Dec. 18, 1951 H. B. DONLEY 2,579,370

PILOT BURNER

Filed Oct. 11, 1947

Fig. 1.

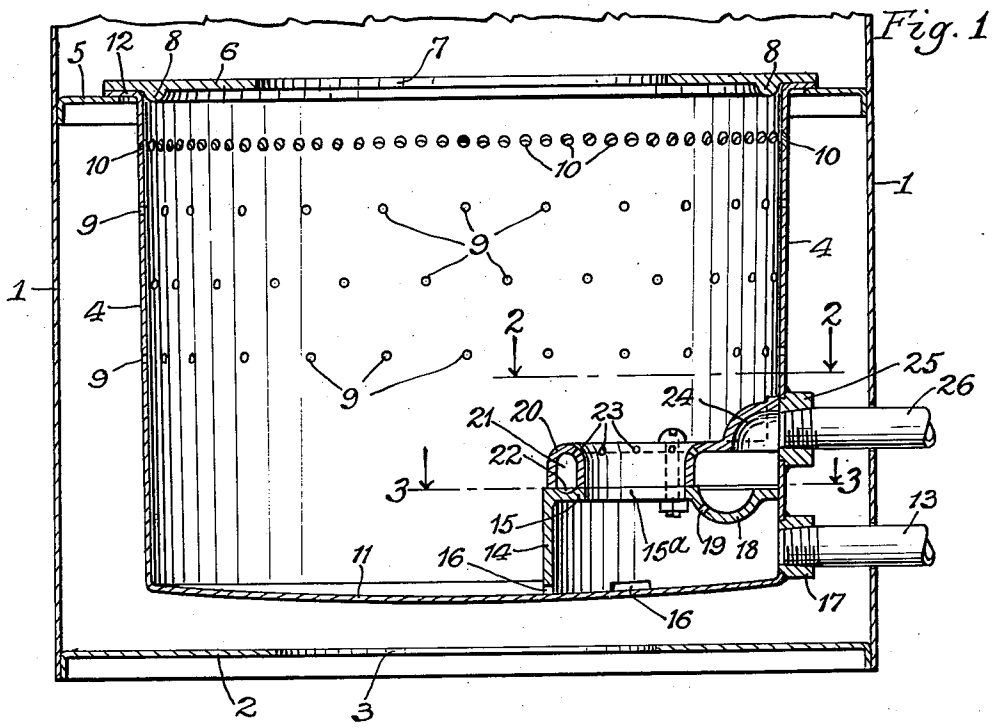


Fig. 3.

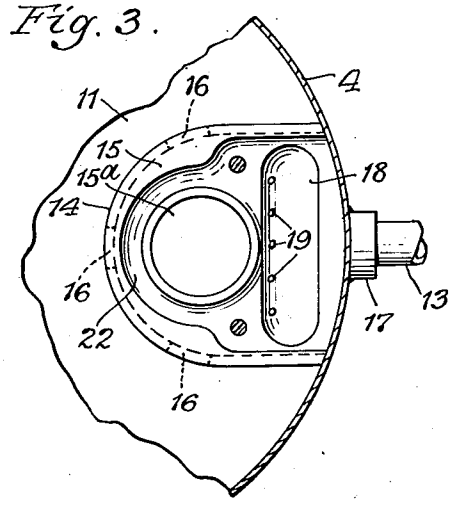
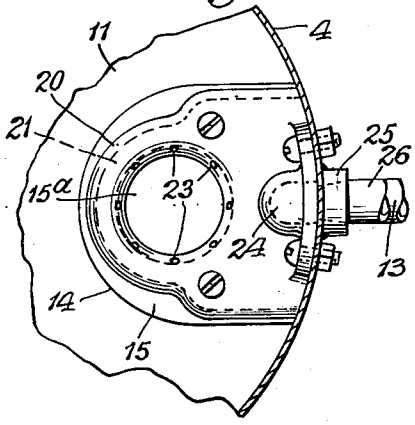


Fig. 2.



Inventor
Harold B. Donley
by Parker & Carter
Attorneys.

Patented Dec. 18, 1951 2,579,370

UNITED STATES PATENT OFFICE

2,579,370

PILOT BURNER

Harold B. Donley, Columbus, Ohio, assignor to Columbus Metal Products, Inc., Columbus, Ohio, a corporation of Ohio

Application October 11, 1947, Serial No. 779,356

1 Claim. (Cl. 158—91)

1

This invention relates to a pilot burner, and particularly to a pilot burner suitable for use with a burner. In the particular form here shown the pilot burner is applied to a liquid fuel burner.

Another object of this invention is to provide a pilot burner suitable for use with the so-called "pot type" burner.

A further object is to provide a pilot burner of the type indicated which is permanently located within the pot or main burner and which remains in place at all times.

Another object is to provide a pilot burner through which all the fuel used in the main burner is passed in liquid or vaporized form.

Other objects will appear from time to time in the specification and claim.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a vertical section through one type of burner to which the pilot may be applied;

Figure 2 is a fragmentary section through the burner illustrating the pot in plan view and taken at line 2—2 of Figure 1;

Figure 3 is a horizontal section taken at line 3—3 of Figure 1.

Like parts are indicated by like characters in the specification and drawings.

As shown, the burner comprises an outer wall or jacket 1 which may be closed at its bottom by a member 2 provided with an opening 3. A burner pot 4 is positioned within the member 1 and is supported on a ledge 5 fixed to the member 1. A flame plate 6 may be positioned over the pot 4. This plate is provided with an opening 7 and may have a centering annular enlargement 8. The pot 4 is provided with one or more groups or rows of perforations 9 positioned in its walls, and with a row or group of upwardly inclined perforations 10 positioned toward its upper edge. The pot 4 is closed by a plate or member 11 which, as shown, is integral with the remainder of the member 4. The member 4 may be provided with a lateral flange 12 which rests upon the ledge 5 and beneath the flame ring 6. A fuel inlet 13 is formed of a pipe or conduit which conducts fuel from any source to the interior of the pilot and thence to the interior of the pot.

The pilot burner comprises a wall-like member 14 which is open at its bottom and closed generally at its top. An outlet or flame opening 15a is provided in the upper edge 15 or toward the top of the burner wall 14. One or more notches or openings 16 are provided in or near

2

the bottom of the wall 14. Preferably, although not necessarily, the pilot housing or wall 14 is provided with an open bottom which is closed by the floor or bottom 11 of the pot 4. The fuel enters through the conduit or pipe 13 which may be connected to a nipple 17 fixed to the pot wall 4.

Formed preferably integrally with the pilot wall 15 is a downwardly curved member 18 which is provided with a row or group of perforations 19.

A cover member 20 is fixed to the member 15. It is generally annular in plan, as shown in Figure 2, and provides an air passage or conduit 21 within itself. If desired, the top of the member 15 may be provided with a rounded arcuate depression 22 which forms a part of the wall of the passage 21. About the opening 15a the member 20 is provided with a group or row of perforations 23. The cover member 20 may, if desired, be upwardly enlarged as at 24 in register with a nipple 25 into which an air conduit or pipe 26 is threaded. That is, an air inlet is provided for the pilot separate from the air inlets provided for the main pot.

It will be realized that although I have illustrated and described an operative device, still many changes may be made without departing materially from the spirit of my invention, and I wish, therefore, that my showing be taken as in a broad sense illustrative and diagrammatic rather than limiting me to my precise showing.

The use and operation of this invention are as follows:

In the particular form here shown, the pilot burner is mounted within a pot type burner. This burner itself may be mounted in many different sorts of housings and associations. The one shown herewith is merely typical of such mountings. Air for the main pot 4 enters through the opening 3 in the plate 2 and passes upwardly about the space bounded by the members 1 and 4. This air passes inwardly through the openings 9 and may be considered the primary air. It mixes with liquid fuel present in the pot 4 and causes a primary vaporization. This results in a rich mixture which rises and into which secondary air is discharged through the upwardly inclined openings or perforations 10. When sufficient fuel is present, combustion occurs in the pot 4 above the bottom, and final combustion occurs toward the top of the pot. The flame produced may extend upwardly through the opening 7.

Fuel for combustion is supplied through the

conduit 13. This fuel passes through the pilot member 14 by means of the notches or openings 16, and moves outwardly onto the floor 11 of the pot 4. It is vaporized from this general point or area. The quantity of fuel may be controlled manually or automatically, and since the invention is not limited to any particular means for accomplishing fuel control, none is shown.

When the burner as a whole is not in use, it is frequently desirable to maintain a small pilot light. When that is the case, a limited quantity of fuel is discharged through the conduit 13 to the interior of the pilot housing 14. Some air reaches this housing through the openings 19, and primary vaporization of the fuel occurs within the housing 14. As the rich mixture thus formed rises, secondary air is discharged into it, through the openings or perforations 23. This air enters from the conduit 26 and passes through the cavity 21 and the openings 23. This rich mixture is ignited and burns toward the top of the pilot assembly and normally creates a flame extending outwardly above the member 20. Under normal conditions of pilot operation, when only the pilot is to burn, only enough fuel will be supplied through the conduit 13 to support combustion in and about the pilot.

When it is desired to ignite the burner as a whole, the amount of fuel which is supplied through the conduit 13 will be increased. Combustion will continue to take place in and above the pilot. The excess fuel which cannot be vaporized or burned in the pilot passes through the opening or openings 16 and flows outwardly into the pot 4 along its bottom 11. As this excess fuel flows outwardly from the pot, the vaporization of the fuel within the pot 4 as above described will take place, and the resultant combustible mixture will be ignited by the flame from the pilot. Then the entire burner burns as a whole.

After general burning, when it is desired to shut off the main burner but to continue the pilot in operation, the quantity of fuel being introduced through the conduit 13 will be reduced to the point at which combustion in and above the pilot can alone be supported. The pilot will then continue to burn, using a minimum of fuel and supporting a small amount of combustion which produces a flame available for immediately lighting the entire burner as a whole whenever the quantity of fuel fed through the conduit 13 is sufficiently increased.

I claim:

For use in a burner having a pot which includes a bottom wall and a side wall, a generally imperforate walled pilot structure adapted to be positioned within the pot, said pilot structure including side and top wall portions having edges adapted to contact the side and bottom walls of the pot and to define, with the side and bottom walls of the pot, a mixing chamber adapted to receive the liquid fuel supply of the pot, said pilot structure including an upper wall portion adapted to define with the pot side wall and the top wall portion of the mixing chamber a plenum chamber above the mixing chamber, said plenum chamber being outwardly open and adapted to receive air through the pot side wall, the top wall of the mixing chamber being provided with a flame aperture, the wall portions of the pilot structure including an annular wall portion surrounding the flame aperture and extending therefrom upwardly through the plenum chamber, said pilot structure being formed adjacent its lower edge to permit the flow of unvaporized liquid fuel from the mixing chamber into the interior of the burner, the annular wall portion which surrounds the flame aperture being provided with small air apertures in communication with the plenum chamber, formed and adapted to direct air upwardly about a mixture flowing upwardly from the mixing chamber through the flame aperture, the top wall portion of the mixing chamber having air outlets adapted to permit air to flow from the interior of the plenum chamber into the interior of the mixing chamber.

HAROLD B. DONLEY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,162,844	Jensen	June 20, 1939
2,355,416	Breese	Aug. 8, 1944
2,369,833	Livar	Feb. 20, 1945
2,460,013	Huston	Jan. 25, 1949
2,460,014	Huston et al.	Jan. 25, 1949