March 6, 1945. D. F. JONES 2,370,795

FORCED AIR CIRCULATOR FOR FURNACES

Filed Aug. 2, 1940 3 Sheets-Sheet 1

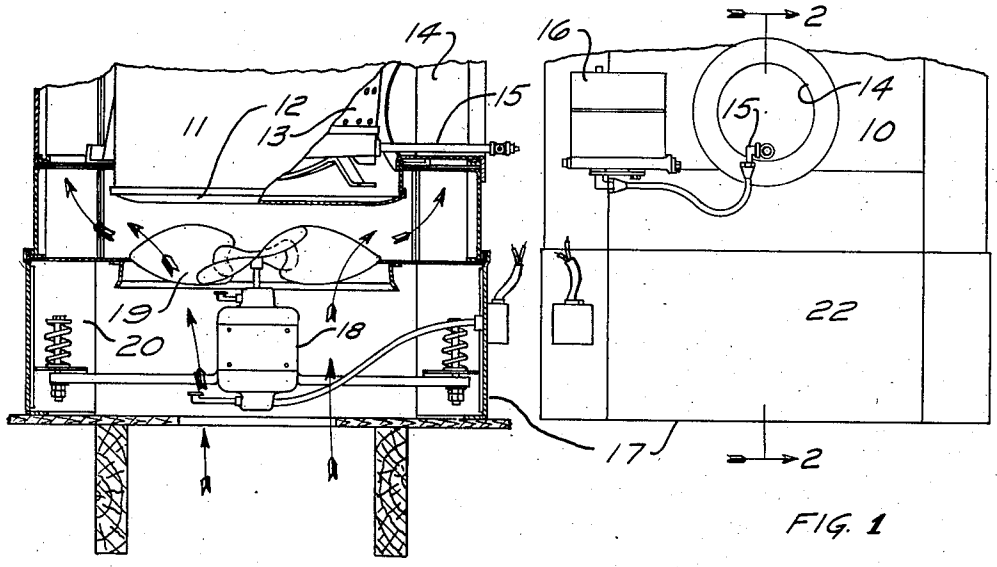


FIG. 1

FIG. 2

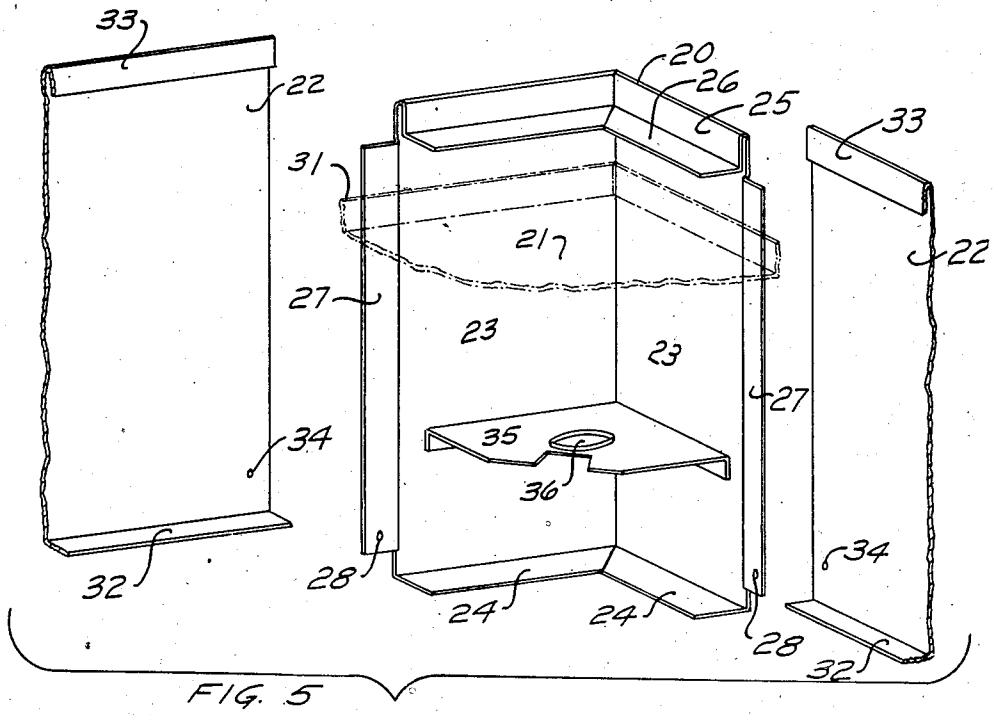


FIG. 5

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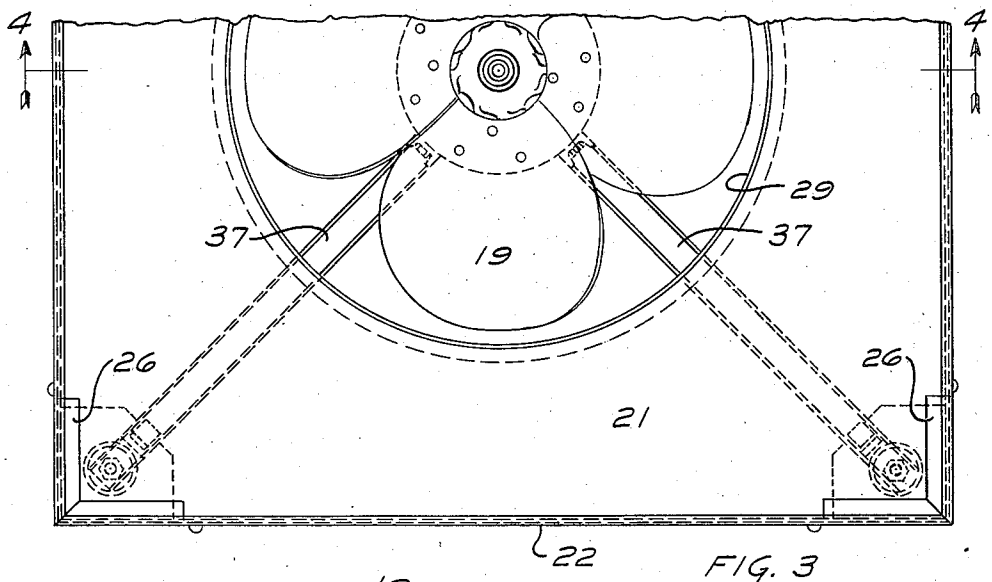


FIG. 3

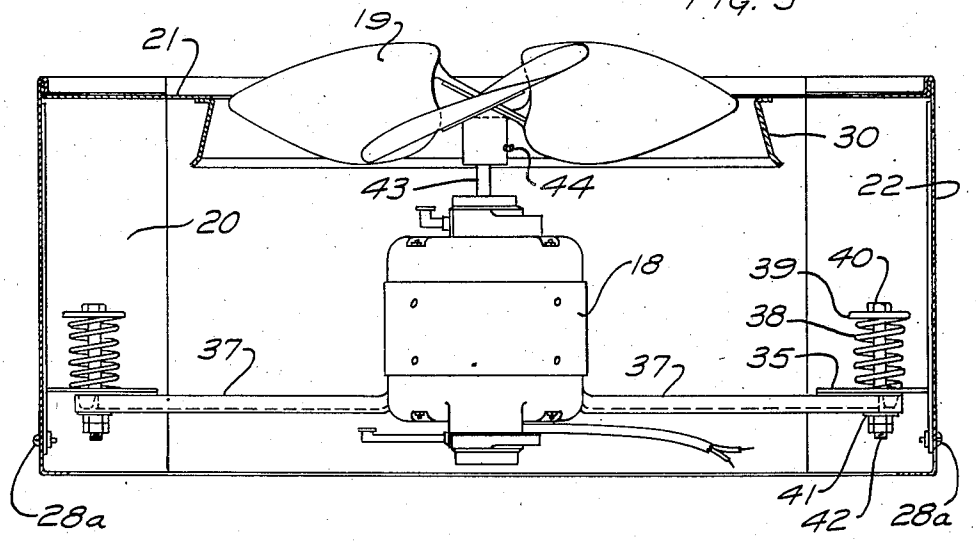


FIG. 4

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FORCED AIR CIRCULATOR FOR FURNACES

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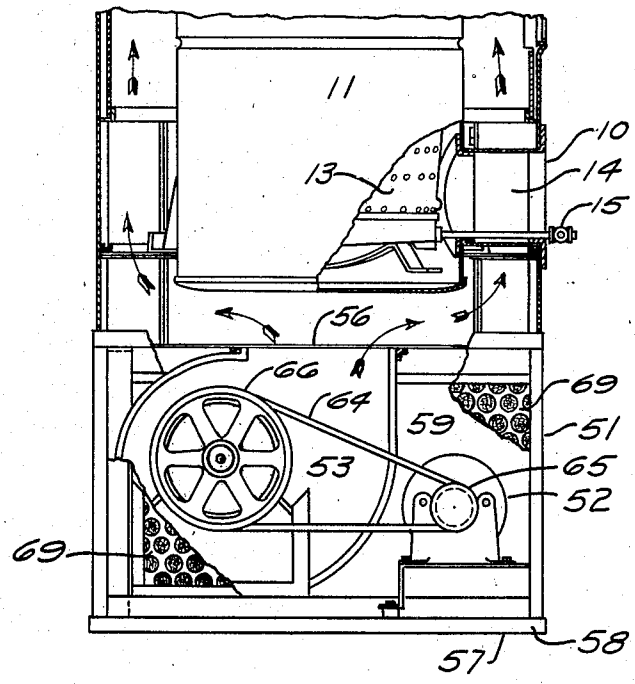


FIG. 6

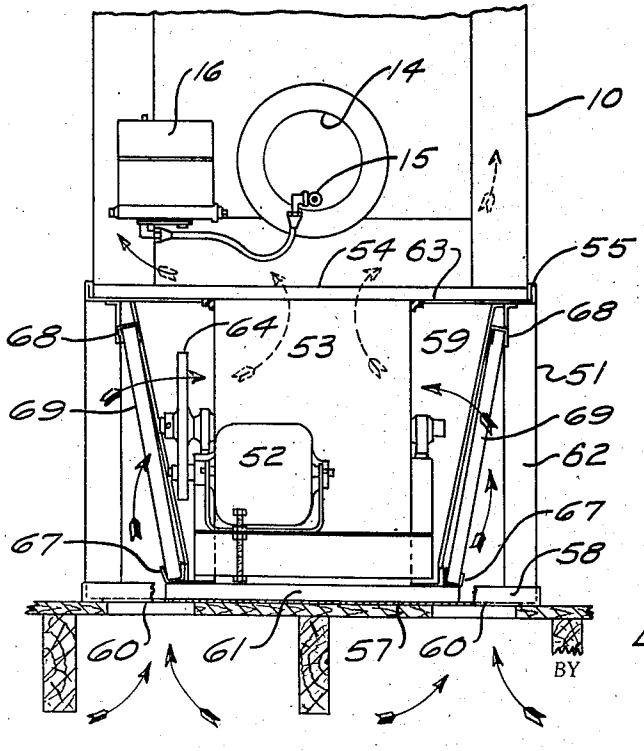


FIG. 7

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Patented Mar. 6, 1945 2,370,795

UNITED STATES PATENT OFFICE

2,370,795

FORCED AIR CIRCULATOR FOR FURNACES

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Application August 2, 1940, Serial No. 349,624

10 Claims. (Cl. 126—110)

This invention relates to furnaces and more particularly to forced air circulators therefor.

The principal object of the invention is to provide a unitary forced air circulator for a furnace which is complete in itself and which may be operatively associated with the furnace simply by placing the latter thereon.

Another object is to provide a unitary air circulator housing that is adapted to act as a base for a standard furnace.

Still another object of the invention is to provide a unitary air circulator the housing of which is provided with readily removable side panels.

A further object is to provide a housing for an air circulator that is simply and economically fabricated and assembled, yet is sturdy enough to support a furnace thereon.

These objects will more fully appear in the following specification when read in connection with the accompanying drawings, wherein—

Figure 1 is a fragmentary front elevational view of a furnace assembly embodying the invention;

Figure 2 is a fragmentary cross-sectional view taken on substantially the line 2—2 of Figure 1;

Figure 3 is a fragmentary plan view of the air circulator;

Figure 4 is a cross-sectional view taken on substantially the line 4—4 of Figure 3;

Figure 5 is an exploded pictorial view of a corner of the air circulator housing;

Figure 6 is a side elevational view of a furnace embodying a modified form of the invention, a side panel being removed and parts being cut away; and

Figure 7 is a front elevational view of the structure shown in Figure 6 with the front panel removed.

Figures 1 and 2 illustrate one form of the invention as applied to a standard oil fired hot air furnace. The furnace itself is ordinarily adapted to rest directly on the floor of a building. It comprises an outer casing 10, rectangular in plan, and an inner cylindrical casing 11. The lower end of the inner casing is closed by a bottom wall 12 which supports an oil burner 13 of the vaporizing pot type. Air for combustion of fuel within the burner is supplied through a duct 14 which is connected at its inner and outer ends respectively to the inner casing 11 and outer casing 10. Fuel is supplied to the burner from a source of supply (not shown) through a pipe 15 and fuel control apparatus 16.

The air circulator unit is shown in place beneath the furnace, the latter resting thereon. Essentially the unit comprises a housing 17, a motor 18 supported therein and a fan 19 connected to the motor.

The air circulator housing 17 is shown best in Figures 3, 4 and 5. It consists of four corner posts 20, a top wall 21, and four side panels 22.

The corner posts 20 are all identical. Each corner post is fashioned from sheet metal. Each post comprises a pair of upright webs 23 at right angles to each other. At the lower end of each web is an inturned flange 24. The upper ends of the webs 23 are reversely bent inwardly and downwardly at 25 and terminate in inwardly projecting flanges 26. The portions 25 are spaced from the outer parts of the webs 23. The upright lateral edges of the webs 23 are offset inwardly at 27 a distance equal to the thickness of the panels 22. Bolt holes 28 are formed in the lower ends of the offset edges 27. A gusset 35 is rigidly attached to each corner post in the angle between the webs 23. The gussets have holes 36 therein for a purpose to be described presently.

The top wall 21 consists of a rectangular sheet of metal having a large central opening 29 therein. About the periphery of the opening and extending downwardly therefrom is a baffle ring 30. About the periphery of the top wall 21 is an upstanding flange 31.

Each side panel 22 is a metal sheet having an inturned flange 32 at its lower edge and a downwardly bent flange 33 at its upper edge. Adjacent each lower corner is a bolt hole 34.

The housing is assembled by hooking the flange 31 of the top wall beneath the reversely bent portions 25 of each corner post so that the flange 31 enters the space between the portions 25 and the webs 23. Preferably the latter are then crimped tightly against the flange 31. The inturned flanges 33 of the side panels 22 are then hooked over the flange 31 between the corner posts and bolts 28a passed through the holes 28 and 34 which are superimposed. It will be evident that when so connected the ends of the panels 22 lie against the offset lateral edges 27 of the corner posts and flush with the outer surfaces of the webs 23.

Four channel shaped supporting arms 37 are bolted at their inner ends to the casing of the motor 18 and radiate outwardly therefrom. The outer ends of the arms 37 are resiliently mounted on the gussets 35. The mounting comprises a spring 38 surrounding the hole 36 in the gusset and resting on the latter. A washer 39 rests on

top of the spring and a bolt 40 passes downwardly within the spring through the hole 36 in the gusset 35 and the arm 37. A washer 41 and nuts 42 are attached to the lower end of the bolt. The arm 37 rests on the washer and is thus resiliently hung from the gusset 35.

The fan 19 is secured to the shaft 43 on the motor 18 by a set screw 44.

It will be evident that the entire air circulator assembly is assembled as a unit and may be readily associated with the furnace. To do so, the furnace is merely lifted into place atop the circulator, the corners of the furnace resting upon the inturned flanges 26 of the corner posts. The furnace is prevented from shifting laterally by the vertical portions 25 on the corner posts 20.

The circulator unit may be positioned over a hole in the floor, as shown in Figure 2. In that case air is pulled up from beneath the floor by the fan and circulated through the space between the inner and outer casings 10 and 11, as indicated by the arrows. In some cases, however, it is not feasible to cut a hole in the floor. When that is the case, one or more side panels 22 may be removed from the air circulator housing. To remove them it is necessary only to remove the bolts 28a at the lower corners of the panels and then lift the hook shaped upper edge of the same formed by flange 33 off of the flange 31 of the top wall 21. Access to the motor to oil or repair it may be obtained by removing one of the panels 22.

Figures 6 and 7 illustrate a modified form of the invention. The furnace 10 is identical with that previously described. The air circulator unit comprises a housing 51 somewhat similar to that previously described, a motor 52, a centrifugal blower assembly 53, and filters 69.

The housing 51 comprises four upright corner posts 62 of angular cross-section. A top wall 63 having an upstanding peripheral flange 54 is attached to the upper ends of the corner posts by reversely bending the metal of the latter over on the flange 54 as indicated at 55. The top wall has an opening 56 therein for the passage of air. The lower ends of the corner posts seat in and are secured to the corners of a bottom wall 57 which is provided with an upstanding peripheral flange 58. The bottom wall has two elongated rectangular openings 60 adjacent the opposite sides thereof. A raised portion 61 is provided in the center of the bottom wall. A plurality of side panels 59 are removably secured to the corner posts to fill the space between them and between the top and bottom walls.

Mounted on the raised portion of the bottom wall is the casing of the centrifugal blower assembly 53 which contains a conventional blower. A motor 52 is also mounted on the bottom wall. The latter drives the blower through a belt 64 and pulleys 65 and 66 on the motor and blower respectively. The upper end of the blower casing is secured to the top wall 54 and communicates with the opening 56 therein.

Between the openings 60 in the bottom wall, and adjacent their inner edges, is a pair of channels 67. Another pair of channels 68 is attached to the top wall. Ordinary air filters 69 are slid into each set of channels as indicated in Figure 7. The filters 69 may be removed by first removing the front panel 59 and sliding the filters out of the channels.

The apparatus just described may be installed by setting the air circulator unit on the floor with the openings 60 in the bottom wall over corresponding openings in the floor. The furnace 10 is then set up on the unit between the upstanding flanges 54 of the top wall.

When the apparatus is in operation air is drawn up through the floor as indicated by the arrows in Figure 7. The air is pulled through the filters and into the interior of the blower casing from which it is discharged into the space between the inner and outer casings of the furnace. See the arrows in Figures 6 and 7.

If it is inadvisable or impossible to cut holes in the floor, two opposite side panels adjacent the filters may be removed. In that case, air is drawn from the vicinity of the floor, but above the same, through the filters and into the blower casing.

From the foregoing it will be seen that this invention provides a simple and economical forced air circulator that can be built and sold as a unit for attachment to existing furnaces or may be used with new furnace installations. In either case it is a simple matter to connect it to the furnace. The circulator housing is fabricated in such a way that the sides may be entirely enclosed (where air can come through the floor) or one or more side panels may be removed without removing any support from the furnace. The circulator unit adds only a little height to the furnace assembly, and does not take up any more floor space than the furnace itself.

The scope of the invention is indicated in the appended claims.

I claim:

1. A unitary air circulator and base for a furnace comprising a plurality of legs each having a pair of upright webs at right angles to each other, the upper ends of each web being reversely bent downwardly and inwardly and terminating in horizontally inwardly extending flanges, a top wall having an upstanding peripheral flange positioned between said webs and said inwardly and downwardly extending portions, said top wall having an opening therein for the passage of air therethrough, a fan communicating with said opening, and a motor for driving said fan, said motor being mounted within and secured to said base.

2. A unitary air circulator and base for a furnace as set forth in claim 1 wherein a plurality of upright panels are removably attached to the upstanding flange on said top wall and depend therefrom to fill the space between said legs.

3. A unitary fan housing and base for a furnace comprising a plurality of legs each having a pair of webs at right angles to each other, the upper ends of each web being reversely bent inwardly and downwardly and terminating in horizontal flanges, and a top wall having an upstanding peripheral flange positioned between said webs and said inwardly and downwardly extending portions, said top wall having an opening therein for the passage of air therethrough.

4. A unitary fan housing and base for a furnace including a plurality of spaced apart upstanding legs, each of said legs comprising a pair of upright webs arranged at an angle to each other, a horizontal flange extending inwardly from each web below its upper end, said flanges forming seats for the corners of a furnace, and a top wall secured to said legs adjacent their upper ends, said top wall having an opening therein for the passage of air therethrough.

5. A unitary fan housing and base for a furnace including a plurality of spaced apart upstanding legs, each of said legs comprising a pair

of upright webs arranged at an angle to each other, a horizontal flange extending inwardly from each web below its upper end, said flanges forming seats for the corners of a furnace, a top wall secured to said legs adjacent their upper ends, said top wall having an opening therein for the passage of air therethrough, and a plurality of upright side panels secured to said top wall and the adjacent legs and filling the spaces between said legs.

6. The combination defined in claim 5 wherein said top wall is provided with an upstanding peripheral flange, and said side panels are provided with flanges adjacent their upper ends hooked over the peripheral flange on the top wall.

7. A unitary air circulator and base for a furnace comprising a plurality of spaced apart legs having upstanding portions at their upper ends and laterally inwardly projecting portions in spaced relation to their upper ends adapted to engage the sides and lower end respectively of a furnace whereby to support the latter and prevent lateral movement thereof, a top wall rigidly connected to said legs to space the latter apart, said top wall having an opening therein, and a rotary fan connected to said base beneath said top wall adjacent said opening for circulating air through said opening.

8. An air circulator as defined in claim 7 wherein said top wall is provided with an upstanding flange at its perimeter secured to said legs.

9. An air circulator as defined in claim 7 wherein side panels are detachably connected to said legs to fill the spaces therebetween.

10. A unitary air circulator and base for a furnace comprising a plurality of spaced apart legs having upstanding portions at their upper ends and laterally inwardly projecting portions in spaced relation to their upper ends adapted to engage the sides and lower end respectively of a furnace whereby to support the latter and prevent lateral movement thereof, and a top wall rigidly connected to said legs to space the latter apart, said top wall having an opening therein for circulation of air therethrough.

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