May 13, 1924. 1,493,795

B. E. TYLER

OIL BURNER

Filed Sept. 5, 1922

Fig. 1

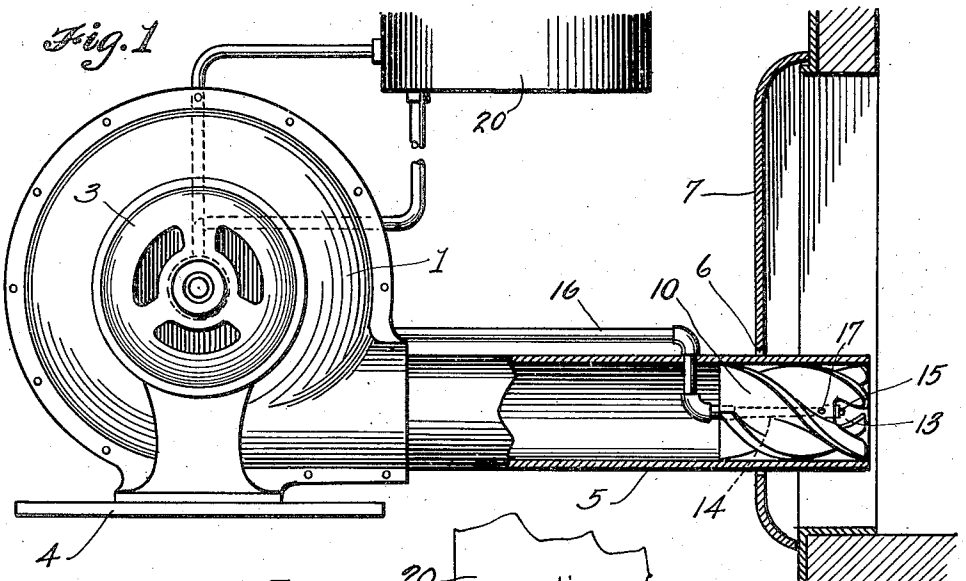


Fig. 2

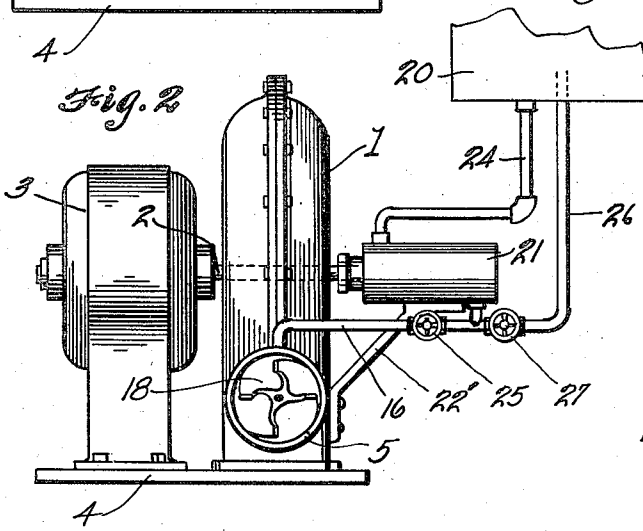


Fig. 3

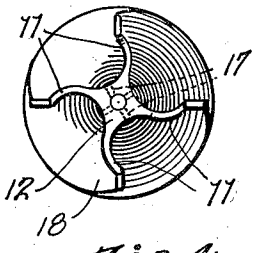


Fig. 4

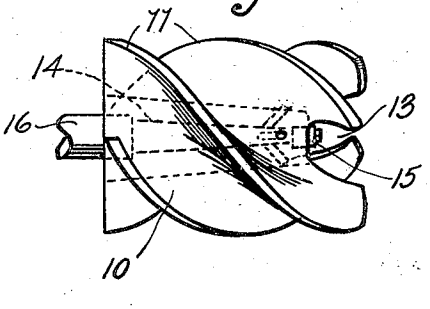
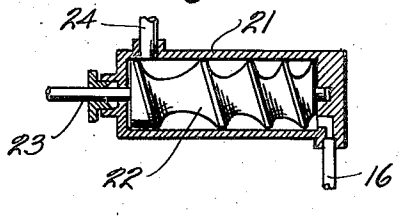


Fig. 5



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UNITED STATES PATENT OFFICE.

BERT E. TYLER, OF EVERETT, WASHINGTON.

OIL BURNER.

Application filed September 5, 1922. Serial No. 586,178.

To all whom it may concern:

Be it known that I, BERT E. TYLER, a citizen of the United States, residing at Everett, in the county of Snohomish and State of Washington, have invented a new and useful Improvement in Oil Burners, of which the following is a specification.

My invention relates to improvements in oil burners, and particularly to burners of a type especially adapted for use in connection with large furnaces and for burning heavy oils; the principal object of the invention being to provide a burner equipped with a spiral deflector which facilitates the mixing of the fuel oil with the air delivered into the furnace, together with means for delivering air forcibly through the spiral passages of the deflector and a pump mechanism for forcibly delivering oil to the burner.

More specifically, it is the object of the invention to provide a burner embodying a blower mechanism having an air discharge pipe for extension into the furnace, with a spiral deflector located in the discharge end of the said pipe; the deflector having spray openings in its spiral passages from which fuel oil is drawn by suction, gravity, or by pump pressure, to be caught up by the air blast and delivered in a whirling spray into the fire box.

Other objects of the invention reside in the various details of construction and combination of parts embodied in the device.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings wherein—

Figure 1 is a side elevation of the construction embodied by the present invention; a part of the blower pipe being broken away in order to better illustrate the location of the spiral burner.

Figure 2 is an end view of the same, particularly illustrating the means for driving the blower, the oil pipe connections with the pump and the disposition of the spiral burner in the blower pipe.

Figure 3 is an enlarged end view of the burner.

Figure 4 is a side view of the same.

Figure 5 is a central, longitudinal section of the oil pump housing and spiral pump.

Referring more in detail to the drawings, 1 designates what may be a fan blower of any standard type, having a fan shaft 2 operatively connected to be driven by an electric motor indicated at 3; both the fan housing and the motor being fixedly secured to a base plate 4 which may be supported, in any suitable manner, in front of the opening of the furnace with which the device is to be used. An air discharge pipe 5 leads from the fan housing, and this may be extended through an opening 6 in the door 7 of the furnace, as shown in Figure 1, so that the blast of air will be directed into the fire box. In such furnaces the fire box preferably would be lined with brick or fire clay.

Disposed within the discharge end of the pipe 5 is a spiral burner 10, which is fitted to the inside diameter of the pipe 5 and consists of four spirally directed blades 11 formed integrally with a central core 12. The blades have a pitch of approximately forty-five degrees with respect to the core, and the outer ends thereof extend beyond that end of the core, as shown best in Figures 1 and 4, to form a sort of mixing pocket 13.

The core of the burner is preferably tapered from its inner toward its outer end, and has a central, tapered bore 14 therethrough. The outer end of the bore is closed by a plug 15 threaded thereinto and an oil supply pipe 16 leads into its inner end. Small openings 17 are drilled, at an incline of about forty-five degrees, into the outer end of the bore from within the air passages or channels 18 between the blades through which oil may be discharged.

Oil for supplying the burner may be stored in a tank, as designated at 20, and in the present construction, I have illustrated a pump as a means of forcibly delivering the oil to the burner. The pump shown comprises a cylindrical casing 21 supported by means of a bracket 22′ from the fan housing. Fitted in the casing is a screw 22 having a drive shaft 23 operatively connected with the fan shaft 3. An oil supply pipe 24 leads from the tank into one end of the casing 21 and the pipe 16 which leads to the burner connects with the other end through a valve 25. A relief pipe 26 also connects with the pipe 16 through a valve 27 and this leads back into the tank 20 to take care of any over supply that the burner can not use. It is preferred to gradually decrease the spac-

ing of the spiral of the pump from the inlet to the discharge end of the casing in order that a better pressure may be effected.

Assuming that the device is so constructed and connected with a furnace as illustrated, in operation the fan and pump will be driven by the motor 3 to effect the discharge of an air blast into the furnace through pipe 5 and the forcing of oil through the pump to the spiral burner through pipe 16. As the oil is delivered through the burner openings 17 it is taken up by the air and is delivered in a whirling spray into the fire box thoroughly mixed with the air.

If the burner is not able to take care of all oil delivered to it by the pump, the excess will be delivered back to the supply tank through relief pipe 26. It is apparent that, should it be desired, oil can in some cases be delivered to the burner by gravity pressure or drawn by suction by the air blast through the burner and the pump eliminated.

Such a burner is especially useful for delivering oil to large furnaces and it will effectively distribute the oil to all parts of a large fire box. It also makes possible the burning of the low grade, heavy oils with the best results.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters-Patent, is:

The combination with an air blower having a discharge pipe and an oil delivery pump of a burner fitted within the discharge end of the blower pipe and comprising a central forwardly tapered core with spirally directed blades integral therewith that terminate forwardly of the end of the core in spaced relation to form an intermediate mixing pocket; said core being provided longitudinally with an oil channel connected to receive oil from the pump and having discharge ports leading in a forwardly inclined direction from the channel into the air passages between the blades.

BERT E. TYLER.