

F. WOMACK.
 ROTOR VAPORIZING OIL BURNER.
 APPLICATION FILED MAY 4, 1921.

1,432,227.

Patented Oct. 17, 1922.

Fig. 1.

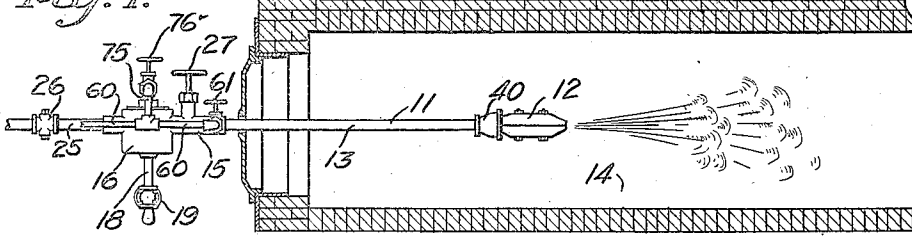


Fig. 2.

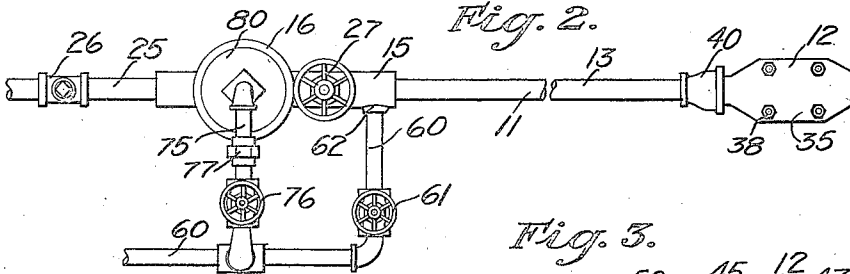


Fig. 3.

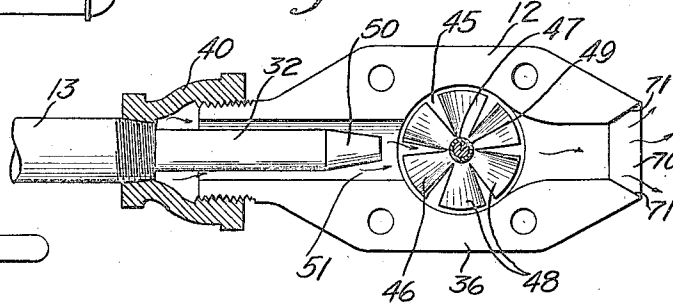
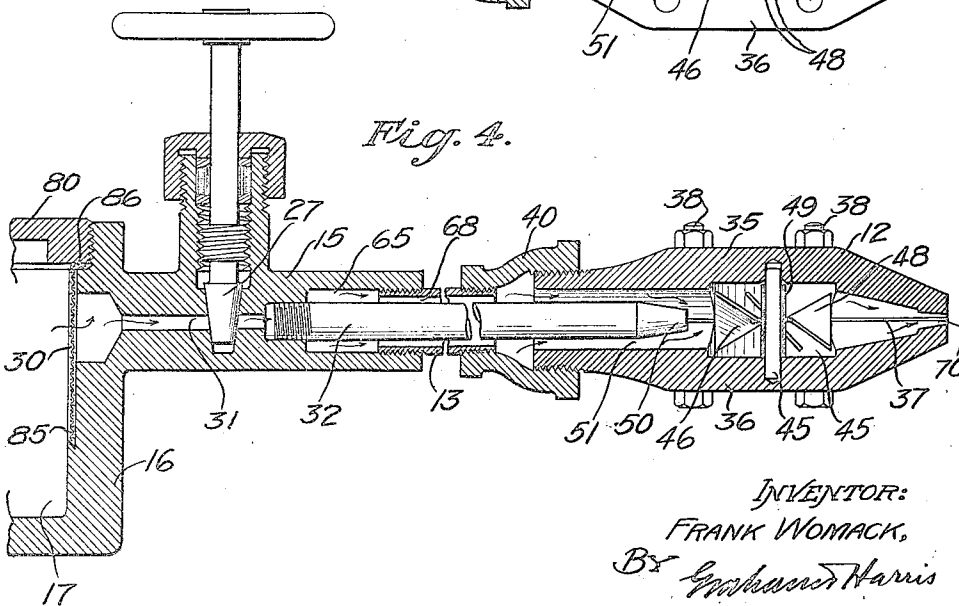


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK WOMACK, OF LOS ANGELES, CALIFORNIA.

ROTOR VAPORIZING OIL BURNER.

Application filed May 4, 1921. Serial No. 466,814.

To all whom it may concern:

Be it known that I, FRANK WOMACK, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Rotor Vaporizing Oil Burner, of which the following is a specification.

My invention relates to oil burners, particularly to that type of oil burner adapted to the use of heavy and crude fuel oils, which owing to their inert consistency do not readily vaporize, and must therefore be atomized by spraying into the combustion chambers with steam or air delivered under high pressure.

In the present types of spraying burners the oil stream and whatever spraying medium is used are combined either externally of the burner nozzles or at a point just within the discharge orifice of the nozzles. This combination has the action of delivering the oil into the combustion chamber in finely divided particles, which, although they may be in a condition susceptible to ready vaporization, must be completely vaporized within the combustion chamber. This necessity of vaporizing the oil within the combustion chamber has a lack of efficiency varying with the characteristics of the fuel oil used, with the result of the oil being incompletely vaporized and quantities of soot formed.

It is the principal object of my invention to provide an oil burner which will accomplish the vaporization of the fuel oil before its injection into the combustion chamber, thereby providing for a more complete combustion than has heretofore been attainable.

It is also a further object of my invention to provide an oil burner of such construction that the different oil passages may be blown out at the close of each period of operation without the necessity of dismantling the burner. These and other objects will become apparent hereinafter.

Referring to the drawings which are for illustrative purposes only.

Fig. 1 is a side elevation of an oil burner embodying my invention in use in a standard form of combustion chamber.

Fig. 2 is a plan view of the burner shown in Fig. 1.

Fig. 3 is a plan view of the discharge nozzle with the upper portion removed to disclose the interior construction.

Fig. 4 is a longitudinal sectional view through the burner nozzle and the control

head with parts disposed in contracted relation.

As shown in the drawings, the burner 11 is comprised of a nozzle 12 mounted on a pipe 13 and adapted to extend within a firebox 14. The pipe 13 is supported in an extension 15 of the filter body 16 which forms a sediment chamber 17 and is provided with a drain 18 in the bottom thereof controlled by a valve 19.

The fuel oil is delivered to the filter 16 through a pipe 25, in which is located a shut off cock 26, and collects within the sediment chamber 17, and with the opening of the needle valve 27 the oil is allowed to flow through a fine mesh screen 30 and a duct 31 provided in the filter body extension 15 into an oil nozzle 32 which extends centrally within the pipe 13.

The discharge nozzle 12 is formed of an upper section 35 and a lower section 26 between which is placed a copper gasket 37, the two sections being held securely together by bolts 38. The discharge nozzle is mounted upon the end of the pipe 13 by a bell reducer 40 into which both the discharge nozzle 12 and the pipe 13 are threaded.

Within the discharge nozzle 12 is formed a chamber 45 in which is located a rotor 46 mounted upon and rotatable around a vertical pin 47. The rotor which I have shown is of a simple type and consists of diagonally pitched blades 48 mounted upon a sleeve 49 which is of sufficient length to provide a substantial bearing upon the pin 47. It will be perceived that the end 50 of the oil nozzle extends up within the passage 51 formed in the discharge head.

Either steam or air may be used as a spraying medium with equal results, and are supplied to the burner 11 through a pipe 60 having therein a valve 61 and which connects with the extension 15, as indicated at 62, delivering the spraying medium into a chamber 65 which surrounds the forward portion of the oil nozzle 32. From there the spraying medium flows through a passage 68 existing between the interior of the pipe 13 and the exterior of the oil nozzle 32 into the chamber 51.

In the operation of this burner the spraying medium, under high velocity owing to the high pressure behind it, picks up the oil as it flows from the nozzle 32 and carries it through the rotor 46 causing it to rotate at a very high velocity, which I have de-

terminated from tests to be around 4,000 R. P. M. with steam at a pressure of 125 pounds. The action of the fastly revolving blades upon the oil particles in combination with the high temperature of the steam used, causes the oil to become vaporized within the nozzle and it is delivered through the discharge orifice 70 of the discharge nozzle into the fire box in a condition which will permit a very complete combustion, producing extremely high heats. The orifice 70 has its sides 71 flared as shown in Fig. 3 to spread the flame over a wide area so that the heat may be applied more advantageously.

A feature of my burner to which I desire to direct especial attention is that the oil passages and chambers of which it is composed may be cleaned of all collected sediment by blowing out with steam or air under high pressure. From the feed pipe 60 I connect with the sediment chamber 17 through piping 75 in which is located a valve 76 and a union 77 to facilitate the removal of the cap 80 through which the piping connection is made. By opening the valve 76 and the valve 19 in the drain pipe 18 the sediment chamber may be blown out; also the oil supply pipe 25 and the oil nozzle 32 may be blown out by opening their respective valves 26 and 27.

The screen 30 is retained in an undercut groove 85, as shown in Fig. 3 of the drawing, and has its upper end 86 bent over so that it will be securely held by the screwing down of the cap 80 thereagainst.

I claim as my invention:

1. In an oil burner, the combination of: a discharge nozzle; a body forming a sediment chamber; an extension upon said body, said body having an oil duct therethrough; a steam delivery pipe connecting between said discharge nozzle and said extension; an oil nozzle extending from said oil duct into said steam delivery pipe; a rotor in said discharge nozzle directly in front of said oil nozzle; a valve mounted in said extension to control the passage of oil through said oil duct; means for supplying oil to said sediment chamber; and means for delivering a flow of steam into said steam pipe.

2. In an oil burner, the combination of: a discharge nozzle; a body forming a sediment chamber, said body being formed to provide an under cut channel on the interior thereof; a screen retained in said channel; an extension upon said body, said body having an oil duct therethrough; a steam delivery pipe connecting between said discharge nozzle and said extension; an oil nozzle extending from said oil duct into

said steam delivery pipe; a rotor in said discharge nozzle directly in front of said oil nozzle; a valve mounted in said extension to control the passage of oil through said oil duct; means for supplying oil to said sediment chamber; and means for delivering a flow of steam into said steam pipe.

3. In an oil burner, the combination of: a discharge nozzle; a body forming a sediment chamber, said body being formed to provide an under cut channel on the interior thereof; a screen retained in said channel; a valve controlled drain from said sediment chamber; an extension upon said body, said body having an oil duct therethrough; a steam delivery pipe connecting between said discharge nozzle and said extension; an oil nozzle extending from said oil duct into said steam delivery pipe; a rotor in said discharge nozzle directly in front of said oil nozzle; a valve mounted in said extension to control the passage of oil through said oil duct; means for supplying oil to said sediment chamber; a steam supply line; and valve controlled branch lines to deliver steam to said sediment chamber and to said steam delivery.

4. In an oil burner, the combination of: a discharge nozzle; a rotor in said discharge nozzle actuated by the passage of fluids through said discharge nozzle; a body forming a sediment chamber, said body being formed to provide an under cut channel on the interior thereof; a screen retained in said channel; a valve controlled drain from said sediment chamber; an extension upon said body, said body having an oil duct therethrough; a steam delivery pipe connecting between said discharge nozzle and said extension; an oil nozzle extending from said oil duct into said steam delivery pipe; a valve mounted in said extension to control the passage of oil through said oil duct; means for supplying oil to said sediment chamber; a steam supply line; and valve controlled branch lines to deliver steam to said sediment chamber and to said steam delivery.

5. In an oil burner, a nozzle having a chamber formed therein, a steam delivery pipe connected to said nozzle, an oil delivery nozzle extending into said steam pipe, and a rotor in said chamber having its axis of rotation extending through the extended axis of said oil nozzle, said rotor having angularly disposed blades.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 27th day of April, 1921.

FRANK WOMACK.