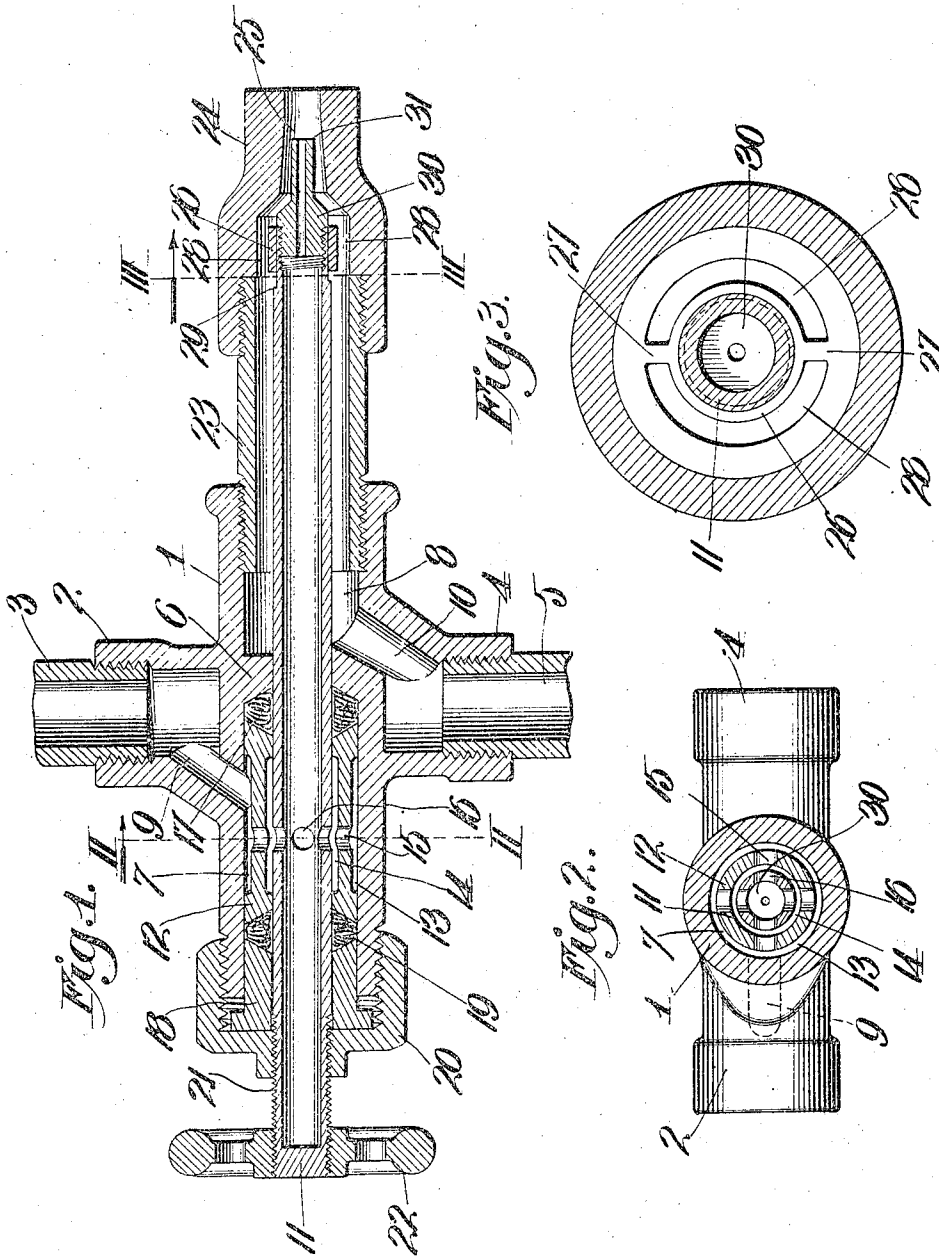


F. L. CLARK.
OIL BURNER.

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Witnesses
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UNITED STATES PATENT OFFICE.

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OIL-BURNER.

1,051,085.

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To all whom it may concern:

Be it known that I, FRANCIS L. CLARK, a citizen of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to liquid fuel or hydrocarbon burners, and aims to provide a burner which is so constructed that oil or other liquid fuel may be drawn or sucked into same by means of steam, hot air or other fluid, so as to atomize and spray the fuel for providing a maximum heating effect with a minimum supply of fuel.

It is also the object of the present invention to provide a burner of the character indicated which may be employed as an injector burner for boilers, and the like, the same being simple and inexpensive in construction and effective in its operation.

The present invention also comprehends the production of a burner of the class described wherein the flow of liquid fuel may be regulated, or stopped, by means for regulating the flow of steam through the burner.

In addition to the foregoing objects this invention also aims to generally improve liquid fuel burners of the type indicated.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention has been illustrated in its preferred embodiment in the accompanying drawings, wherein:—

Figure 1 is a longitudinal central section of the burner. Fig. 2 is a sectional view taken on the line II—II of Fig. 1. Fig. 3 is an enlarged sectional detail taken on the line III—III of Fig. 1.

Referring specifically to the drawings, the present burner embodies a tubular body 1, which is provided with interior and exterior screw threads at its forward and rear ends, respectively. The body 1 is provided with a radially projecting socket 2 intermediate its ends for the engagement of the fuel pipe 3 and diametrically opposite the

socket 2 the body is provided with a radially projecting socket 4 for engagement of the steam pipe 5. The body 1 is also provided with a partition 6 therein which is arranged forwardly of the axis of the sockets 2 and 4 and which provides a rear chamber 7 and a front chamber 8 within the body. The body 1 also has a diagonal passage 9 leading from the rear side of the socket 2 to the rear chamber 7 at a point in rear of the partition 6 and has another diagonal passage 10 leading from the forward side of the socket 4 to the rear end of the forward chamber 8.

A tubular stem 11 is arranged axially or concentrically within the body 1, with its ends protruding beyond the ends of the body, and the rear end being closed. The stem 11 passes through a sleeve 12 arranged within the chamber 7, which sleeve is slidable in the said chamber and has the exterior and interior shallow annular channels 13 and 14, respectively. These channels 13 and 14 are of considerable width, the sides of the channels terminating short of the ends of the sleeve. The sleeve is also provided with an annular series of apertures 15 intermediate its ends. The forward end of the sleeve 12 projects beyond the passage 9 so that the said passage communicates with the exterior channel 13 of the sleeve.

Between the forward end of the sleeve and the partition 6 and around the stem 11 is disposed suitable packing 17, and a gland 18 fits into the rear end of the body 1, suitable packing 19 being disposed between the gland 18 and the rear end of the sleeve 12 around the stem 11. A cap 20 is screw threaded on the rear end of the body to bear against the gland 18 in order to force the gland forwardly or inwardly, and the gland being forced inwardly causes the packings 17 and 19 to be pressed against the walls of the chamber 7 and against the stem 11 in order to prevent leakage, as will be apparent. The stem 11 passes through the cap 20 and is provided with external screw threads 21 engaging the said cap, so that when the stem is rotated, the same will be moved longitudinally solely. For convenience in turning the stem 11, a hand wheel 22 is secured on the rear end thereof. The said stem 11 also passes loosely through the partition 6, as well as through the gland 18 and the sleeve 12. The stem 11 is also

provided with an annular series of apertures 16 complementing the apertures 15, so that the liquid fuel may flow from the pipe 3 into the stem 11. It will be noted that the channels 13 and 14 will permit the sleeve to move longitudinally and will permit the stem to move longitudinally without interrupting the fuel supply, or the sleeve 12 may be reversed in order to vary the position of the apertures 16 relative to the apertures 15, the apertures 15 being arranged closer to one end of the sleeve 12 than the other end.

A tubular lengthening member 23 is screw threaded into the forward end of the body 1, and a nozzle 24 is screw threaded onto the forward end of the tubular lengthening member 23, the said nozzle having a forwardly tapered and constricted outlet passage 25 providing a rearwardly facing beveled shoulder or seat. A guide collar or ring 26 is arranged concentrically within the nozzle 24 in rear of its seat and is connected to the inner walls of the nozzle by means of the diametrically opposed webs 27, thus providing arcuate passages 28 around the collar 26 to the outlet passage 25. The forward end of the stem 11 is reduced and enters the guide collar 26 as designated by the numeral 29, and a nozzle 30 is screw threaded into and seated against the forward end of the stem 11, the nozzle 30 having the reduced tip 31 entering the outlet passage 25 of the nozzle 24. The reduced tip 31 provides a conical shoulder on the nozzle 30 facing forwardly, the shoulder of the nozzle 30 corresponding with and complementing the beveled seat of the nozzle 24. The nozzle 30 is of greater diameter than the diameter of the passage 25, so that when the nozzle 30 is moved forwardly, the same will tend to close the passage 25, and as the stem is moved rearwardly, the passage between the shoulders is increased.

In use, the pipe 3 is connected to a suitable source of liquid fuel and the pipe 5 is connected to a suitable source of steam, hot or other suitable fluid, it being preferable to have the source of fuel, such as a tank or the like, located below the burner so that the fuel must be drawn into the burner. Then when the stem 11 is turned to move rearwardly, the nozzle 30 will move away from the seat of the nozzle 24 so as to permit the steam to pass through the outlet passage 25, from the chamber within the nozzle 24, the tubular lengthening member 23 and the forward portion of the body 1. The steam in passing between the shoulders of the two nozzles will be directed toward the axis of the nozzles or toward the tip 31 of the nozzle 30 and passing between the walls of the outlet passage 25 and the tip 31 will be caused to pass over the free end of the tip 31 in a manner so as to create a

vacuum, in which event, the fuel will be drawn from the supply pipe 3 through the passage 9 and the apertures 15 and 16 into the stem 11 and then through the tip 30. The oil or other liquid fuel is thus raised into the burner and is atomized and sprayed, so that the particles of oil will thoroughly commingle with the same for the production of a flame of high degree.

It will be noted that the stem 11 may be rotated so as to be moved forwardly or rearwardly without interrupting the fuel supply, and as the said stem is moved forwardly or rearwardly the supply of steam is correspondingly diminished or increased, which will accordingly decrease or increase the quantity of fuel discharged from the nozzle 30. By moving the stem forwardly sufficiently, the conical shoulder of the valve 30 may be seated against the beveled seat of the nozzle 24, so as to close the passage through the nozzle 24, thereby preventing the discharge of steam and correspondingly cutting off the discharge of fuel. The nozzle 30 may be adjusted relative to the forward end of the stem 11 by screwing the nozzle 30 in the proper direction, and when the nozzle 30 is screwed rearwardly so as to seat against the end of the stem 11, the shoulder formed by the reduced portion 29 of the stem is adapted to strike the collar 26 prior to the contact of the conical shoulder of the tip 30 with the beveled seat of the nozzle 24. This, therefore, will ordinarily leave a small passage for the restricted discharge of the steam, which discharge will be so small as not to cause a suction sufficient to lift the fuel, but at the same time preventing the pressure of the steam from rising excessively.

From the foregoing taken in connection with the drawings, the advantages of the present burner will be manifest, and it will appear that the objects aimed at have been carried out in a satisfactory manner.

Having thus described the invention, what is claimed as new is:

1. An oil burner embodying a body having a pair of diametrically opposite pipe engaging sockets intermediate its ends and a partition therein forming forward and rear chambers, the body being provided with a passage leading from one socket to the forward chamber and with another passage leading from the other socket to the rear chamber, a sleeve slidable in the rear chamber having exterior and interior shallow annular channels of considerable widths and having an annular series of apertures nearer one end than the other, the forward end of the sleeve projecting beyond the latter passage so that the passage communicates with the exterior channel of the sleeve, a member engaged to the rear of the body, a tubular stem adjustable through the said member

and passing through the sleeve and partition, the stem being provided with an annular series of apertures, complementing the aforesaid apertures of the sleeve, cooperating nozzles attached to the forward ends of the stem and body, and packing disposed between the respective ends of the sleeve and the partition and said member.

2. An oil burner embodying a body having a pair of diametrically opposite pipe engaging sockets intermediate its ends and a partition therein forwardly of the axis of the said sockets and forming forward and rear chambers, the body being provided with a diagonal passage leading from the forward side of one socket to the rear end of the forward chamber and with another diagonal passage leading from the rear side of the other socket to the rear chamber at a point in rear of the partition, a sleeve slidable in the rear chamber having exterior and interior shallow annular channels of considerable widths and having an annular series of apertures nearer one end than the other, the

forward end of the sleeve projecting beyond the latter passage so that the said passage communicates with the exterior channel of the sleeve, a gland fitting into the rear end of the body, a cap screw threaded on the rear of the body, a tubular stem screw threaded through the cap and passing through the gland, sleeve and partition, the tubular stem being closed at its rear end and being provided with an annular series of apertures complementing the aforesaid apertures of the sleeve, a nozzle secured to the forward end of the stem, and a nozzle attached to the forward end of the body and inclosing and cooperating with said nozzle, and packing disposed between the respective ends of the sleeve and the partition and gland.

In testimony whereof I affix my signature, in the presence of two witnesses.

FRANCIS L. CLARE.

Witnesses:

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