

Oct. 23, 1934.

J. C. KORTH

1,977,798

OIL BURNER

Filed Feb. 6, 1931

Fig. 1.

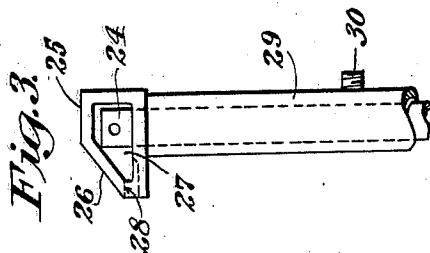
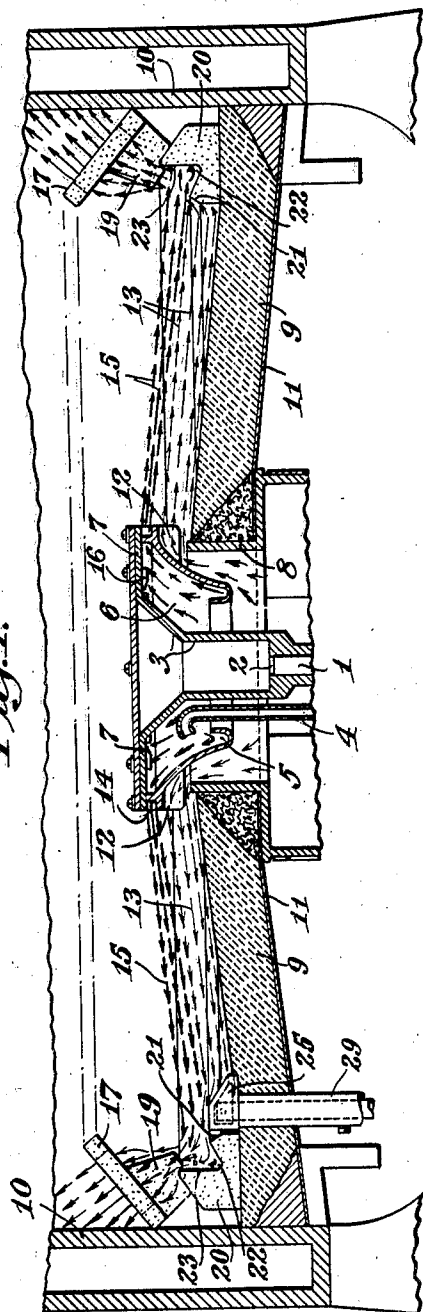
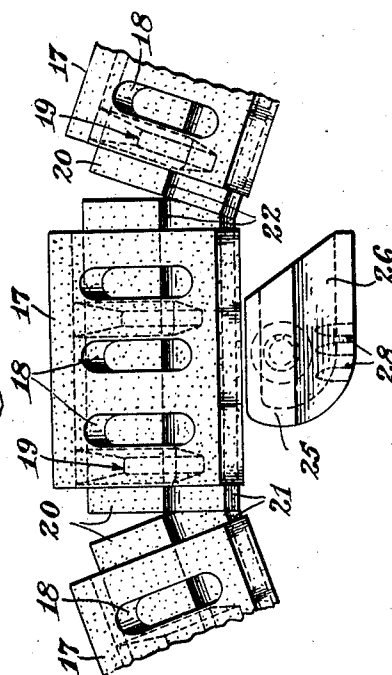


Fig. 2.



Inventor:

John C. Korth

By his Attorney

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UNITED STATES PATENT OFFICE

1,977,798

OIL BURNER

John C. Korth, Maplewood, N. J.

Application February 6, 1931, Serial No. 513,895

1 Claim. (Cl. 158-4)

This invention relates to oil burners, and more particularly relates to means for igniting, concentrating and directing the flame of rotary oil burners in the combustion chambers in which the burners operate.

It is well known that with oil burners which project the oil and air radially from a rotating head, there is a considerable loss of efficiency due to the fact that the swirling and rotation of the flame interferes with its concentration at and impingement against the walls of the combustion chamber or boiler in which the burner operates.

A principal object of my invention is to provide means for concentrating and directing the flame of rotary oil burners against the walls desired to be heated by the burner.

Another object of this invention is to provide a pilot light construction which not only serves to ignite the burner mixture but also aids in concentrating and directing the flame of a rotary oil burner against the walls desired to be heated by the burner.

Accordingly, the objects of my invention include the provision of simple, durable, efficient and improved means for igniting, concentrating and directing the flame of rotary oil burners against the walls desired to be heated thereby, to the end that the heating efficiency of the burner is increased.

Other objects of this invention will be in part obvious and in part pointed out hereinafter.

In order that a clearer understanding of this invention may be had, attention is hereby directed to the accompanying drawing, forming a part of this application, and illustrating certain possible embodiments of this invention.

Referring to the drawing:

Fig. 1 is a sectional view of the head of a rotary oil burner positioned in the combustion chamber of a boiler (only a fragment of the boiler walls being shown), and showing means, embodying my invention, for igniting, concentrating and directing the flame of the burner against the boiler walls;

Fig. 2 is a top view of the grill and pilot light embodying my invention; and

Fig. 3 is a front view of the pilot light construction.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Referring to the drawing; for an illustration of a rotary burner head I have shown the head of the burner for which an application was filed an April 7, 1930, in the names of John C. Korth and George Irving Carter, Serial No. 442,089.

This head is adapted to be rotated by any suitable means, not shown; for instance by an electric motor whose drive shaft 1, is engaged in the recess 2, of the hollow central member 3 of the head. Oil is caused to flow by gravity, or by other suitable means, through pipe 4 and to drop into the annular trough 5 formed at the lower end of the sloping, annular spreader plate 6 which is suspended from the periphery of the annular flange 7 at the top of the hollow central member 3. The head projects through an annular casing 8, and, preferably, refractory material 9 extends from casing 8 to the boiler walls 10, being supported, if desired, on a suitable plate 11.

Vanes 12 are provided on the outside of plate 6 so that when the head rotates, air will be drawn up between casing 8 and plate 6 and will be projected in a sheet across the top of the refractory material 9 toward the boiler walls, as indicated by the lighter arrows, marked 13 in Fig. 1.

When the head rotates, centrifugal action will cause oil to flow from trough 5 up the sloping plate 6 and to be projected through apertures 14, provided between the plate 6 and the flange 7 of central member 3, and across the top of the air sheet toward the boiler walls, as indicated by the heavier arrows, marked 15 in Fig. 1. Some air is drawn up between the spreader 6 and central member 3 and is intermixed with the projected oil spray, and, if desired, to increase the volume of such air and to cause more intimate intermixing of the oil and air, vanes 16 may be provided for this purpose on the under side of flange 7.

Due to the manner of projection of the mixed air and oil draft and the underlying air draft, these would tend to move circumferentially along the boiler walls, in a more or less indiscriminate manner, tending somewhat to swirl away from the walls, and interfering with the establishment of a uniform mixture at the boiler walls. As stated hereinbefore, my objects include the provision of means for correcting and avoiding such conditions at the boiler walls.

To this end I provide concentrating and directing means at the boiler walls and in the paths of the drafts. Such means may comprise a circle of refractory grill members 17, having apertures 18 and flanges 19 whereby the grills may be supported on suitable refractory bases 20, which, in turn, rest on the refractory hearth 9, as shown, and to which they may be cemented. The grills and bases may be made in one piece, or in more than two parts, as desired.

The two-piece construction shown permits

arbitrary positioning and spacing of the grills on the bases. It also permits the use of all whole grills even when one or more of the bases are cut away to fit into the installation.

- 5 Each base presents a tapered surface 21 toward the drafts from the burner head, and has a depression or valley 22 behind the tapered surface, and a vertical wall 23 extending from the valley, higher than the surface 21, and directed toward the tops of the grill 17.

- 10 The lower strata of the drafts projected by the burner head impinges against the tapered surfaces 17 and is deflected upwardly thereby into the upper strata and toward the apertures of the grill. The mixture impinging against the walls 23 is also deflected upwardly thereby to and through the apertures of the grill. The valleys 22 create eddy currents in the mixture and thus aid in causing thorough and intimate intermixing of the several strata of the drafts projected by the head. The vertical walls or flanges 19 of the grill also have the same effect, and also stop any circumferential movement of the projected mixture about the boiler walls, deflecting any impinging currents through the apertures of the grill straight against the boiler walls.

- 25 The result of the construction described is that the projected air and oil not only will be thoroughly and intimately mixed and intermingled so that the mixture at the boiler walls will be of uniform character, and not characterized by lean and rich spots, but the mixture and flame also will be directed straight against the boiler walls instead of circumferentially, or with swirling or rotary movement thereabout. Thus the concentration of the heat at and against the boiler walls is increased, and, obviously, the effect of a construction of this character increases the efficiency of the burner tremendously.

- 40 To ignite the mixture projected by the burner head, I preferably provide a pilot light 24, immediately in front of one of the grill bases, and provide the light with a hood 25 having a tapered surface 26 presented toward the burner head, so that this surface 26 will deflect the projected drafts impinging thereagainst upwardly into the upper strata and toward the grill apertures. The

pilot hood has a flame emitting aperture 27 at one end facing transversely of the path of oil and air projected from the burner head, and preferably has breather holes 28 facing the burner head. The hood 25 may have a hollow stem 29, adapted to telescope over the pilot light pipe 24, and be provided with a set screw 30, whereby the hood may be set in adjusted position on the pilot light pipe.

The hood not only aids in creating a uniform mixture of the projected oil and air and in directing the mixture and flame through the grills in straight lines against the boiler walls, but also shields the flame of the pilot light against being blown out by the drafts projected from the burner head, and by shooting the ignition flame transversely across the projected mixture where the mixture is most readily combustible, insures ignition promptly and with certainty.

As many changes could be made in the above construction and as many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is to be understood that all matter contained in the above description or shown in the accompanying drawing be interpreted as illustrative and not in a limiting sense.

What I claim is:—

In a fire box for oil burners of the character described, in combination, a substantially annular hearth, a substantially annular refractory grill support disposed on the hearth adjacent its periphery, and grill members adapted to be disposed and supported in any selected places on the grill support, whereby the spacing of the grill members from each other may be varied, said grill members having flat inclined apertured portions disposed above the surface of the hearth, and having supporting walls or flanges integral with and extending downwardly from said flat portions and resting on the grill support, the grill support having a beveled top surface, and said grill walls or flanges having shoulders overhanging the upper edge of said beveled top surface of the grill support.

JOHN C. KORTH.