Aug. 23, 1949. C. E. YOUNG 2,479,889

POT TYPE OIL BURNER WITH AIR PREHEATING MEANS

Filed Aug. 9, 1946

Fig 1.

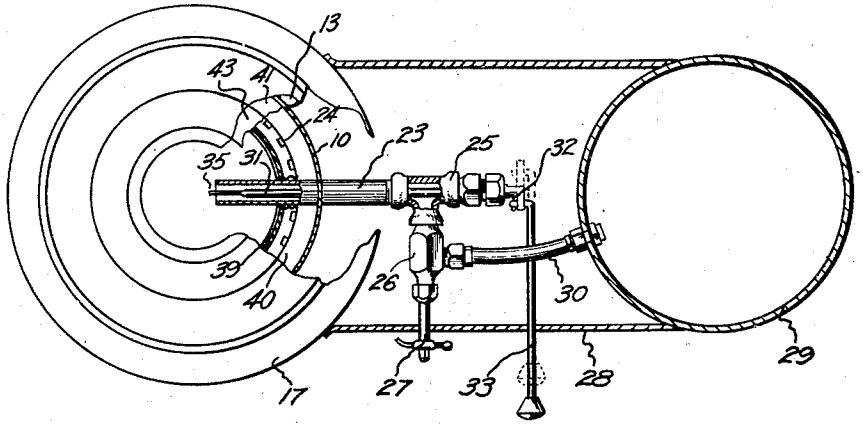


Fig. 2

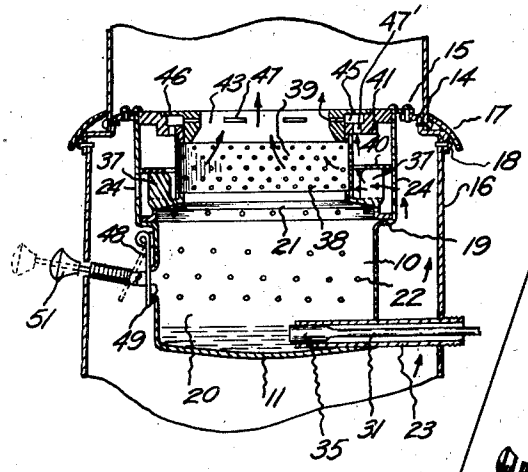
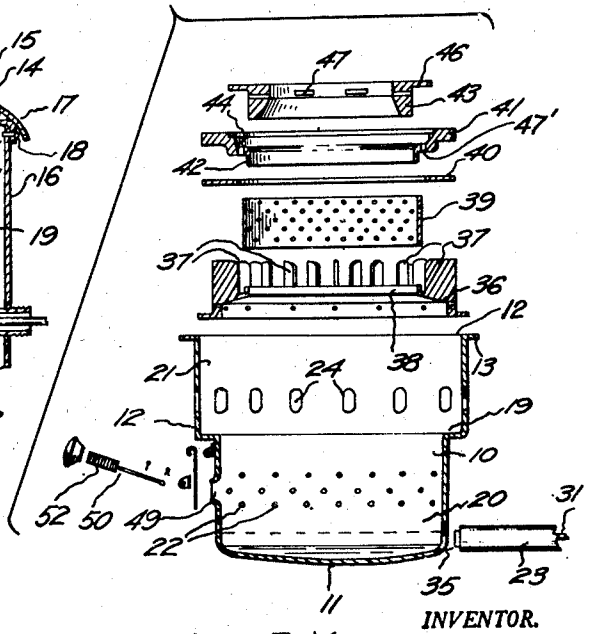


Fig. 3



INVENTOR.

CECIL E. YOUNG

BY Irving L. McCutcheon

HIS ATTY.

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POT TYPE OIL BURNER WITH AIR PREHEATING MEANS

Cecil E. Young, Arlington, Tex., assignor to Richard S. Moore, Dallas, Tex.

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1 Claim. (Cl. 158—91)

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This invention relates to oil burners and has for one of its objects the production of a natural draft or forced draft oil burner wherein hot air is directed to the top of the burner to facilitate mixing of the air with the gas vapors near the top of the burner to provide complete combustion of the fuel.

A further object of this invention is the production of a simple and efficient oil burner having an automatically closing choke door for controlling the draft while lighting the burner.

Other objects and advantages of this invention will appear throughout the following specification.

In the drawing:

Figure 1 is a top plan view partly shown in section and illustrating the burner and sump.

Figure 2 is a vertical sectional view of the burner.

Figure 3 is an exploded view of the burner, the parts being shown in section and drawn apart.

By referring to the drawing, it will be seen that 10 designates the fire pot of the burner in the nature of a cylindrical shell having a closed dished bottom 11 and an open top 12. The fire pot 10 is provided with a lateral flange 13 around the top thereof, which flange 13 overhangs the burner support 14 and this flange 13 is anchored in place by suitable screws 15. The support 14 is carried by the burner housing 16 which housing carries a suitable finishing ring 17 to cover the screw heads 18 of the burner housing 16.

The fire pot 10 is provided with an inset ledge portion 19 intermediate the bottom and top thereof, dividing the fire pot into a lower chamber 20 and an upper chamber 21. The side cylindrical wall of the lower chamber 20 is perforated as at 22 and a feed pipe 23 leads to the dished bottom 11 to feed fuel to the chamber 20. The side cylindrical wall of the upper chamber 21 is provided with air inlet openings 24.

The fuel pipe leads to a T connection 25 which carries a valve 26 extending at right angles to the fuel pipe 23. An operating handle 27 of the conventional type is carried by the valve 26 and extends beyond the casing or support 28 which connects the sump 29 with the burner housing 16.

A line 30 of a suitable type connects the sump or fuel supply reservoir 29 to the valve 26, where the flow of fuel from the supply reservoir 29 to the burner may be controlled by the valve 26. A rod 31 extends longitudinally of the pipe 23 and is provided with a crank 32 at its outer end

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for connection with the operating rod 33. This rod 33 extends through the casing or support 28. By reciprocating the rod 33, the flattened scraper blade 35 will be rotated within the inner end of the fuel pipe 23 to scrape or break loose any hard carbon which might form in the discharge end of the fuel pipe 23.

An air heating element 36, preferably circular in formation rests upon the ledge portion 19 and is provided with a plurality of upwardly extending spaced fins 37 arranged annularly around the upper face of the element 36, as shown in Figure 3. These fins 37 are spaced or inset inwardly of the air inlet apertures 24, as shown in Figure 2, so that air may pass upwardly of the housing 16, through the apertures or air inlets 24, and between the fins 37. This element 36 is provided with an inwardly extending upturned annular ring slupporting flange 38, upon which the lower edge of a ring 39 rests. This ring 39 is inset relative to the fins 37 to permit heated air to pass between the ring 39 and the fins 37 and through the perforations of the ring 39. A flat ring 40 rests upon the top of the fins 37 and encircles the perforated vertical ring 39 in spaced relation thereto.

A cap plate 41 fits over the upper edge of the ring 39 and carries a depending flange 42 which fits within the ring 39. This plate 41 is preferably anchored in position upon the support 14 in overhanging relation by suitable screws, in any desired manner. A removable inset ring 43 having an annular depending flange fits within the flange 42 of the plate 41 to space the ring 43 from the wall 44 of the plate 41 and provide a channel 45 therebetween. This ring 43 is provided with an overhanging lateral flange 46, overhangs the plate 41 and extends flush therewith to removably support the ring 43 upon the plate. The ring 43 is provided with slots 47 to provide outlets for the channel 45.

A door 48 is hinged to the fire pot 10 over the opening 49 opposite the fuel pipe 23. A spring pressed choker rod 50 engages the door 48 to cause the door 48 to automatically close when released. The rod 50 extends through the housing 16 and carries an actuating knob 51 at its outer end. A spring 52 is carried by the rod 50 between the door 48 and the inner face of the housing 16 to hold the door 48 normally closed.

In assembling the burner, the fire pot 10 is fitted in position, the flange 13 hanging upon the burner support 14. The fuel pipe 23 is placed in position and the door operating mechanism for the door 48 is placed in position. The air heat-

ing element 36 is placed in position to fit upon the ledge portion 18 and the rings 39 and 40 are placed upon the element 36. The cap 41 is then placed in position over the ring 39 and anchored in position. The removable inset ring 43 is then dropped in place upon the cap plate 41. This ring 43 is removable for cleaning the burner from the top.

When assembled, the burner may be lighted after permitting a proper amount of fuel to flow into the dished bottom of the fire pot 10. The door 48 is opened by pulling outwardly upon the rod 50 and a lighted paper is dropped through the opening 49 into the dished bottom of the fire pot 10 upon the fuel. When the rod 50 is released, the door 48 will automatically close and remain closed until again manually opened. The door assembly acts as a choker. When the door 48 is opened, this lets a volume of excess air into the burner, holding the flame in the burner down near the bottom thereof. This will heat the metal of the fire pot 10 which in turn speeds up the vaporization of the fuel, thereby producing a quick fire. This operation only takes a few seconds and when the choker rod 50 is released, as stated above, the door 48 closes automatically by action of the compression spring 52.

It will be noted that the ring 40 rests on the air heating element 36 in the manner shown and directs air passing through the apertures or air inlet openings 24 and between the fins 37. Since these fins 37 are very hot, when the burner is in operation, the air passing therebetween will be heated to a very high degree of temperature, before it enters the perforated ring 39 and openings 47 and the openings 47' in the bottom of the cap plate 41. This arrangement will cause the hot air to come into the burner near the top thereof, where the hot air is most valuable and useful in perfecting combustion. The element 36 also tends to hold the temperature down in the fuel chamber 20, since it absorbs heat from the burner fire pot 10. The draft on the heating unit in which the burner is installed, is drawn through the openings 24 and between the fins 37, tending to cool the fins and consequently take heat from the metal of the burner fire pot 10.

Furthermore, it should be understood that as the draft is drawn through the openings 24, from outside the burner and is turned upwardly and between the fins 37, jets of air are forced through the various perforations thereby mixing with the gas vapors that form in the burner. The air heating element 36 which carries the fins 37 naturally becomes heated while at the same time, because of its construction, it tends to draw heat away from the metal parts of the surrounding casing. The heated air will pass upwardly through the ports or openings 47' and 47 as above described and also through the perforated ring 39. Since this air is very hot, and is discharged near the top of the burner, a complete combustion is obtained.

It should be understood that certain detail changes in the structure may be made without departing from the spirit of the invention, so long as these changes fall within the scope of the appended claim.

What is claimed is:

A burner of the class described comprising, a firepot including a closed bottom and open top and provided intermediate the depth thereof with a circumferential inset ledge, upper and lower chambers in said firepot defined by said inset ledge, a fuel supply line entering said firepot adjacent the closed bottom thereof, said firepot having air inlet openings formed about the circumference of the upper chamber of said firepot, a circular air heating element seated on said inset ledge and provided with a plurality of upstanding spaced fins arranged annularly about and inwardly of the circumference thereof, said fins being disposed inwardly of and opposite said firepot air inlet openings, a cylindrical perforated ring seated concentrically within said fins on said heating element, a flat ring seated on said fins in abutment between the chamber wall and the perforated ring member, a circular cap seated about the open top of said firepot, a depending flange formed about the inner circumference of said circular cap and seating telescopically with the upper end of said perforated ring acting to center the same, a circular ring having a depending flange seated on said cap with said flange in an inserted position within said cap, and the last mentioned ring having circumferentially spaced vent slots formed therein.

CECIL E. YOUNG.

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