

Sept. 19, 1933.

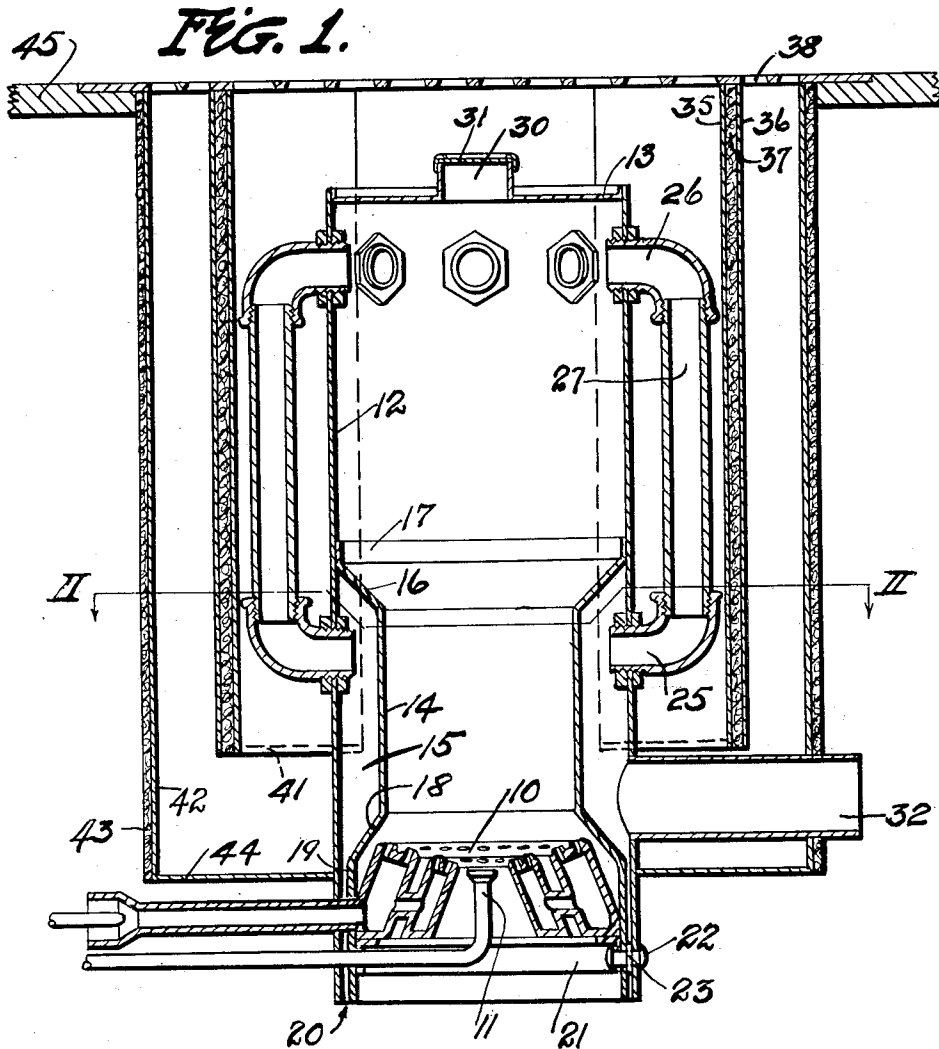
W. E. SANDERS

1,927,299

HEATER

Filed Jan. 22, 1932

2 Sheets-Sheet 1



INVENTOR
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Attor.

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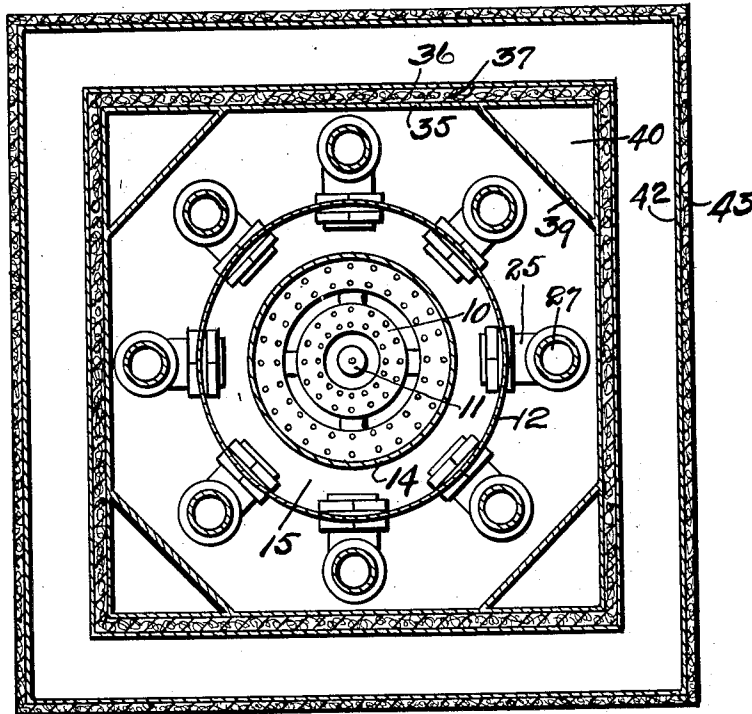
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HEATER

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2 Sheets-Sheet 2

FIG. 2



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UNITED STATES PATENT OFFICE

1,927,299

HEATER

William E. Sanders, Memphis, Tenn.

Application January 22, 1932. Serial No. 588,073

4 Claims. (Cl. 126—116)

This invention relates to a heater for use in connection with a burner, particularly a gas or oil burner for heating a room or house. It particularly relates to a heater which will abstract a maximum amount of the heat furnished by the burner and deliver same to the air for heating purposes and which will therefore release the gases of combustion at a minimum temperature.

It further relates to a heater which will properly humidify the heated air so delivered and to the method of heating by which most advantageous results are accomplished.

The objects of the present invention are to provide a heater for association with a burner, which will maintain segregation of the products of combustion from the air used in heating and which will at the same time transfer from these products of combustion a maximum amount of the heat thereof;

To provide in such a heater means for humidifying the heated air;

To provide in such a heater means for leading of the liquid products of combustion or condensate associated with such products of combustion;

To provide means for readily observing the burner action; and

To provide a method of room heating in which the lowest and coldest air of the room to be heated is abstracted by gravity and after heating is directly returned to the room at a low point therein.

The means by which the foregoing and other objects are accomplished and the method of their accomplishment will readily be understood from the following specification on reference to the drawings, in which:

Fig. 1 is a sectional elevation of my heater as applied to direct room heating; and

Fig. 2 is a sectional plan taken on the line II—II of Fig. 1.

Referring now to the drawings in which the various parts are indicated by numerals, 10 indicates a gas burner of any usual or desired type and 11, a pilot light therefor. Disposed largely above the burner 10 is a cylindrical metal drum 12 having its upper end closed by a head 13, and its lower end open and extending downward below and surrounding the burner 10. Disposed within the drum 12 and having its upper end somewhat below the mid height of the drum is a smaller cylinder 14, which is spaced equally from the surrounding drum to provide therearound an annular channel or passageway 15 immediately above and concentric with the burner. The up-

per end of this cylinder has a frusto-conical portion 16 extending upward and outward to a junction with the inner surface of the drum 12, the upper end of this portion having a cylindrical extension 17 which is secured and sealed to the drum. The lower end of the cylinder terminates slightly above the burner 10 and is provided with a frusto-conical extension 18 which extends downward and outward toward the drum 12 but does not come in contact therewith. From the lower end of this latter extension a further cylindrical extension 19 extends downward parallel with but slightly spaced from the drum 12 leaving between such latter portion and the drum 12 an annular space 20 of minor size.

Disposed within the extension 19 is a shelf 21 on which the burner 10 is supported. This shelf may be secured to the extension 19 and the drum 12 by rivets 22, washers or space blocks 23 being disposed around the rivets and between the extension and the drum to maintain the spacing thereof.

The annular channel or passageway 15 is connected with the upper end of the drum 12 by a plurality of passageways or flues, each of which may comprise an elbow 25 leading through the wall of the drum 12 and from the passageway 15, a second elbow 26 leading through the wall of the drum adjacent the upper end thereof and a vertical pipe 27 connecting these elbows. In the center of the head of the drum is an eye hole 30 which is covered and sealed by a disc of mica or other transparent heat resisting material 31, which provides a means for viewing the action of the burner. From the lower portion of the annular channel 15 a vent flue 32 extends laterally outward.

It will be understood that it is extremely desirable that these flues be gas tight, that all connections with the drum 12 be likewise gas tight, and also that not only is the upper end 17 of the inner casing hermetically sealed to the drum but that the head of the drum is also gas tight.

Surrounding the structure above described is a casing which is preferably square in horizontal section. This casing preferably comprises metal inner walls 35, metal outer walls 36 and interposed insulating lining 37, preferably asbestos. The upper end of this casing extends slightly above the head 13 of the drum, and above the eye piece 31 and is secured to and supported by a grating or grill 38. The lower end of the casing is entirely open and terminates at approximately the level of the top of the flue 32, though it may extend slightly lower should it be

so desired. In each corner of the casing are diagonally disposed vertical plates 39 which are sealed to the inner wall 35 to form triangular containers 40, each of which necessarily has a closed bottom 41, (shown dotted in Fig. 1) but which containers are open at the top and are filled with water for humidifying purposes.

Surrounding the casing is a housing preferably also square in cross section and having sheet metal walls 42 insulated as with asbestos 43. This housing is secured to and depends from the grating 38 and extends below the casing. It is closed at the lower end by a bottom 44 which extends inward and is secured to the drum 12 substantially at the lower end of the passageway 15 and about the level of the burner 10, forming a support for the drum.

In installing the device, a hole is cut through the floor 45 of the room, of sufficient size to permit the passage of the heater housing. The heater is lowered through this opening and supported from the floor by the grating 38.

In using the heater, the humidifying tanks 40 are filled with water and the device is ready. The burner 10 is lighted and heats up the drum. The products of combustion from the burner pass upward within the drum and outward and downward therefrom through the passageways 27 into the annular passageway 15 from which they escape through the flue 32. If during combustion aqueous products are produced or condensation takes place such liquid products are discharged through the opening 20. As the drum heats up cold air surrounding the drum is heated and rises into the room and at the same time cold air within the room passes downward through the grating into the space between the casing and the outer housing to displace and replace the heated air. Since both the casing and the housing are insulated this cold air is not in any way heated until it passes below the bottom of the casing and inward toward the drum, the full weight of the cold column of air being thus available for establishing circulation.

It is found that the cold air coming in contact with the outer wall of the passageway 15 abstracts substantially all heat therefrom and that in its upward passage around the drum it is highly heated and delivers to the room substantially all the heat generated by the burner, so that the gases of combustion discharge from the flue at so low a temperature that the heat losses are substantially negligible. In their upward passage the heated air coming in contact with the walls of the humidifying tanks evaporates water from the tanks and furnishes to the room the necessary humidity. By surrounding the hot air discharge with the cold air intake an extremely advantageous circulation of air along the floor from the most remote point of the room is accomplished, the room being thereby heated in a remarkably uniform and economical manner.

Having described my invention, what I claim is:

1. In a heater, a grating, an insulated housing depending therefrom, said housing having an open top end and closed lower end, an insulated casing, having both top and bottom ends open, disposed within said housing and depending from said grating, said casing terminating above the closed lower end of said housing, a vertically disposed cylindrical metal drum, having a closed upper end and open lower end, disposed within said casing and below said grating, the lower end of said drum extending through and being

secured to the lower end of said housing, an annular case having frusto-conical ends disposed within said drum adjacent but above said housing end, the upper end of said case being sealed to said drum, and the lower end thereof having a cylindrical downward extension spaced a minor amount from said drum, said case and drum cooperating to form an annular passageway, a plurality of flues exterior to said drum, connecting said passageway with the upper part of said drum, a vent flue leading laterally outward from the lower part of said passageway through said housing wall, and a burner disposed and supported within said drum, below said annular passageway.

2. In a heater, a grating, an insulated housing depending therefrom, said housing having an open top end and closed lower end, an insulated casing, having both top and bottom ends open, disposed within said housing and depending from said grating, said casing terminating above the closed lower end of said housing, a vertically disposed cylindrical metal drum, having a closed upper end and open lower end, disposed within said casing and below said grating, the lower end of said drum extending through and being secured to the lower end of said housing, an annular member, disposed within said drum, having its upper end secured adjacent the vertical center of said drum, and forming therewith an annular passageway adjacent but above the lower end of said housing, a plurality of flues exterior to said drum connecting said passageway with the upper part of said drum, a flue leading laterally outward from the lower part of said passageway through said housing wall, and a burner disposed and supported within said drum, below said annular passageway, said drum and associated parts hermetically separating the combustion gases from the air heated thereby.

3. In a heater, a grating, an insulated housing depending therefrom, said housing having an open top end and closed lower end, an insulated casing, having both top and bottom ends open, disposed within said housing and depending from said grating, said casing terminating above the closed lower end of said housing, a vertically disposed cylindrical metal drum, having a closed upper end and open lower end, disposed within said casing and below said grating, the lower end of said drum extending through and being secured to the lower end of said housing, an annular member, disposed within said drum, having its upper end secured adjacent the vertical center of said drum, and forming therewith an annular passageway adjacent but above the lower end of said housing, a plurality of flues exterior to said drum connecting said passageway with the upper part of said drum, a flue leading laterally outward from the lower part of said passageway through said housing wall, vertically disposed humidifying tanks within said casing and exterior to said drum, a burner disposed and supported within said drum, below said annular passageway, said drum and associated parts hermetically separating the combustion gases from the air heated thereby.

4. In a heater, a grating, an insulated housing depending therefrom, said housing having an open top end and closed lower end, an insulated casing, having both top and bottom ends open, disposed within said housing and depending from said grating, said casing terminating above the closed lower end of said housing, a vertically disposed cylindrical metal drum, having a closed

upper end and open lower end, disposed within said casing and below said grating, the lower end of said drum extending through and being secured to the lower end of said housing, an annular member, disposed within said drum, having its upper end secured adjacent the vertical center of said drum, and its lower end adjacent but spaced from the lower end of said drum, said member forming with said drum an annular passageway adjacent but above said housing end, and said lower end spacing maintaining an annular restricted passageway between the lower portion of said drum and the contiguous portion of said member, a plurality of flues connecting said passageway with the upper part of said drum, a flue leading laterally outward from the lower part of said passageway through said housing wall, and a burner disposed and supported within said drum, below said annular passageway, said drum and associated parts hermetically separating the combustion gases from the air heated thereby.

WILLIAM E. SANDERS.

15	90
20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150