Sept. 25, 1934. W. B. KERRICK 1,974,818

OIL BURNER

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FIG. 1.

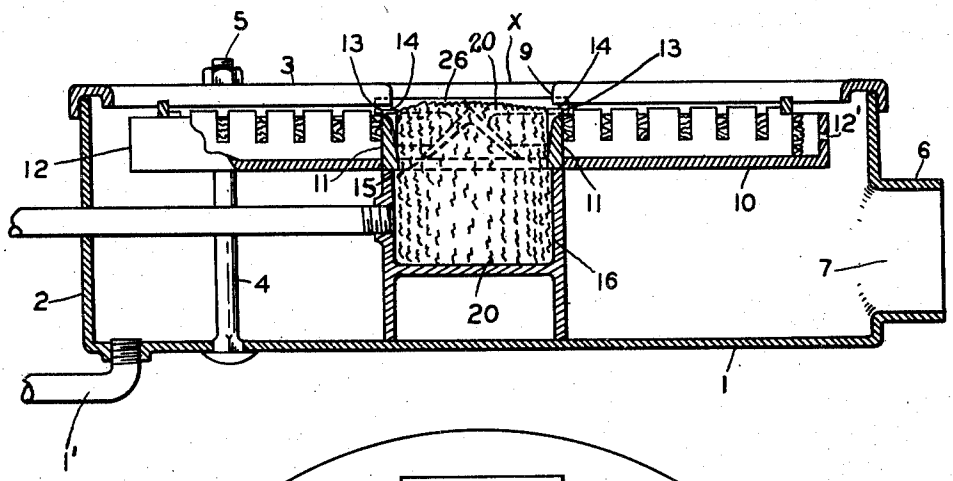
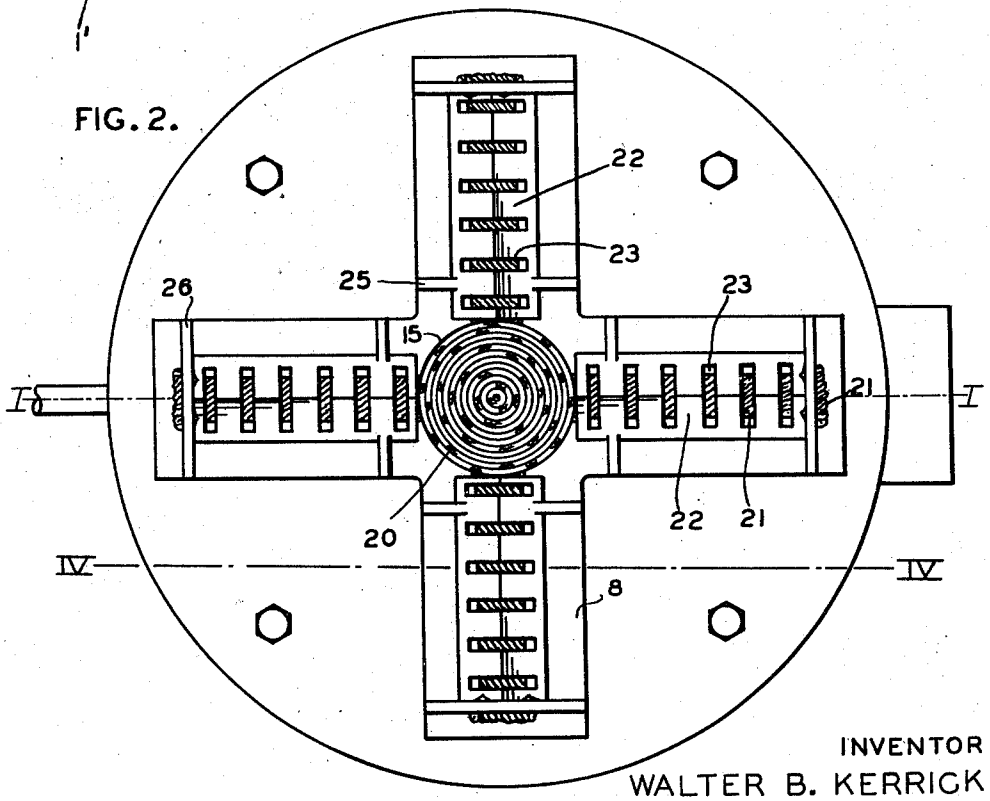


FIG. 2.



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FIG. 3.

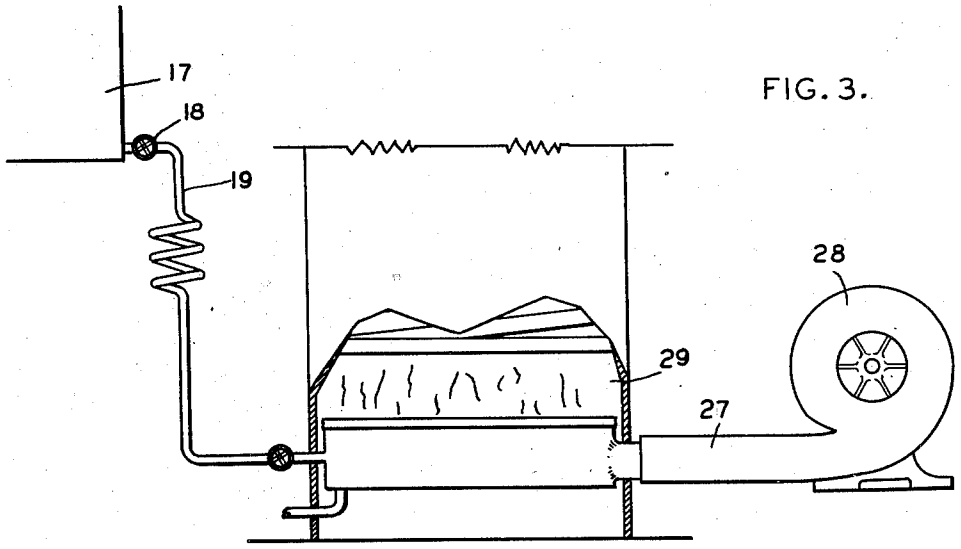
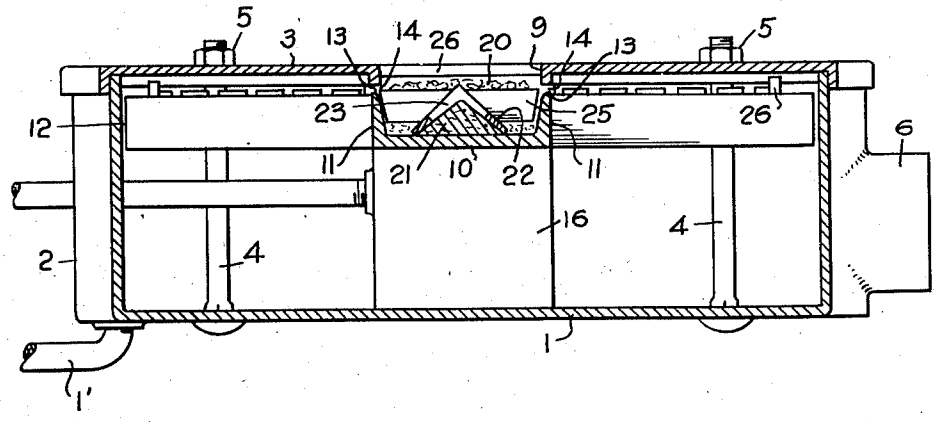


FIG. 4



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UNITED STATES PATENT OFFICE

1,974,818

OIL BURNER

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Application December 23, 1931, Serial No. 582,709

3 Claims. (Cl. 158—94)

This invention relates to improvements in oil burners and more particularly to burners of the wick type.

The principal object of the invention is to perfect the combustion of the lower grades of oil fuels, such as the kerosenes.

Another object is to eliminate the dangers of accumulated fuel or fuel gas in the burner.

Another object is to prevent the deposit of carbon as unburned tar and similar residuals upon the burner parts.

A further object is to cause the complete consumption of all the fuel remaining in the burner after the fuel supply is shut off.

Other objects and advantages will appear as the description progresses.

In this specification and the accompanying drawings the invention is disclosed in its preferred form. It is to be understood, however, that it may be embodied in other forms without departing from the spirit of the invention as defined in the claims following the description.

In the two sheets of drawings:

Fig. 1 is a vertical section on the line I—I, Fig. 2, of a burner constructed in accordance with this invention.

Fig. 2 is a plan view from above of the burner.

Fig. 3 is a side elevation diagrammatically illustrating a practical application of the burner.

Fig. 4 is a vertical section of the burner on the line IV—IV, Fig. 2.

In detail the construction shown in the drawings, referring to Fig. 1, comprises the cylindrical pan, having the bottom 1 and the side wall 2, and having the cover 3 to form an air distributing box. The cover is held down by the bolts 4 engaging the bottom 1, and having the nuts 5 engaging the cover. The neck 6, surrounds the draft opening 7 in the side of the air box. Should the fuel overflow into the air box it would drain off through the waste pipe 1' beyond the influence of the flame.

The cover 3 has openings 8 therein radiating from the open center, preferably forming an equilateral cross, or multiples thereof. The shape of the burner may be varied according to the capacity desired. It may be long and narrow with a single opening 8, or have a plurality of openings as shown. The best results are attained by feeding the fuel at the center of the burner. The edges of the openings 8 are flanged downward as at 9 to form tuyère lips.

The fuel distributor comprises a trough having the bottom 10, the sides 11, and the closed ends 12. This trough must follow the outlines of the openings 8 so that the upper edges 13 will register with the flanged lips 9 of the cover to form the tuyère openings 14 between the trough and the cover. This trough may be easily constructed from channel iron pieces welded together or it may be an integral casting.

The trough has a central opening 15, into the fuel cup 16 beneath. The fuel is conducted from the fuel tank 17, through the valve 18 and the pipe 19 to the cup 16, see Fig. 3. The fuel cup has the wick 20, which may be conveniently made of a strip of sheet asbestos rolled upon itself and fitted into the cup to about level with the top thereof.

The type of fuel it is proposed to use will not ignite by direct contact with a pilot light, but when the wick 20 is impregnated it forms a gas by evaporation, which may be readily ignited by a match, taper or electric ignition.

This center wick 20 also acts as a fuel distributor for the lateral asbestos wicks 21, in capillary contact with the center wick and extending along the bottoms 10 of the troughs.

The jet plates 22 are superimposed over these wicks 21. These plates are preferably triangular, as shown, with their apices upward, and they extend from the edge of the cup 16 to near the trough ends 12, see Fig. 1. They are transversely slotted as at 23 to permit the escape of the gaseous vapors arising from the wicks 21. When these vapors are ignited they burn freely and cleanly because of the equal distribution of fuel along the wick and the interspaced areas of ventilation between the edges of the plates and the adjacent walls of the troughs and between the flames at 23 which are thus properly oxidized to support combustion. The heat of combustion communicated to the plates 22, has a retort-like effect on the wicks 21, increasing the volume of gaseous vapor given off by the wicks throughout their lengths and improving the combustion.

These plates are centered by the lateral lugs 25 formed thereon and abutting the walls 11 of the troughs at their inner ends. The opposite ends are centered and held down by the bridges 26, formed on the plates and clamped between the cover 3 and the troughs, in notches formed in the lips 9.

The exhaust pipe 27 of the conventional motor driven blower 28 is connected with the neck 6. The forced draft from the blower is distributed evenly by the air box 1—2—3 and escapes through the tuyères 14 on opposite sides of the troughs and blows across the flames issuing from the jet plates. This creates a very active com-

bustion, capable of increased volume as the fuel is fed into the cup 16, under control of the valve 18. The fuel burns cleanly and completely with a clear flame with a bluish green zone at the jet plates and is practically transparent and free of soot forming smoke above the lower luminous flame zone. When confined in a fire box, within a casing such as 29, the products of combustion are comparable to the effects of true gas burners.

The flame should be ignited at the center wick 20 in any manner convenient to the type of apparatus to which the burner is applied. Fuel should not be fed to the burner beyond the saturation point of the wicks 20—21. Surplus fuel liquid accumulating in the trough will burn, but not efficiently. If fuel is fed to an unlighted burner, the troughs will overflow into the pan 1 and drain off at 1' without danger or damage. To prevent flooding of the troughs, a hole or holes could be provided in the ends 12 at the proper level, as at 12', Fig. 1.

One of the safety features of the present burner is the center wick 20, which is the first to receive the fuel and the last to give it up. The result is that after fuel is shut off at 18 the center wick continues to burn until the fuel in the cup 16 is exhausted, preventing the accumulation of unburned gases in the fire box 29. If the fuel be thermostatically controlled, the center wick 20 can be kept burning to act as a pilot for successive ignitions. The center wick will burn with or without the blower 28.

Having thus described this invention, what I claim and desire to secure by Letters Patent is:

1. A liquid fuel burner including a central fuel cup with troughs having perpendicular side walls and radiating therefrom; a wick in said cup having extensions into said troughs; perforated triangular jet plates in said troughs overlying said wick extensions; opposed tuyères arranged along the edges of said troughs; and means for forcing air through said tuyères.

2. A liquid fuel burner including a central fuel cup with troughs radiating therefrom above the bottom of said cup; a wick in said cup having extensions into said troughs perforated jet plates in said troughs and having sides inclined away from the side walls of said troughs, and overlying said wick extensions; an air distributing box enclosing said cup and troughs and having a cover with an opening with flanged edges registering with the edges of said troughs and forming tuyères on the opposite sides of said troughs and means for forcing air through said tuyères.

3. A liquid fuel burner including a central fuel cup with troughs radiating therefrom and having upstanding side walls; an air distributing box enclosing said cup and troughs and having a cover spaced above and having an opening therethrough registering with the walls of said cup and troughs; means for forcing air into said box and through the opening in said cover; a wick in said cup having extensions into said troughs; and perforated jet plates in said troughs and overlying the wicks therein.

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