

UNITED STATES PATENT OFFICE

2,353,439

PILOT SUPPORT AND AIR FEED FOR POT TYPE BURNERS

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Application August 13, 1941, Serial No. 406,634

4 Claims. (Cl. 152-91)

Our 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.

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

We illustrate the invention more or less diagrammatically in the accompanying drawing wherein:

Fig. 1 is a section through an installation illustrating our invention; and Figure 2 is a partial vertical section illustrating a variant form.

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

Referring to the drawing, 1 generally indicates 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.

We may provide any suitable secondary air supply means adjacent the top of the pot, but illustrated for example is 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. We 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 drawing, we employ a plurality of upstanding air inlet ducts 14, of which three is a convenient number. These ducts are hollow and communicate with the space above the partition 3. Mounted upon these ducts at their upper ends is an annulus 30, herein shown as a hollow ring having downwardly and inwardly tilted pilot primary air apertures 31.

It will be understood that air flows upwardly through the ducts 14 into the space within the annulus 30, and downwardly and inwardly through the apertures 31. Positioned above the annulus 30, we may employ a supplemental pilot ring 32 centrally apertured as at 33 and supported by any suitable means, such as the pins 34.

Referring to Figure 2, instead of employing the upright supporting members or ducts 14, we may employ radially inwardly extending hollow ducts 40.

It will be realized that, whereas we 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 the invention. We therefore wish the description and drawing to be taken as in a broad sense illustrative or diagrammatic, rather than as limiting us to our precise showing.

The use and operation of the invention are as follows:

In hydroxylating pot type burners, obtaining a maximum turndown is a somewhat difficult problem, and a number of solutions have been composed with varying success. We find it advantageous to provide a hollow member, which may be in the form of a tube or ring to which air from outside the burner may be delivered in order to supply the primary air necessary for the lowest or pilot stage of combustion. We illustrate for example an annular tube having a plurality of primary air inlets so disposed as to direct the primary air for the pilot stage downwardly and inwardly toward the center of the bottom of the burner. We may employ, in connection with such a tube, additional means for forming what is in effect a small supplemental burner. Such additional means may be

in the form a pilot baffle, as shown at 32 in Figs. 1 and 2. This annulus prevents down drafts from above and creates what is in effect a small burner for the pilot stage, the primary air for the pilot stage being delivered, not through the apertures in the burner wall, but through ducts 14 or 40, which put the interior of the annular tube in communication with air outside the burner.

In practice we find it highly advantageous to so proportion the tube as to provide a clearance between it and the inner face of the burner wall, and also between the tube and the annular baffle 32, as shown in Figs. 1 and 2. The result is to cause or to permit a recirculation of the vaporized hydrocarbon and air, which subjects the fuel for a longer period to the process of hydroxylation, and makes a better mixture. It will be understood that, when the mixture rises to or above the level of the ring 32, it mixes with the secondary air flowing in through the burner wall apertures 8, and the final mixture is burned at or above the level of the baffle, which serves as a flame ring for the pilot or low stage. We may provide any suitable means for controlling the rate of flow of fuel, for example any suitable valve in the float chamber. It will be understood that when the rate of flow is increased to the high fire stage, then the apertures 8 in the burner wall become primary air inlet apertures, secondary air being supplied by the apertures 9 or by any other suitable means.

We claim:

1. In combination, in a pot type burner, a burner pot having a plurality of air inlet apertures located at various levels in the side wall thereof, a pilot structure including a hollow tube extending circumferentially about said pot intermediate bottom and top thereof and below the lowest of said air inlet apertures in the pot, said tube having a plurality of air outlets adapted to deliver air to the space within the pot, means for delivering outside air to the tube, and a baffle ring located above the tube and below the lowest of said apertures, said tube being spaced downwardly below said ring and inwardly away from the wall of the pot, whereby recirculation of gases is permitted outwardly and downwardly between the tube and the ring and between the tube and the pot wall.

2. In combination, in a pot type burner, a burner pot having a plurality of air inlet apertures located at various levels in the side wall thereof, a pilot structure including a hollow tube extending circumferentially about said pot intermediate bottom and top thereof, said tube having a plurality of air outlets adapted to deliver air to the space within the pot, means for delivering outside air to the tube, and a baffle ring located above the tube, said tube being spaced downwardly below said ring and inwardly away from the wall of the pot, whereby recirculation of gases is permitted outwardly and downwardly between the tube and the ring and between the tube and the pot wall.

3. In combination, in a pot type burner, a burner pot having a plurality of air inlet apertures located at various levels in the side wall thereof, a pilot structure including a hollow tube extending circumferentially about said pot intermediate bottom and top thereof and below the lowest of said air inlet apertures in the pot, said tube having a plurality of air outlets adapted to deliver air to the space within the pot, means for delivering outside air to the tube, and a baffle ring located above the tube and below the lowest of said apertures, said tube being below said ring and spaced inwardly away from the wall of the pot, whereby recirculation of gases is permitted outwardly and downwardly between the tube and the ring and between the tube and the pot wall.

4. In combination, in a pot type burner, a burner pot having a plurality of air inlet apertures located at various levels in the side wall thereof, a pilot structure including a hollow tube extending circumferentially about said pot intermediate bottom and top thereof, said tube having a plurality of air outlets adapted to deliver air to the space within the pot, means for delivering outside air to the tube, and a baffle ring located above the tube, said tube being below said ring and spaced inwardly away from the wall of the pot, whereby recirculation of gases is permitted outwardly and downwardly between the tube and the ring and between the tube and the pot wall.

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