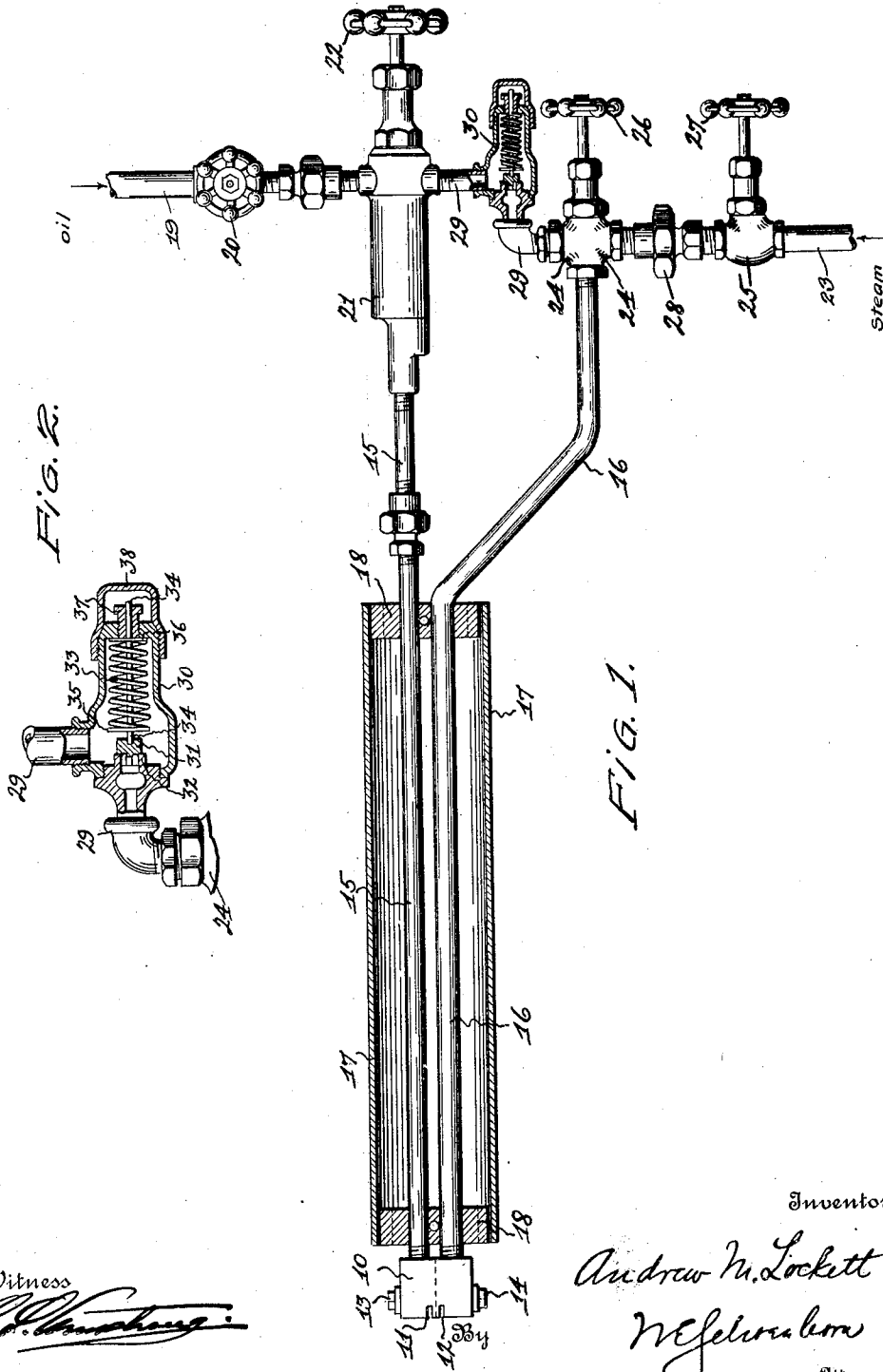


1,432,071.

Patented Oct. 17, 1922.



Witness
[Signature]

Inventor
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UNITED STATES PATENT OFFICE.

ANDREW M. LOCKETT, OF NEW ORLEANS, LOUISIANA, ASSIGNOR TO A. M. LOCKETT & CO. LTD., OF NEW ORLEANS, LOUISIANA, A CORPORATION OF LOUISIANA.

LIQUID-FUEL BURNER.

Application filed June 10, 1920. Serial No. 387,940.

To all whom it may concern:

Be it known that I, ANDREW M. LOCKETT, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Liquid-Fuel Burners, of which the following is a specification.

My invention relates to liquid fluid burners and more particularly to fuel oil burners or atomizers which consist of an oil pipe and a steam pipe entering any form of burner tip in which the steam and oil emerge from the burner in separate openings or slots arranged one above the other.

The objects of the invention are to be so construct and arrange the burner, oil and steam supply pipe with respect to each other and said burner, with a pressure or spring controlled check valve, so that when the oil supply is cut off from the burner, the oil remaining within the burner and other parts subjected to the heat of the furnace is automatically and entirely blown out or discharged from said burner and cooperating heated parts, thereby preventing the carbonization of oil in the burner or its parts, and interfering with the continuous or renewed operation of the burner or proper shape of flame formed by the burner tip when the oil and steam are again supplied and the burner put in service.

Another and most important object of the invention is to make a fuel oil burner entirely safe and free from any possibility of flare back which usually occurs with burners as now constructed and arranged and due to the large volume of oil entrapped in the long pipe connection between the cut off valve and burner tip being suddenly blown into the highly heated furnace after the oil is shut off and the steam is rapidly and manually diverted into the burner and its oil pipe connections by the fireman.

Other objects and advantages of the invention will appear from the detailed description of the construction and manner of assembling and operation which will be presently given.

The invention consists of structural characteristics and relative arrangements of elements which will be hereinafter more fully described and particularly pointed out in the appended claims.

In the drawings, in which similar reference characters indicate the parts in the several figures,

Figure 1, is a side elevation partly in section of the improved burner arrangements; and

Figure 2, an enlarged and sectional view of the valve used in connection with oil and steam supply pipes.

In the use of liquid fuel for furnaces the burner is usually projected slightly into the fire chamber of the furnace, and were it not for the cooling effect of the steam and oil entering said burner, it would become highly heated by the high temperatures generated and existing in the fire chamber. When the oil is shut off and the flame of the burner is extinguished, although there may be no other burners in use in the furnace, the heat radiating from the highly heated fire brick would be sufficient to carbonize any oil remaining in the burner, thereby causing the particles of carbon to partially or completely close up the burner or connecting sections of pipe which would interfere with the proper flow of oil to the burner or efficient shape of flame produced by the tip of the burner when the oil is again turned on furnace put in service. The foregoing conditions and bad results would be more likely to occur, if in the case of a furnace operating several burners, one of which be temporarily shut down by reason of reduced steam consumption or heating requirements.

Previous to my invention to take care of and avoid the carbonization of oil in the burners there was provided and arranged a steam connection with the oil pipe, so that immediately after shutting down the burner by cutting off the oil supply, the fireman by a separate and independent act or operation caused steam to be blown through the oil pipe, to remove the oil which remained there in and would be carbonized, and this provision for taking care of and eliminating the danger of carbonization is dependent upon manual operation, and it has been found out and repeatedly demonstrated, that sooner or later and in the best regulated industrial plants, the fireman will fail to make use of the above indicated steam connection, resulting in trouble with the burner as described. To overcome all the objections and failures herein pointed out, and remove the

necessity of a separate operation and all responsibility of the fireman to blow steam through the oil pipes, this invention was devised.

5 Referring to the drawings in which the preferred form of the invention is illustrated, 10 is the burner tip which is provided with the usual oil slot 11 and steam slot 12 and removable screw plugs 13 and 14. Connected to and communicating with the interior chambers of the burner tip 10 are the liquid fuel or oil supply pipe 15 and pressure or steam supply pipe 16, which may be surrounded by the centering casing 15 17 suitably supported therein and carried by the centering castings 18. 19 is a pipe connected with a suitable liquid fuel or oil supply under pressure and provided with a valve 20 for cutting off said fuel supply 20 when desired. Between said valve 20 and oil supply 15 is preferably interposed a combined strainer and regulating valve 21, controlled by hand wheel 22, as shown for example in U. S. Patent No. 1,206,354 to 25 Bernard S. Nelson and dated Nov. 28, 1916, and while it is contemplated using such a strainer it is not absolutely essential in carrying out the present invention.

A pipe 23 connected to any suitable supply of pressure as steam is in communication with the steam supply pipe 16, and is provided with the usual cut off valves 24 and 25 controlled by hand wheels 26 and 27, respectively, and interposed between said 35 valves 24 and 25 is a strainer 28, and by closing said valves 24 and 25, the strainer 28 can be readily removed, inspected, cleaned or repaired without disturbing the other parts of the burner.

40 29 is a branch pipe connecting the interior of the oil supply pipe 15 with the source of steam supply, and while I have shown and preferably use the branch pipe 29 in connection with the strainer 28 and valve 24, such an arrangement is not essential and 45 could be varied or modified without in any way departing from the broad application of the present invention. A pressure actuated or spring controlled check valve 30 is provided in said branch pipe 29, and as 50 shown in Fig. 2 consists of a valve disk 31 cooperating with and normally held to its seat 32 by means of a coil spring 33, surrounding a valve spindle 34 and interposed 55 around a disk 35, fixed to the spindle 34 and a disk 36 capable of movement along said spindle by properly turning the screw plug 37 when cap 38 is removed, as will be readily understood and needs no further 60 disclosure, and while I have shown this as my preferred form of pressure actuated valve, any other form of this type of valve may be readily substituted without in any way changing the essential features and operation of the present invention. 65

The parts being arranged as shown in the drawings and disclosed, the operation of the invention is as follows:

The valves 20 and 25 being open and oil and steam being supplied under pressure to 70 their respective pipes 15 and 16 and issuing from the burner tip 10 through slots 11 and 12, for the proper atomization of the oil in the furnace, under these conditions of the burner, the disk 31 of the automatic valve 30 75 is normally held to its seat 32 by the action of the spring 33 and pressure of the oil within the pipe 29 while passing through strainer 21 to the oil supply pipe 15. Should it be desired to extinguish the 80 burner, the valve 20 is closed thereby cutting off all supply of oil to the strainer 21, supply pipe 15 and burner tip 10, and when this is done, the pressure within the strainer 21 and its connecting branch pipe 85 29 and on one side of valve disk 31 is reduced to such an extent that the steam pressure within the valve 24, and the section of branch pipe 29 connected with the automatic valve 30, and on the opposite side of the 90 valve disk 31 will be such as to automatically lift said disk 31 off its seat 32 and gradually allow the steam to pass through said valve 30, branch pipe 29, through strainer 21 into oil supply pipe 15, and out 95 of slot 11 of the tip 10, and in so doing thoroughly and automatically blow out slowly all liquid fuel or oil remaining in said oil pipe 15 and entrapped in said pipe 15 and strainer 21 between the cut off valve 100 20 and burner tip 10, and prevent any possibility of clogging up or fouling of the burner tip or oil pipe connection therewith, due to carbonization of the oil as is usual in fuel oil burners where through neglect or 105 forgetfulness the burner is not blown out after the fuel has been cut off.

From the foregoing disclosure of the construction and operation of the invention, it will be seen that the objects and advantages 110 of the present arrangement pointed out in the statement of invention are fully and efficiently carried out, and that there has been devised a burner which is not only guaranteed to operate continuously and with 115 uniform heating capacity, but at the same time is absolutely safe and fool proof in its operation. It will also be understood that many changes and modifications will readily suggest themselves to any one without departing from the essential features and 120 spirit of the present invention, and therefore wish it to be distinctly understood that I do not limit myself to the specific arrangement and construction herein shown and described. 125

What I claim is:—

1. A liquid fuel burner comprising a burner tip, a liquid fuel supply pipe connecting said tip with a fuel supply, means 130

for cutting off the fuel supply into said supply pipe and to the burner tip, a branch pipe leading from a source of pressure into fuel supply pipe, means separate and independent of the burner tip in said branch pipe and so constructed and arranged to automatically open and close communication between said source of pressure and fuel supply pipe respectively by the cutting off and in the fuel supply to said fuel supply pipe, whereby any fuel remaining in said fuel supply pipe and burner tip after the fuel supply is cut off is automatically blown out to prevent carbonization of fuel and fouling of the burner.

2. A liquid fuel burner comprising a burner tip, a liquid fuel supply pipe connecting said tip with a fuel supply, a valve for cutting off the fuel supply into said supply pipe and to the burner tip, a pipe leading from a source of pressure to the burner tip for atomizing the fuel, a branch pipe connecting said source of pressure with said fuel supply pipe at a point intermediate the burner tip and valve for cutting off the fuel supply, and a separate and independent pressure controlled valve in said branch pipe adapted to be reacted upon by the pressure within the fuel supply pipe and so constructed and arranged to automatically open and close communication between said source of pressure and fuel supply pipe respectively by the closing and opening of the valve cutting off the fuel supply.

3. A liquid fuel burner comprising a burner tip, a liquid fuel supply pipe connecting said tip with a fuel supply, a valve for cutting off the fuel supply into said supply pipe and to the burner tip, a pipe leading

from a source of steam pressure to the burner tip for atomizing the fuel, a branch pipe connecting said source of steam pressure with said fuel supply pipe, and a valve independent of the burner tip in said branch pipe normally closing communication between the fuel supply pipe and source of steam pressure when the valve for cutting off the fuel supply is open and automatically open communication through said branch pipe between said fuel supply pipe and source of steam pressure through the burner tip when valve controlling fuel supply is closed.

4. A liquid fuel burner comprising a burner tip, a liquid fuel supply pipe connecting said tip with a fuel supply, a valve for cutting off the fuel supply into said supply pipe and to the burner tip, a pipe leading from a source of steam pressure to the burner tip for atomizing the fuel, a branch pipe connecting said source of steam pressure with said fuel supply pipe at a point intermediate the burner tip and valve for cutting off the fuel supply, and a valve in said branch pipe without the burner tip and reacted upon and held to its seat by the pressure within fuel supply pipe and normally closing communication between the fuel supply pipe and source of steam pressure when the valve for cutting off the fuel supply is open and automatically opens communication through said branch pipe between said fuel supply pipe and source of steam pressure when valve controlling fuel supply is closed.

In testimony whereof I affix my signature.

ANDREW M. LOCKETT.