Co. v. Dittmar Powder Manuf'g Co., 1 Fed. 328.]

[In equity. Bill by the Atlantic Giant Powder Company against Jasper R. Rand and others for a preliminary injunction restraining the infringement of reissue No. 5,799, of patent No. 78,317. Injunction granted.]

George Gifford and Causten Browne, for plaintiff.

Edward N. Dickerson and Charles C. Beaman, Jr., for defendants.

BLATCHFORD, Circuit Judge. This is an application for a preliminary injunction, founded on reissued letters patent, No. 5,799, granted to the Giant Powder Company, March 17th, 1874, for 17 years from the 26th of May, 1868. The original patent was granted to Julius Bandmann, as assignee of Alfred Nobel, of Hamburg, Germany, the inventor, as No. 78,317, May 26th, 1868. Bandmann assigned the patent to the Giant Powder Company, and it was reissued to them October 21st, 1873, as No. 5,019. On the surrender of No. 5,619, reissue No. 5,799 was granted. The plaintiff is the owner of No. 5,799 for all the States and territories of the United States which lie east of the easterly boundary lines of the territories of Montana, Wyoming, Colorado, and New Mexico. The application for No. 5,799 was filed March 11th, 1874. The specification of No. 5,799 is signed by the Giant Powder Company. It begins by setting forth that Nobel invented "an improved explosive compound, of which the following is a specification." It then proceeds: "This invention relates to a new and useful combination or mixture of nitro-glycerine with some absorbent substance, whereby the condition of the nitro-glycerine is so modified as to render the resulting explosive compound more practically useful and effective as an explosive, and far more safe and convenient for handling, storage, and transportation, than nitro-glycerine in its ordinary condition as a liquid. The invention consists in combining or mixing with nitro-glycerine some porous or absorbent substance, which, being free from any quality which will cause it to decompose, destroy or injure the nitro-glycerine, forms, in combination with it, an explosive compound possessing certain marked properties of great practical utility, which not only increases Its efficiency, but also obviates many of the serious practical objections to the employment of nitro-glycerine as an explosive. Some of these peculiar properties of this mixture will be briefly stated. Nitro-glycerine being a liquid, It is usually necessary, in exploding it as an explosive for blasting purposes, to place it in cases or cartridges formed of paper, metal or other substance, which must, of

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course, be of somewhat smaller diameter than the bore holes, as, if not so inclosed, the nitro-glycerine would permeate the seams of the rock, and prove highly dangerous to the miner, on account of its liability to explode in subsequent drillings; but, by means of this invention the nitro-glycerine, being held in combination with the porous or absorbent substance with which it is mixed, and then assuming the altered form of a powder or paste, remains in the bore hole in which it is placed, without leaking through the seams of the rock. Another advantage over liquid nitro-glycerine is, that this mixture can be made to fill the bore hole more closely than a cartridge case will, owing to the irregularities of the shape of the hole, which greatly increases its efficiency. The liability of fluid nitro-glycerine to accidental explosion from agitation or concussion, renders its handling and transportation very dangerous. This danger is, however, almost entirely obviated by the use of the compound described in this specification, because, when mixed with a suitable absorbent, the nitro-glycerine is far less sensitive to shocks than when in a liquid condition, so that it may be handled in mass, either loose or in packages, with impunity. So much is this the case, that, when this mixture is packed in a wooden case or box. the inclosure may be knocked to pieces without danger of exploding its contents. This invention, then, consists in mixing liquid nitroglycerine with some solid (as distinguished from liquid or fluid) substance, which will absorb and retain a sufficient amount of nitro-glycerine to form an efficient explosive. The substance which is believed to be best adapted for this purpose, is a kind of silicious earth, found in various parts of the globe, and known by the various names of silicious marl, tripoli and rotten stone. The peculiar variety of this material best suited for this use is homogeneous, has a large specific gravity and great absorbent capacity, and is generally composed of the remains of infusoria. So great is the absorbent capacity of this infusorial earth, that, when in a pulverized condition, it will take up about three times its own weight of liquid nitro-glycerine, and still retain the form of a powder. Other porous substances, even though they have less absorbent capacity, may be used; but, in this case, the explosive strength of the powder will be diminished, owing to the smaller proportion of nitroglycerine

contained therein. Chalk, for example, will absorb about fifteen per cent of nitro-glycerine and retain its powdered condition; and porous charcoal, although of greater absorbent capacity, has less elasticity of particles, so that nitro-glycerine is apt to squeeze out of it. Any of the various vegetable or mineral substances susceptible of pulverization or comminution, and which will retain nitro-glycerine by absorption, may be substituted for infusorial earth. The relative proportion of the ingredients used in making this new explosive compound will vary according to the absorbent capacity of the substance mixed with the nitro-glycerine, it being preferable in all cases—and this is the only limit—to use so much only of the liquid nitro-glycerine as the absorbent substance will retain without liability to subsequent separation by compression or leakage. Where the absorbent used in a powdered condition is infusorial earth, a thin paste or semifluid condition of the mixture is to be avoided. The method of making this new explosive compound with infusorial earth is as follows: The earth being first thoroughly dried and pulverized, is placed in any suitable vessel, and the nitro-glycerine is then gradually introduced and thoroughly mixed with the powdered earth, which is effected either by stirring with the naked hand or by means of any suitable wooden instrument, worked either by machinery or by hand. Where infusorial earth is used, the proportions may be conveniently varied, from sixty parts, by weight, of liquid nitro-glycerine, and forty parts, by weight, of infusorial earth, to seventy-eight parts, by weight, of nitro-glycerine, and twenty-two parts, by weight, of infusorial earth, the former proportions forming, at ordinary temperatures, a dry, pulverulent mass, and the latter a pasty mixture. These proportions may, however, be varied outside of the limits above stated, it being observed, that the explosive force of the mixture is increased where a larger proportion of nitroglycerine is employed, and that, when the mixture is to be used in a cold climate, a larger quantity of nitro-glycerine may be safely employed than when it is to be exposed to a warmer atmosphere. For ordinary practical purposes, a mixture of seventy-five parts, by weight, of nitro-glycerine, and twenty-five parts, by weight, of infusorial earth, gives a powder sufficiently dry at ordinary temperatures, and which is susceptible of compression to a specific gravity nearly equal to that of pure nitro-glycerine. When the ingredients have been intimately mixed and thoroughly incorporated, by stirring and kneading, the compound may be rubbed through a sieve made of hair, silk or brass wire, and any lumps which remain may be powdered by rubbing them through the sieve with a “stiff bristle brush. The powder is then ready for use, and may be packed in bulk in boxes, or compressed into cartridge cases made of paper, of such convenient sizes as may be most in demand for blasting purposes. A greater or less degree of fineness of grain may be given to the powder by using a fine or coarse sieve. In using this improved explosive compound for blasting, it may be inserted into cartridge cases, as above stated, or without any inclosure or wrapping, as may be preferred. For the best effect, it should be pressed firmly down so as to fill the bore hole, whether in cartridge or not, a small quanti-

ty at a time, with a wooden rod, until it is firmly packed. If the cartridges are smaller than the bore, the pressure will burst them, and allow the powder to spread laterally and fill the bore. It may be easily and efficiently exploded by means of an ordinary blasting fuse inserted into the open end of a percussion cap, the metallic edges of the cap being compressed or crimped tightly and firmly around the fuse, so as to hold it in place, with the end of the fuse in close contact with the fulminate in the percussion cap. The capped end of the fuse is then inserted into the explosive powder, which is pressed closely around it in the bore hole, and a tamping of sand or other suitable material may be placed above the charge of powder, and pressed down upon it. The fuse thus applied is fired in the ordinary manner, and, when the fire reaches the percussion cap, it explodes, which effects the immediate explosion of the charge of explosive compound. It is better to use a percussion cap having a heavy charge of fulminate, in order to insure an explosion of the powder, although, under favorable circumstances, it might be exploded with an ordinary fuse, without any cap; but this method is too uncertain to be relied upon. For ordinary blasting, the bore holes may be about one-half the size, and the charge of explosive compound about one-fifth the quantity, that would be made use of when gunpowder is used as the explosive." The claim is in these words: "The combination of nitro-glycerine with infusorial earth, or other equivalent absorbent substance, as a new explosive compound."

The infringement complained of is the making and selling by the defendants of an explosive compound known as "rendrock powder," and which, by analysis, contains in one hundred parts, by weight, the following ingredients in the following quantities: nitro-glycerine, 34.71 parts; nitrate of potash, 52.68 parts; sulphur, 5.84 parts; woody fibre, charcoal and resin, in nearly equal proportions, 6.77 parts. Mr. Hayes, the chemist who made such analyses, testifies, that the solid ingredients found in such powder constitute together an absorbent substance which is the equivalent of the infusorial earth mentioned in the plaintiff's patent; that such powder is a combination of nitro-glycerine with such absorbent substance, in substantially the same manner as the combination of nitro-glycerine and infusorial

earth specifically mentioned in said patent; that said solid ingredients have the property of absorbing and retaining by absorption nitro-glycerine, and are free from any quality which will cause them to decompose, destroy or injure nitro-glycerine; that the nitro-glycerine is combined with such solid ingredients in such proportions as to be retained without liability to separation by compression or leakage; that such solid ingredients are not liable to explode by concussion, as nitro-glycerine is; that the entire combination constitutes a safety powder, which can undergo the ordinary shocks of transportation and manipulation without explosion; that the nitro-glycerine therein is explosible, in blasting operations, by the means ordinarily employed for exploding nitro-glycerine; that, while the mixture is in the form of a powder, the nitro glycerine remains so compact and concentrated as to have its original explosive power; that he has been unable to separate the carbonaceous woody fibre and the resin from the charcoal, so as to determine their percentage proportions with accuracy, but that they are not materially different from charcoal, as constituents of the powder; and that they each have all the properties which the other solid ingredients of the powder have, as above described, for the purposes of performing the office of infusorial earth in the mixture. These averments in respect to the rendrock powder are not controverted by the defendants.

The rendrock made by the defendants is a composition of nitro-glycerine with an explosive substance, but it was admitted, on the hearing, by the counsel for the defendants, that the claim of the plaintiff's patent includes a mixture of nitro-glycerine with an explosive substance, as well as a mixture of nitro-glycerine with an inexplusive substance. It is very plain, therefore, that the claim of the plaintiff's patent covers the defendants' powder.

It is insisted, however, by the defendants, that the cause [course] of litigation between the parties, in regard to the rendrock powder and the patent No. 5,709, has been such that the plaintiffs are not now entitled to a preliminary injunction. The view urged is, that the plaintiffs, owning No. 5,799, and also owning a reissued patent No. 4,818, brought a suit in equity in this court on both them, in 1874, against these defendants, for making this rendrock powder; that the plaintiffs took proofs in that suit to show that the rendrock powder, as a mixture of nitroglycerine with an explosive substance, infringed No. 4,818; that they gave no evidence to show that it infringed No. 5,799; that they subsequently notified the defendants that they need not, until further notice, put in proofs in that case; that they then brought and prosecuted suits on No. 5,799, in another court; and that, having been successful in those suits, they discontinued the first suit against the defendants, and brought the present one on No. 5,799 alone. It is urged that this course of action deprives the plaintiffs of the right to ask, in this suit, for a preliminary injunction. The answer to this contention is, that the defendants appear to have been always notified, by the existence of the first suit against them, and by the suit in Massachusetts against Goodyear, [Case No. 623,] that the plaintiffs claimed that powders like the rendrock powder in-

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fringed No. 5,799. There is nothing to show that the defendants were misled into making investments by any action of the plaintiffs, or that they have any peculiar equity, as against the plaintiffs, to be allowed to continue to infringe the patent until a final hearing, while preliminary injunctions are granted against others making like powders.

It is urged by the defendants that the reissued patent NO. 5,799 is for a different invention from the original, No. 78,317, and is, therefore, invalid. The specification of No. 78,317 says that the invention is "a new and useful composition of matter, to wit, an explosive powder." It proceeds: "The nature of the invention consists in forming out of two ingredients long known, viz.: the explosive substance, nitro-glycerine, and an inexplusive porous substance hereafter specified, a composition which, without losing the great explosive power of nitro-glycerine, is very much altered as to its explosive and other properties, being far more safe and convenient for transportation, storage and use than nitro-glycerine. In general terms, my invention consists in mixing with nitroglycerine a substance which possesses a very great absorbent capacity, and which, at the same time, is free from any quality which will decompose, destroy or injure the nitroglycerine or its explosiveness. It is undoubtedly true, as a general rule, that nitro-glycerine, when mixed with another substance, possesses less concentration of power than when used alone; but, while the safety of the miner, (to prevent leakage into seams in the rock,) prohibits the use of nitro-glycerine without cartridges, which latter must, of course, be somewhat less in diameter than the bore holes which are to contain them, the powder herein described can be made to form a semi-pasty mass, which yields to the slightest pressure, and thus can be made to fill up the bore hole entirely. Practically, therefore, the miner will have as much nitro-glycerine in the same height of bore hole with this powder as with nitro-glycerine in its pure state. This is the real character and purpose of my invention, and, in order to enable others skilled in the art to which it appertains, or with which it is most nearly connected, to make, compound and use the same, I will proceed to describe the same, and also the manner and process of making, compounding and using it, in full, clear and exact terms. The substance which most fully meets the requirements above mentioned,

so far as I know or have been able to ascertain from numerous experiments, is a certain kind of silicious earth or silicic acid found in various parts of the globe, and known under the several names of silicious marl, tripoli, rotten stone, &c. The particular variety of this material which is best for my compound is homogeneous, has a low specific gravity, great absorbent capacity, and is generally composed of the remains of infusoria. So great is the absorbent capacity of this earth that it will take up about three times its own weight of nitro-glycerine, and still retain its powder form, thus leaving the nitro-glycerine so compact and concentrated as to have very nearly its original explosive power; whereas, if another substance having a less absorbent capacity is used, a correspondingly less proportion of nitro-glycerine will, be absorbed, and the powder will be correspondingly weak or wholly inexplusive. For example, most chalk will take but about fifteen per cent, of nitroglycerine and retain its powder form; twenty per cent, will reduce it to a paste. Porous charcoal has also a considerable absorbent capacity, but it has the defect of being itself a combustible material, and also of less elasticity of its particles, which renders it easy to squeeze out a part of its nitro-glycerine. The two materials are combined in the following manner: The earth, thoroughly dried and pulverized, is placed in a wooden vessel. To it is introduced the nitro-glycerine in a steady stream, so small that the two ingredients can be kept thoroughly mixed. The mixing may be effected by the naked hand, or by any proper wooden instrument used in the hand, or by wooden machinery. Sufficient of nitro-glycerine should be used to render the compound explosive, but not so much as to change its form of powder to a liquid or pasty consistency. Practically, about sixty parts, by weight, of nitro-glycerine to forty of earth forms the useful minimum, and seventy-eight parts, by weight, of nitro-glycerine to twenty-two of earth, the useful maximum of explosive power. The former has a perfectly dry appearance; the latter is pasty. Between these two extremes the composition will be explosive powder, and it will be more easily exploded, and its explosive power greater, as the relative proportion of the nitro-glycerine is greater. The proportions, by weight, of seventy-five of nitro-glycerine to twenty-five of earth gives a powder as well adapted to ordinary practical purposes as that from any proportions I am now able to name, and can be easily compressed to a specific gravity nearly equal to that of pure nitro-glycerine. "When the mass has been intimately mixed and thoroughly incorporated by stirring and kneading, it is rubbed through a hair, silk or brass wire sieve, (Iron corrodes,) and any lumps which may remain are rubbed with a stiff bristle brush till they are reduced and made to pass the sieve. The powder is then finished and ready for use. The fineness desired for the powder will determine the fineness of the sieve to be used. The chief characteristic of this powder is its nearly perfect exemption from liability to accidental or involuntary explosion. It is far less sensitive than nitro-glycerine to concussion or percussion, and, contained in its usual packing, a wooden cask or box, the latter may be smashed completely to pieces without any danger of explosion. Unlike gun-



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powder in the open air or in ordinary packing, a wooden cask or box, it burns up, when set fire to, without exploding. It can, therefore, be handled, stored and transported with less danger than ordinary gunpowder. When confined in a tight and strong inclosure, it explodes by heat applied in any form when above the temperature of 360° Fahrenheit. Under all other circumstances, it may be exploded by some other explosion in it or into it. The most simple and certain method known to me of exploding it is as follows: The end of a common blasting fuse is inserted into a percussion cap, and the rim of the cap crimped tightly and firmly about the fuse by nippers or other means, so as to leave the fulminating powder of the cap and the end of the fuse tightly and firmly inclosed together. The end of the fuse with the cap attached is then imbedded in the powder, the more firmly the more certain the explosion. In blasting, the powder is pressed tightly about the cap and fuse, and tamping of sand, or other proper material, added and pressed, but not pounded in. A tamping firmly pressed is as good as if rammed in the most solid manner. The fuse explodes the cap and this explosion explodes the powder. I will here add, that, by carefully packing the end of a good fuse amid the powder of a charge inclosed, like a blasting charge, in a tight place, the fuse alone will explode the powder, especially if the powder is strongly charged with nitroglycerine; but this method of explosion requires too much care, and is too uncertain, to be depended upon or generally used. As before stated, the more strongly the powder is charged with nitro-glycerine the more easily it explodes. If, therefore, the powder contains a low proportion of nitro-glycerine, it is necessary to employ in its explosion a correspondingly long, strong and heavily charged percussion cap, made especially for the purpose. For the sake of certainty of explosion, it is better to use such a cap in all cases. If the fire from the fuse comes in contact with the powder before the cap is exploded, (which is liable to occur if the fuse is leaky and the cap extends too far into the powder,) a portion of the powder will be burned before the explosion takes place. To guard against this, the cap should only be fairly inserted into the powder, and poor fuses wound next to the cap firmly with strong glued paper or hemp, or otherwise secured. The bore holes, as a practical but

not absolute rule, should be about one-half” the size, and the charge should be from one-fifth to one-tenth the quantity, ordinarily used in gunpowder blasting. A very convenient form in which to use the powder is to pack it firmly in cartridges of strong paper.” The claim is in these words: “The composition of matter made substantially of the ingredients and in the manner and for the purposes set forth.”

It is contended by the defendants that the invention set forth in No. 78,317 had for its declared object, the preparing of a solid composition of matter which should contain practically, in a given space, as much nitroglycerine as could be put into that space in a liquid state, whereby the force of the nitroglycerine would be preserved, while at the same time the inconvenience of using it as a liquid would be obviated; that No. 78,317 stated that to be the “real character and purpose” of the invention; and that No. 78,317 did not set forth that the inventor had in view, as an object, the safety character of the compound. It is urged that, in these respects, the reissue departs from the original: and that, as the claim in the original was a claim to the invention of a compound made substantially of the ingredients, and in the manner, and for the purposes set forth in the specification of the original, and the reissue claims broadly the combination of nitroglycerine with infusorial earth, or other equivalent absorbent substance, as a new explosive compound, ignoring the concentration feature as the character and purpose and essence of the invention, the original and the reissue are for different inventions, and not for the same invention, and so the reissue is invalid.

The specification of No. 78,317 sets out with declaring that the invention is of an explosive powder. This means a powder, as distinguished from a fluid mixture, and a powder which will explode. It states that the composition forming the powder is made of nitro-glycerine and infusorial earth; that nitro-glycerine is explosive, and infusorial earth is inexplusive; that, while the explosive power of nitro-glycerine is preserved in the composition, the composition is more safe and convenient for transportation, storage and use, than nitro-glycerine; that, in general terms, the invention consists in mixing with nitro-glycerine a substance which possesses a very great absorbent capacity, and yet will not injure the nitro-glycerine or its explosiveness; that, generally, the mixture of nitro-glycerine with another substance causes the nitro-glycerine in the mixture to possess less concentration of power than when it is not so mixed; that, while liquid nitro-glycerine must be used in cartridges, which must be less in diameter than the bore hole, this new powder can be made into a semi-pasty mass, and be used without cartridges, and so fill the bore hole entirely; and that thus, by using this new powder, the miner will have, in a bore hole of a given size, practically as much nitro-glycerine, notwithstanding he has in the hole the infusorial earth also, as if he used a cartridge with liquid nitro-glycerine. The specification then says that what has thus been stated is the real character and purpose of the invention. That is, that, by the mixture of the nitro-glycerine with the absorbent substance, the

explosive power of the former will be preserved and not injured, while the mixture will be more safe in use than the liquid nitro-glycerine, with the incidental result, that any loss of concentration of power in the nitro-glycerine, by mixing it with the other substance, will be compensated by the fact that the bore hole can be filled with the mixture while it could not be filled with liquid nitro-glycerine, and thus practically there will be the same quantity of nitro-glycerine in a given size of hole in one case as in the other. The specification then states, that the best substance to meet the above requirements is the infusorial earth, because it will take up about three times its own weight of nitro-glycerine, and yet retain its original powder form, so that, in four pounds of the mixture, there will be three pounds of nitro-glycerine, and that the latter will be so concentrated as to have very nearly its original explosive power; that, when a substance of less absorbent capacity than infusorial earth is used, a less proportion of nitro-glycerine will be absorbed, and the explosive power of the powder will be reduced; that, for example, most chalk will take but about 15 per cent, of nitro-glycerine and retain its powder form, while 20 per cent will reduce it to a paste; and that porous charcoal, while absorbent, is combustible and will suffer what it absorbs to leak out. These remarks show that the inventor contemplated the use, also, of a substance having less absorbent capacity than the infusorial earth, resulting in a mixture with a less proportion of nitro-glycerine, and with a less explosive power than the mixture in which infusorial earth is used; and that the mixture was in all cases to be and remain in the powder form, and to be such as to retain the absorbed nitro-glycerine and not suffer it to leak out. The mode of preparing the mixture with infusorial earth is then set forth. Stress is laid on the requirement that enough nitro-glycerine must be used in the compound to render it explosive, while the earth, in dry powder, is not to have so much nitro-glycerine put with it as to change its form of powder to a liquid or a paste. The useful minimum and the useful maximum of explosive power are then stated, according to given proportional weights of nitro-glycerine to infusorial earth, the minimum compound having a perfectly dry appearance and the maximum compound being pasty. It is then set forth, that, between these two extremes the compound will be explosive powder, and that it will be more easily exploded, and its explosive power be greater, as the

relative proportion of the nitro-glycerine in the compound is greater. These observations are to the effect that the useful maximum of explosive power in the compound is attained when the absorption of nitro-glycerine causes the mixture to cease to have the form of powder; that the useful minimum of explosive power in the compound is what results from the stated proportion of nitro-glycerine; that, although so much as 78 parts by weight of nitro-glycerine to 22 of infusorial earth may be used, and still the compound be just leaving the powder form, yet, even in the use of infusorial earth, a useful result will be given when the nitro-glycerine is 60 parts by weight to 40 of the earth; and "that between such maximum and such minimum the compound will be a powder and an explosive powder, with greater explosive power and more easy of explosion as the relative proportion of the nitro-glycerine is greater. The specification then states, that, when infusorial earth is used, the proportion, by weight, of 75 nitro-glycerine to 25 of earth will give a powder, and one as well adapted to ordinary practical purposes as can be specified, and one which can be made to have a specific gravity nearly equal to that of pure nitro-glycerine. Directions are then given how to treat the mixture to make it pulverulent. The specification then sets forth, that the chief characteristic of the powder is its nearly perfect exemption from liability to accidental or involuntary explosion; that it is far less sensitive than nitro-glycerine to concussion or percussion; that, unlike gunpowder, it burns up, when set fire to, without exploding; and that it can, therefore, be handled, stored and transported with less danger than ordinary gunpowder. The safety character of the powder is thus dwelt upon. It will not explode accidentally or involuntarily, because, first, fortuitous concussion or percussion will not be likely to cause it to explode; and, secondly, it will burn, and not explode, when set fire to. The specification" then sets forth the proper method of exploding the powder, by exploding a percussion cap in it, with the injunction, that the percussion cap must be longer, stronger and more heavily charged, as the proportion of nitro-glycerine is less in the powder, for the reason, that, the greater the proportion of nitro-glycerine, the more easily will the powder explode. This analysis of the specification of No. 78,317 shows, that, taking the whole of it together, the concentration feature referred to, that is, the preparing of a solid compound which should contain practically, in a given space, as much nitro-glycerine as could be put into that space in a liquid state, was not set forth in that specification as of the essence of the invention; that such concentration feature was set forth as an incident of the use of the proportions of 75 parts of nitro-glycerine, by weight, to 25 of infusorial earth; that a compound of less nitro-glycerine and more earth, which would, of course, not have such concentration feature, was stated to be useful and to be within the invention; that the safety character of the compound was set forth as an object in view, in the invention; and that one feature of such safety character was alleged to consist in the diminished sensitiveness of the compound to accidental explosion from concussion or percussion, as compared with liquid nitro-glycerine.

The reissue is, therefore, not open to the objection, that it departs from the original, in the respects mentioned.

The original patent speaks of the substance that is to be mixed with the nitro-glycerine as “an inexplusive, porous substance.” The substances it mentions are the silicious or infusorial earth, chalk and porous charcoal. These substances are absolutely inexplusive, whether fire be applied to them or not, and without reference to the fact whether they will burn or not Nitro-glycerine is liable to explode by accidental concussion or percussion. The proper and usual mode of exploding in it is by designed percussion, that is, exploding something in it or into it. The object desired was to prevent its explosion by accidental percussion, and to ensure its explosion by designed percussion. In that view, and taking the whole of the original specification together, when the absorbent substance is spoken of therein as inexplusive, it clearly means inexplusive by percussion or concussion, as compared with nitro-glycerine. The object was to mix with the nitro-glycerine a substance which, not being liable, like nitro-glycerine, to explode by accidental percussion or concussion, would produce a powder not liable to explode by accidental percussion or concussion. The word “inexplusive” had reference to the explosive nature of nitro-glycerine. If the substance mixed with it acted its part of an absorbent, to make a powder safe from liability to accidental explosion by percussion, and yet a powder the nitro-glycerine in which could be exploded by designed percussion, and could not be injured, in its explosive quality, by such substance, it was, manifestly, entirely immaterial what became of such substance after the nitro-glycerine in the powder had been exploded, whether it did or did not itself burn up, or even though it should itself be caused to explode by the explosion of the nitro-glycerine, and thus perform a useful office, in addition to that of acting as such an absorbent as the specification prescribes. Such is the plain meaning of the language of the original specification.

The questions thus considered were, to some extent, passed upon by Judge Shepley, in his decision in the case of *The Atlantic Giant Powder Co. v. Mowbray*, [Case No. 624] where this same patent was sued on. Objection was there made to the reissue, on the ground that the description of the invention was broader in the reissue than in the original patent. Judge Shepley held that the description of the invention in the original

patent appeared to describe all that was more specifically described in the reissue, and stated that a careful comparison of corresponding passages in the original and reissue had failed to satisfy him that the reissue was open to objection on the ground of its being for an invention broader than, or different from, the one described in the original. He added, that he did not think that the omission of the word “inexplosive,” in the reissue, rendered the reissue defective, or that the claim in the reissue was any broader than in the original.

The defendants in the Mowbray case made a powder by mixing 52% pounds of tri-nitro-glycerine with 47% pounds of mica scales. Judge Shepley held, that, in the compound so made, the mica scales possessed all the properties which rendered the infusorial earth efficient and useful in the compound, as well as some additional valuable properties; and that the mica scales performed the same function, in the compound, that the infusorial earth did, as an absorbent of the nitro-glycerine.

Reissue No. 5,799 came again before Judge Shepley in the case of The Atlantic Giant Powder Co. v. Goodyear, [Case No. 023,) where the defendant made a powder composed of 32.60 parts of nitro-glycerine, 49.46 of nitrate of soda, 9.63 of charcoal, and 8.31 of sulphur. The nitrate of soda, charcoal and sulphur were in the form of a mealed powder, their proportions being the same as in gunpowder in common use in the granular form. This mealed powder was mixed with the nitro-glycerine. It possessed, in the mixture, as Judge Shepley held, every property claimed for the infusorial earth in the plaintiff's patent, and the powder known as “Vulcan blasting powder,” resulting from its combination with the nitro-glycerine, possessed every attribute and property, in a greater or less degree, possessed by the plaintiff's powder. It was set up, in the Goodyear case, as a defence, that the only object of Noble's invention, as patented, was to render nitro-glycerine safer in handling and transportation, without any intent to augment its explosive force, because the substance mixed with the nitro-glycerine was inert; and that the object of the manufacturer of the Vulcan powder was “to render the explosion and combustion of gunpowder instantaneous.” But Judge Shepley held, that the substitution of gunpowder, as used in the Vulcan powder, in combination with nitro-glycerine, in the place of the infusorial earth or other absorbent of the plaintiff's patent, did not make the combination a different, and not equivalent, compound, because the gunpowder, when used as an absorbent, in addition to fulfilling every condition, and performing every function, of the absorbent in the plaintiff's compound, up to the time of the explosion, and at that time, had then the additional function of cooperating, by means of its conversion into gas, with the nitro-glycerine, in rending the rock, instead of remaining, like the infusorial earth, an inert substance. In the Goodyear case, it was further contended for the defendant, that, as gunpowder was an explosive of itself, the use of it in the compound was no infringement, because the plaintiff was limited to a non-explosive substance as the absorbent; that, if the omission of the term “inexplosive,” in the reissue, enlarged the scope of the invention, the

reissue was void; and that, if the reissue was to be construed in connection with the original, and for the same invention, it must be limited to the use of inexplusive absorbents as equivalents. On this subject Judge Shepley said: "The word 'inexplusive' is applied, in the original patent, as a term of description to a substance only preferentially used. The other descriptions in the specification clearly apply to substances which, in one sense, may be explosive, but are inexplusive as compared with nitro-glycerine. The word 'inexplusive' appears clearly to have been used, in the original patent, to describe substances which, as compared with nitro-glycerine, were inexplusive by concussion, which would not, of themselves, explode under those conditions which rendered nitro-glycerine so dangerous and unsafe for practical use, and which, inexplusive of themselves under those conditions, when combined with nitro-glycerine, would make the combination a compound which would also be inexplusive, except under such conditions as were not inconsistent with substantial safety, in its use for blasting and similar purposes. In this sense, the-mealed powder used by the defendants is inexplusive. It prevents, by the interposition of its particles, the explosion of the nitroglycerine by any such concussion as would ordinarily explode it when uncombined with an absorbent. It makes the compound practically inexplusive under ordinary, fortuitous and accidental concussions, and practically explosive only under predetermined and prearranged conditions. The word is omitted in the reissue, and, we think, properly omitted, not for the purpose of including equivalents which were not within the scope of the original invention, as described, but as an ambiguous expression, not consistent with the other words in the specification, which clearly describe the absorbent, its properties and functions, all of which properties and functions, it is evident from a reading of the-original patent, might appertain to a substance explosive under some conditions, but inexplusive under those conditions which made nitro-glycerine explosive by concussion, and dangerous and unsafe for practical use. The conclusion, therefore, I think, is a legitimate one, that, under the reissued patent, the owners of the patent are not limited to-treat as infringements the use of such equivalents only as are actually inexplusive, but they are entitled to the exclusive use of such equivalents as are inexplusive as compared

with nitro-glycerine, and which, while complying with the other requisites of the infusorial earth in the combination, will also, when combined with nitro-glycerine, form, out of the two ingredients, a composition which, without losing the great explosive power of nitro-glycerine, is more safe and convenient for transportation, storage and use than nitro-glycerine.”

The first of these cases was a final hearing, the other was a motion for a preliminary injunction. Comity would induce a following of the views of a coordinate court on questions so directly raised, considered and decided, especially where the decision was made by so careful and discriminating a judge. Independently of this the observations cited meet the full concurrence of this court.

It is contended, for the defendants, that what is claimed in No. 5,799 is described in a French patent and in an English patent, each previously issued. The French patent was taken out September 18th, 1865, [1863,] by Nobel, for 15 years, and was delivered to him November 5th, 1863. It was for “improvements in the manufacture of mining and shooting powders.” The descriptive memoir annexed to the patent is dated, Paris, September 18th, 1863. The French text is not furnished to me. An English translation is furnished in these words: “The invention consists in the employment of explosive or easily decomposable substances, especially of explosive liquids mixed with ordinary powder, gun cotton or other analogous bodies. By this mixture one succeeds in tempering the breaking force of every fulminating substance, so as to heat it, if it is a liquid, to the degree of heat at which it explodes. There are many fulminating bodies that may be used for this purpose, such as nitro-glycerine, the nitrates of ethyle and methyle, &c. I use, by preference, nitro-glycerine, and I prepare it by introducing the glycerine slowly into a mixture of sulphuric acid and nitrate of soda or of potash, after having freed the liquor from the sulphate of soda or of potash, which is formed. This nitro-glycerine, mixed with or absorbed by the ordinary powder, communicates to it the following properties: 1. In appearance, it is dry like ordinary powder; 2. It is much stronger, without producing a more breaking effect; 3. It produces less debris; 4. The explosion is a little slower. If it is only wanted to obtain this last effect, I mix with the powder, or I make it absorb, if it is already prepared, any other fluid, such as oil, &c. With regard to mining powder, it may be mixed with nitro-glycerine until it is wet on the surface. Nitrate of soda may then be used with advantage for the powder, as the nitro-glycerine prevents it absorbing the water. The nitro-glycerine, to explode, must be heated to 170° Centigrade. It is evident, that, besides ordinary powder, there are many mixtures which may determine this heating, but the explosive liquid must always be absorbed by their mass; and equally-distributed in it; if not, there will always be breaking effects. Thus it is, that, in a powder formed solely of charcoal and sulphur, the nitro-glycerine will in a manner replace the saltpetre.” On the 19th of January, 1864, a certificate of addition to the French patent of September 18th, 1863,



was taken out in France by Nobel, and was delivered April 1st, 1864. The descriptive memoir annexed to such certificate of addition is dated Paris, January 19th, 1864. The French text is not furnished to me. Two English translations of it are furnished. One of them is in these words: "The numerous experiments which I have made since my first application have demonstrated to me that I could employ the substances mentioned in my patent of September 18, 1863, (nitro-glycerine and others,) both as powder for war or sporting, and as mining powder, under the following forms: 1. Absorbed in the powder, as described by the first patent, for shooting powder. 2. Mixed with the powder, which they wet more or less. 3. In a cartridge, with or without powder; in the former case, the powder surrounds or environs the cartridge, which may be of wood, zinc or any other material. In mines, and especially in galleries, I make use of cartridges soldered hermetically; and, to avoid smoke, gun cotton replaces the powder. It is, then, the powder or the gun cotton, placed around the cartridge, which pierces its walls and communicates the fire to the interior. 4. Absorbed in charcoal or other porous substances, it is still, as in the preceding cases, the powder or an analogous agent, which determines the explosion. As the nitro-glycerine mixed with the powder is denser than the latter, it is often important to economize It Wherever less force is wanted for breaking than for raising the rock, and the pressure of the gas is of more consequence than its volume, I close with wood or any other substance a part of the cylindrical hole, to the height filled by the powder, as shown in the annexed sketch. This method may also serve sometimes for ordinary powder. The introduction of hermetical cartridges, hitherto not in use, facilitates the employment, even alone, of the powder with nitrate of soda, being preserved from dampness, whence results a notable economy. I shall observe, in closing, that the proportions of the mixture of the powder with the nitro-glycerine may vary according to the nature of the applications, and that, consequently, nothing can be stated precisely with regard to them." The other translation is in these words: "The numerous experiments which I have made since my first application have demonstrated to me that I could employ the substances mentioned in my patent of September, 18, 1863, (nitro-glycerine and others,) as well for powder

for military purposes (or for hunting purposes) as for blasting powder, under the following forms: 1st Absorbed in the powder, as the first patent for gunpowder indicates. 2d. Mixed with the powder, which they moisten more or less. 3d. In a cartridge, with or without powder; in the first instance, the powder surrounds or encases the cartridge, which may be of zinc, wood or any other substance. In mines, and especially in galleries, I make use of cartridges hermetically sealed; and, to avoid all smoke, gun cotton replaces the powder. It is, then, the powder or the gun cotton placed around the cartridge, which perforates the walls and communicates the fire to the inside. 4th. Absorbed in charcoal or other porous substances, it is still, as in the preceding cases, the powder, or an analogous agent, which causes the explosion. As nitro-glycerine mixed with powder is more dense than this latter, it is often important to economize it "Where less force is needed to break than to carry away the rock, and where the pressure of the gas is of more importance than its volume, I close with wood or any other substance a part of the cylindrical hole, up to the height of which the powder fills it, as the sketch opposite indicates. This method may also sometimes serve for ordinary powder. The introduction of hermetically sealed cartridges, hitherto unemployed, facilitates the use, even by itself, of powder, being protected from moisture, whence results a noteworthy economy. I will remark, in conclusion, that the proportions of the mixture of the powder with the nitro-glycerine may vary according to the value of the application, and that, therefore, one cannot be definite in this respect." The English patent was dated September 24th, 1863, and was sealed March 1st, 1864. It was granted to Alfred "Vincent Newton for "improvements in the manufacture of gunpowder and powder for blasting purposes," and the invention was "a communication from abroad by Alfred Nobel." The provisional specification, dated September 24th, 1863, declared the nature of the invention to be as follows: "This invention consists in the employment of explosive substances, or of substances easily decomposed, especially of explosive liquids, mixed with ordinary gunpowder, gun cotton, or other analogous substances. By this mixture, the exploding force of every fulminating substance may be tempered or regulated; if it be a liquid, it may be heated to the degree necessary to cause explosion. There are many fulminating substances which may be used for this purpose, such as nitro-glycerine and the nitrates of ethyle and methyle. By preference, nitro-glycerine is used, and is prepared by introducing slowly glycerine into a mixture of sulphuric acid and nitrate of soda or potash, after having-removed from the liquid the sulphate of soda or potash which is formed. This nitro-glycerine is to be mixed with or absorbed into the ordinary powder, in such proportion, that the appearance will still be preserved of dry ordinary powder, and it will then be much more powerful without producing a greater explosive effect, it will create less foulness, and the explosion will be somewhat retarded. If this last effect only is desired to be obtained, the powder is mixed with, or made to absorb, when prepared, some other fluid, such as oil, in such quantity as not

to destroy its granular character. As regards the blasting powder, it may be mixed with sufficient nitro-glycerine to render it damp at the surface. Nitrate of soda may then be employed with advantage for the powder, as the nitro-glycerine prevents it from absorbing water. The nitro-glycerine, to cause explosion, should be heated to 170° Centigrade. It is evident, that, besides the ordinary powder, there are many mixtures that may determine the degree of heat, but it is always necessary that the explosive liquid should be absorbed by their mass, and equally distributed therein; if not, it will always have a bursting effect. It is thus, that, in powder formed solely of carbon and sulphur, the nitro-glycerine will replace, to some extent, the salpetre." The full specification, dated and filed March 23d, 1864, is in these words: "This invention relates chiefly to the utilization of certain substances known to chemists as organic nitrates or liquid nitrates, which are capable of being easily decomposed into gases, by combining the same with ordinary gunpowder or analogous substances, to produce an improved powder suitable either for ammunition or blasting purposes. By this mixture the exploding force of every fulminating substance may be tempered or regulated; or, if it be a liquid, the heat generated by ignition may be transmitted through the mass at the degree necessary to cause explosion. There are many fulminating substances which may be used for this purpose, such as nitro-glycerine and the nitrates of ethyle and methyle. By preference, nitroglycerine is used. This substance may be prepared by introducing slowly glycerine into a cool mixture of sulphuric acid and nitric acid, or sulphuric acid and nitrate of soda or potash, the sulphate of soda or potash which is formed being removed from the liquid. This nitro-glycerine is to be mixed with, or absorbed into, ordinary gunpowder, in such proportion that the appearance will still be preserved, of dry ordinary powder, and the mixture will then act most efficiently without producing a greater explosive effect, it will create less foulness, and the explosion will be somewhat retarded. When the retardation only of the explosive action is desired to be obtained, the powder is mixed with, or made to absorb, when prepared, some other fluid, such as oil, in such quantity as not to destroy its granular character. As regards the blasting powder,

it may be mixed with sufficient nitro-glycerine to render it damp at the surface. Nitrate of soda may then be advantageously employed, for, as nitro-glycerine is neither hygroscopic nor even soluble in water, it will, by being made to surround the nitrate of soda, effectually prevent that substance from absorbing water. The nitro-glycerine, to cause explosion, should be heated to one hundred and seventy degrees Centigrade. It is evident, that, besides the ordinary powder, there are many mixtures that may determine the degree of heat, but it is always necessary that the explosive liquid should be absorbed by their mass and equally distributed therein; If not, it will always have a bursting effect: It is thus, that, in powder formed solely of carbon and sulphur, the nitro-glycerine will replace, to some extent, the salpêtre." The claim is: "Producing explosive mixtures by treating gunpowder or analogous substances in the manner and for the purposes above set forth."

It is quite clear that these French and English patents set forth that nitro-glycerine is to be mixed with gunpowder, and that the resulting compound is to be used, in the shape of a dry powder, for shooting and blasting purposes. The nitro-glycerine is stated to be absorbed by the gunpowder. But, throughout these patents, there is no allusion to the explosion of the compounded powder by the detonation or percussion of the nitro-glycerine in it, or to the explosion of the gunpowder in it by the prior explosion of the nitro-glycerine in it. On the contrary, the suggested method of exploding the compounded powder, is by the ignition, first, of the gunpowder in it and the communication to the nitro-glycerine in it of the heat generated by the burning or exploding gunpowder, so as to cause the explosion of such nitro-glycerine. There is no allusion to the fact, that nitro-glycerine can be exploded by percussion or detonation, or that it ought to be so exploded, or that it is liable to be exploded by accidental concussion, or that it is, therefore, unsafe in being handled or transported, or that it is, when mixed with a suitable absorbent, less sensitive to shocks than when in a liquid condition, or that the proportions of nitroglycerine and absorbent should be such that the absorbent will retain what it absorbs and not let it leak out, and that there should be sufficient nitro-glycerine to form an efficient explosive when designedly exploded by concussion." These are all distinctively described features, in No. 5,709, of the powder there described, and they are none of them described in the French and English patents as features of the compound of nitro-glycerine and gunpowder there referred to. It was not until July, 1864, that it was suggested, so far as appears, that nitro-glycerine could be practically used by exploding it by detonation. In Nobel's English patent No. 1,813, the provisional specification of which was dated July 20th, 1864, he suggests the explosion of a percussion cap or detonating compound to explode a portion of the nitro-glycerine, and thus heat the rest of the mass to the exploding temperature.

It is equally clear that the rendrock powder of the defendants is not described in the French and English patents referred to, or in any of them. It is composed of nitro-glycerine and an explosive substance analogous to gunpowder, and so far it has a resemblance to

the compound produced under the English and French patents referred to, but, in respect of the qualities, before pointed out, which it has in common with the compound patented by No. 5,799, no allusion to those qualities, is found in the English and French patents referred to. The powder of the defendants contains enough nitro-glycerine to be exploded designedly by detonation or concussion, and not enough to yield up any by leakage after absorption. It is a safety powder against accidental explosion by concussion, and yet can be exploded by designed concussion at its place of useful service. The English and French patents referred to do not describe any such powder, or give directions whereby any such powder can be certainly made. If any one, seeking to compound a powder under those patents, had compounded a powder possessing the qualities of the powder set forth in No. 5,799, or the qualities of the defendants powder, so far as the qualities of the latter powder correspond with the qualities of the powder of No. 5,799, the making of such powder would have been a matter of pure accident, and not the result of any directions in the English and French patents, either as to the qualities of the powder or the law of its composition. This leaves the invention in No. 5,799 a patentable invention, within the recognized decisions on the subject. Especially is this so, when it is not shown that any one had, in fact, before Nobel set forth the description in the original patent No. 78,317, made a powder possessing the qualities of the powder of that patent, or a powder possessing the qualities which the defendants powder has in common with the powder of No. 78,317, by undertaking to follow the directions in the English and French patents referred to. In inventing what he patented in No. 78,317, Nobel did not merely find out an new property in an old compound. He invented a new compound possessing new properties, and pointed out how the new compound could certainly be made so as to possess such new properties.

The defence that No. 78,317 was void because the invention was patented in a foreign country more than six months before the application for No. 78.317 was made in the United States fails in one respect, when it is decided that the French and English

patents referred to did not set forth or patent such invention. If the English patent to Nobel, No. 1,345, be regarded as a patent for the same invention found in No. 78,317, and as having been granted more than six months before Nobel's application for No. 78,317, still No. 78,317 was not invalid, because it does not appear that the invention covered by it was introduced into public and common use in the United States prior to the application for No. 78,317. It does not appear satisfactorily that the Howden compound was the compound of No. 78,317 or of No. 5,799, by being prepared under the conditions prescribed in those patents, or by possessing the qualities of the compound of those patents; nor does it appear that the use made of it was an introduction of it into public and common use, in the United States, before April 27th, 1868, the date of the application for No. 78,317. Under these views, the question as to when No. 5,799 will expire is immaterial, in the present case, for it is still in force, even though its duration should hereafter be held to be only 14 years from the date of publication of the English patent No. 1,345.

Another defense is set up. A patent, No. 50,617, was granted to Nobel October 24th, 1865, for "substitute for gunpowder." This patent having been reissued as No. 3,380, April 13th, 1869, was reissued March 19th, 1872, in five divisions, to the United States Blasting Oil Co. One of those divisions is No. 4,818, division D. The defence is, that, if No. 5,799, being the reissue of a patent granted in 1868, claims that which is described in No. 4,818, then No. 5,799 is invalid, because No. 4,818 is the reissue of a patent granted in 1865. The basis of this proposition is, that No. 4,818 describes the invention patented by No. 5,799. No. 4,818 describes a method of promoting the explosion of nitroglycerine by compounding with it other more easily explosive substances. The specification of No. 4,818 says: "There is a class of explosives long known, but not at the date of Nobel's invention applied to technical purposes, in consequence of practical difficulties in procuring their explosion. Such substances are nitro-glycerine, the nitrates of ethyle and of methyle and nitro-manite. These substances are liquid at ordinary temperatures, and by that characteristic are distinguishable from solid explosives, such as gunpowder, gun cotton, &c; and they have also the property that fire may be applied to them without their exploding. Nitro-glycerine, for example, If ignited in an open space, is slowly decomposed and takes fire, but the flame is apt to die out when the match is withdrawn. Hence, it cannot, under ordinary circumstances, be looked upon as a ready explosive agent, for, while gunpowder and other substances used as explosives prior to Nobel's invention always explode or deflagrate throughout their whole mass, when fire is set to them, nitro-glycerine and the analogous substances before named will not explode from the mere contact of flame. So, also, if a drop of nitro-glycerine be poured on an anvil, the blow of a hammer causes it to explode, but only that part is involved which has received the blow, so that, in this case, the explosion is merely a local one. A principal object of Nobel's invention consists

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in the removal of this obstacle to the use of nitro-glycerine and the analogous substances before named as explosives.” The specification then states, that Nobel discovered that the difficulty referred to could be overcome by mixing or combining the nitroglycerine and the other liquid substances with gunpowder, gun cotton or other similar substances, in proportions which “may be varied to suit the pleasure or convenience of the user or manufacturer.” It says: “The nitro-glycerine may be mixed with gunpowder or gun cotton, either of which will absorb a considerable quantity of nitro-glycerine, say, thirty per cent, more or less, in such proportions as to make the compound either wet or comparatively dry. If mixed with gunpowder, it may be either absorbed with it, by pouring the nitro-glycerine on the mass of gunpowder, or the two may be mingled together by trituration, the powder in the nitro-glycerine. The effect of these combinations will produce an explosive especially suitable for certain blasting purposes, for example, in crevice rock, and greatly superior either to gunpowder or gun cotton in explosive force, and quite readily exploded, so that it may be fired and exploded by means of a match or electric spark, in like manner as gunpowder or gun cotton alone. By means of this combination with gunpowder, gun cotton, or other similar readily explosive substances, of nitro-glycerine and the analogous substances before named, which are liquid at the ordinary temperature, these substances, which had not, at the date of Nobel’s invention, been applied to any technical use as explosives, owing to their difficulty of explosion, have been introduced from the domain of science into that of practical use in the arts, and have rendered of commercial value what was previously known as a mere chemical curiosity.” The claims of No. 4,818 are in these words: “1. The utilization, as explosives, of nitro-glycerine, and the analogous liquid substances hereinbefore mentioned, by combining therewith gunpowder, gun cotton, or other similar substances developing a rapid heat on combustion, substantially as hereinbefore described. 2. The combination of gunpowder with nitro-glycerine, substantially as and for the purposes hereinbefore described. 3. The combination of gun cotton with nitro-glycerine, substantially as and for the purposes hereinbefore described.” The construction hereinbefore given to No. 5,799 shows, that neither the invention covered by it, nor the defendants powder, is described in No. 4,818. The description in No. 4,818 only describes

nitro-glycerine absorbed by gunpowder, so as to enable the nitro-glycerine to be exploded by igniting the gunpowder; and there is no hint in No. 4,818 of making a compound with a safety property of non-explosion by ordinary concussion, and with the ingredients existing in the proportions necessary to attain the result of certain explosion of the nitroglycerine by designed detonation or percussion, and of freedom from liability to explosion by accidental concussion. This I understand to have been the view taken of No. 4,818 by Judge Shepley, on the hearing in the Goodyear case, No. 4,818 having been called to his notice in that case.

All the views urged on the part of the defendants have been carefully considered. The plaintiff's patent has been sustained by Judge Shepley, on final hearing, in the Mowbray case, and on a motion for a preliminary injunction, in the Goodyear case, and, in the latter case, against a compound to all intents like that made and sold by the defendants in this case, and nothing is now shown to justify a denial of the injunction now asked for. It is, therefore, granted.

[NOTE. See note to Atlantic Giant Powder Co. v. Mowbray, Case No. 624.]

<sup>1</sup> [Reported by Hon. Samuel Blatchford, Circuit Judge; reprinted in 4 Ban. & A. 263; and here republished by permission. Merw. Pat Inv. 173, contains partial report only.]

<sup>2</sup> [16 O. G. 87 gives "percussion."]