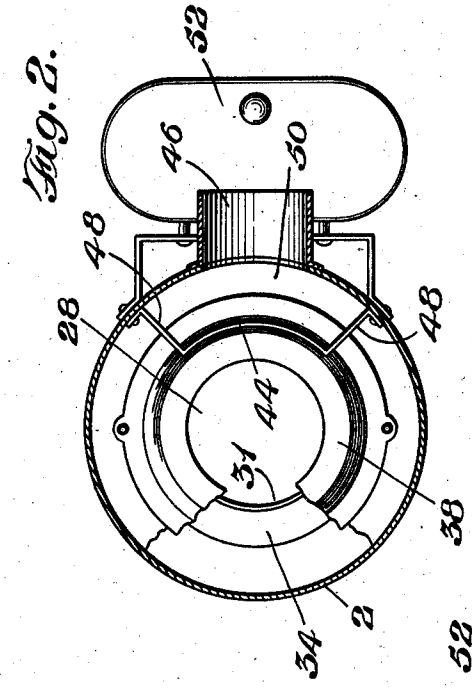
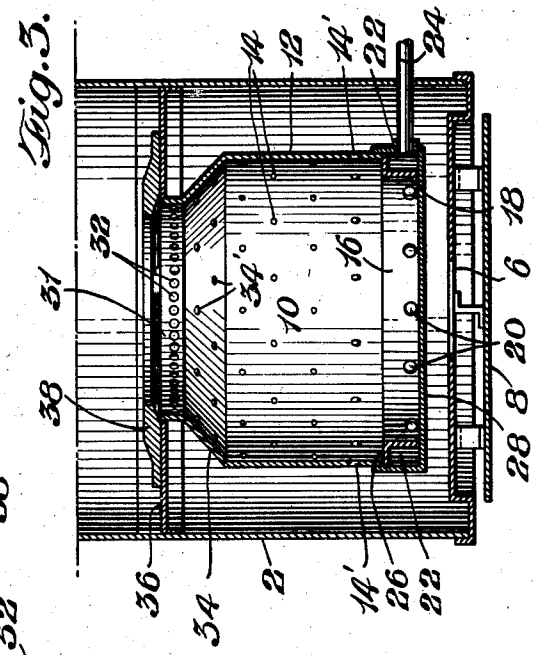
May 3, 1938. L. O. MORIN, JR., ET AL 2,116,278

OIL BURNER

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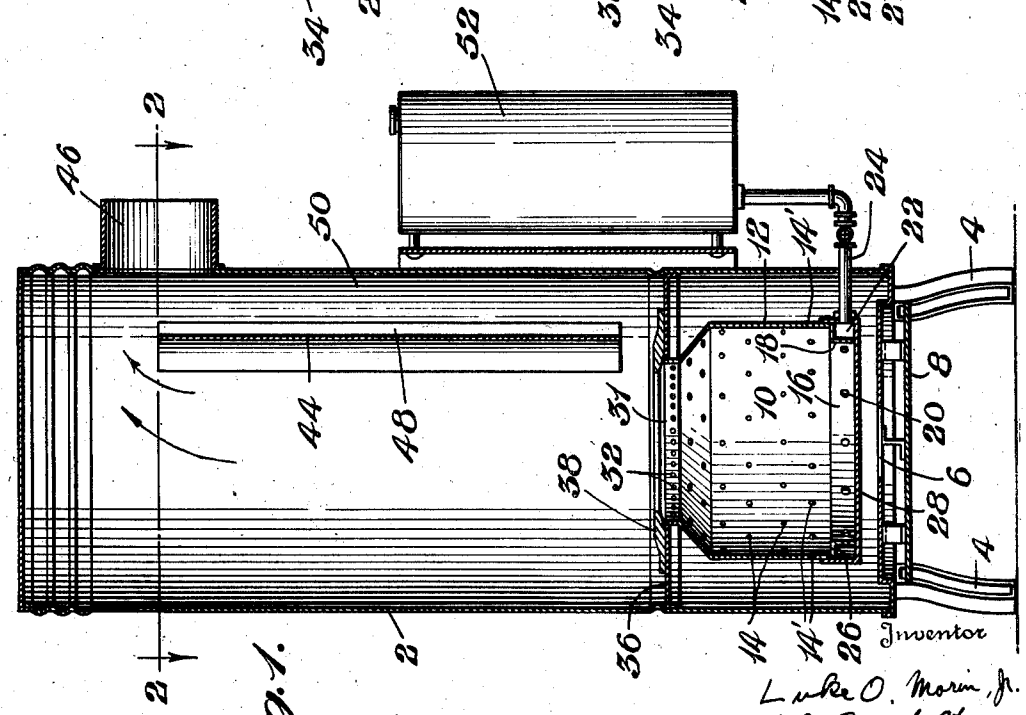


Fig. 1.

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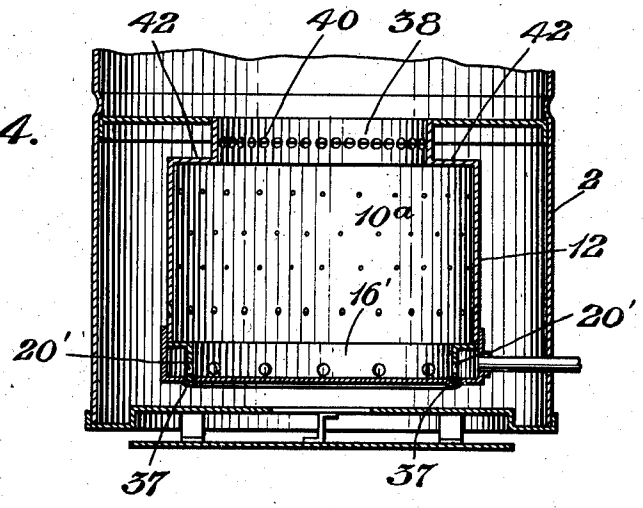
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OIL BURNER

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Fig. 4.



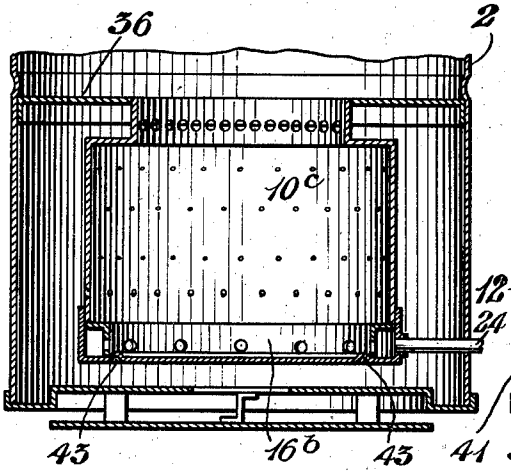


Fig. 6.

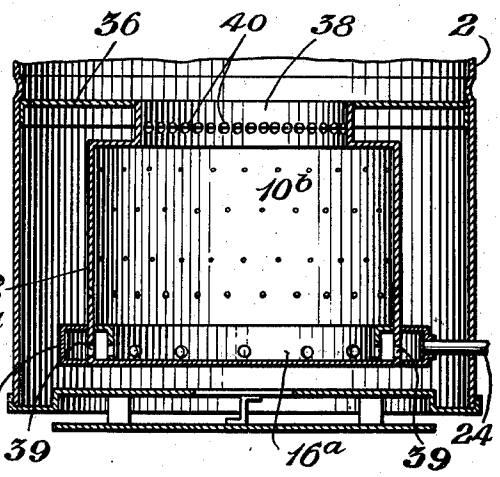


Fig. 5.

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UNITED STATES PATENT OFFICE

2,116,278

OIL BURNER

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Application June 15, 1937, Serial No. 148,388

3 Claims. (Cl. 158—91)

This invention is an improvement in oil burners, particularly of the pot type, usually using kerosene or a slightly heavier oil.

The principal object of the invention is to provide a burner of increased efficiency, which will vaporize the oil readily, and will mix with the oil vapor primary and secondary air for effecting thorough and complete combustion.

One of the important objects of the invention is to provide means for more evenly distributing the oil to the bottom of the burner from all directions, thereby giving a large vaporizing surface, and to provide for preheating the oil for aiding the vaporization thereof. This is preferably accomplished by an oil distributor ring placed in the bottom of the burner and spaced inwardly slightly from the burner wall, this ring being provided with weep holes for feeding oil into the bottom of the burner from all directions, thereby giving a more uniform feed and distribution of the oil to the bottom of the burner.

An important feature of this oil distributor ring is that its lower edge dips into the oil while its upper edge absorbs heat from the hot gases in the combustion chamber and will conduct heat downwardly into the oil, thereby aiding its vaporization.

Another important feature of the invention is that the upper part of the burner is provided with a restricted throat apertured for the admission of secondary air. This restricted throat is preferably formed of an inset wall, inset with respect to the main wall of the burner, and provided with a large number of holes for admitting secondary air.

The cooperative effect of the oil distributor ring and primary air apertures is to give a primary mixture of oil vapor and air, which mixture passes up through the restricted throat, which supplies to it secondary air for completing the combustion.

Another important feature of the invention is the provision of a baffle plate above the burner proper, this baffle plate being set on the inside of the casing or housing and spaced from the inside wall of said housing, to provide a dead air space for insulating the back part of the burner from the flame. This baffle also serves to direct the flame somewhat forwardly so that the flame stays in the upper part of the housing a little longer, giving it more time for completion of the combustion. Without the baffle plate, the gases may pass too quickly to the smoke pipe so that a good deal of flame goes up the smoke pipe, resulting in an unnecessary heat loss. It has been found by actual experiment that the use of this baffle plate improves the heating efficiency of the heater.

The invention will now be described in connection with the accompanying drawings, illustrating the present preferred embodiments of the invention. In these drawings,

Fig. 1 is a vertical sectional view through the entire heater;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a vertical, cross sectional view, somewhat enlarged, of the vaporizing and mixing chamber;

Fig. 4 is a similar view showing a modification; and

Figs. 5 and 6 are fragmentary, sectional views of two other modifications.

Referring now to these drawings in which similar reference characters indicate similar parts, 2 indicates the main housing of the heater, provided with supporting legs, a relatively large hole 6 in the bottom for the entrance of air and a shield 8 spaced from the bottom of the burner allowing air to pass inwardly to the opening 6 but serving to protect the floor from the heat.

The vaporizing and mixing chamber 10 is preferably round, although it could be of any desired shape, and comprises a vertically disposed wall 12 provided with holes 14 for the admission of primary air. One or more rows of lower holes, as shown at 14', are preferably downwardly and inwardly directed, for directing the air toward the surface of the oil.

Coming now to an important feature of the invention, 16 indicates an oil distributor ring, comprising a vertical portion 18 provided with weep holes 20 all the way around. This ring is placed in the bottom of the burner and it may be welded in place if desired. The wall 18 is spaced inwardly slightly from the bottom of the wall 12 to provide an oil accumulating space 22, to which oil is admitted through one or more oil inlet pipes 24. The upper part of the oil distributing ring is provided with an outwardly extending horizontal flange 26 which is substantially in contact with the wall 12.

By the provisions of the weep holes 20 near the lower edge of the oil distributing ring, it is evident that the oil will be distributed substantially uniformly over the substantially flat bottom 28 of the vaporizing and mixing chamber and that oil will be fed radially inwardly from all directions. This provides a large vaporizing surface for the oil nearly equal in area to the cross-sectional area of the chamber 10 and gives a uni-

form feed which aids the ready volatilization of the oil.

The oil distributor ring may be of any desired dimensions but preferably it is between one and two inches in height, so that its lower edge dips into the oil, while its upper edge absorbs heat from the hot gases in chamber 10 so that the heat absorbed by the upper part of the ring will be carried down by the ring into the oil, thereby aiding its vaporization.

The upper part of the chamber 10 is provided with a restricted throat formed by an inset wall 31 which is substantially vertical and which is provided with a relatively large number of air inlet apertures 32 for the admission of secondary air. The cross-sectional area of the restricted throat is less than the area of the bottom vaporizing surface 28. The lower edge of the inset wall 31 is connected to the upper edge of the main wall 12 by a connecting wall 34 which could be, if desired, provided with air inlet apertures 34', although these air inlet apertures 34' could be omitted.

The chamber 10 just described is mounted in place in the heater casing 2 by a bracket 36 so that the bottom 28 of the chamber 10 is spaced slightly above the air aperture 6. The mouth of the chamber 10 is bordered by the usual cast iron ring 38.

Referring to the modification in Fig. 4, the bottom of the chamber 10*a* is provided with an annular groove 37 in which is seated the lower edge of an oil distributing ring 16', provided with weep holes 20'.

The upper part of this chamber 10*a* is provided with a restricted throat formed by a substantially vertical wall 38 provided with air inlet apertures 40 for the admission of secondary air. The lower edge of the inset wall 38 and the upper edge of the main wall 12 are connected by the substantially horizontally extending connecting wall 42.

Referring to the modification in Fig. 5, weep holes 39 are provided near the bottom of the wall 12 of the vaporizing and mixing chamber 10*b*, the oil being supplied to these holes from a distributing collar 41 extending around the outside of the wall 12, as shown, to which collar oil is supplied by the pipe 24. This arrangement would feed oil inwardly from all directions. A heating and distributing ring 16*a* having its lower edge dipping into the oil and having weep holes or apertures at or near its lower edge, could be used in this modification, if desired.

In the modification shown in Fig. 6, the bottom wall of the vaporizing and mixing chamber 10*c* is provided with an annular upstruck rib 43. Seated just outside this annular rib is an oil distributor ring 16*b*, provided with weep holes for the admission of oil inwardly from all directions. The oil is supplied from the pipe 24.

The burner structures as described are very efficient, will burn the usual fuel oil uniformly and reliably, the combustion being thorough and complete, so that substantially no soot is formed. By actual tests the heating efficiency of burners of the type described is substantially increased.

Referring now to the baffle plate for insulating the rear part of the housing, this baffle plate, indicated generally as a vertically extending member 44, is secured to the inside wall of the casing 2, just above the vaporizing and mixing chamber 10 and below the flue outlet 46, the baffle being provided with inwardly extending flanges 48 which space it from the inside wall of the housing to provide a dead air space 50, which space serves to keep cool the rear part of the housing on which an oil reservoir 52 may be carried safely. The baffle 44 serves to prevent the flames taking a "short cut" to the flue outlet 46 and so allows a completion of the combustion in the housing proper before the flame, after completing combustion, passes out of the flue outlet.

In the claims, the oil distributor ring is claimed as a ring, although it should be understood that it need not be circular. Practically speaking, however, it would be circular.

While we have illustrated our invention in some detail, it should be understood that the invention is not limited to the precise details here disclosed, but may be carried out in other ways, as falling within the scope of the claims.

We claim as our invention:

1. An oil burner of the vaporizing pot type, comprising a combustion chamber having a substantially vertical wall provided with apertures for the admission of primary air and having a substantially flat and horizontally disposed bottom extending completely across the lower part of the combustion chamber, an oil distributor ring in the bottom of the combustion chamber and spaced slightly inwardly from the inner wall thereof, said oil distributor ring being provided near its lowermost edge with a plurality of weep holes for feeding oil radially inwardly from a plurality of directions onto the bottom wall of the combustion chamber, certain of the holes for the admission of primary air in the lower wall of the combustion chamber being inclined downwardly and inwardly for directing primary air downwardly and inwardly onto the surface of the oil admitted through said weep holes, and means for supplying oil to the outside of said oil distributor ring.

2. An oil burner of the pot type, comprising a combustion chamber provided with a substantially vertical wall provided with apertures for the admission of primary air, the combustion chamber being provided with a substantially flat bottom, an oil distributor ring at the bottom of said combustion chamber and spaced inwardly slightly from the inner surface of the vertical wall, said oil distributor ring being provided with weep holes near its lower edge for feeding oil inwardly onto the flat bottom of the combustion chamber from a plurality of directions, the vertical wall of the combustion chamber, at its upper edge, being provided with an inwardly extending flange forming an annular baffle, said annular baffle having at its inner edge a substantially vertical wall forming a constricted throat, said constricted throat being provided with apertures for the inlet of secondary air, said annular shoulder serving to baffle the upwardly flowing mixture of vapor and air for causing them to mix thoroughly, while the constricted throat serves to increase the velocity of the upwardly flowing gases and thereby accelerate the inflow of secondary air through the apertures in the constricted throat.

3. An oil burner of the pot type, comprising a combustion chamber provided with a substantially vertical wall provided with apertures for the admission of primary air, the combustion chamber being provided with a substantially flat bottom, an oil distributor ring at the bottom of said combustion chamber and spaced inwardly slightly from the inner surface of the vertical wall, said oil distributor ring being provided with weep holes near its lower edge for feeding oil inwardly onto the flat bottom of the combustion cham-

ber from a plurality of directions, certain of the lower inlet apertures for primary air being inclined downwardly for directing primary air downwardly and inwardly onto the surface of the oil undergoing vaporization on the bottom of the combustion chamber, the vertical wall of the combustion chamber, at its upper edge, being provided with an inwardly extending flange forming an annular baffle, said annular baffle having at its inner edge a substantially vertical wall forming a constricted throat, said constricted throat being provided with apertures for the inlet of secondary air, said annular shoulder serving to baffle the upwardly flowing mixture of vapor and air for causing them to mix thoroughly, while the constricted throat serves to increase the velocity of the upwardly flowing gases and thereby accelerate the inflow of secondary air through the apertures in the constricted throat.

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