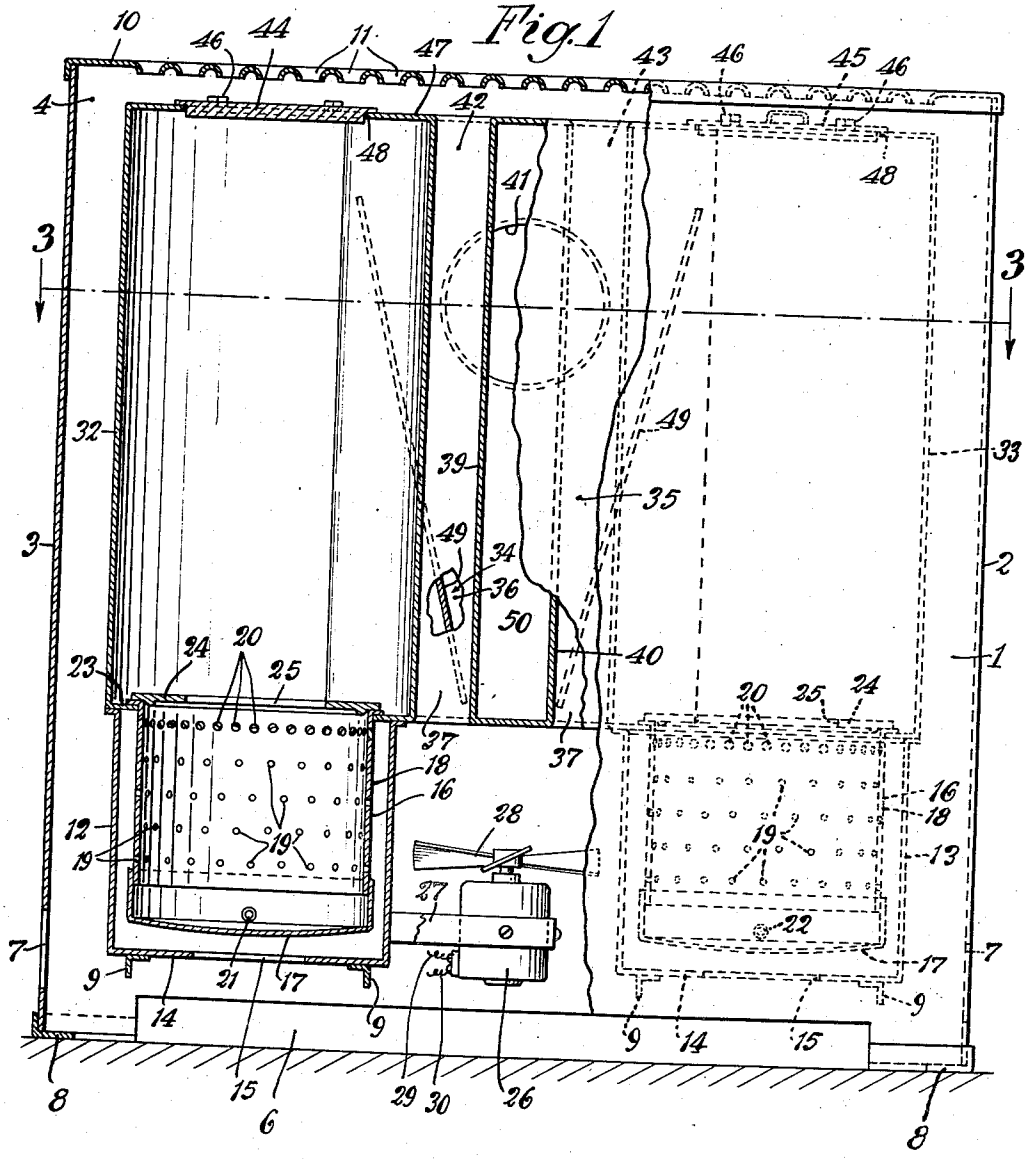
Dec. 31, 1940. B. HAYTER ET AL 2,227,086

DUPLEX BURNER AND COMBUSTION CHAMBER THEREFOR

Filed Sept. 14, 1939 2 Sheets-Sheet 1

Fig. 1



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Filed Sept. 14, 1939 2 Sheets-Sheet 2

Fig. 2

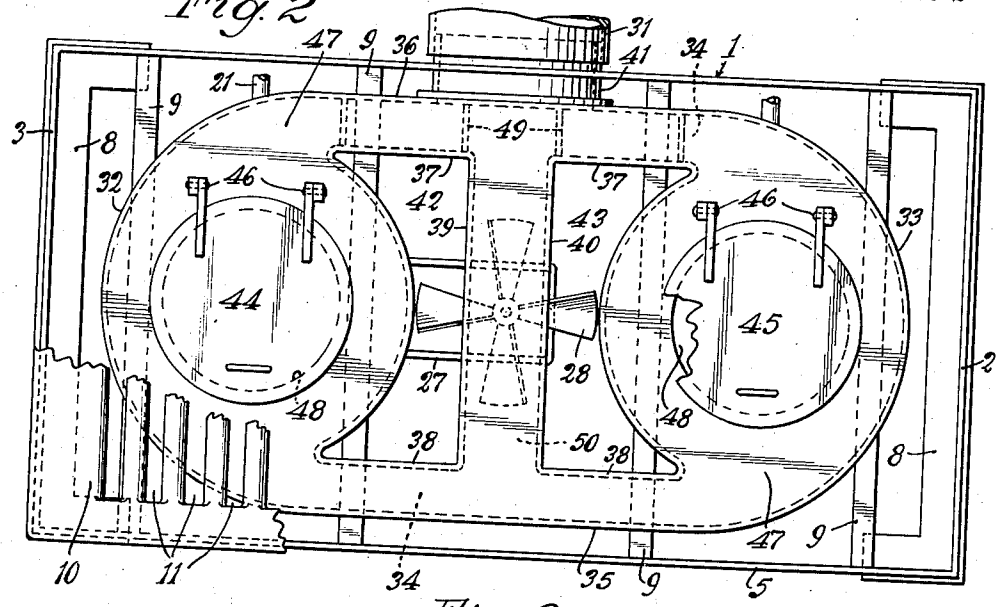
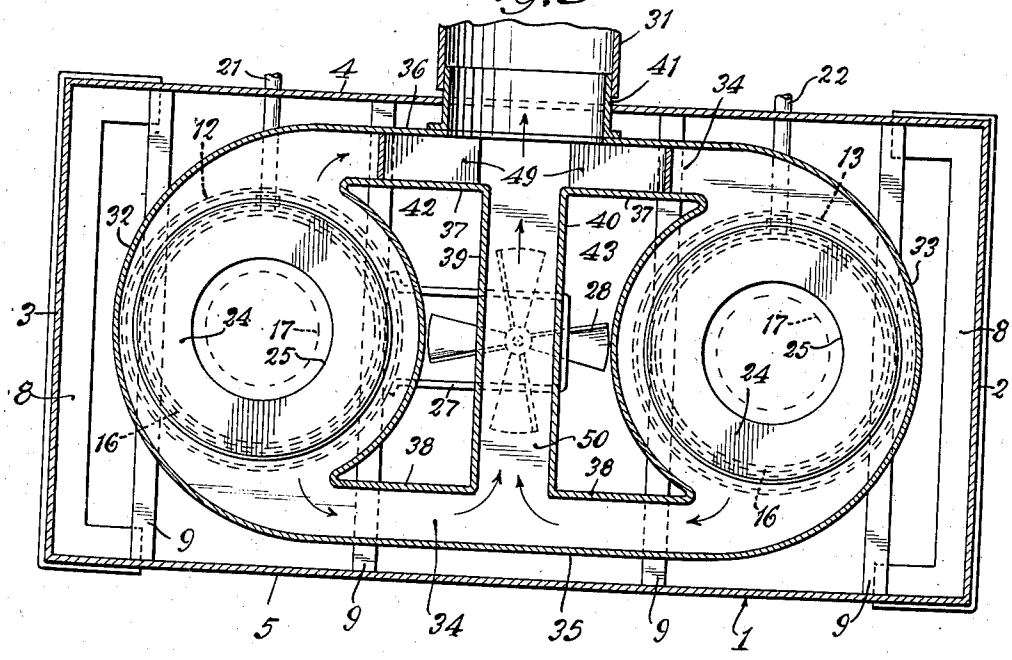


Fig. 3



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DUPLEX BURNER AND COMBUSTION CHAMBER THEREFOR

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Application September 14, 1939, Serial No. 294,901

8 Claims. (Cl. 126—93)

Our invention relates to an improvement in burners or heaters of the pot type, and has for one purpose the provision of an improved multiple pot heater for liquid hydrocarbon fuels.

Another purpose is the provision of an improved unit for a heater in which a plurality of pot type burners may be employed in connection with a unitary cabinet structure.

Another purpose is the provision of improved means for circulating the products of combustion from a plurality of pot type burners and for thereby heating air to be circulated through the space to be heated.

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

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

Fig. 1 is a side elevation of parts in vertical section;

Fig. 2 is a plan view with parts broken away; and

Fig. 3 is a section on the line 3—3 of Fig. 1.

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

Referring to the drawings, 1 generally indicates an outer housing having end walls 2, 3 and side walls 4, 5. The side walls may be cut away as at 6 in order to provide for the entry of air, and if desired air inlets 7 may be provided in the end walls 2, 3. 8 indicates any suitable transversely extending base supports, and 9 intermediate transversely extending heater supports, which may be of angle iron or the like and are shown as arranged in two pairs and as extending between the side walls 4, 5. 10 is any suitable top, which may be provided with outlet apertures 11 for the delivery of heated air to the space to be heated.

Mounted on the members 9 is the heater or burner structure proper, which includes a pair of generally cylindrical shells 12, 13, having bottoms 14, apertured as at 15. Located within each such shell is a pot 16, having a bottom 17 and a side wall 18, provided with a plurality of primary air apertures 19 and secondary air apertures 20.

21, 22 are any suitable fuel inlet lines, which may be controlled by valve or in any manner not herein shown and not of themselves forming part of the present invention.

It will be understood that air admitted through the apertures 6 or 7 in the outer housing may penetrate through the apertures 15 of the bottom members 12 and 13 and may thereby penetrate to the space between the members 12 and 13 and the pots 16. The upper portion of such space is closed by any suitable flange or flanges 23. The top aperture of the pot may further be partially closed or restricted as by baffles 24, with central apertures 25.

26 is any suitable motor mounted, for example, on a bracket 27, which may be secured to the member 12, which operates a fan 28, which may be energized from any suitable source of electric power through the conductive lines 29 and 30. It will be understood that our device may be operated at natural circulation, but under some circumstances a fan or other means for forcing the circulation of air may be advantageous.

It will be observed that we provide two separate pots or burners within a single heating structure. In order to maintain an advantageous heat exchange and in order to simplify the flue structure, we may provide a single unitary flue 31.

Positioned above each of the pots 16 we provide a generally cylindrical combustion or radiation chamber 32, 33, such chambers being connected by tangential passage structures 34, formed by tangential side walls 35, 36, and inner side walls 37, 38. We also provide a cross passage 50 defined by the walls 39, 40, generally aligned with the flue 31. 41 is any suitable flue connection extending from the side wall 36 to the flue 31 and adapted to permit the passage of the heated products of combustion from both pots.

It will be observed that the passage structure above described provides free air passages 42, 43 from bottom to top of the structure and that these passages are generally aligned with the fan 28, whereby when the fan is rotating air is blown upwardly through the passages 42 and 43, such passages being entirely surrounded by walls heated by the products of combustion.

44, 45 are any suitable lids or closures, which may be hinged as at 46 on the upper wall 47 of the above described structure, and which are adapted to close apertures 48. 49 are any suitable upwardly inclined baffles located in the passage adjacent the side wall 36.

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 our invention. We therefore wish our description and drawings 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 our invention are as follows:

The drums 32, 33 received the heated products of combustion from the pots 16, and also are heated by radiation from the flame. The hot gases as they leave the combustion chambers pass through the front and rear flue passages 34, which connect to the flue or smoke pipe 31 and which are so baffled, as by the baffles 49, that the flow of hot flue gases is equalized, and the proper

proportion of the gases flows through the front flue passages 34 and the connecting cross passage 50, which opens directly to the smoke pipe or flue connection 31, 41. The baffles 49 prevent the flue gas from short circuiting directly from the drums 32, 33 to the smoke pipe.

The height of the two drums is such that access to the burners or pots can easily be obtained through the top. No side doors need be employed, and the top doors 44, 45, or hinged lids, or even an ordinary cast iron stove lid, may be employed to give access to the interior.

Under ordinary circumstances a fan need not be used, but if air forcing means are advantageous, the employment of the fan is practical, and the device is designed for efficient use of the fan.

Under test the draft gain is substantially the same as in the ordinary single drum heaters, and the true efficiencies are extremely high. There is an absence of tortuous passages, and no draft loss problem to contend with.

We claim:

1. In a heating unit, a pair of adjacently located burners and means for delivering fuel and air thereto, a generally cylindrical combustion chamber located above and in communication with each said burner, a plurality of transversely extending flue passages tangentially connecting said combustion chambers, said passages extending substantially from top to bottom of the combustion chambers, and defining an upwardly extending air passage, a cross flue passage connecting said transversely extending tangential passages, and stack means in communication with said flue passages.

2. In a heating unit, a pair of adjacently located burners and means for delivering fuel and air thereto, a generally cylindrical combustion chamber located above and in communication with each said burner, a plurality of transversely extending flue passages tangentially connecting said combustion chambers, said passages extending substantially from top to bottom of the combustion chambers, and defining an upwardly extending air passage, a cross flue passage connecting said transversely extending tangential passages, and stack means in communication with said flue passages, said stack means being aligned with said cross flue passage.

3. In a heating unit, a pair of adjacently located burner pots and means for delivering liquid fuel and air thereto, combustion chambers located above and in communication with each said pot, a plurality of transversely extending flue passages tangentially connecting said combustion chambers, said passages extending substantially from top to bottom of the combustion chambers, a cross flue passage connecting said transversely extending tangential passages, stack means in communication with one of said tangential passages, in alignment with said cross flue passage, and baffle means in said tangential passage, adjacent said stack means, adapted to restrict the flow of hot gases therethrough toward the stack means.

4. In a heating unit, a pair of adjacently located burner pots and means for delivering liquid fuel and air thereto, combustion chambers located above and in communication with each said pot, a plurality of transversely extending flue passages connecting said combustion chambers, said passages extending substantially from top to bottom of the combustion chambers, a cross flue passage connecting said transversely extending passages, stack means in communication with one of said transversely extending passages, in alignment with said cross flue passage, and baffle means in said transversely extending passage, adjacent said stack means, adapted to restrict the flow of hot gases therethrough toward the stack means.

5. In a heating unit, a pair of adjacently located burner pots and means for delivering liquid fuel and air thereto, combustion chambers located above and in communication with each said pot, a plurality of transversely extending flue passages connecting said combustion chambers, said passages extending substantially from top to bottom of the combustion chambers, a cross flue passage connecting said transversely extending passages, stack means in communication with one of said transversely extending passages, in alignment with said cross flue passage, and baffle means in said transversely extending passage, adjacent said stack means, adapted to restrict the flow of hot gases therethrough toward the stack means, said baffle means including baffle plates inclined downwardly toward the connection between said stack means and said cross flue passage.

6. In a heating unit, a pair of adjacently located burner pots and means for delivering liquid fuel and air thereto, combustion chambers located above and in communication with each said pot, a plurality of transversely extending flue passages connecting said combustion chambers, a cross flue passage connecting said transversely extending passages, stack means in communication with one of said transversely extending passages, in alignment with said cross flue passage, and baffle means in said transversely extending passage, adjacent said stack means, adapted to restrict the flow of hot gases therethrough toward the stack means.

7. In a heating unit, a burner pot having a wall with a plurality of primary air inlets therein, and a bottom, means for delivering liquid fuel to the pot bottom, a combustion chamber located above and generally coaxial with the burner pot, a flue laterally spaced from said upper chamber, and a flue outlet therefor, said flue and said upper chamber being of generally the same height and having a plurality of connections therebetween extending substantially from top to bottom thereof, said flue outlet being adjacent one of said connections, and a baffle means in the passage closest said flue outlet, adapted to restrict the flow of hot gases therethrough toward said flue outlet.

8. In a heating unit, a burner pot having a wall with a plurality of primary air inlets therein, and a bottom, means for delivering liquid fuel to the pot bottom, a combustion chamber located above and generally coaxial with the burner pot, a flue laterally spaced from said upper chamber, and a flue outlet therefor, said flue and said upper chamber being of generally the same height and having a plurality of generally tangential connections therebetween extending substantially from top to bottom thereof, said flue outlet being adjacent one of said connections, and a baffle means in the passage closest said flue outlet, adapted to restrict the flow of hot gases therethrough toward said flue outlet.

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