

April 18, 1944.

S. PERRY

2,346,781

POT TYPE BURNER WITH HOLLOW PILOT

Filed Aug. 8, 1941

2 Sheets-Sheet 2

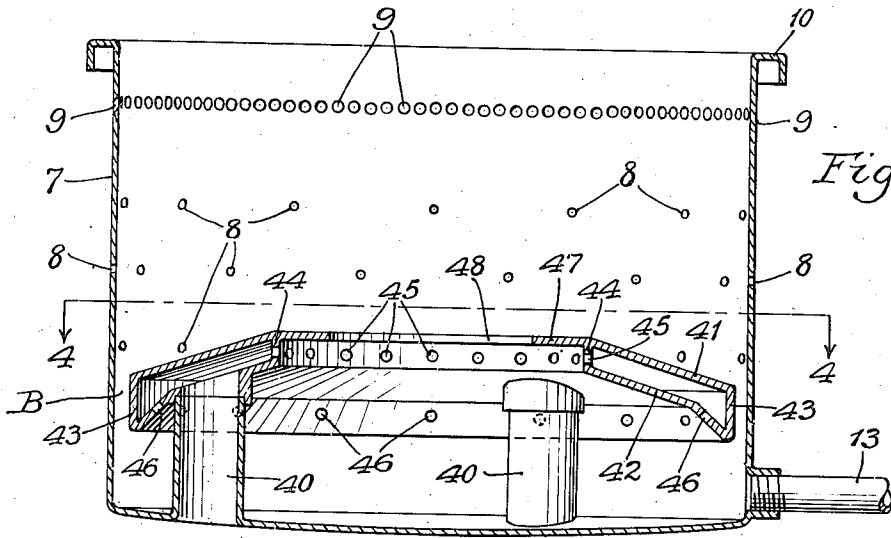


Fig. 3.

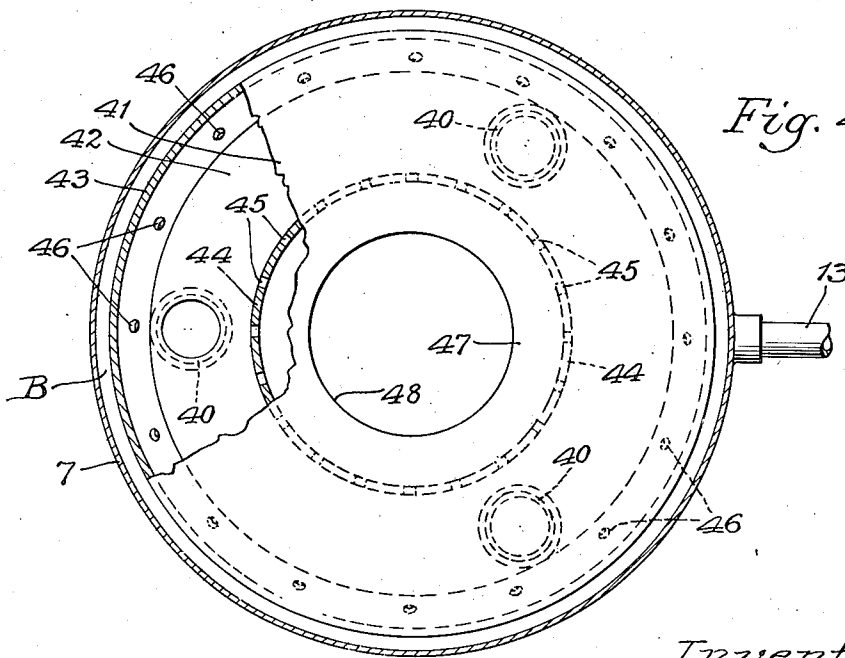


Fig. 4.

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UNITED STATES PATENT OFFICE

2,346,781

POT-TYPE BURNER WITH HOLLOW PILOT

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Application August 8, 1941, Serial No. 405,932

1 Claim. (Cl. 152-91)

My invention relates to an improvement in pot type burners and has for one purpose the provision of improved pilot means for such a burner.

Another purpose is the provision of improved pilot means in which the pilot structure is to some extent cooled and protected by the supply of air passing therethrough.

Another purpose is the provision of a hollow pilot structure for pot type burners.

Another purpose is the provision of a pilot structure which serves as air supply means for the pilot stage.

Another purpose is the provision of a pilot which supplies primary and secondary air for pilot combustion.

Other purposes will appear from time to time in the course of the specification and claim.

I illustrate my invention more or less diagrammatically in the accompanying drawings wherein:

Fig. 1 is a sectional view of a heater with my invention installed;

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

Fig. 3 is a sectional view of the burner, showing a modified form of the pilot ring; and

Fig. 4 is a section on the line 4-4 of Fig. 3.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings, 1 generally refers to an outer housing, herein shown in the form of a drum. It may include an upper portion 2 adapted to serve as a combustion chamber for high fire, and under some circumstances as a direct radiating member, as when the device is used for a radiant space heater. Any suitable flue means may be provided in connection with the portion 2, not herein shown. 3 is a partition extending across a lower portion of the drum 1 and provided with a central air inlet aperture 4. 5 are any suitable means for supporting the burner structure.

It will be understood that air may penetrate through any suitable supporting means 5, which may constitute or include legs or the like, so that air may flow upwardly through the central aperture 4 of the partition 3. 6 is any suitable pot supporting means, herein shown as an angle ring. 7 indicates a pot having a plurality of primary air inlets 8.

I may provide any suitable secondary air supply means adjacent the top of the pot, but I illustrate for example a row of secondary air inlets 9 adjacent the top of the pot. The pot

is provided with any suitable flange 10 adapted to rest upon the ring 6. 11 is any suitable flame ring for the top of the pot, having a central outlet aperture 12.

13 is any suitable fuel supply line extending to the bottom of the pot from a source of liquid fuel not herein shown. The level of fuel may be controlled in any suitable manner, for example by any suitable float chamber or the like not herein shown. I may employ any suitable valve or control means not herein shown for varying the rate of supply or the volume of flow of the liquid fuel along the line 13.

Referring to the form of Fig. 1, 14 illustrates a central pilot air inlet and support. It may be in the form of a pipe terminating at 15. Mounted upon said pipe and supported thereon is a pilot structure which may include an upper conic wall 16, herein shown as having a generally cylindrical outer skirt portion 17. 18 is a lower wall generally parallel with the upper wall 16, the structure as a whole being shown as upwardly and inwardly conic. 19 is an inner wall connecting the inner edges of the wall 16 and 18 and provided with a plurality of apertures 20, which may constitute secondary air inlet apertures for the pilot stage. 21 is any suitable combustion ring herein shown as centered by a flange 22. The ring is shown as somewhat downwardly and inwardly inclined. The ring is in effect a flame ring or combustion ring for the pilot stage. It is provided with a central aperture 23 of substantial size. The lower outer edge portion of the wall 18 is provided with a plurality of air inlets 24, which serve as primary air inlets for the pilot stage of combustion.

The pilot structure as a whole may be supported upon the upstanding pilot air inlet 14, and may be centered thereon, for example by the central sleeve 30, which is provided with an inwardly extending flange 31, adapted to rest upon the upper edge of the pilot air inlet 14. Air from the pilot inlet 14 may be conducted to the air space defined between the walls 16 and 18 by any suitable ducts herein shown at 32 and 33. Any suitable number of these ducts may be employed. I illustrate for example three.

Referring to the form of Figs. 3 and 4, I illustrate a variant form of structure in which I employ a plurality of separate pilot inlet passages 40, extending upwardly from the bottom of the pot. I may for example employ three. In the variant structure the pilot element includes a top conic wall 41, a bottom conic wall 42, an outer

skirt or wall 43, and an inner wall 44. The inner wall 44 is broken by a plurality of pilot secondary air apertures 45, and the lower outer edge of the wall 42 is provided with a plurality of primary air apertures 46. It will be observed in this form, as in the form of Fig. 1, that the lower or edge portion of the wall 18 or 42 is somewhat more conic than the inner portion. The angle may be set at any suitable fashion in order to direct the air from the pilot primary apertures inwardly as well as downwardly.

In the form of Figs. 3 and 4 I illustrate a combustion ring 47, which may be formed integrally with the pilot structure or may be mounted removably. It is also provided with a central aperture 48.

It will be realized that, whereas I have described and illustrated a practical and operative device, nevertheless many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as in a broad sense illustrative or diagrammatic, rather than as limiting me to my precise showing, except as limited by the claim. The use and operation of my invention are as follows:

In pot type hydroxylating burners a maximum turndown to the pilot stage is desirable so that the pilot flame is of insufficient size substantially to heat the burner. On the other hand, the pilot structure cannot practically be removed when the burner is burning at high stage. I, therefore, provide a pilot structure which is effective at the pilot stage and which itself serves as the source of all the air necessary for pilot combustion, including both primary and secondary air. When the burner is at high stage the primary air or part of the primary air for combustion is sup-

plied by the primary air inlets 8 of the wall of the burner pot, all of which are located above the above described baffle structure. And the secondary air for high stage combustion may be supplied by the secondary air inlets 9 of the pot. When the burner is burning at high stage, air continues to flow through the pilot structures and serves a cooling effect, preventing burning out of the pilot structure by the intensity of the flame of pilot combustion. I also find it desirable, although not necessary, to provide an air gap between the outer edge of the pilot structure and the opposite wall of the burner. This gap is illustrated for example at A in Figs. 1 and 2, and at B in Figs. 3 and 4.

I claim:

In combination in a pot type burner, a burner pot having a circumferential side wall with a plurality of air inlet apertures located at various levels therein, a liquid fuel duct extending to said pot, said pot having a closed bottom and an open top, an air inlet passage upwardly extending from the center of the bottom of the pot and an air distributor located at the upper end of said passage and including a hollow ring, the outer edge of which approaches but is spaced from the side wall of the pot at a level below the lowest of the air inlet apertures in the wall, said ring having a lower wall provided with a plurality of air outlet apertures adapted to direct air downwardly and inwardly toward the bottom of the pot, and air conduits and supports extending generally radially outwardly from said central air inlet passage to said ring, the ring having a central aperture, and a centrally apertured pilot ring partly closing the aperture of the hollow ring.

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