

Nov. 28, 1944.

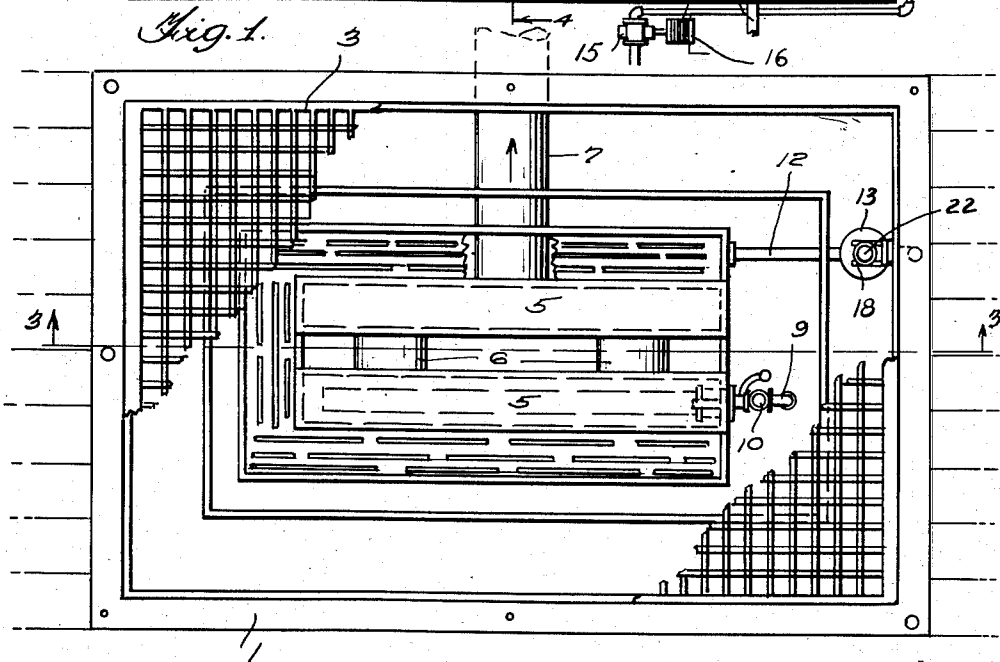
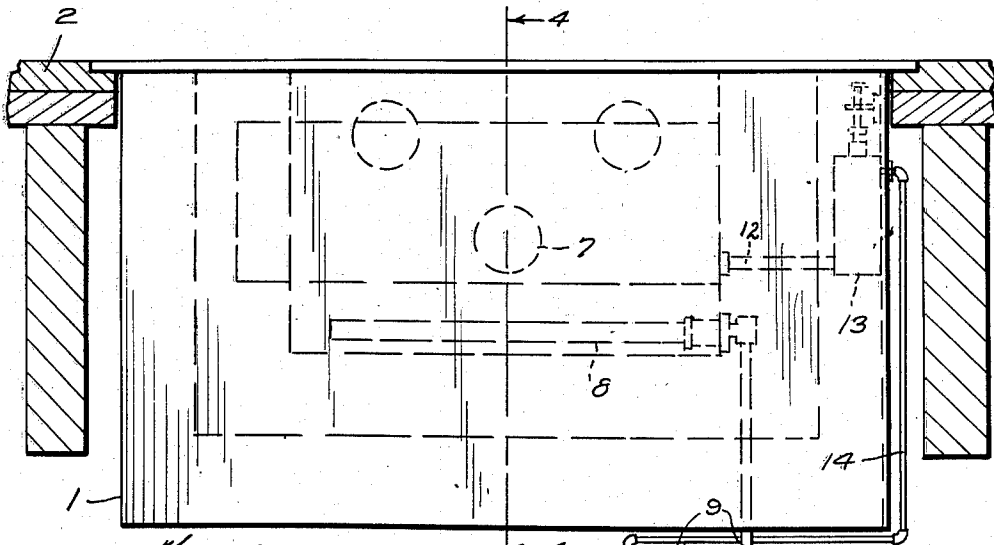
J. H. FORRESTER

2,363,953

GAS FURNACE

Filed May 1, 1942

2 Sheets-Sheet 1



Inventor

JOHN HUGHES FORRESTER

By *Clarence A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

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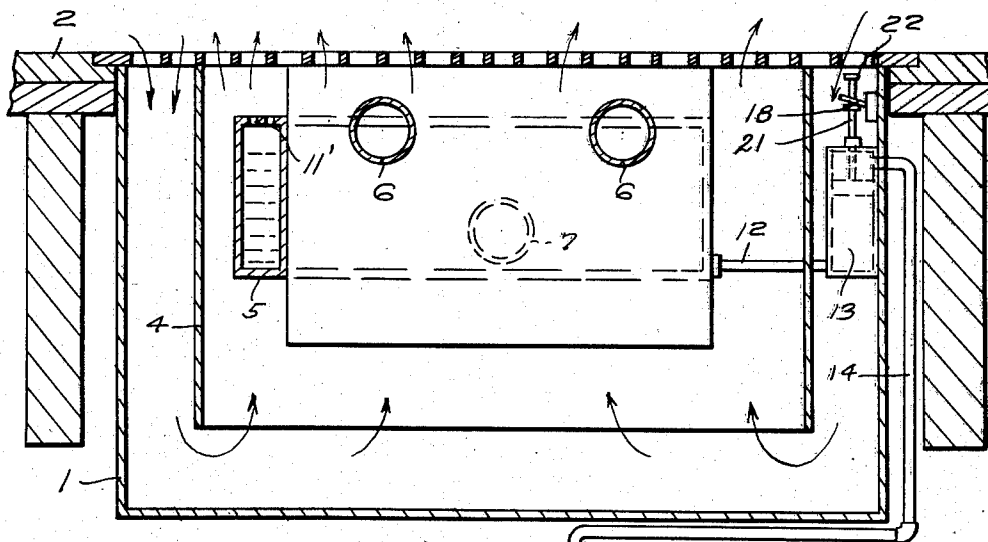


Fig. 3.

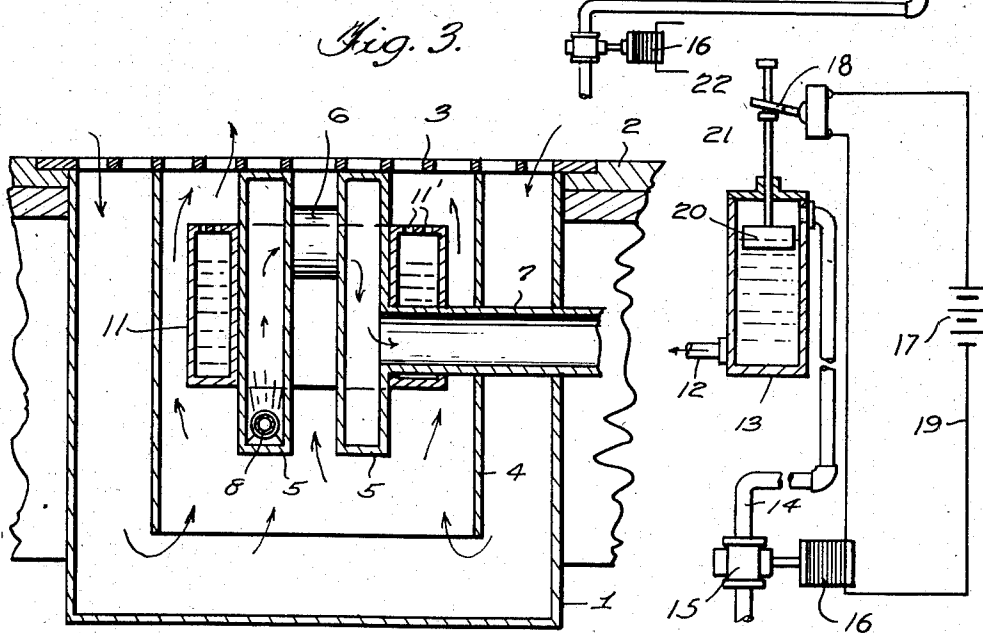


Fig. 4.

Fig. 5.

Inventor

JOHN HUGHES FORRESTER

By *Clarence A. O'Brien*
and *Harvey B. Jacobson*
Attorney

UNITED STATES PATENT OFFICE

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GAS FURNACE

John Hughes Forrester, Waldron, Ark.

Application May 1, 1942, Serial No. 441,367

1 Claim. (Cl. 126-113)

My invention relates to improvements in so-called gas floor furnaces such as are commonly built into the floors of houses and other buildings to discharge heated air directly into the rooms.

As is well known, such furnaces discharge a hot, exceptionally dry heat which is objectionable for various reasons, and particularly because it affects the membranes of the throat and nose injuriously.

Having the foregoing in mind, it is the principal object of my invention to adapt furnaces of the type specified to discharge properly humidified hot air and to accomplish this result without altering the basic structure of the furnaces or materially increasing the cost of installation and manufacture.

To the accomplishment of the above, and subordinate objects presently appearing, a preferred embodiment of my invention has been illustrated in the accompanying drawings, set forth in detail in the succeeding description, and defined in the claim appended hereto.

In said drawings:

Figure 1 is a view partly in side elevation and partly in section illustrating a furnace embodying my improvement and installed,

Figure 2 is a view in top plan partly broken away,

Figure 3 is a view in longitudinal vertical section taken on the line 3-3 of Figure 2,

Figure 4 is a view in transverse section taken on the line 4-4 of Figure 1, and

Figure 5 is a detail view partly in vertical section and partly diagrammatic illustrating the water storage tank, control valve and float operated means for opening the valve.

Reference being had to the drawings by numerals, my improvements have been shown therein as embodied in a well known type of gas floor furnace including an outer, rectangular, open top casing 1 set into and suitably secured in the floor 2 and covered by the usual grating or grid 3. Centered in the casing 1 is a smaller, rectangular shell 4 spaced from the bottom of the casing 1 and rising to the top thereof. The shell 4 forms a wall member spaced from the sides and ends of the casing 1. Within the shell 4 is a heating unit comprising a pair of side-by-side, rectangular, flat, hollow members 5 depending edgewise from the top of the shell 4 and spaced apart parallel from each other and from the sides of said shell 4 with a pair of upper, connecting, cross flues 6 extending between the same and a lower horizontal vent pipe 7 extend-

ing from the side of one member through one side of the shell 4 and one side of the casing 1 for connection to a chimney, not shown. The other heating member 5 is equipped with a tubular gas burner 8 extending along the bottom thereof.

A gas supply pipe 9 extends through the space between one end of the shell 4 and one end of the casing 1 and is connected by a control valve 10 to one end of the burner 8.

In the type of burner described, the products of combustion rise in the burner equipped member 5; pass across to the other member 5 through the flues 6, then downwardly in said other member and out of the vent pipe 7. Air from the room is drawn downwardly into the casing 1 by way of the space between the sides and ends of the casing 1 and shell 4 and is discharged upwardly from the shell being heated as it passes through the shell by the described heating unit.

According to my invention, in the illustrated embodiment thereof, a horizontal, U-shaped, transversely rectangular, water jacket 11 is fitted around the sides and one end of the heating unit in horizontally extending position within the shell 4 and spaced from the walls of said shell. The water jacket 11 may be of any suitable size and capacity depending upon the B. t. u. capacity of the furnace. The water jacket 11 is provided preferably with a perforated top, as shown at 11', and the vent pipe 7 is extended through said jacket to assist in heating the water in said jacket. A water-tight seal, not shown, may be provided in any suitable manner around the vent pipe 7 where said pipe extends through the jacket 11.

At one end of the water jacket 11, a lateral water supply pipe 12 extends from adjacent the bottom of the jacket through one end of the shell 4 to a water storage tank 13 suitably secured to one end wall of the casing 1 between the same and the shell 4. A water inlet line 14 extends from the tank 13 adjacent its top thereof downwardly for connection to the house supply system, not shown. The storage tank 13 is substantially of the same depth as the water jacket 11 and arranged at substantially the same level with the supply pipe 12 extending from the bottom portion of the tank to the bottom portion of said jacket.

A normally closed, electrically operated control valve 15 is interposed in the line 14 and which includes an electro-magnet 16 interposed in a suitable circuit 19 including a source of energy 17, in which circuit a self-opening switch

18 is interposed in one side thereof. The storage tank 13 contains a float 20 with a rod 21 upstanding therefrom and slidably extended through the top of the storage tank 13. A tappet 22 fast on the rod 21 overlies the switch 18 so that fall of the float 20 and the rod 21 moves said tappet into engagement with the switch 18 to close the same, the arrangement being such that when water in the water jacket 11 falls below a predetermined level, the water in the storage tank 13 correspondingly falls and the switch 18 is closed to energize the electromagnet 16 and cause the latter to open the valve 15 to open the water supply line to the storage tank until the water level in said tank and in the jacket 11 rises to substantially fill the same.

As will be apparent, recirculated air entering the casing 1 and arising through the shell 4 will become properly humidified by vapor issuing from the water jacket 11 through the perforated top thereof, while at the same time such air will be properly heated by the described heating unit.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention without further explanation.

Manifestly, the invention, as described, is susceptible of modification without departing from the inventive concept, and right is herein reserved to such modifications as fall within the scope of the subjoined claim.

What I claim is:

In a furnace for suspension from a floor pro-

vided with a rectangular opening therein, a box-like rectangular casing having an open top adapted to be fitted in said opening, a relatively smaller rectangular shell open at the top and bottom thereof and centered in said casing with the top thereof flush with the top of the casing and its bottom spaced above the bottom of the casing to provide a cold air down-draft space between said casing and shell, and an up-draft chamber in the shell communicating with said down-draft space, a heating unit in said shell comprising a pair of side-by-side rectangular hollow members depending edgewise into the shell and having top surfaces level with the top edges of the shell, said members being spaced apart laterally and spaced from the shell to expose a maximum heating surface in the shell, a burner in the bottom of one member, a cross flue connecting the upper portion of said one member with the upper portion of the other member, a heat vent pipe extending from one side of said other member laterally through said shell and casing, and a U-shaped transversely rectangular water jacket straddling the members of the heating unit horizontally, and fitting against the same for heating by said members, said jacket being spaced from the shell to provide for up-draft past the same, and having a perforated top located below the top of the shell for the escape of moisture therethrough to humidify air heated in the said shell.

JOHN HUGHES FORRESTER.