

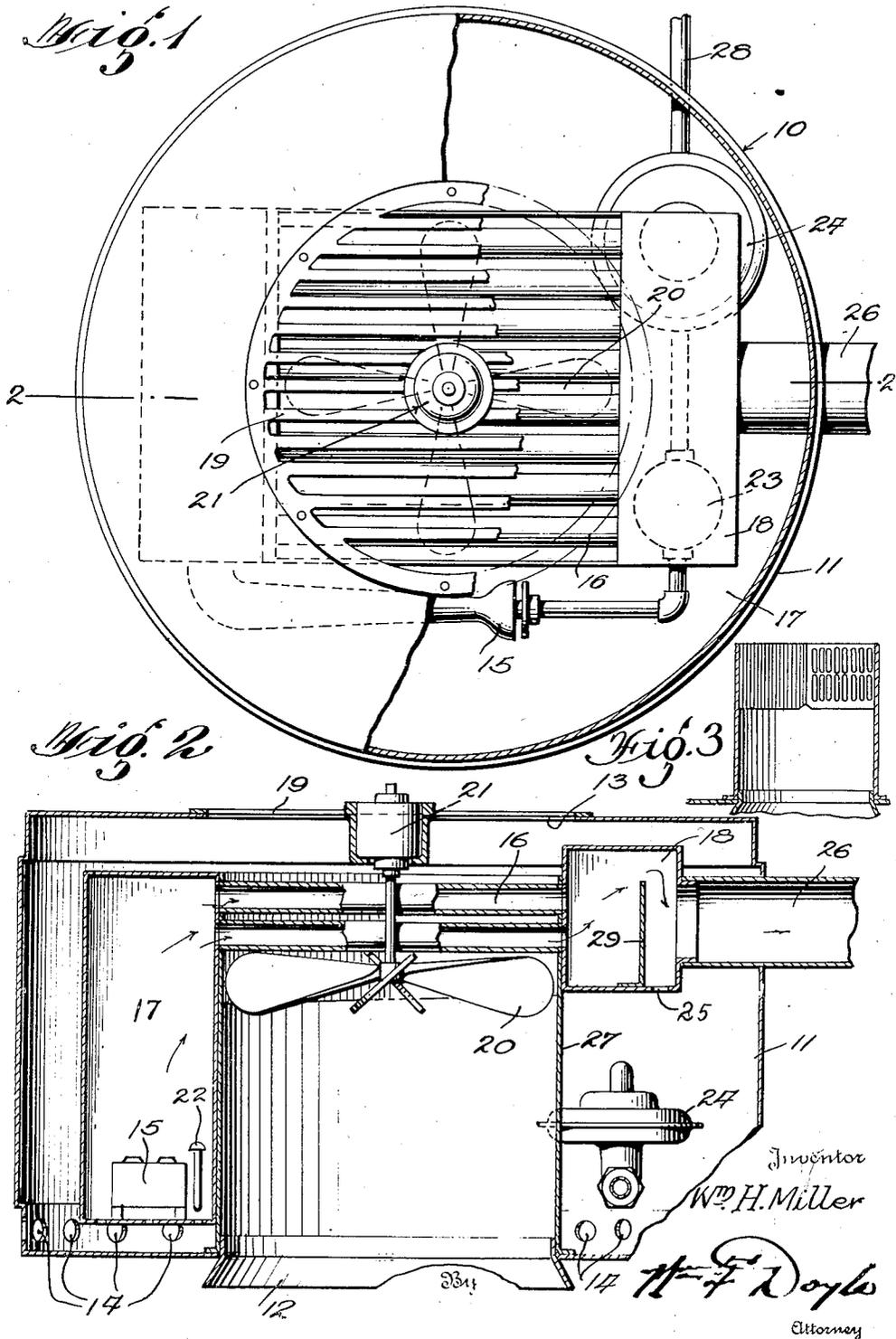
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VERTICAL BLOW UNIT HEATER

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VERTICAL BLOW UNIT HEATER

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2 Claims. (Cl. 126—110)

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The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

This invention relates to a vertical blow unit heater and more especially one that is gas-fired.

An object of this invention is to provide a heater that is compact and so designed that it can be suspended from a ceiling or roof and so constructed that the heated air is blown downward toward the floor.

Another object of the invention is to improve the distribution of heated air within an area or space so that a broader spread of heated floor area or space is obtained while at the same time eliminating the stratified air at the ceiling.

Another object of the invention is to produce a heater that will draw down the warm air at the ceiling through the heater, and reheat and recirculate the air within the area or space for which the heater is intended.

Another object of the invention is to produce a design of heater that is simple, effective and compact and one which will provide more effective heating of air within a designated area or space.

The invention produces a design of heater that spreads the heated air over an evenly distributed area providing a greater volume of heated air at a lower velocity. The heated air, as it leaves the unit and emerges at a high velocity due to the fan being placed within a restricted area, spreads in a cone-shaped manner, increasing in volume as it travels downward and during the descent decreases in velocity.

While the invention incorporates an assembly of parts which are conventional in any style of gas-fired unit heater, they are so arranged as to accomplish the objects previously pointed out which are not found in any known conventional type of unit heater.

With the above and other objects and advantages in view the invention consists of features of construction, arrangement and operation of parts which will appear in the specification and be finally pointed out in the claims.

While a preferred embodiment of the invention is shown, it will be understood that slight changes in form and minor details of construction may be resorted to without departing from the spirit of the invention and fall beyond the scope of the claims.

Referring now to the drawing, in which similar characters and references in the several figures indicate identical parts:

Fig. 1 is a top plan view partly broken away of an embodiment of the invention.

Fig. 2 is a fragmentary sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a reduced view of the shell.

Referring more particularly to the drawing, there is shown a unit heater 10 comprising a sheet metal cabinet 11 adapted to be suitably suspended from the ceiling of a room or other building structure. A flared opening 12 is provided at the bottom of the cabinet 11 for the emission of heated air, and an opening 13 is provided at the top of cabinet 11 for the entrance of the circulated air within the room. Near the bottom of the cabinet 11 there are provided a series of openings 14 for the purpose of entraining primary and secondary air for combustion as well as for circulation of air about the heating element 15, heating tubes 16, combustion chamber 17 and flue collecting chamber 18 which are all substantially contained and mounted within the cabinet 11.

A suitable grill cover 19 is provided for the opening 13 of the cabinet 11. A fan 20 driven by a motor 21, is mounted on the grill cover 19 in such a manner that the fan and the grill can be removed as a unit. The fan is positioned within the cabinet to force the circulation of the air as described, and the motor is positioned at the top of the unit so that it is out of the path of the heated air and the shaft of the fan is placed so that the fan falls below the heating tubes.

A safety pilot 22 located in the lower portion of the combustion chamber 17 near the heating element 15 prevents the heater from being extinguished and together with gas valve 23 and pressure reducing regulator 24 there is provided a heater which is safe and easy to regulate. Other devices may be added if necessary to incorporate other control and safety features that may be required in the locality where the device is proposed to be used but are not required to be added since the device as described is safe and will properly function under all conditions.

The flue collecting chamber 18 has a self-contained back draft divertor 29 and the bottom is provided with an opening 25 for the purpose of diverting any back draft. Also connected to the chamber 18 is a flue outlet 26 adapted to exhaust all odors of combustion originating in the combustion chamber 17. The flue outlet as shown is in a horizontal position; however, where conditions permit, the flue outlet may be carried from the top of the unit. The gas inlet 28 to the heat chamber may also be positioned to the best advantage.

Within the cylinder 11 there is provided a shell 27, which is square or rectangular at the top and

round at the bottom, the change in shape taking place at a level immediately above the fan 20. The shell 27 extends from the top of the cylinder to the bottom thereof and heating tubes 16 are connected to the shell 27 in a position intermediate to the open grill 19 and the circulating fan 20, thereby forming passageways for circulating the heated air within the cylinder 11. As stated, the unit may be suspended reasonably close to the ceiling or roof, by any suitable means, but enough distance should be provided between the unit and the ceiling to permit entrance of a sufficient amount of air for recirculation.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawing. Therefore, it is regarded as unnecessary to go into a lengthy description of the operation of the device.

The invention, however, is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims without departing from the spirit or scope of the invention.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent is:

1. An air-heating apparatus, comprising a cabinet having an open grill-covered top, and a flared open lower end, a combustion chamber within

said cabinet, a flue collector chamber within said cabinet, a back draft divertor within said flue collecting chamber, heating tubes connecting said combustion chamber and said flue collecting chamber, a burner in the lower end of said combustion chamber, circular openings positioned near the bottom of the cabinet, adapted to entrain primary and secondary air to aid combustion and a fan in said cabinet below the heating tubes for drawing the air through the opening in the top over the heating tubes and discharging it through the bottom.

2. An air-heating apparatus, comprising a cabinet having an open grill-covered top and a flared open lower end, a combustion chamber within said cabinet, a flue collecting chamber within said cabinet, a back draft divertor within said flue collecting chamber, heating tubes connecting said combustion chamber and said flue collecting chamber, a burner in the lower end of said combustion chamber, circular openings positioned near the bottom of the cabinet, adapted to entrain primary and secondary air to aid combustion, a motor mounted on said open grill in such a manner that said grill and said motor can be removed as a unit and a fan in said cabinet positioned below the heating tubes and adapted to be rotated by said motor for drawing the air through the opening in the top over the heating tubes and discharging it through the bottom.

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