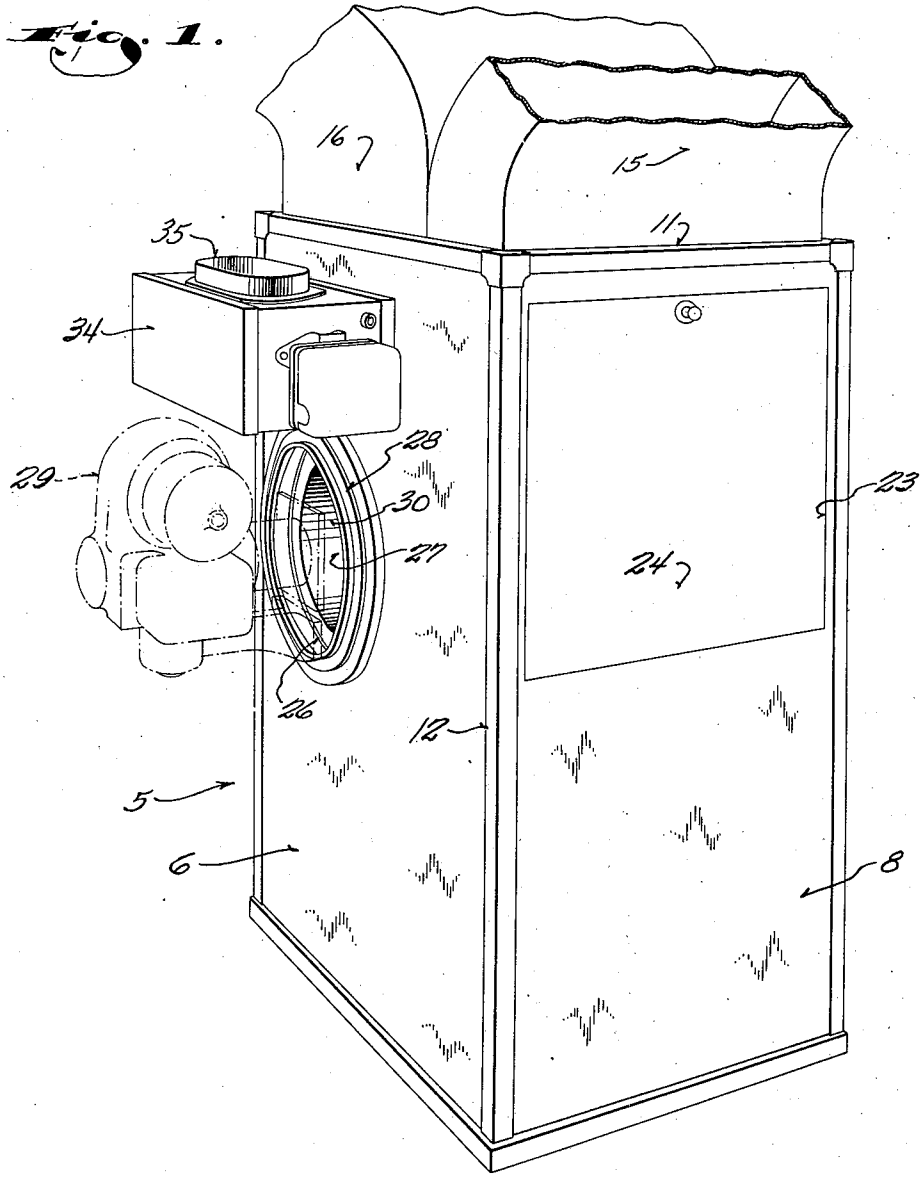
Nov. 5, 1940. R. C. JEPERTINGER 2,220,604

AIR TREATING APPARATUS

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Fig. 1.



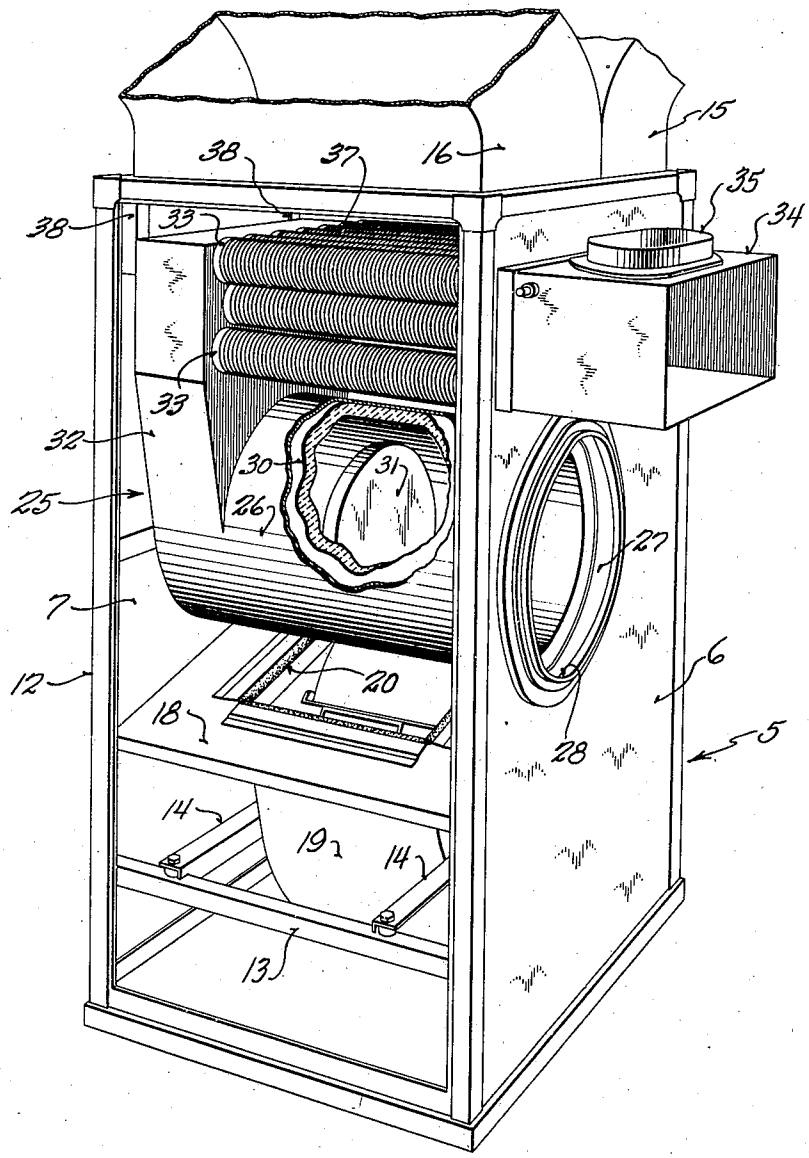
Inventor
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AIR TREATING APPARATUS

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Fig. 2.



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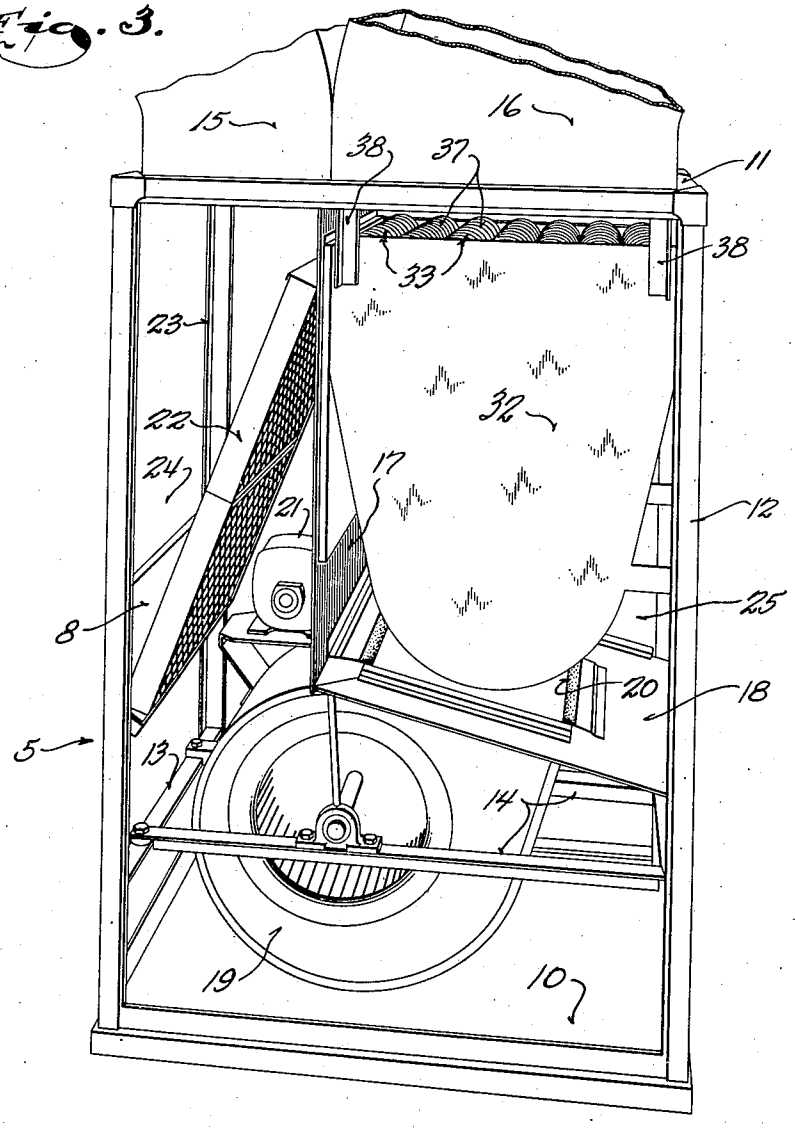
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AIR TREATING APPARATUS

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Fig. 3.



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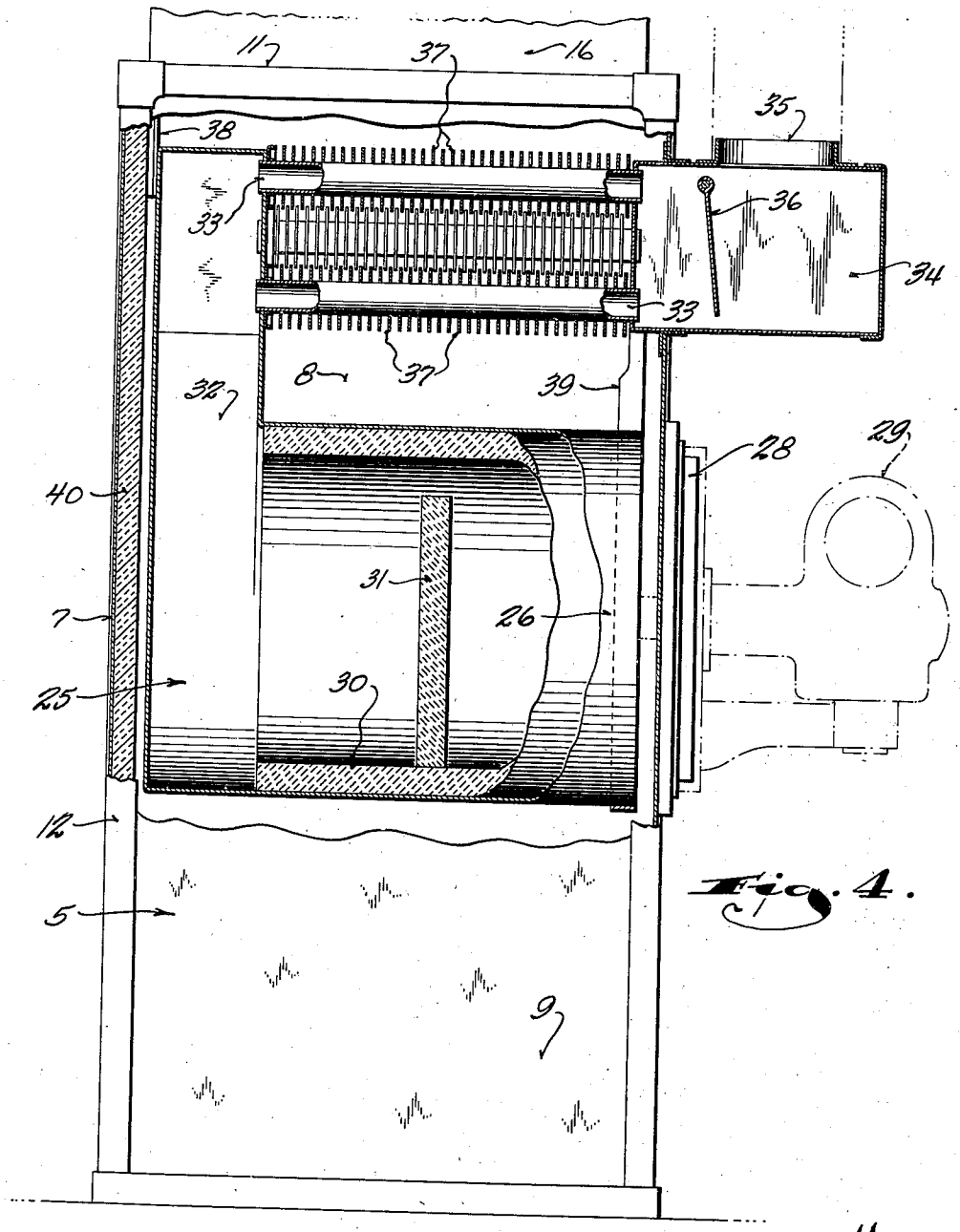


Fig. 4.

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UNITED STATES PATENT OFFICE

2,220,604

AIR TREATING APPARATUS

Richard C. Jepertinger, Milwaukee, Wis., assignor to Synchromatic Air Conditioning Corporation, Milwaukee, Wis., a corporation of Wisconsin

Application October 16, 1937, Serial No. 169,366

1 Claim. (Cl. 126—104)

This invention relates to improvements in air treating apparatus and refers particularly to a direct fired hot air type of unit particularly suitable for domestic installation.

It is an object of this invention to provide an efficient hot air furnace in combination with air treating or conditioning means.

Another object of this invention is to provide a compact air treating unit complete in itself to the inclusion of a hot air furnace and which is so designed as to obtain greater efficiency by more complete heat transfer and the assurance of proper combustion under all circumstances.

Another object of this invention is to provide a new and novel construction for combustion chambers for use with oil burners whereby perfect combustion can be assured regardless of the requirements of any particular installation.

More specifically it is an object of this invention to provide simple means whereby the volume or size of the combustion chamber may be adjusted to suit the requirements of any particular burner or installation.

Still another object of this invention is to provide a compact air treating apparatus capable of moving a large volume of air at relatively slow velocity and to insure the maintenance of uniform temperatures for such air as predetermined by suitable control instrumentalities.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claim, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claim.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which;

Figure 1 is a perspective view of the complete air treating apparatus showing the exterior thereof and illustrating the manner in which the oil burner is mounted;

Figure 2 is a perspective view of the apparatus with one side wall of the casing removed and parts broken away and in section;

Figure 3 is a perspective view showing the back of the unit with the back wall removed; and

Figure 4 is a view partly in side elevation and partly in vertical section through the apparatus.

Referring now particularly to the accompanying drawings in which like numerals designate like parts throughout the several views, the numeral 5 designates generally the casing of the apparatus which consists of a vertical front wall 6, a back wall 7, side walls 8 and 9, a bottom 10, and a top 11. These walls are secured to a fabricated frame 12 which includes uprights at the corners of the casing and transverse supports 13 and 14.

The top wall 11 has inlet and outlet openings with which ducts 15 and 16 connect, and extending down from the top wall 11 between its inlet and outlet openings is a vertical partition wall 17. This wall terminates a substantial distance from the bottom 10 and has one edge of a slanting transverse partition wall 18 secured thereto, the opposite edge of which extends to the side wall 9. The partition walls 17 and 18 extend from the front wall to the back wall and thus divide the interior of the casing into two separated compartments, one communicated with the inlet opening, and the other with the outlet opening. The only communication between these compartments is through a blower indicated generally by the numeral 19 and mounted in the space beneath the partition walls 17 and 18.

The blower discharges through an opening 20 in the partition wall 18 into the outlet compartment, and the inlet of the blower, provided by its open sides, is in open communication with the inlet compartment as will be readily apparent. The blower is suitably mounted from the transverse supports 14 and is driven by an electric motor 21.

All air entering the inlet compartment through the inlet duct 15 is filtered before it reaches the blower, by means of a filter 22 extending across the inlet compartment, preferably at a slant to provide greater area. Access may be had to the filter 22 through a door 23 in the side wall 8 which is closed by a removable panel 24.

Positioned within the outlet compartment is a heating device indicated generally by the numeral 25. This heating device comprises a cylinder or tube 26 disposed horizontally within the casing and extending substantially from the front wall 6 to the back wall 7. The end of this tube or cylinder adjacent to the front wall is open and is in line with an opening 27 in the front wall. The opening 27 is bounded by a flange 28 which provides for the attachment of an oil burner 29 (indicated in construction lines in Figures 1 and 4) so that the burner discharges directly into the cylinder. A refractory lining 30 in the cylinder protects the same from the direct flame.

Medially of its ends the cylinder has a transverse baffle 31 adjustably mounted therein. This baffle is formed of a suitable refractory material and is so shaped that its lower portion fits the curvature of the inner lining wall, while its upper edge is spaced from the lining of the cylinder to divide the interior of the cylinder or tube into two restrictedly communicated chambers, one of which constitutes a combustion chamber.

The baffle is not secured to the cylinder or tube, but is sufficiently heavy to remain in any adjusted position, and being adjustable, it is obvious that the volume or size of the combustion chamber for which it forms the back wall, may be adjusted to meet the requirements of any particular burner or installation.

The closed end of the cylinder or tube 26 connects with an upstanding flat flue 32. This flue preferably has increasing cross sectional dimensions to permit expansion of the heated gases, and its upper end which terminates just below the top wall of the casing, is connected through a plurality of ducts 33 with a flue bonnet 34 mounted on the outside of the front wall above the oil burner.

The bonnet 34 has the usual flange 35 to provide for the attachment of a stack pipe and is equipped with a damper 36 to control the flow of heated gases from the ducts 33. The ducts 33 are formed of metal having a high coefficient of heat transfer and have a multiplicity of fins 37 mounted thereon to increase their ability to transfer heat to the air passing over them.

The bank of ducts extends across the entire outlet compartment not occupied by the flue 32. Consequently, all air moving upwardly through the outlet compartment comes in intimate contact with a highly heated surface. The efficiency of the device is therefore very high.

The heating device generally indicated by the numeral 25, and which as described constitutes the cylinder 26, the flue 32, and the ducts 33, is suspended in any suitable manner from the framework 12 of the casing, and in the embodiment illustrated supporting straps 38 attached to the upper end of the flue 32 and a supporting band 39 holding up the open front end of the cylinder 26 are shown.

If desired, the walls of the casing may be provided with a heat insulated lining 40 as shown on the back wall 7.

In operation suitable control instrumentalities govern the functioning of the oil burner and the blower motor. These instrumentalities start the burner and the blower motor in the customary manner when required, and when in operation the burner projects its flame directly into the combustion chamber heating the tube or cylinder 26 to an intense heat and causing highly heated gases to flow upwardly through the flue 32 and forwardly through the finned ducts 33 into the flue bonnet 34 at a velocity controlled by the damper 36.

The operation of the blower, as will be readily apparent, draws the air down through the filter 22 and discharges the same up through the outlet compartment past the highly heated combustion chamber, the flue 32, and the ducts 33.

While not illustrated, it is obvious that humidification can be provided by introducing a spray into the heated air above the ducts 33 or at any other suitable point.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art that this invention provides an exceptionally compact air treating apparatus, and that it provides an improved and highly efficient hot air furnace compactly combined with air treating means.

What I claim as my invention is:

A furnace comprising: a substantially cylindrical tube providing a combustion chamber and having an open front end to admit a heating flame; a flue connected with the rear end of the tube and extending upwardly therefrom, said flue having substantially parallel front and back walls with the tube joined to the front wall whereby the back wall of the flue closes the rear end of the tube, said parallel walls being substantially normal to the axis of the tube and said flue having side walls tangential to the tube and diverging outwardly; a plurality of ducts connected with the front wall of the upper portion of said flue and extending forwardly above the tube with their forward ends terminating substantially in line with the front end of the tube; a cabinet having vertical walls enclosing the tube, flue and ducts with the open front end of the tube and the forward ends of the ducts adjacent to the front wall of the cabinet; and a flue bonnet connected with the open forward ends of the ducts and projecting forwardly therefrom to protrude from the front wall of the cabinet and receive support therefrom, said flue bonnet having an outlet opening for connecting the bonnet with a stack.

RICHARD C. JEPERTINGER.