R. G. BOONE.

COMBINED HEATER AND VENTILATOR.

APPLICATION FILED SEPT. 7, 1920.

1,416,601. Patented May 16, 1922.

Fig. 1.

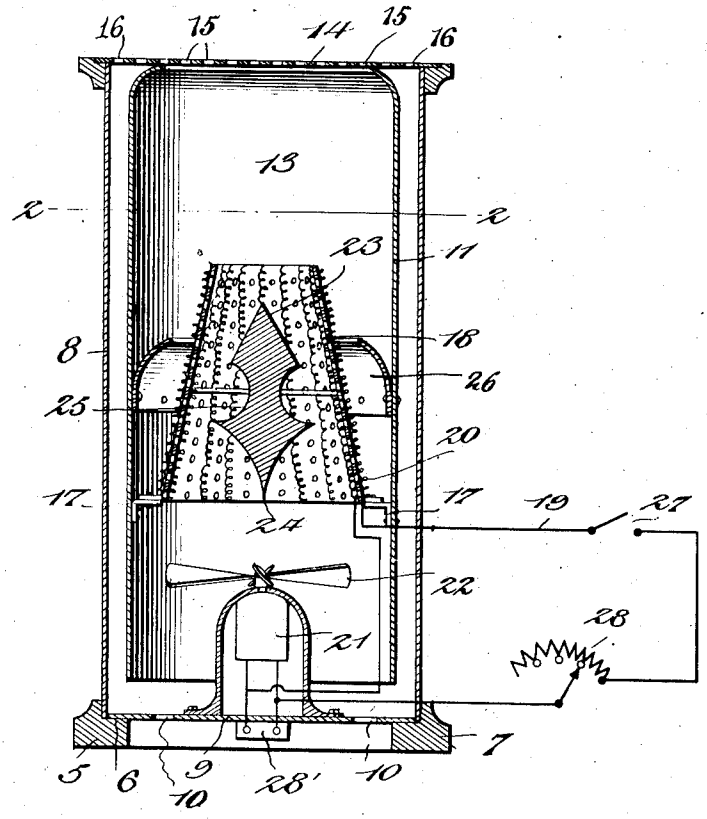
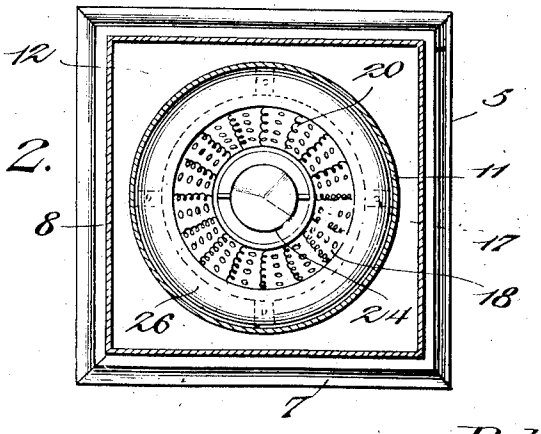


Fig. 2.



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COMBINED HEATER AND VENTILATOR.

1,416,601. Specification of Letters Patent. Patented May 16, 1922.

Application filed September 7, 1920. Serial No. 408,710.

To all whom it may concern:

Be it known that I, ROBERT G. BOONE, a citizen of the United States, residing at Asbury Park, in the county of Monmouth and State of New Jersey, have invented new and useful Improvements in Combined Heaters and Ventilators, of which the following is a specification.

This invention relates to a combined heater and ventilator and has for its primary object the provision of means for heating a current of air electrically and for drawing the heavier or cool air by induced suction into the presence of a heating unit so that the air will rise in a room and be heated in proper ratio to its velocity and loss of weight through its assimilation of heat from said unit, the device serving to establish atmospheric rotation of the air in a manner which will enable the device to be used economically while heating the air to the desired temperature.

Another object of the invention is to provide a device of the character described which will be of portable construction and capable of being connected in any well known source of electrical current.

A still further object of the invention is to provide a device of this character which will include a combination of elements which can be operated singly or together so that the device can be used either as a heater or as a means for cooling and disturbing air and for discharging the same into a room to be ventilated.

Another object of the invention is to provide a device of this character which is capable of being connected with an outside air duct or source so that fresh atmospheric air may be taken into the device and then subjected to the action of a heating means and then finally thrown off into the space to be heated and ventilated.

A still further object of the invention is to provide a combined heater and ventilator which will include a heating unit, an air impelling and suction unit, and means associated respectively with both of said units for causing full impingement of the air to be heated against the heating unit and for accelerating the discharge of the heated air after it has passed said heating unit.

With the above and other objects in view which will appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangements of parts which will hereinafter be fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated, a single and preferred form of the invention, it being, however, understood that no limitations are necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the claims may be resorted to when desired.

Figure 1 is a vertical section through the device.

Figure 2 is a section therethrough taken on the line 2—2 of Figure 1.

In carrying the invention into practice, use is made of a suitable base 5 provided with a shoulder 6 and annular flange 7. Rising from the base with its lower end surrounded by the flange 7, is a drum 8 and seated on the shoulder 6 and extending across the bottom of the drum is a plate or suitable support 9 having perforations 10 therein for a purpose to be hereinafter explained. Within the drum 8 is a shell 11 whose walls are spaced from the walls of the drum so as to provide an intervening air duct 12 between the mentioned parts. This shell is preferably of less length than the drum 8 so that the bottom of the shell is spaced from the plate 9 to establish communication between the duct 12 and the bore or passage-way 13 of said shell. A grilled top plate or grate 14 extends over the upper ends of the drum 8 and said inner shell 11, the perforations 15 therein functioning for the egress of air from the device and the perforations 16 functioning for the ingress of air to the duct 12 so that a continuous strata of outside air will be maintained in said duct 12 to cool the drum 8, the spacing of the base of the shell 11 from the support 9 serving to permit the air as it is drawn downward through the duct to finally enter the passage-way 13 of the inner shell for a purpose to be hereinafter explained.

Located in the passage way 13 and supported therein by brackets 17 which are secured to the inner shell 11 is a heating unit 18. This unit is of perforated frusto conical formation and is hollow. It is formed preferably of insulating or heat resisting material such as porcelain. An electric circuit is indicated at 19 and included in said circuit and suitably associated with the

porcelain cone is a resistance wire 20 which is wound preferably onto said cone. In said circuit is also arranged an electric motor which is conventionally illustrated at 21, the same mounted upon the plate 9 and disposed beneath the large end of the porcelain cone. The motor is provided with a fan 22 whose blades are set so as to draw the cold air upward from the base of the structure or floor line as the case may be and then cause said air to be impelled upward through the bore of the porcelain cone and around the same. This causes the cold air to impinge against the cone to be thoroughly heated electrically through the arrangement previously referred to. The fan further serves to cause the air thus heated to be discharged by way of the perforations 15 into a room to be heated.

On the inside of the porcelain cone is a baffle member which is somewhat of the double spear shaped formation, the pointed ends 23 and 24 of which are reversely extended and connected together by a neck portion 25 which preferably increases in width in the direction of the large parts of said pointed ends so as to merge thereinto. The restricted end of the point 24 is projected toward the fan 22 so that the air is thrown outward and radially against the inner walls of the hollow cone, the neck 25 and upper point 23 of said baffle mutually serving to cause the air to be deflected and thoroughly subjected to the action of the resistance wire 20. A second baffle member 26 is arranged outside of the hollow cone and the same is curved upward and inwardly in the direction of the walls of the cone so that the air which passes outside of the cone or between it and the shell 11 will be thrown into impingement with the cone to be thoroughly heated.

A switch 27 in the electric circuit 19 functions to permit the air heating unit to be shut off or cut out of the circuit when the fan 22 is desired for use as a ventilator. A rheostat 28 is also located in the circuit so that varying amounts of current can be taken into the resistance wire 20 according to the amount of heat desired.

The structure is portable and is capable of being placed at any point or place where the heater or ventilator is desired. It may be mounted upon the floor of a room so that air may be drawn into the structure directly from the floor line and then impelled by the action of the fan 22 against the heating unit when the device is used as a heater. The same operation of drawing the air into the structure and discharging the same therefrom is also true when the device is used simply as a ventilator for disturbing or churning atmospheric air. The base of the structure may, if desired, be connected with an outside air pipe so that fresh outside air can be taken into the structure and thoroughly heated before it is discharged into the room. The circuit 19 includes a socket member 28′ which may be connected with any suitable well known plug that constitutes part of an electric system of wiring.

What is claimed as new is:—

1. A structure of the class described comprising, a hollow open ended column, a concentric shell associated with the column and having its walls spaced from the walls of the column so as to provide a heat insulating chamber between the respective walls, a heating element in said shell, and means for drawing cold air into the shell and for subjecting said air to the action of the heating element and for subsequently discharging the heated air from the shell, said means serving to produce a down draft in the space between the walls of the shell and the walls of the column, as and for the purpose specified.

2. A structure of the class described comprising, a hollow open ended column, a concentric shell associated with the column and having its walls spaced from the walls of the column so as to provide a heat insulating chamber between the respective walls, a heating element in said shell, and means for drawing cold air into the shell and for subjecting said air to the action of the heating element and for subsequently discharging the heated air from the shell, said means serving to produce a down draft in the space between the walls of the shell and the walls of the column, and mechanism for actuating said means and for controlling said heating element collectively or singly, said means serving to draw the atmospheric air into the space between the walls of said member by induced suction.

In testimony whereof I have affixed my signature.

ROBERT G. BOONE.

Witness:
W. HAROLD WARREN.