Jan. 25, 1949. M. D. HUSTON ET AL 2,460,014

LIQUID FUEL BURNER AND PILOT STRUCTURE

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Fig. 1

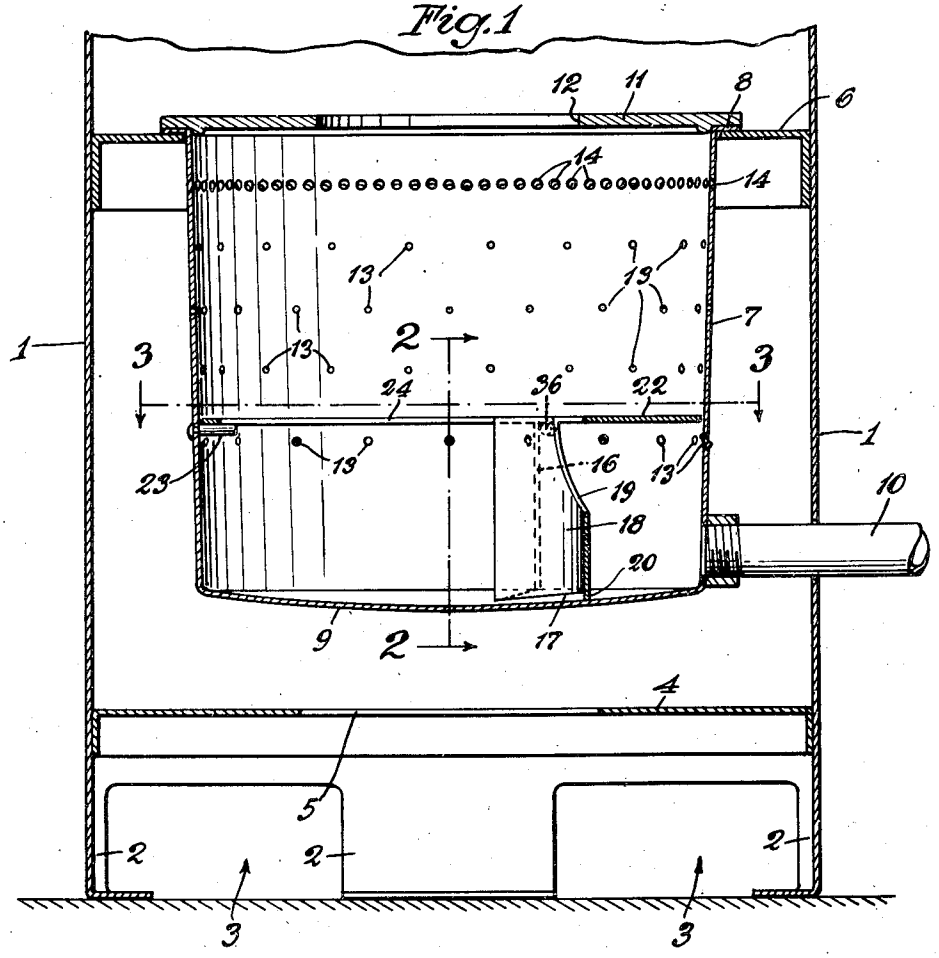
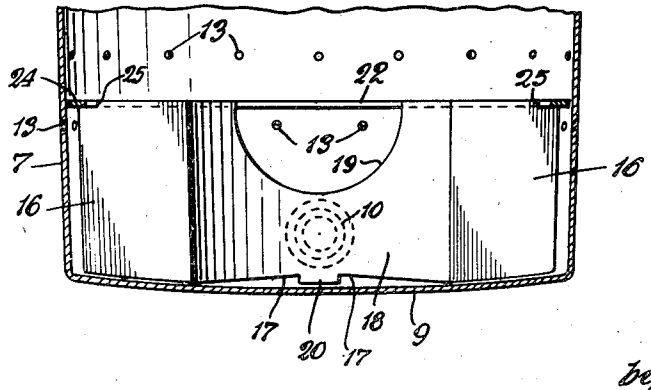


Fig. 2



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Fig. 3

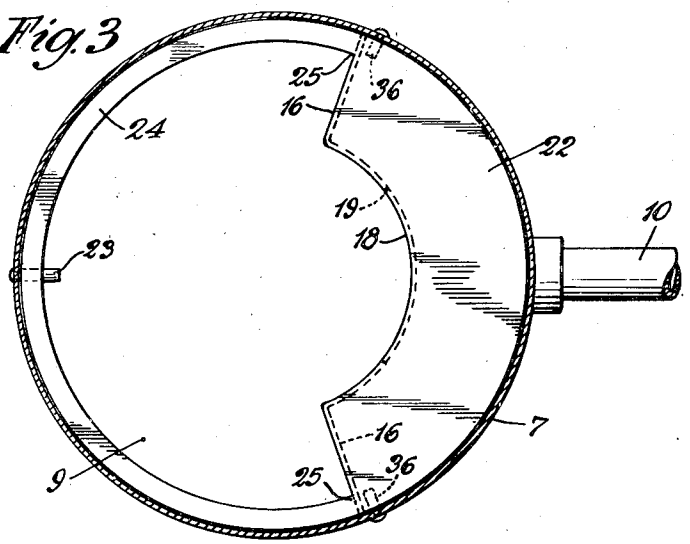


Fig. 4

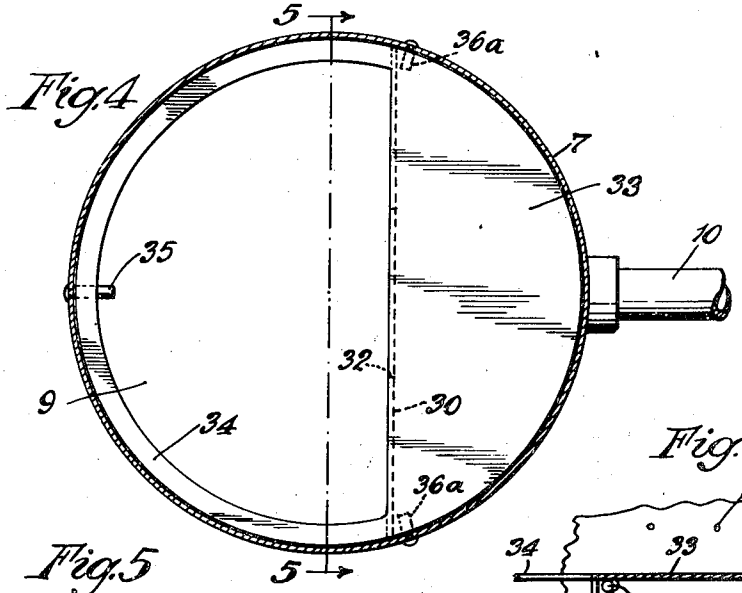


Fig. 5

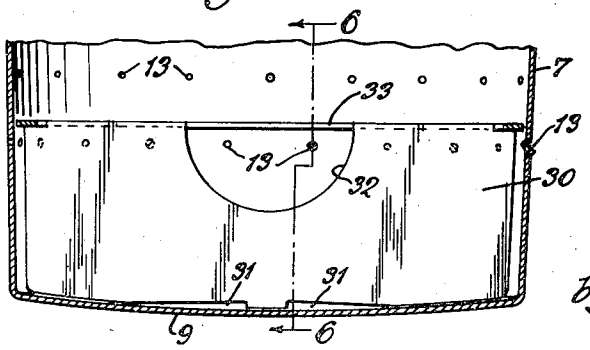
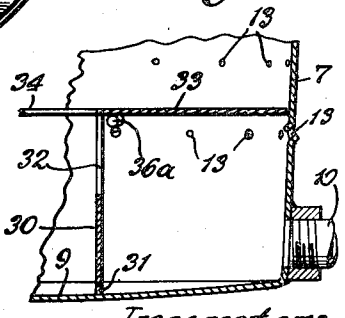


Fig. 6



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Patented Jan. 25, 1949 2,460,014

UNITED STATES PATENT OFFICE

2,460,014

LIQUID FUEL BURNER AND PILOT STRUCTURE

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Application September 28, 1944, Serial No. 556,176

6 Claims. (Cl. 158—91)

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Our invention relates to an improvement in pilot devices for pot type burners. It has for one purpose to provide an improved device for maintaining a low or pilot flame in a pot type burner during periods when the heating demand on the burner is eliminated or reduced to a minimum.

Another purpose is to provide an improved pilot means which shall be readily insertable into and removable from the pot of a pot type burner.

Another purpose is to provide an improved pilot means for surrounding the fuel inlet aperture or nozzle.

Another purpose is to provide a pilot attachment or structure for pot type burners which provides silent combustion.

Another purpose is to provide a pilot structure for pot type burners which operates with a minimum of free carbon deposit.

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

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

Figure 1 is a vertical axial section;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a similar section through a variant form of the device;

Figure 5 is a section on the line 5—5 of Figure 4;

Figure 6 is a section on the line 6—6 of Figure 5.

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

Referring to the drawings, 1 indicates any suitable heater outer housing or drum, herein illustrated as being mounted on legs 2, which provide air inlet spaces 3. 4 is a bottom partition having a central air inlet aperture 5 whereby the atmospheric air which passes through the spaces 3 may enter the space within the housing. 6 is a supporting angle ring mounted intermediate top and bottom of the housing, centrally apertured to receive the top flange 8 of a burner pot 7. The burner pot is shown as having an upwardly concave bottom 9 adapted to receive fuel from the pipe 10 from any suitable source of liquid fuel not herein shown.

Any suitable means may be employed for varying the flow of liquid fuel inwardly along the pipe 10. Since such means are well known, they are not herein illustrated in detail, but it is understood that the volume or rate of flow of fuel admitted along the fuel pipe 10 may be manually or thermostatically controlled to provide a relatively small flow of fuel at the pilot stage and a larger flow of fuel when the heating demand rises.

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The upper space within the housing 1 above the ring 6 serves as a combustion chamber. The open top of the pot 7 may be partially closed by any suitable flame ring 11, with a central aperture 12. The wall of the pot 7 is provided with a plurality of primary air inlet apertures 13, located at various levels, the lowest row being shown as downwardly tilted. Any suitable means may be employed for admitting secondary air at or adjacent the top of the pot. We illustrate for example a row of secondary air inlets 14, which are more closely spaced than the inlets 13 and preferably upwardly tilted.

It will be understood that the entire fuel supply may be delivered to the bottom 9 of the pot along the pipe 10. Surrounding the area of admission of the fuel, we provide a pilot piece which includes a pair of generally radial inwardly converging vertical walls 16, the inner edges of which define, at the bottom, a liquid fuel inlet space or aperture 17. The walls may also be connected by an intermediate arcuate vertical partition 18 provided with an upper aperture 19. 20 indicates a spacer or support for the lower edge of the wall 18 adapted to keep the space 17 open for the passage of unvaporized liquid fuel from the space within the pilot piece to the interior of the pot.

22 is any suitable top plate or cover for the pilot piece. The pilot piece may be held in position for example by a pin 23, supporting a ring segment 24, the ends of which are secured to the pilot piece as at 25. It will be noted that the plate 22 is located at a level above the lowest row of primary air inlet apertures so that air is admitted through the wall of the pot 7 into the interior of the pilot piece.

With references to Figures 4 to 6 inclusive, we may substitute, for the converging walls 16, a single vertical wall 30 apertured to provide leakage space or spaces 31 at its lower edge, the upper central aperture 32 and the top plate 33 located above the lowest of the primary air inlet apertures 13. 34 is an annular or segmental connecting and supporting element which rests upon the supporting pin 35.

It will be understood as to both forms of the device that additional spacing pins 36 or 36a may be employed in order to position and support the

pilot piece in proper relation to the liquid fuel inlet duct 10.

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 materially from the spirit of our invention. We therefore wish that the description and drawings be taken as in a broad sense illustrative or diagrammatic, rather than as a limitation to our precise showing.

We claim:

1. In combination, an open topped burner pot having a closed bottom, a circumferential wall provided with a plurality of primary air inlet apertures located at various levels in the wall, means for delivering secondary air to the mixture of primary air and vaporized fuel formed in the pot, and a pilot housing defining and surrounding a space in communication with a plurality of the lower primary air inlet apertures of the pot, said housing including generally upright side walls extending inwardly from the pot wall, a top wall, and a front wall, means for delivering liquid fuel to the pot at a point enclosed by said pilot housing, said front wall having an aperture adjacent its upper edge, said front wall terminating above the closed pot bottom to provide a leakage space between the lower edge of the wall and the pot bottom, adapted to permit the flow of flame and liquid fuel respectively from the interior of the pilot housing to the interior of the pot.

2. In combination, an open topped burner pot having a closed bottom, a circumferential wall provided with a plurality of primary air inlet apertures located at various levels in the wall, means for delivering secondary air to the mixture of primary air and vaporized fuel formed in the pot, and a pilot housing defining and surrounding a space in communication with a plurality of the lower primary air inlet apertures of the pot, said housing including generally upright side walls extending inwardly from the pot wall, a top wall, and a front wall, means for delivering liquid fuel to the pot at a point enclosed by said pilot housing, said front wall having an aperture adjacent its upper edge, said front wall terminating above the closed pot bottom to provide a leakage space between the lower edge of the wall and the pot bottom adapted to permit the flow of flame and liquid fuel respectively from the interior of the pilot housing to the interior of the pot, said top wall being generally horizontal and having formed, unitarily therewith, a ring segment extending about the inner face of that part of the pot wall which is exterior to the pilot housing.

3. In combination, an open topped burner pot having a closed bottom, a circumferential wall provided with a plurality of primary air inlet apertures located at various levels in the wall, means for delivering secondary air to the mixture of primary air and vaporized fuel formed in the pot, and a pilot housing defining and surrounding a space in communication with a plurality of the lower primary air inlet apertures of the pot, said housing including generally upright side walls extending inwardly from the pot wall, a top wall, and a front wall, said front wall being generally upright and generally arcuate, means for delivering liquid fuel to the pot at a point enclosed by said pilot housing, said front wall having an aperture adjacent its upper edge said front wall terminating above the closed pot bottom to provide a leakage space between the lower edge of the wall and the pot bottom, adapted to permit the flow of flame and liquid fuel respectively from the interior of the pilot housing to the interior of the pot.

4. In combination, an open topped burner pot for liquid fuel, having a circumferential wall provided with a plurality of primary air inlet apertures located at various levels in the wall, means for delivering secondary air to the mixture of primary air and vaporized fuel formed in the pot, and a pilot housing defining and surrounding a space in communication with a plurality of the lower primary air inlet apertures of the pot, said pilot housing including a generally upright side wall structure engaging the pot wall at its ends and a closed top wall, means for delivering liquid fuel to the pot at a point enclosed by said pilot housing and a ring segment connected to said pilot housing and extending about that part of the pot wall which is exterior to the pilot housing, the pilot housing wall being apertured to provide an outlet from the interior of the pilot housing to the interior of the pot.

5. In combination, an open top burner pot having a circumferential side wall provided with a plurality of primary air inlet apertures located at various levels in the wall, a pilot housing within the pot, means for delivering liquid fuel for vaporization to the interior of the pilot housing, means for delivering secondary air to the mixture of air and vaporized fuel moving upwardly through the pot, the pilot housing defining a space in communication with a plurality of the lower primary air inlet apertures of the pot, a ring segment connected to the pilot housing extending about that portion of the pot which is not occupied by the housing and being located above the level of the lowest and below the level of the remainder of the primary air inlets.

6. In combination, an open top burner pot having a circumferential side wall provided with a plurality of primary air inlet apertures located at various levels in the wall, a pilot housing within the pot, means for delivering liquid fuel for vaporization to the interior of the pilot housing, means for delivering secondary air to the mixture of air and vaporized fuel moving upwardly through the pot, the pilot housing defining a space in communication with a plurality of the lower primary air inlet apertures of the pot, said pilot housing including a pair of converging generally upright side walls extending inwardly from the wall of the pot, a top wall extending across the space between the side walls inwardly from the wall of the pot and a curved inner wall extending across the space between the inner edges of the side walls and the top wall, one of the walls of the pilot housing being apertured to connect the interior of the housing with the interior of the pot.

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