

SHIPMAN ENGINE CO. *ET AL.* V. ROCHESTER TOOL-WORKS, LIMITED, *ET AL.*

*Circuit Court, N. D. New York.*

April 16, 1888.

PATENTS FOR INVENTIONS—PATENTABILITY—PRIOR STATE OF THE ART.

Letters patent No. 304,365, granted to Albert H. Shipman for a “hydrocarbon furnace,” cover a device consisting of a boiler of any known form, with an oil reservoir containing liquid fuel and from which said fuel is drawn up; two pipes, one for conducting the oil from the reservoir, and the other the steam from the boiler; a steam oil-atomizing jet, formed by arranging the orifices of the pipes in such relation to each other that the steam will suck up the oil from the reservoir, and spray the oil with which it comes in contact; and a steam regulator, operating automatically by the pressure of steam in the boiler, to diminish or entirely cut off the supply of steam to the atomizing jet. All previous devices lacked either the atomizing jet or the automatic regulator; the nearest approach being one by Dickerson, in which there is no atomizer, and the oil supply is obtained by gravity and not by suction. It appears that Shipman’s device has been sold extensively both at home and abroad, as the others have not. *Held*, a patentable device as regards the prior state of the art

In Equity. On bill for an injunction.

*John Lowell and George B. Selden*, for plaintiff.

*B. F. Thurston and Josiah Sullivan*, for defendant.

WALLACE, J. This suit is brought to restrain infringement of letters patent No. 304,365, dated September 2, 1884, granted to Albert H. Shipman for “hydro-carbon furnace.” The defense of prior public use.

based upon the experiments made with the apparatus of Marvin E. Otis, need not be considered, as the record discloses nothing to modify the opinion expressed at the hearing of the cause, that this defense only presents an instance of an experimental use, which did not and could not demonstrate a practical realization of the apparatus of the patent.

The real question in the case is whether there was any patentable novelty in Shipman's apparatus in view of the prior state of the art. He makes no pretensions to being a pioneer in utilizing liquid fuel as a substitute for coal or other bulkier or more expensive fuels for producing heat or steam. He assumes to have invented certain improvements in hydro-carbon furnaces, which consist of a combination of devices for regulating more efficiently the rate of combustion by the degree of steam-pressure in the boiler. Although he contemplated the application of his devices more particularly to steam-engines designed for driving light machinery, what he devised, and what his patent describes, is an improvement in a hydro-carbon burner for use under a steam-boiler of any kind, effected by a combination of parts, each of which was old and well known when he took up the subject, several of which had previously been used in such burners to perform in combination the functions they performed in his apparatus, but all of which had never before been combined together in the same apparatus. The patent describes a steam-boiler, which may be of any known form; an oil reservoir, which is to contain the liquid fuel, and from which the liquid fuel is drawn upward; two pipes, one leading from the reservoir for conducting the oil, and the other leading from the boiler for conducting the steam; a steam oil-atomizing jet, which is an atomizer formed by arranging the orifices of the pipes in such relation to each other that the steam will suck up the oil from the reservoir, and spray the oil with which it comes in contact; and a steam regulator, which operates automatically by the pressure of steam in the boiler, to diminish or entirely cut off the supply of steam to the atomizing jet. The regulator is described in the specification as follows:

"In order to provide for the regulation of the steam-pressure in the boiler, I combine with the pipe, K, which supplies steam to the atomizer, the regulator, L'. The regulator consists of a flexible diaphragm, N', (Figs. 3 and 4,) arranged, in connection with a valve, s'', to operate to reduce the supply of steam to the atomizer when the pressure in the boiler becomes too great. The diaphragm, N', forms one side of a chamber, into which the steam is admitted through a pipe, t''', communicating with the boiler or steam-dome through a hollow boss, b'''. The diaphragm is provided at its center with a boss, u'', into which the stem of the valve, s'', (Fig. 3,) is screwed. The head of the valve is fitted to a suitable valve-seat, v'', (Fig. 3,) and it operates, when the diaphragm, N', is pressed outward, as represented by the dotted lines in Fig. 3, by the steam in the chamber, to diminish or entirely cut off the supply of steam to the atomizer. The amount of pressure which will be required to accomplish this result may be regulated by screwing the valve, s'', in or out of the boss, u.'" As shown in the drawings, this can only be effected when

the pipe. K, is removed; the intention being to adjust the regulating valve at the factory before the engine is sent out, and to prevent any subsequent alteration of it. The practical effect of the regulator is that, if the pressure in the

boiler rises above any given point at which the valve is set, the supply of steam to the atomizer is entirely cut off, and the fire goes out. It will be noticed, also, that if the water should be entirely evaporated from the boiler there will be no more steam to supply the atomizer, and the fire in this case also will be extinguished. Provision is thus made for insuring entire safety under any circumstances which may arise. I have demonstrated, by practical trials under various circumstances, that the regulator above described is highly efficient, and never fails to produce the desired results. In starting an engine provided with my improved regulator, I obtain a pressure of air in the boiler by means of an air-pump, or by turning the engine backward. I am aware that the supply of steam and liquid fuel to the furnace of a steam-boiler has been heretofore controlled by a diaphragm regulator operating to control valves in the supply-pipes, but such construction I do not claim, as in my invention the delivery of the liquid fuel is controlled by varying or cutting off the supply of steam to the atomizing device by a regulator operated by the pressure of the steam in the boiler. The construction of the regulator herein shown forms no part of the present invention, as it is my intention to file a separate application for letters patent on the novel features thereof.”

The claims of the patent are as follows:

“The combination with a steam-boiler, of an oil reservoir, a steam oil-atomizing jet, an oil conduit, a steam-supply pipe, K, and a steam regulator operating to vary or cut off the supply of steam from the boiler to the atomizer, substantially as and for the purposes set forth. (2) The combination, with a steam-boiler, of an oil reservoir, the steam oil-atomizing jet and oil conduit located above the oil reservoir, and arranged to draw oil therefrom, and a steam-supply regulator, through which the steam passes on its way from the boiler to the atomizer, substantially as and for the purposes set forth.”

The prior state of the art is illustrated by United States patents granted to Van Norman, Brown & Morrison, dated August 1, 1865; to Joseph K. Caldwell, dated September 12, 1871, and March 19, 1872; to Abner Burbank, dated November 5, 1878; to J. L. Kite, dated March 8, 1881; to Park & Heath, dated October 11, 1881; and to E. N. Dickerson, Jr., dated April 18, 1882. The patent to Van Norman, Brown & Morrison is cited by the defendant as showing all the devices of Shipman’s apparatus in combination. The patent describes a complicated apparatus for commingling oil vaporized in a retort with superheated steam. The apparatus is a hydro-carbon furnace, in which the steam is carried from a boiler through a coil in the fire-box, by which it becomes superheated, and is then delivered to a steam jacket or chamber, which adds heat to a retort already heated by the fire below it. Oil is delivered by means of another coil into the retort, and, after being there vaporized, the gas escapes through small holes in the retort, mingles with the superheated steam escaping through small holes in the steam jacket, and they are burned together. It does not contain an atomizer in any sense. It does contain an automatic reg-

ulator which operates by pressure in the boiler to shut off the steam in the coil. The apparatus is so remote in principle, as well as in detail of construction and arrangement, from Shipman's apparatus, that it could never have suggested any important feature in his. The patent does not contribute any light of value upon the case, and only incumbers the record. The patent to Park & Heath was not deemed of sufficient importance to be commented upon in the argument

of counsel at the hearing; but in the brief which has since then been submitted for the defendants it is cited as describing an apparatus which contains an atomizer, a steam-generator and furnace, and an automatic regulating device, in combination with these parts. The apparatus contains an injector, in which three tubes are located concentrically, one for oil, one for steam, and one for air, all three of which materials are to be burned together. The defendants' expert says, "The steam does not meet the oil in the manner of the Shipman apparatus." In other words, there is no atomizer. The regulator is described in the specification as one by which "the amount of fuel and the combustion are steadily maintained without regard to the amount of pressure in the boiler," and in this respect differs radically in principle from Shipman's regulator. The patents to Caldwell, Burbank, and Kite do not show any apparatus in which an automatic regulator is employed, but the regulator in the apparatus of each is a common stop-cock, to be manipulated by hand. The hydro-carbon furnace of each of these patents would contain the combination of steam-boiler, oil reservoir, oil and steam pipes, and atomizer arranged and constructed substantially as described in Shipman's patent, and operating together to perform all the functions of his apparatus, if his did not contain a regulator. In the first Caldwell patent the specification states:

"This invention consists of an arrangement of two or more pipes adjustably connected together in such a manner that the passage of steam, heated or superheated, through one pipe, produces a vacuum in the other pipe, by means of which oils of any gravity are drawn out, driven into a mist or spray, and, combining with the steam, form into hydro-carbon vapor."

The later Caldwell patent describes an oil-pipe leading to an oil reservoir located on a lower plane, a steam-pipe leading from a boiler, and an arrangement of orifices of the two pipes at a right angle to each other so as to make an atomizer, substantially such as is described in his earlier patent. The specification states that he uses these devices in connection with the boiler which supply steam to an engine, and that the dry steam crossing the orifice of the oil-pipe causes a sufficient vacuum in the latter to induce the hydro-carbon to rise, and the moment it reaches the orifice it is forced into spray by, and is intimately mixed with, the steam. The devices, thus combined, resemble the devices of the Shipman apparatus so closely that it is unnecessary to refer to the other prior patents which do not contain an automatic regulator. The patent to E. N. Dickerson, Jr., describes apparatus which approximates much more nearly to Shipman's apparatus than anything shown in the other prior patents. His specification states that the invention "relates to a method of automatically regulating the combustion or heat produced by a hydro-carbon burner under boilers or other similar places where pressure is generated; and it consists in combining with the naphtha or naphtha and water supply-pipes leading to such burner, a valve or valves controlled automatically by the pressure produced by the combustion,

and so arranged as to automatically control the supply of liquid fuel without completely cutting off the same." The apparatus described contains a fire-box under

the boiler in which a naphtha burner or retort is located. In this retort, water from the steam-boiler and naphtha are burned together. The vaporized oil is conducted through an orifice in the retort by a pipe terminating under the retort, where it escapes, and where combustion takes place. Two pipes enter the retort, one connecting with the steam-generator, and the other with the naphtha reservoir, from which the naphtha flows by gravity into the retort. The regulator is described as follows:

“H represents a valve controlling the water supply, and J. a valve controlling the naphtha supply. K is a connecting rod, moved vertically by the Clark damper, L, which may be made adjustable by sliding weight, M. The stems controlling valves H and J are controlled by adjustable nuts. The upward movement of the rod K, may be limited by an adjustable stop, P, for a purpose to be explained.”

The specification then describes the operation of the apparatus as follows:

“In the ordinary condition, and before steam has been generated, water and naphtha will be allowed to flow into the burner and be there consumed, thereby heating the boiler and making steam. As soon, however, as the pressure in the boiler is sufficient to counter-balance the weight, M, the rod, K, will begin to rise, thereby shutting off the water and naphtha supply. The extent to which this supply is reduced can be determined by the adjustment of the stop, P, because it will be undesirable to shut off the flow altogether, as doing so would necessitate kindling the fire afresh. By having the positions of the valves relatively adjustable the apparatus may be so arranged that the water will be entirely shut off, leaving a limited supply of naphtha, which will burn at the point, G, (under the retort,) and keep the apparatus hot, and ready to start fresh when the steam falls in the boiler.”

From this description it is obvious that not only there is no atomizer in the Dickerson apparatus, but the mode of operation necessitated by the differences between his apparatus and Shipman's is different from Shipman's. In Shipman's apparatus the oil supply is controlled solely by the steam supply, and, when the steam supply is diminished or wholly cut off, the oil supply is thereby likewise diminished or cut off; the regulator is not applied to the oil-pipe, but the flow of oil is controlled by the steam suction which is automatically regulated in the steam-pipe. As in Dickerson's apparatus the oil supply is not obtained by suction, but by gravity, his regulator required to be applied to the oil-pipe as well as the steam-pipe, and it is therefore so devised as to cut off the supply of naphtha by shutting off the naphtha supply pipe. Undoubtedly Shipman has only combined in effective relations an automatic regulator that was not novel in itself with the atomizers of earlier patents. One test of invention in such cases is whether a new result has been obtained by the combination of old parts as distinguished from an aggregation of old results. The new combination of Shipman can meet this test, because it is perfectly clear that this combination enables the steam supply pipe to perform a new function in an



atomizer,—that is to exercise a varying suction upon the oil-pipe, graduated by the degree of steam-pressure in the boiler. That Shipman's apparatus is exceedingly useful

cannot be disputed; certainly the defendants who have appropriated it completely can hardly dispute the proposition. Everybody recognizes the advantage of having the fuel supply and the steam-pressure reciprocally regulated, so that when the pressure in the boiler reaches the designated point of safety or convenience the diminished fuel supply will relieve the pressure, and, when it falls below the proper point, the increased supply will bring it back to the required power. Dickerson devised one set of contrivances adapted to his particular form of burner to accomplish this object. Shipman devised another set adapted to the particular form of atomizer employed in his furnace to accomplish it. There was inventive thought in the idea that he could make a valve in the steam-pipe of existing atomizers to do the work of a valve in both the steam-pipe and the oil-pipe of Dickerson's apparatus. Still more was there inventive thought in the idea that he could make any form of existing regulators lend a new function to the steam-pipe of existing atomizers. It is a significant fact that Shipman's apparatus immediately commended itself to the public for its practical efficiency, and has met with an extensive and increasing patronage both in this country and abroad, while none of the devices described in the prior patents have ever gone into public use. This circumstance, while it suggests that the former devices may not have been practically operative, is persuasive that what Shipman did by way of improving them was not such an obvious thing as to deprive it of the merit of ranking as invention. A decree is ordered for the complainants.