

July 29, 1941.

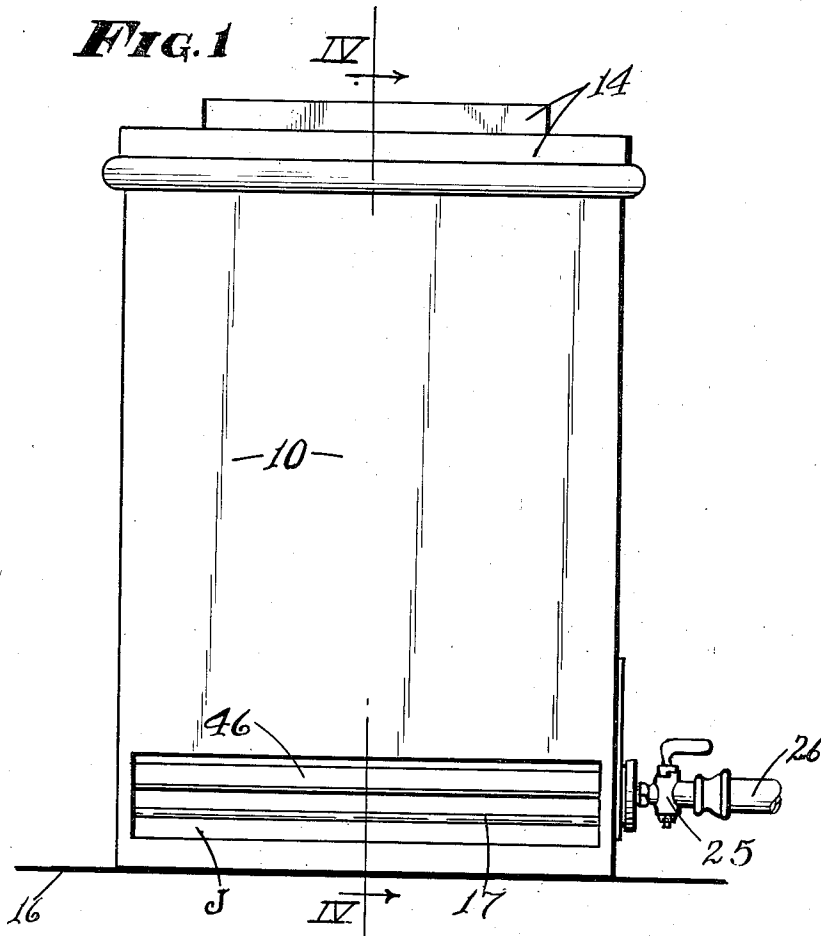
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2,250,893

HEATER

Filed April 15, 1941

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

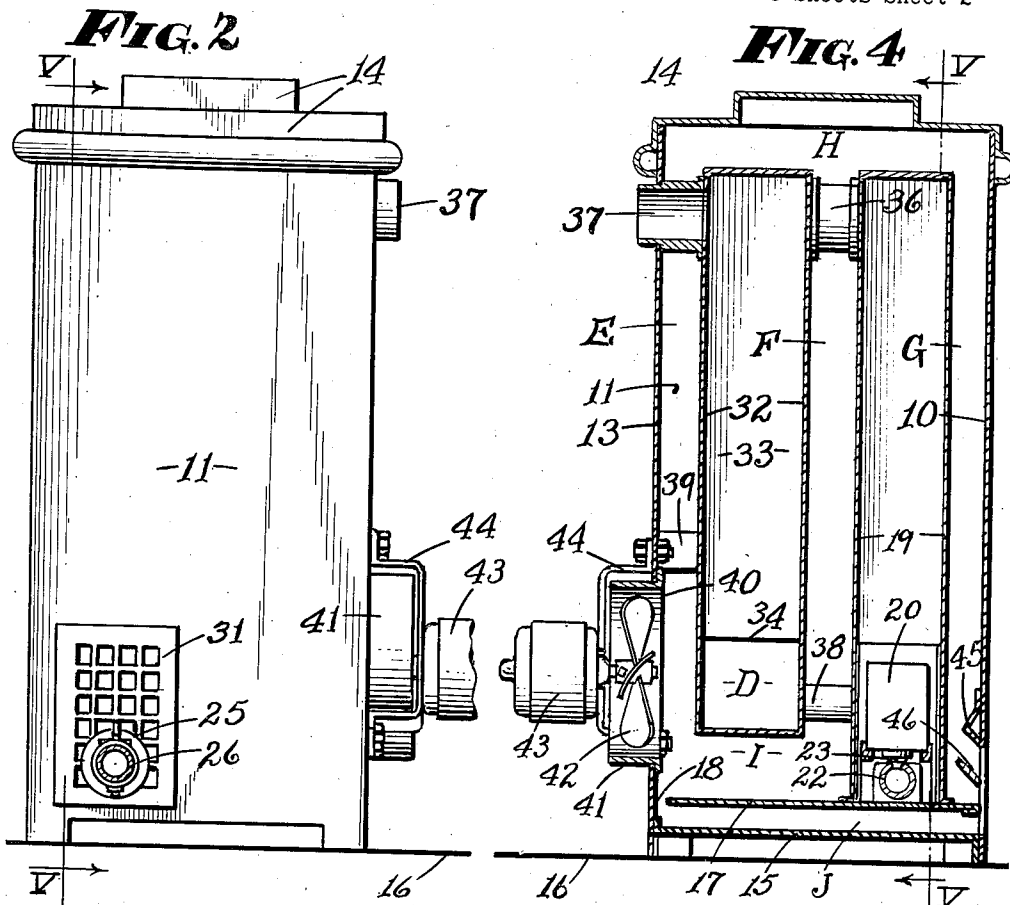
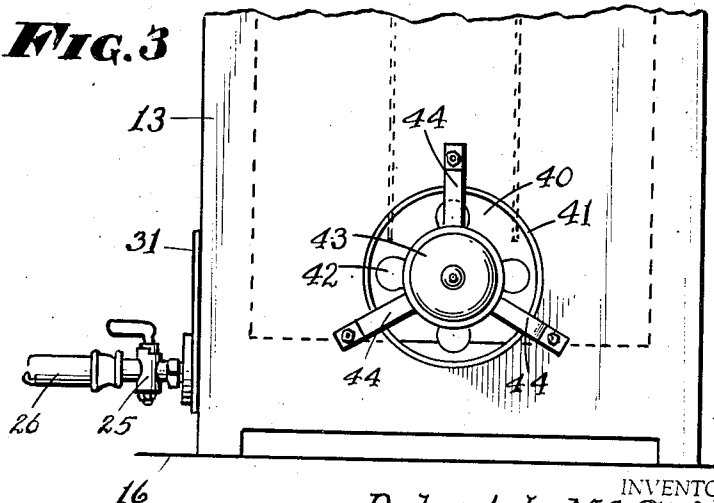


FIG. 3



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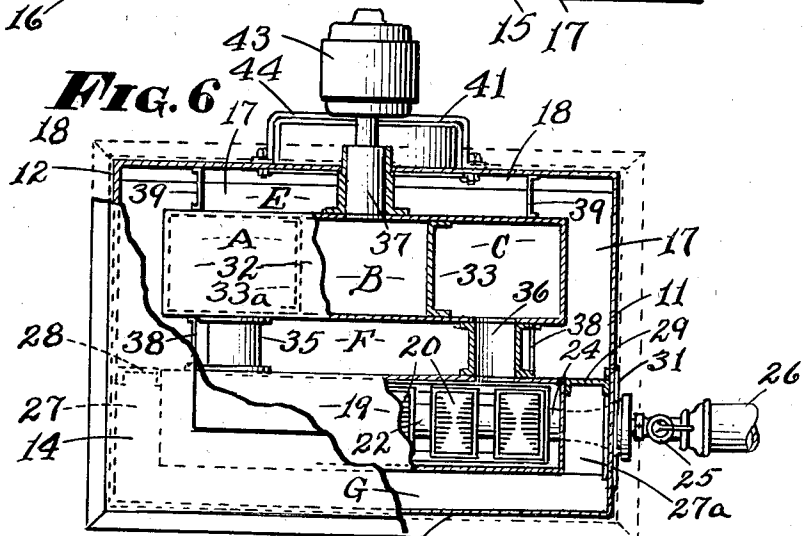
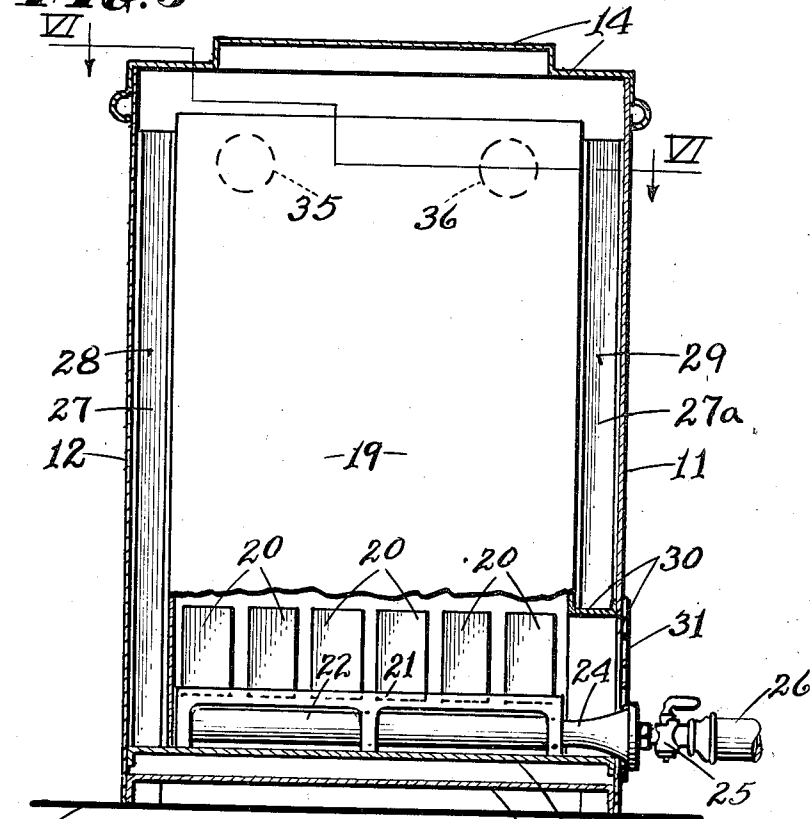
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**FIG. 5**



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# UNITED STATES PATENT OFFICE

2,250,893

HEATER

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Application April 15, 1941, Serial No. 388,669

4 Claims. (Cl. 126—110)

My invention relates to an improvement in heaters and has for its object to provide a heater in which two distinct channels for air flow are provided in the heater. One of these air channels is for the transmission by force of cold air which is emitted from the heater at a point adjacent the floor of the space to be heated. The other of these air channels is for the transmission of air by force around and between heating drums from which the air is heated and then emitted from the heater in a stream of air parallel to and riding the cold stream of air also being emitted.

Another object is to provide a heater of the kind mentioned which has a cold air channel spaced above the floor of the space to be heated so as to permit a free circulation of air between the bottom of the heater and the floor of the space to be heated. This arrangement provides the cold flow of air in the heater beneath the heated flow of air and above the air circulation beneath the bottom of the heater so as to avoid excess heating of the floor of the space to be heated beneath the heater.

A still further object is to provide a heater of the kind mentioned in which the air is forced to circulate under the influence of a fan around an unusually large heating surface.

A still further object is to provide a heater of the kind mentioned in which a gas or oil burners or other suitable heating means may be employed.

A still further object is to provide a heater of the kind mentioned that is simple in construction, inexpensive to make and highly efficient in its operation.

Now referring to the accompanying drawings, Fig. 1 is a front view of the heater.

Fig. 2 is a side view of the heater.

Fig. 3 is a rear view of the lower portion of the heater.

Fig. 4 is a sectional view through the heater, the view being taken through the line IV—IV in Fig. 1.

Fig. 5 is a sectional view through the heater, the view being taken along the lines V—V in Figs. 2 and 4, and looking in the direction of the arrows.

Fig. 6 is a partial top and sectional view of the heater, the view being taken along the line VI—VI in Fig. 5.

Similar numerals of reference designate the same parts throughout the several figures of the drawings.

In the drawings is shown a housing having a

front wall 10, side walls 11 and 12 and a rear wall 13. The housing is provided with a cover 14 and a bottom 15, which is spaced above the floor 16 of the space that is to be heated.

Spaced above the bottom 15 is a sub floor 17 that lacks a little of reaching the rear wall 13 so as to leave an opening 18 between the rear edge of the sub floor 17 and the rear wall 13.

Supported on the sub floor 17 is a heater housing 19, in which is supported a series of gas burners 20 that are supported on a frame 21 under which is supported a gas manifold 22 from which gas is fed through jets 23 to the gas burners 20. At 24 is shown a Venturi section connecting with the gas manifold 22 and at 25 is a gas control valve through which gas fuel is fed from the pipe 26 into the Venturi section 24 and manifold 22.

The heating drum 19 is narrow enough to leave spaces 27 and 27a between the heating drum 19 and the end walls 11 and 12 of the heater, there being division walls 28 and 29 at the rear vertical corners of the heating element, said partitions 28 and 29 extending within a short distance of the top of the heating element 19, and the bottom end of the partition 28 joining the sub floor 17 as shown in Fig. 5.

The bottom end of the partition 29 joins the top of a duct 30, which reaches from the bottom of the partition 29 to the sub floor 17 and opens into the heating element 19, the duct 30 being of sufficient size that the gas burners 20 and supporting frame 21 and gas manifold 22 and Venturi element 24 may be entered therethrough for assembly purposes and for lighting the burner.

At 31 is an ornamental grill over the duct 30 and having openings therein for the admission of air to and around the burners as secondary air for fuel combustion.

At 32 is a second heating element having vertical divisions 33 and 33a that are spaced away from the ends of the heating element 32 and extend from the top of the heating element to a point 34 that is well above the bottom of the heating element 32 so as to form three compartments A, B and C therein. The compartments A and C joining the compartment B at the bottom of the heating element 32 through an opening D as illustrated in Fig. 4.

At 35 and 36 are tube like elements opening from the top of the heating element 19 into the compartments A and C in the heating element 32.

At 37 is a vent or flue connecting opening

from the top of the compartment B and leading through the rear wall 13 of the heater as shown in Figs. 2, 4 and 6.

At 38 is shown spacer elements between the heating elements 19 and 32 and at 39 is shown spacer elements between the heating element 33 and the rear wall 13.

The arrangement above described provides two heating elements 19 and 32, between which is an air passage F and also an air passage E between the rear wall 13 and the heater element 32 and another air passage G between the heater element 19 and the heater wall 10 and an air passage H occurs over the top of the heating elements 19 and 32 and joins with the air passages E, F and G.

Beneath the heating element 32 is an air passage I which joins the passages E and F. In the rear wall 13 is a circular shaped opening 40 bounded by an outwardly projecting flange 41 in which is positioned a fan 42 that is driven by a motor 43 that is mounted on a spider bracket 44 that is rigidly mounted on the rear wall 13 of the heater.

The front wall 10 of the heater is provided with an opening having a baffle 45 and a louver 46 therein so positioned as to direct a flow of air downwardly and outwardly from the air passage G.

The opening in the front wall 10 is also large enough to include the opening from the cold air passage J.

The operation of the device is as follows: The gas valve 25 is turned to the open position whereupon gaseous fuel is emitted from the burner 20 and the fuel may be ignited by match or small torch as will readily be understood. The heat and draft from the burning gases will heat the heating element 19 and pass through the tubular elements 35 and 36 into the top of the compartments A and C and travel downwardly therein and pass through the opening D at the bottom thereof, and then into the compartment B and travel upwardly therein to be exhausted through the vent 37. During the travel through all of these heating elements and compartments, practically all of the heat has been radiated through the walls of the heating elements 19 and 32 and into the air passages therearound. The electric motor 43 being in motion will drive the fan 42 to bring in air through the opening 40 and discharge it into the inside of the heater housing, whereupon the air is forced to travel, some upwardly and some downwardly and some sideways through the passage E to the passages H and I and also upwardly through the passage F to join the passage H, thence downwardly through the passage G to be discharged in an outwardly and downwardly direction through the opening in the front wall 10 by reason of the baffle 45 and louvre 46.

This stream of air, because of its contact with the heating elements 19 and 32 during its travel just described, is hot. Simultaneously with the flow of air just described, is a second flow of air, also impelled by the fan 42 and which is a part of the air coming through the passage 18 and cold air passage J to be discharged through

the opening in the front wall 10 and beneath the stream of hot air being discharged immediately above. Therefore a stream of air is being emitted from the heater along the floor line 16, the bottom portion of said stream of air being of considerably lower temperature than the upper portion thereof, which results in a composite stream of air having a tendency to flow along the floor line 16 for considerable distances thereby accomplishing a more uniform heating of the room or space to be heated than is accomplished in other forced draft heaters.

Such modifications may be employed as lie within the scope of the appended claims without departing from the spirit and intention of the invention. Having fully described my invention, I claim:

1. In a heater of the character described the combination with an external casing, a radiator structure in said casing spaced from the walls of the casing at all points, partitions connecting the radiator with the opposite sides of the casing and dividing said casing into front and rear compartments, means for heating the interior of the radiator structure, a cold air inlet in the rear wall of the casing at a point nearer the bottom than the top of the casing, an outlet for discharging heated air obliquely downward, said outlet being located in the front wall of the casing at a point relatively close to the floor line, a substantially horizontal partition spanning the casing close to the bottom thereof and spaced from the bottom of the casing enough to provide a conduit for air across the lower portion of the casing, a fan for drawing air into the cold air inlet, means for establishing communication between the rear end of said conduit and the rear compartment at a point adjacent the fan whereby cold and relatively dense air may travel directly from said fan across the casing and be discharged in a substantially horizontal path across the floor line and beneath the stream of hot air being discharged from the heated air outlet, the said conduit opening through the front wall of the casing at a point below the outlet for heated air.

2. A structure as recited in claim 1 in combination with means for holding the bottom of the casing in spaced relation to the floor line, the horizontal cold air conduit protecting the floor from heat.

3. A structure as recited in claim 1 wherein the radiator structure comprises a pair of spaced vertical drums, and wherein the said first named partitions are so located that the one of said drums lies in the rear compartment and the other of said drums lies in the front compartment.

4. A structure as recited in claim 1 wherein the radiator structure comprises a pair of spaced vertical drums, and wherein the said first named partitions are so located that the one of said drums lies in the rear compartment and the other of said drums lies in the front compartment with its rear wall exposed to the air in the rear compartment.

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