Nov. 15, 1927.

B. F. CRISENBERRY

1,648,981

CABINET OIL BURNER

Filed June 23. 1926

3 Sheets-Sheet 1

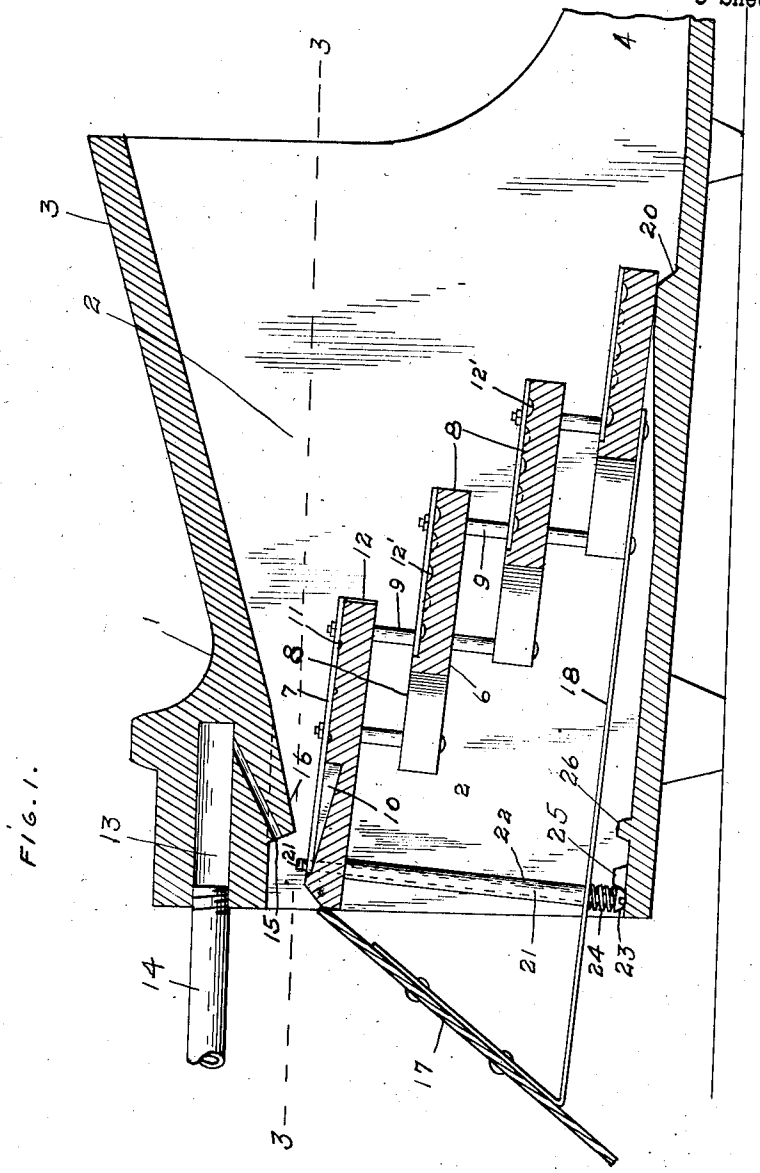


FIG. 1.

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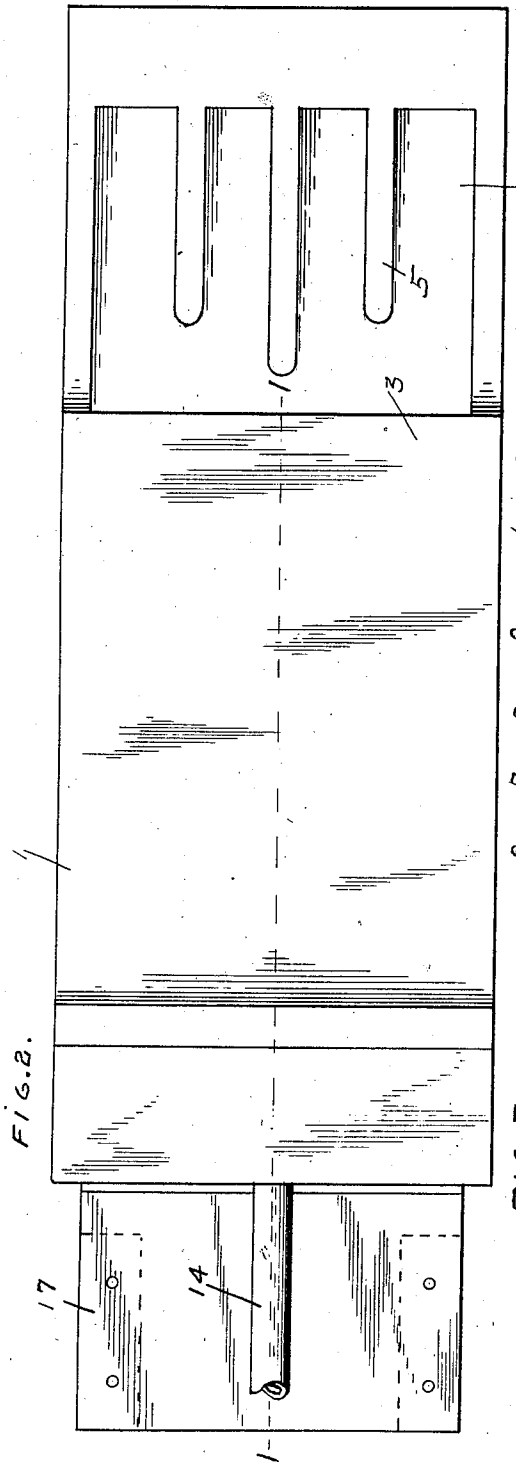


FIG. 2.

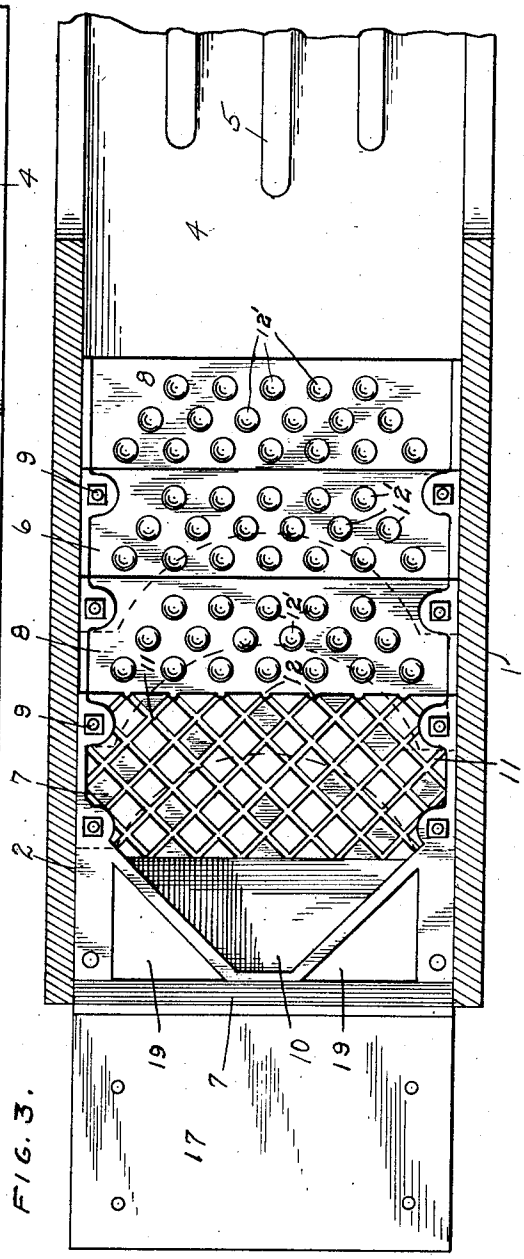


FIG. 3.

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3 Sheets-Sheet 3

FIG. 5.

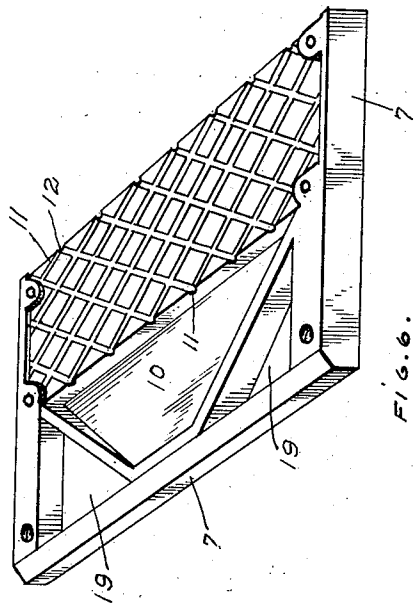


FIG. 6.

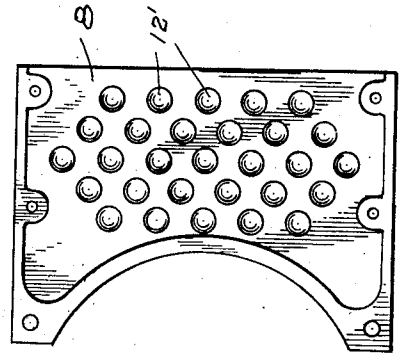
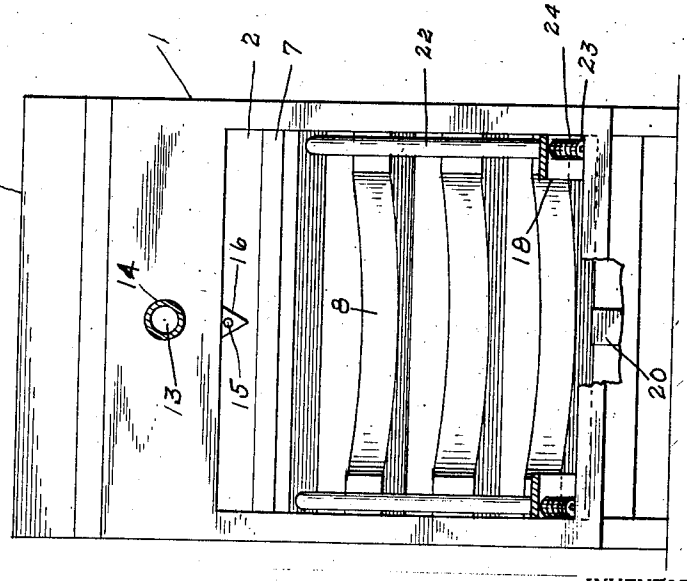


FIG. 4.



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UNITED STATES PATENT OFFICE.

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CABINET OIL BURNER.

Application filed June 23, 1926. Serial No. 117,973.

This invention relates to oil burners of that class to be used primarily for heating dwellings, although it may be used for general heating purposes if desired, said burner having suitable regulators and controls associated therewith for automatically increasing or decreasing the heat as desired with a resultant minimum cost of upkeep and a maximum of efficiency.

One feature of the invention is the provision of a cabinet in which is to be removably mounted a unit for vaporizing the oil as it is entered into the cabinet.

A further feature of the invention is in so building up the unit of plate sections that the oil will be thoroughly vaporized at a high or low temperature.

A further feature of the invention is in so arranging the plates forming the vaporizing unit that oxygen will be thoroughly and uniformly commingled with the vaporized oil.

A further feature of the invention is in so constructing the uppermost plate of the unit that the oil will be spread uniformly over the entire surface of said plate, thereby creating a heating surface throughout the width of the plate.

A further feature of the invention is the provision of means for creating a slight vacuum above the topmost plate for retarding and controlling the flow of air over said plate when the burner is operating at a low temperature.

A further feature of the invention is the provision of means for retaining pools of oil over the surfaces of the respective plates below the uppermost plate, which retains the plates in a more or less dampened condition as well as distributing the oil over the entire upper surfaces of the lower plates.

A further feature of the invention is the provision of means for regulating the pitch of the plates forming the heating unit and also for adjusting the unit laterally for maintaining the plates level and preventing a greater supply of oil from flowing to one side of the burner than the other.

A further feature of the invention is the provision of means for regulating the amount of oxygen fed to the vaporizing unit.

A further feature of the invention is in so constructing the cabinet for the vaporizing unit that the expanding heat may readily escape, thereby creating a suction for drawing air into the cabinet and through the vaporizing unit.

Other objects and advantages will be hereinafter more fully set forth and pointed out in the accompanying specification.

In the accompanying drawings which are made a part of this application,

Figure 1 is a longitudinal sectional view through the burner as seen on line 1—1, Fig. 2.

Figure 2 is a top plan view of the burner.

Figure 3 is a horizontal sectional view as seen on line 3—3, Fig. 1.

Figure 4 is an end elevation of the burner, partly in section and partly broken away.

Figure 5 is a perspective view of the top of pilot plate, and,

Figure 6 is a top plan view of one of the secondary plates.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates the cabinet of the burner, one end portion thereof being enclosed to form a combustion chamber 2, while the upper forward wall 3 thereof is flared upwardly to permit the heated fuel to readily and quickly expand. The forward portion of the lower wall of the cabinet is extended forwardly of the cabinet proper and is provided with side walls and an end wall to form a basin 4 into which any unconsumed oil will descend and be consumed, the interior of the basin preferably having ribs 5 therein to form pockets, thus collecting the oil in small quantities so that it will be more readily consumed, that part of the lower floor of the cabinet 1 within the chamber 2, being preferably inclined so that any oil dropping onto said lower wall will readily flow into the basin.

Located within the enclosed part of the cabinet 1 is a vaporizing and mixing unit 6, composed of a top or pilot plate 7 and a plurality of associate plates 8, each succeeding plate being stepped forwardly a distance beyond the edge of the preceding plate and spaced a uniform distance apart to provide air spaces between the plates, said

plates being secured together to form a single unit, in any suitable manner, preferably by means of bolts 9.

The pilot plate 7 is provided near its outer edge with a reservoir 10, which tapers downwardly from its outer edge, the fuel overflowing therefrom onto the surface of the pilot plate. In order to spread the fuel uniformly over the entire surface of the plate 7, the surface thereof is provided with a plurality of grooves 11, which are arranged diagonally of the plate and in crossed relation with each other, the inner ends of the grooves terminating in vertical channels 12 in the end face of the plate 7.

The upper surfaces of the plates 8 are preferably provided with series of pockets 12′ which retain a minor quantity of oil for constant distribution over the faces of the plates and thus maintaining a slight moisture over said plates. These pockets also aid in properly and uniformly ditributing the oil over the entire surfaces of the plates. The outer edges of the plates 8 are preferably crescent shaped so as to provide space for air to more readily pass into the spaces between the plates, while the inner edges thereof may be provided with vertical channels like the channels 12′ in the plate 7, if desired.

The outer edge of the top wall of the cabinet is provided with a bore 13 with which connects a fuel pipe 14, leading from any suitable source of supply and the fuel is fed to the reservoir 10 through a port 15. The under face of the top wall of the cabinet is provided with a projection or rib 16, through which the port 15 is formed, the projection being substantially V-shaped in cross section and the end face thereof set at an angle so that the fuel in leaving the port, will flow to the pointed end of the projection and descend into the center of the reservoir 10.

The pilot plate 7 is spaced from the under face of the top wall of the cabinet and in order to properly control the admission of air above the plate 7, a shield 17 is positioned at the outer edge of the plate 7, with its top edge resting against or adjacent the end of the plate and its lower edge at a distance from the end of the cabinet, so that the shield will rest at an angle, bars 18 being provided for supporting the shield. The innermost ends of the bars 18 are attached to the lowermost plate 8, while the outer ends thereof are attached to the shield, so that the shield will be substantially stationary with the vaporizing unit 6.

With this construction, the air to be mixed with the fuel above the plate 7 passes upwardly over the shield 17, while the air for the fuel on the plates 8 passes under and around the shield and the volume of air drawn over and between the plates depends upon the position of the vaporizing unit within the cabinet, moving the unit into the cabinet, lessening the volume of air. In order to retard the flow of air over the pilot plate 7, when a low temperature is desired, the plate 7 has a pair of openings 19 therethrough near its outer edge so that the greater volume of air passing below the plate 7 will create a suction or vacuum above the plate 7 and retard the flow of air above the plate, whereby when a minimum of oil is being fed onto the plate, it will be fully consumed while passing over the plate 7, thus maintaining the plate in a highly heated state. Consequently, when a larger supply of oil is turned onto the plate 7, it will be instantly vaporized. Likewise, by creating the vacuum, thus retarding the flow of air over the plate, the flame will not be extinguished, although burning very low.

The forward end of the unit 6, rests upon a lug 20, preferably at the transverse center of the lowermost plate 8, while the outer end of the unit 6 is supported by a pair of posts 21, the upper ends of which thread through the plate 7, and by adjusting said posts lengthwise, the angle of the unit 6 may be regulated and the unit may be kept in a level plane by adjusting one or the other of said posts. By providing the latter adjustment, the fuel will be caused to flow uniformly over all parts of the several plates constituting the unit.

The posts 21 pass through the bars 18 and that part of the posts between the bars and the plate 7 are surrounded by spacing sleeves 22, while between the bars 18 and the heads 23 of the posts are takeup springs 24, the tension of said springs holding the bars 18 and sleeves 22 in substantially fixed position.

The heads 23 of the posts rest upon the bottom wall of the cabinet and in order to retain the unit in its adjusted position within the cabinet, ribs 25 and 26 are formed on said bottom wall, the rib 26 preferably extending the full width of the cabinet to prevent fuel from flowing out at the open end of the cabinet. By placing the unit 6 as shown in Fig. 1 of the drawings, the maximum volume of air will be admitted to the cabinet, but by placing the heads of the posts 21 adjacent the rib 26, the volume of air entering the cabinet will be reduced.

By securing together the several plates and forming them independently of the cabinet, the unit 6 may be readily removed from or entered into the cabinet, so that the unit may be quickly and easily removed from the cabinet and cleaned without interrupting the heating process any great length of time. A further advantage in making the plates separate from the cabinet is that the walls of the cabinet may attain a high temperature without affecting the temperature of the

plates, nor will the temperature of the plates affect the temperature of the cabinet, the plates being normally kept at a lower temperature than the temperature of the cabinet, as the loose fit between the plates and the cabinet prevents induction of heat from one to the other.

It will further be seen that by entering the air below the fuel a better mixture will result and by forming the outer edges of the plates 8 substantially crescent shaped. a larger volume of air may be drawn into the cabinet and, owing to the enlarged space forwardly of the plates, the air will properly distribute to enter between all the plates.

It will likewise be seen that by flaring upwardly the top wall of the cabinet, a more rapid expansion of the fuel will result, thereby creating a vacuum or suction for drawing the air from the outer end of the cabinet through the vaporizing unit, thus obtaining the maximum amount of air for mixture with the vaporized fuel.

It will further be seen that the volume of air passing over the pilot plate may be lessened by adjusting the posts to raise the plate 7 nearer the top wall of the cabinet, and, furthermore, by adjusting the posts longitudinally, the fuel may be caused to flow over the plates at a greater or less speed.

What I claim is:

1. In an oil burner, a hollow cabinet having an upwardly flared top wall, a vaporizing and mixing unit mounted in said cabinet, comprising a pilot plate and a series of secondary plates, and a shield stationarily mounted at the forward end of said unit and having one of its edges resting substantially against the outer edge of the pilot plate, whereby a substantially constant unchanging flow of air will be conducted above the pilot plate.

2. In an oil burner, a cabinet having a combustion chamber formed therein, and a plurality of vaporizing and mixing plates of substantially uniform width and in uniform lateral stepped relation, and united in a single unit and removably and adjustably mounted in said chamber.

3. In an oil burner, a cabinet having a combustion chamber formed therein, a combined vaporizing and mixing unit comprising a pilot plate and a plurality of secondary plates, said unit being removably mounted in said chamber, and a stationarily mounted downwardly and outwardly inclined shield having one of its edges resting substantially in engagement with the outer edge of the pilot plate for separating the air passing above the pilot plate from the air passing between the secondary plates.

4. In an oil burner, a cabinet having a combustion chamber in one part thereof and an expansion chamber in another part thereof, a plurality of plates united to form a single vaporizing and mixing unit, said unit being removably mounted in said combustion chamber, means for adjusting said unit vertically and laterally, and means for controlling the admission of air to said chamber.

5. In an oil burner, a cabinet having a combustion chamber therein, a vaporizing unit in said chamber, comprising a pilot plate and a series of secondary plates all of which are inclined at the same common angle and in the same direction, means for assembling all of said plates together, means for causing fuel to flow to all parts of said pilot plate, means for retaining small particles of fuel on the secondary plates and a shield attached to said assemblage of plates for separating and guiding the air as it passes into the spaces between said secondary plates and over said pilot plate.

6. In an oil burner, a vaporizing and mixing unit consisting of a pilot plate and a succession of secondary plates, means for uniting all of said plates in spaced relation and into a single unit, and a shield at the intake ends of said plates, said shield being stationary and at an outward and downward inclination, one edge of said shield resting adjacent one edge of said pilot plate, whereby the air passing above the pilot plate will be separated from the air passing over the secondary plates for supplying a substantially constant unchanging flow of air above the pilot plate.

7. In an oil burner, a plurality of plates of substantially uniform width assembled one below the other and the inner edge of each succeeding plate projecting a distance beyond the inner edge of the preceding plate, means for securing said plates into a single unit and in spaced relation, a cabinet adapted to loosely receive said unit of plates, and a shield fixed to the forward end of said unit and at a downward and outward angle for regulating the admission of air into said cabinet.

8. In an oil burner, a plurality of plates assembled to form a vaporizing unit, channels in the face of the uppermost plate for carrying fuel to all parts of said plate, and series of depressions in the faces of the remainder of said plates for retaining small quantities of fuel and for properly distributing the fuel over said plates.

9. In an oil burner, a vaporizing unit composed of a plurality of plates connected together, a shield for directing air above the uppermost plate, a cabinet to receive said unit, and adjustable posts for regulating the lateral and horizontal pitch of said unit.

In testimony whereof I hereto affix my signature.

BENJOHN F. CRISENBERRY.