

March 9, 1948.

L. N. WALTER
HEATER CONSTRUCTION

2,437,573

Filed Oct. 10, 1945

2 Sheets-Sheet 1

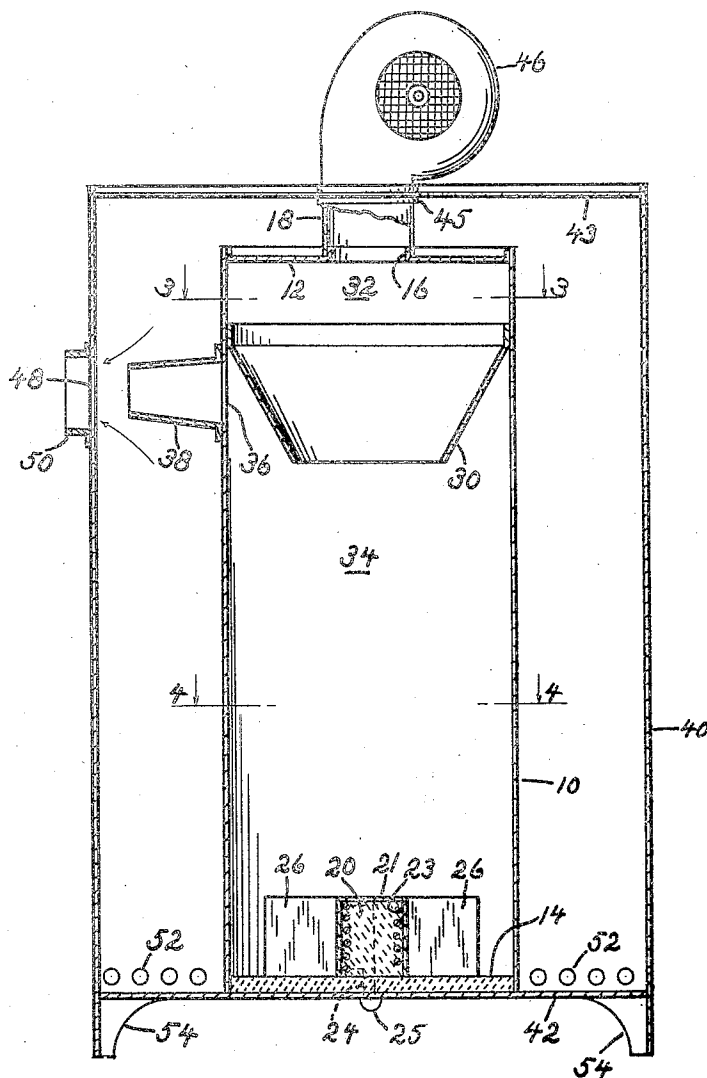


FIG. 1

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2 Sheets-Sheet 2

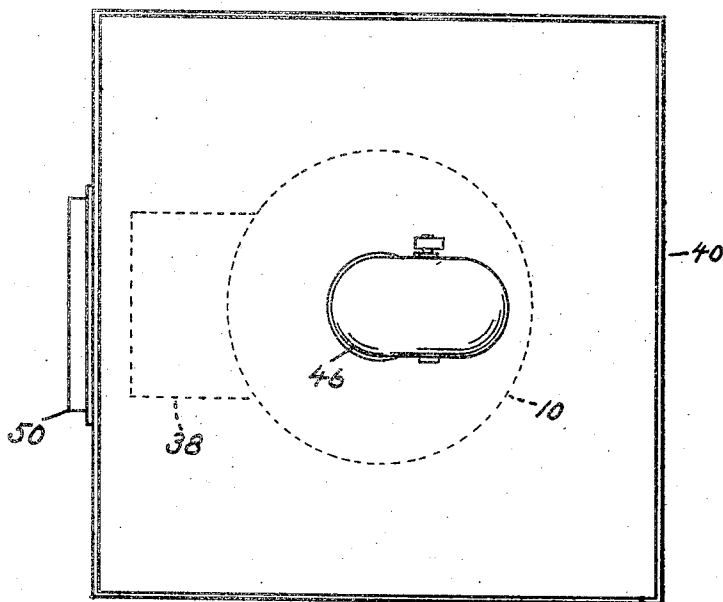


FIG. 2

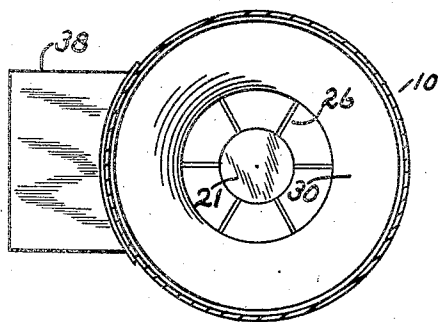


FIG. 3

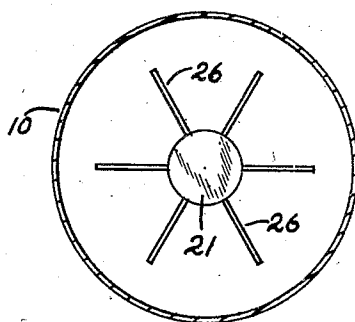


FIG. 4

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HEATER CONSTRUCTION

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7 Claims. (Cl. 219—39)

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This invention relates to an improved heater construction and has for one of its principal objects the provision of means for economically producing an efficient, sturdy and efficient device which may be thermostatically or manually operated. The present invention is a continuation in part of my co-pending application Ser. No. 523,826, filed February 25, 1944, which matured into Patent No. 2,391,111.

Another object of advantage and importance of the present invention resides in the provision of means for evenly distributing heat from the centrally located heating means over substantially the entire floor surface of the unit. Moreover the heat conducting means are arranged to lessen turbulence and eddies in air currents passing through the unit.

A still further object of advantage and importance is the provision of means for locating the improved heating unit within a cabinet and utilizing the discharge from the unit for aspirating air through the cabinet. The air circulated through the cabinet picks up heat from the exterior of the unit and tends to maintain the cabinet walls cool.

A further object of importance is the provision of means for inducing air from two levels into the unit for conditioning and discharging the conditioned air at a level intermediate the first two levels to thereby decrease or totally eliminate stratas of varying temperatures.

An additional object of advantage of the improved device of this invention is the provision of means for directing entering air downwardly into a centrally located heating and mixing chamber and thence upwardly and along the walls of the unit and through the discharge passage. While the substantially funnel-shaped member positioned between the entrance and the mixing chamber aids greatly in directing and controlling the flow of air through the unit, the unit may be operated, but less efficiently, without the member.

Additional objects of advantage and importance will become apparent as the following detailed description progresses, reference being had to the accompanying drawings wherein,

Fig. 1 is a vertical section of a heater which embodies the invention.

Fig. 2 is a top plan view of the device.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1, and looking in the direction indicated by the arrows, and

Fig. 4 is a similar view taken on line 4—4 of Fig. 1 also looking in the direction indicated by the arrows.

The reference numeral 10 indicates generally the body of the improved heater of this invention. In the preferred construction of the device the body 10 is cylindrical and the top end

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thereof has an apertured closure 12 affixed thereto and the bottom end is provided with a ceramic or other refractory floor member 14. The closure member 12 is centrally apertured, as is best shown in Fig. 1, and the edges of the aperture are turned upwardly to form an annular flange 16. Fixed to the annular flange 16 as by welding or the like is an inlet pipe 18.

Carried by the ceramic floor member 14 is a heating element 20 which is preferably enclosed in a casing member 21. The heating element 20 here shown comprises a single core upon which a high resistance conductor 23 is wound. However it will be apparent that any suitable element or plurality of elements may be substituted for the one shown. Power for the heating element 20 may be supplied through conductors 24 indicated by the dotted lines in Fig. 1. The conductors 24 are adapted to be encased in a conduit 25 or the like positioned beneath the heater 20 and floor member 14.

Extending radially from the casing member 21 is a plurality of heat conducting fins 26. The fins 26 are constructed of a good heat conducting metal and are preferably bonded to the casing member. The number of fins employed in any single structure may be increased or decreased as desired or required.

Positioned adjacent the top closure 12 and secured to the walls of the body 10 is an apertured member 30. The apertured member 30, which is substantially in the form of a truncated cone, divides the interior of the body 10 into an upper chamber 32 and a lower or mixing chamber 34.

Formed in the wall of the body 10 closely adjacent and beneath the point at which the apertured member 30 is affixed is a discharge opening 36. The discharge opening 36 is provided with a nozzle 38 which projects radially from the surface of the body 10.

The entire structure thus far described is adapted to be positioned within a cabinet 40 which in the preferred embodiment may be constructed of sheet metal or other suitable material. Where it is so desired insulation, not shown, may be provided for the interior of the cabinet 40 and also for the exterior of the body 10.

The cabinet is preferably rectangular in shape and is provided with a floor 42 which is adapted to support the body 10 as is best shown in Fig. 1. Secured to the top of the cabinet 40 is a centrally apertured closure member 43. The aperture in the closure member 43 is provided with a collar 45 into which the inlet pipe 18 is telescoped. The upper portion of the collar 45 has attached thereto a power blower 46 as is clearly shown in Figs. 1 and 2. Electrical energy for operating the blower 46 may be supplied from a suitable source.

Formed in one wall of the cabinet 40 and in alignment with the discharge nozzle 38 is an out-

let opening 48. The opening 48 may be provided with an outlet duct 50 which is secured in place by any suitable means. It is to be noted that the outlet opening 48 is spaced from and is of greater diameter than the outlet of the nozzle 38 for a purpose hereinafter more fully disclosed. Formed in the walls of the cabinet closely adjacent the floor member 42 is a plurality of apertures 52. The apertures 52 provide an inlet so that air may be drawn into the cabinet 40 when the unit is in operation. Suitable legs or feet 54 are provided at the base of the cabinet 40 as is best shown in Fig. 1.

Where it is so desired the power means for the blower 46 and the heater element 20 may be connected in series and thereby controlled by a single switch either manually or thermostatically operated. Under such conditions when the switch is closed the heater is energized and the blower started. The blower 46 functions to force air downwardly through the inlet pipe 18 and into the upper chamber 32 and thence through the funnel shaped member 30 into the mixing chamber 34. The air entering this chamber is forced downwardly toward the heater 20 and fins 26 where in absorbing the heat it is forced outwardly and upwardly toward the upper portion of the mixing chamber 34. As the upwardly flowing heated air nears the funnel shaped member 30 it is deflected outwardly and through the outlet aperture 36 and nozzle 38 thence through the larger outlet 48 and duct 50. The flow of air from the nozzle 38 to the duct 50 sets up an aspirating action which draws air within the cabinet 40 in the direction of the arrows shown adjacent the outlet 48 and passes it from the cabinet 40 with the heated air. Thus warm air within the cabinet is mixed with and discharged in the stream of heated air delivered to the space being heated. In this manner a considerably greater volume of conditioned air is delivered through the outlet 50 than is passed through the inlet 18. Moreover the aspirating effect draws air from a level adjacent the floor and the inlet of the blower 46 draws air from a much higher level and the delivery of conditioned air being intermediate the two inlets a condition is created which tends to eliminate or greatly reduce stratified heating. Thus the improved device tends to create and maintain a substantially uniform temperature at all levels within the space being heated.

It will be apparent to those skilled in the art to which the device appertains that numerous details of construction and design may be altered and changed without departing from the spirit or scope of the invention. Accordingly the patent granted hereon is not to be limited to the preferred embodiment here shown or in any other manner except as is necessitated by the terminology of the appended claims when given the range of equivalents to which they may be entitled.

I claim as my invention:

1. A portable heater comprising, a cabinet, a cylindrical member positioned within said cabinet, a duct providing inlet means extending through said cabinet and into the interior of said cylindrical member, means adjacent the base of said cabinet for admitting air into the interior thereof, separate discharge means for said cylindrical member and said cabinet positioned intermediate said inlet means, said separate discharge means being disposed to prevent a flow of air from said cabinet into said cylindrical

member when the heater is in operation, power means for causing air to flow into said inlet means and outwardly through said outlet means, and means for heating said flowing air intermediate said inlet and said outlet.

2. A portable heater comprising, a cabinet having inlet and outlet openings adjacent opposed ends thereof, a cylindrical member having inlet and outlet openings adjacent one end thereof and positioned within said cabinet, means for forcing air through said cylindrical member, the outlet opening of said cylindrical member being disposed in alignment with and spaced from the outlet of said cabinet to aspirate air from said cabinet when air is forced through the outlet of said cylindrical member, and means for heating the air as it passes through said cylindrical member.

3. A portable heater, comprising, a closed cabinet having inlet and outlet openings therein, said inlet openings being positioned near the lower portion of said cabinet, a cylindrical member having inlet and outlet openings therein vertically disposed within said cabinet, the inlet in said cylindrical member extending through the upper end thereof, a duct secured to said cylindrical member and providing a continuation for the outlet therein, said duct being in alignment with and spaced from the outlet of said cabinet, means for circulating air through said inlet and outlet openings in said cabinet and said cylindrical member, and means for heating air as it passes through said cylindrical member.

4. A portable heater, comprising, a vertically disposed cylindrical member having closed ends, an inlet formed in the upper end of said cylindrical member, an outlet formed in the peripheral wall of said cylindrical member intermediate the ends thereof, power means associated with said inlet for forcing air into said cylindrical member and outwardly through said outlet, means for heating said air as it passes through said cylindrical member, a closed cabinet encasing said cylindrical member, the top and side walls of said cabinet being spaced from like walls of said cylindrical member, said cabinet being apertured adjacent the lower portion and the intermediate portion to permit a flow of air there-through, and the aperture in the intermediate portion of said cabinet being in alignment with the outlet of said cylindrical member whereby the discharge of air from the cylindrical member aspirates air through the space between the walls of said cylindrical member and said cabinet.

5. A portable heater, comprising, a hollow heat transfer member having a closed end and an inlet and an outlet at the other end portion thereof, means for forcing air through said member, means secured to the closed end of said member for heating the air within said member, a cabinet encasing said heat transfer member, said cabinet having inlet and outlet openings, the outlets in said member and said cabinet being disposed to aspirate air through said cabinet when the means for forcing air through the member is in operation.

6. A portable heater, comprising, a hollow heat transfer member having a closed lower end and an inlet and an outlet at the upper end portion thereof, means for forcing air downwardly into said member, means including a heating element having radially extending fins secured to the closed lower end for heating and reversing the direction of flow of the air within said member, a cabinet encasing said heat transfer member,

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said cabinet having inlet and outlet openings, the outlet in said member terminating within said cabinet, the outlet in said member and the outlet in said cabinet being in alignment to provide an aspirating action for passing air through said cabinet when the means for forcing air downwardly into the heat transfer member is in operation.

7. In a portable heater, a hollow heat transfer member having an inlet and an outlet at one end portion thereof, means for forcing air into said member, and means for heating the air within said member, said means including an electric actuated thermal element positioned within said member at the opposite end thereof, means encasing said element to protect it from the air passing through said member, and means associated with said encasing means and extend-

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ing radially therefrom for disseminating heat generated by said thermal element and assisting in causing the heated air to flow toward the first named end portion.

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The following references are of record in the file of this patent:

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1,754,232	Fisher -----	Apr. 15, 1930
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