July 5, 1927. 1,634,819

S. W. BATES

OIL BURNER

Filed July 31, 1924

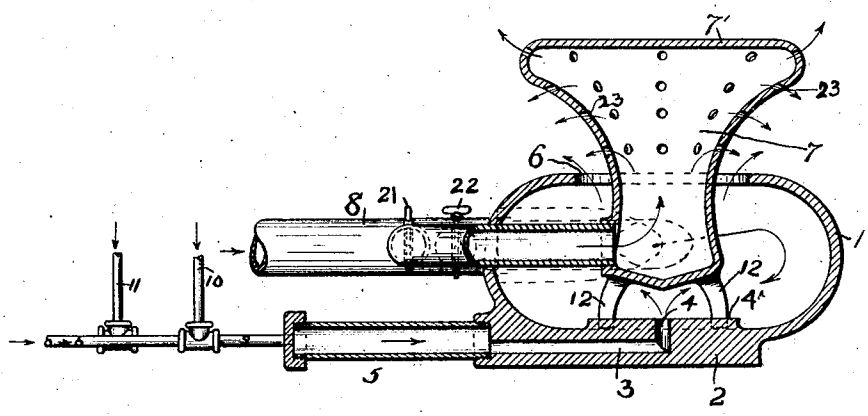


Fig. 1

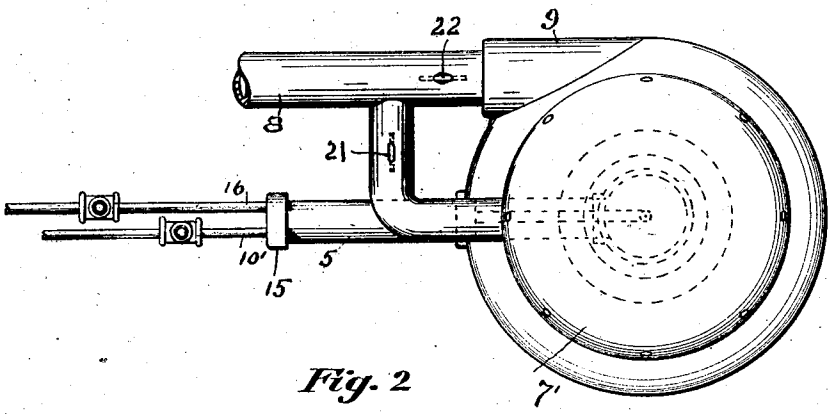


Fig. 2

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UNITED STATES PATENT OFFICE.

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OIL BURNER.

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My invention relates to an oil burner of that class that is usually provided with an upward discharge opening usually circular in form and the object of the invention is to spread the flame so that it will cover a comparatively large surface rather than to condense the same.

The invention consists of a disk spreader located somewhat above the opening and having a stem or support extending vertically through the opening. This stem extending vertically through the center of the flame has the effect of separating the flame and the stem as it increases in height is spread out laterally so as to gradually cause the sections of the flame as it ascends to move from a perpendicular to a horizontal direction. Thus the body of the flame while it is baffled against the under portion of the spreader is also spread out into large area.

A further object of the invention is to introduce into the enlarged stem, which is made hollow, a supply of air to be added to the flame for the purpose of increasing the combustion of the oil.

For this purpose my invention includes in its preferable form a thickened stem which is made hollow and perforated with means by which a supply of air may be introduced into the lower portion of the stem passing outwardly through the holes made in the stem and through the body of the upper portion of the spreader as well.

This air may be taken from the air blast pipe, which usually accompanies the burner, carrying into the enlarged stem a blast of air under pressure, which is in position to be mixed with the flame which passes upward around said stem, baffling and spreading around the enlarged upper portion of the stem.

Instead of being forced in by the blower, the air may be sucked in from any portion of the burner, the upward velocity of the flame creating a certain amount of vacuum for the purpose of pulling in the air.

I have illustrated in the accompanying drawing a burner of the type referred to, containing a spreader which illustrates the general construction of my burner and shows an ordinary form of burners having a blast of air or air under pressure supplied to it.

Referring to the drawing,

Fig. 1, shows a central longitudinal section through any burner provided with the spreader such as I have described and

Fig. 2, is a plan of the same.

Referring to the drawing, 1 represents a hollow pot which is usually made of cast iron, 2 is the base of the same, 3 represents an oil inlet connecting with the passage or outlet 4, which discharges upwardly through the center of the burner. 5 is an enlarged oil inlet connecting with the passage 3.

At the outer end of the inlet pipe 5 is a plug 15 into which enters an oil supply pipe 10′ and an oil supply pipe 16 connecting by means of a suitable fitting with the oil supply pipes 10 and 11.

The flame is discharged through the circular opening 6 in the top of the pot 1 and air is supplied from a suitable fan through the air pipe 8 entering the side of the pot in a tangential direction through an opening 9 formed in the pot.

The parts thus far spoken of constitute no part of my invention and are well known in burners of this type.

According to my invention, I make use of a spreader 7 having at the top a disk 7′ some little distance above the opening 6 and circular in form.

The flat top or disk 7′ is somewhat greater in diameter than the opening 6 in the burner.

Beneath and supporting the disk 7′ is an enlarged stem which acts to divide the flame centrally and by an increasing diameter as it ascends, turns the flame from a vertical to a horizontal position or substantially so and tends to spread the flame in all directions with an upward turn to the same.

The upper end of the stem which is the widest portion of the same turns inwardly to join the disk or top forming rounded edges at the upper part of the structure as it joins the stem.

The lower end of the stem rests, as here shown, on the bottom of the pot on a plurality of legs 12 which straddle the inlet 4.

The legs 12 surround a raised projection 4′ through which the oil enters the pot.

As here shown, the spreader is formed hollow with a solid lower end which forms a baffle plate for the incoming oil and numerous openings 23 are made in the hollow

spreader through which compressed air will be injected to be added to the flame as it surrounds the spreader.

For the purpose of introducing air into the body of the spreader, I connect the stem with the air pipe 8 by the branch air pipe 20 which passes through the side of the pot and enters the side of the stem of the spreader. A damper 21 is placed in the branch pipe 20 and a damper 22 is located in the air pipe 8.

By means of these two dampers the relative amount of air entering the pot direct and the amount diverted to enter the spreader may be accurately determined.

A spreader such as I have described in a burner of this type enables me to spread the flame over a very large surface and particularly to direct it around the lower edge of the water legs of a boiler where it is most needed and to add to the heating quality of the oil flame by producing a secondary combustion at the point where it is used.

While I have shown my spreader as applied to a hollow pot having air under pressure blown into said pot with an oil supply taken from the bottom of the same, any burner provided with an upwardly acting discharge opening is adapted to receive such a spreader with beneficial results to the combustion.

I claim:—

A burner comprising, in combination, a mixing chamber having separate inlets for fuel and for primary air sufficient to support combustion and having a flame discharge opening at its top; and a hollow flame spreader mounted centrally on the bottom of said chamber having connection with an air supply and extending upward through said flame discharge opening with its walls diverging outward so that the upper edge of said spreader is laterally beyond the edge of said opening, whereby the flame is gradually spread and directed laterally; there being a closed top on said spreader and holes in its diverging walls above said flame opening for escape of heated air from the interior of said spreader into this diverging flame.

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