

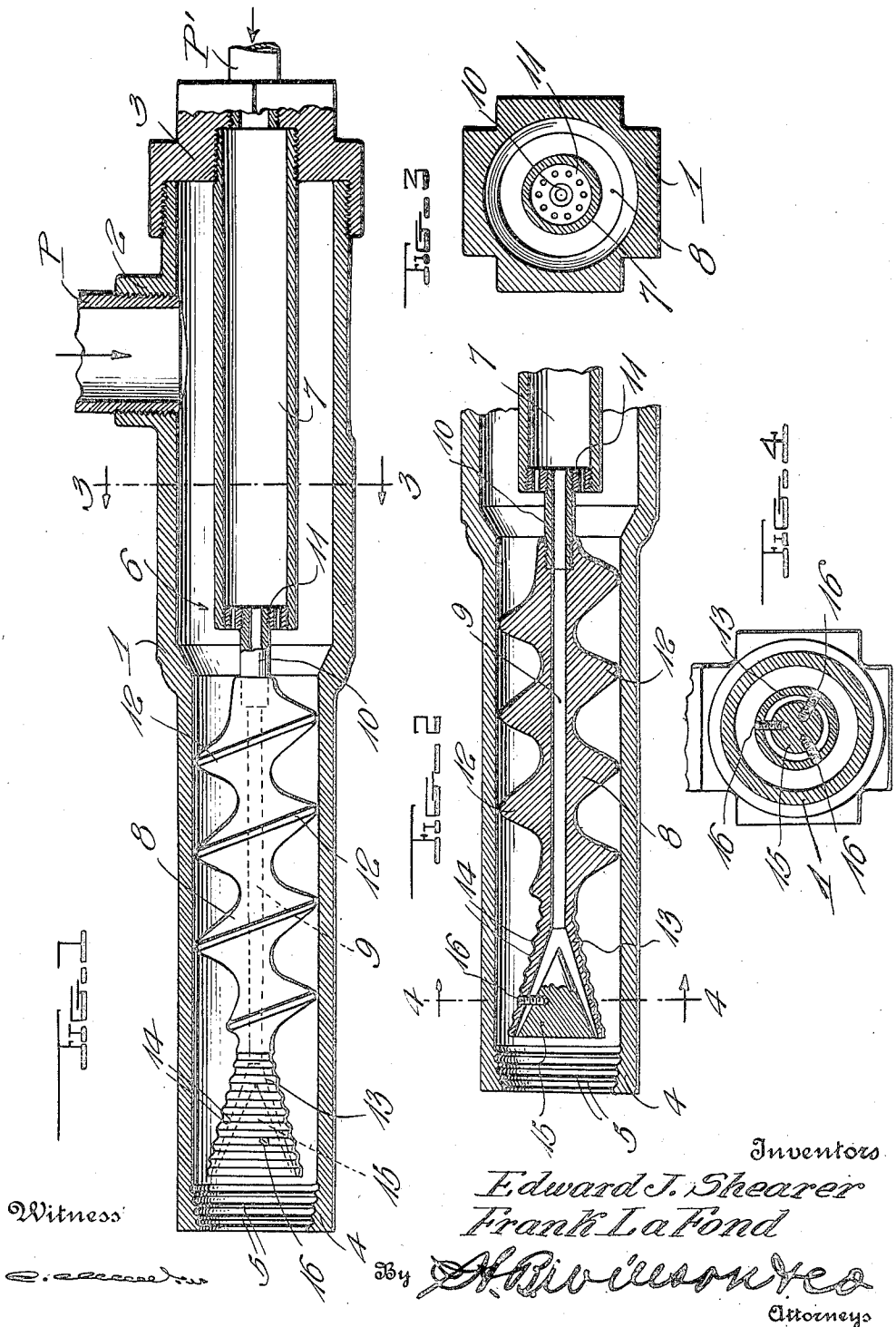
April 22 , 1924.

1,491,318

E. J. SHEARER ET AL

OIL BURNER

Filed Sept. 25 . 1922



UNITED STATES PATENT OFFICE.

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CALIFORNIA.

OIL BURNER.

Application filed September 25, 1922. Serial No. 590,433.

To all whom it may concern:

Be it known that we, (1) EDWARD J. SHEARER and (2) FRANK LA FOND, citizens of the United States, residing at (1) Colton and (2) Los Angeles, in the counties of (1) San Bernardino and (2) Los Angeles and State of California, respectively, have invented certain new and useful Improvements in Oil Burners, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an improved oil burner, which is especially, but not necessarily, designed for use on locomotives.

The principal object of the invention is to generally improve upon oil burners by providing one which is such in construction as to thoroughly heat and thin or reduce the density of the oil and to effectively mix it with hot steam to provide an effective and highly ignitable mixture.

More specifically, it is another object of the invention to provide a unique oil burner which comprises, among other details, an outer pipe through which the fuel passes with a conduit arranged therein for passage of the steam or other heating fluid therethrough to be thoroughly mixed with the fuel to produce the aforesaid readily ignitable mixture, the fluid passage being provided on a portion of its exterior with spiral ribs between which the fuel travels and there being a novel nozzle and other unique means at the discharge end of the conduit and pipe for assisting in producing an intimate mixture.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a central longitudinal section through a complete burner constructed in accordance with this invention, portions of the burner being shown in elevation.

Figure 2 is a detail of the outer end of the burner showing the core in section.

Figure 3 is a transverse section taken on the line 3—3 of Figure 1.

Figure 4 is a similar section taken on the line 4—4 of Figure 2.

In the drawings, the numeral 1 designates generally a pipe through which the

fuel, preferably oil, passes this pipe being reduced in diameter intermediate its ends and being formed with a screw-threaded neck 2 into which the oil pipe P is tapped. Threaded or otherwise detachably arranged on the adjacent end of this pipe is a removable cap 3 having a central opening into which the steam pipe P' extends. At its opposite end, this fuel pipe is thickened gradually as indicated at 4 and the pipe is thus reduced in diameter slightly. This thickened portion is equipped with internal corrugations 5 which serve a purpose to be hereinafter described. As before indicated, a steam conduit 6 is arranged within the oil pipe and is composed of a relatively small length of pipe 7 and a core 8 which is formed with a central longitudinal bore 9 to permit passage of steam therethrough and through the tubular connection 10 which extends into the bore and has further connection with the apertured disk 11 which is threaded into the inner end of the pipe 7.

The last named pipe is in turn threaded at its opposite end and is engaged with the threads of the socket formed in the aforesaid removable cap 3. By again directing attention to the core 8, it will be seen that this is formed with spaced helical ribs 12 between and around which the oil must pass before being discharged through the left-hand end of the burner. Attention is directed to the fact that the core 8 is equipped with an integral flaring part 13 having external corrugations 14 thereon. A solid cone or the like 15 telescopes into this flared end 13 of the core and is removably held in place by small screws 16. A nozzle is thus formed at this end of the steam conduit and as shown clearly in the drawings, this nozzle terminates inward of the thickened and corrugated discharge end of the oil pipe.

In operation, oil passes through the pipe P and into the oil pipe 1 of the burner. Since the point of entrance of the oil is adjacent the intake for the steam, it will be seen that the oil will contact the pipe 7 and by the passing of steam therethrough, it is obvious that the oil will in turn be heated and will be thinned to some extent to facilitate rapid flowing through the pipe 1. At the same time oil is fed through the pipe 1, steam enters the conduit 6 through the pipe P' and passes rapidly through the short length of pipe 7 and encounters the closing

disk 11 at the inner end thereof. Some of the steam passes through the apertures in this disk while some of it passes through the small bore 9 in the aforesaid core. Such steam that passes through the apertures in the part 11 mixes with the oil at this point and forces it around the helical ribs of the core. The steam issuing from the nozzle mixes with the already mixed steam and oil and forces it against the corrugation 5 serving to more thoroughly mix the steam and oil to provide a readily ignitable mixture for burning at this end of the burner. It is of course understood that the steam and oil are mixed together during their passage around and between the helical ribs on the core and the mixture is also acted on by the corrugations on the exterior of the nozzle. Hence, by heating the oil and mixing hot steam with it and forcing it through the pipe 1 to be acted on by the helical ribs at the corrugations and by utilizing a portion of the steam to forcibly eject the mixture from the discharge end of the burner, the latter is rendered highly practical and desirable.

From the foregoing description, it will be seen that we have evolved and produced a unique oil burner which is highly desirable for use on locomotives and the like. By arranging the parts so that the oil is partially acted on after entering the oil passage of the burner, it is usually unnecessary to heat the oil in the tank before supplying it to the burner, and this is highly desirable in that it prevents waste of more or less of the heat units of the oil which are ordinarily lost before reaching the burner as results from preheating the fuel. In this burner, the steam is particularly advantageous in that it assists in nebulizing the mixture, heating the oil as it is fed into the pipe and facilitating its passage through the latter. By properly atomizing the mixture, a saving in both oil and steam is accomplished and the accumulation and depositing of soot in the flues is reduced due to the fact that the mixture provided, is entirely consumed.

It may be added that although it is not shown, a valve may be arranged either in the burner or in the steam line for reducing the steam in proportion to the oil to secure the best possible results.

By carefully considering the description in connection with the drawings, persons familiar with devices of this class will doubtless be able to obtain a clear understanding of the invention. Therefore, a more lengthy and detailed description is deemed unnecessary.

Since probably the best results may be obtained with the construction and arrangement herein shown and described, this is taken as the preferred embodiment of the invention. However, it is to be understood that minor changes coming within the scope of the invention as claimed may be resorted to if desired.

We claim:—

1. An oil burner comprising a pipe through which the oil passes, a conduit for the steam to pass through, said conduit terminating short of the discharge end of said pipe, the latter being reduced in diameter at the discharge end and formed with internal corrugations with which the mixture coacts, said steam conduit being provided with a restricted passage, with spaced helical ribs and with a nozzle having external corrugations.

2. In a burner, a fluid passage embodying a core having a bore for passage of the fluid and equipped with external helical ribs, said core being equipped at its discharge end with an integral flared portion, and a conical body telescoping into said flared end of the core and having its exterior spaced from the inner surface of said portion to provide a nozzle.

3. In a burner, a conduit for passage of a fluid, said conduit being composed of a pipe having an apertured disk fitted into one end thereof, and a core having a central longitudinal bore communicating with said pipe through the medium of a tubular connection connected to said disk, said core being provided with external helical ribs and being equipped at its discharge end with a nozzle.

4. A burner of the class described comprising an outer pipe through which oil or the like is designed to pass, said pipe being reduced in diameter at its discharge end and equipped with internal corrugations at this end, the fluid conduit arranged within said pipe, said conduit embodying a pipe at its intake end constituting a heater for the oil and a core having a bore through which the fluid passes, said core being equipped at its discharge end with a nozzle terminating inward of the discharge end of the oil pipe, and ports for discharge of the fluid intermediate the end of the conduit for mixing with the oil and for rapidly forcing it through said oil pipe.

In testimony whereof we hereunto affix our signatures.

EDWARD J. SHEARER.
FRANK LA FOND.