April 18, 1933. W. EWALD 1,904,918

HEATING AND VENTILATING APPARATUS

Filed Feb. 15, 1932 2 Sheets-Sheet 1

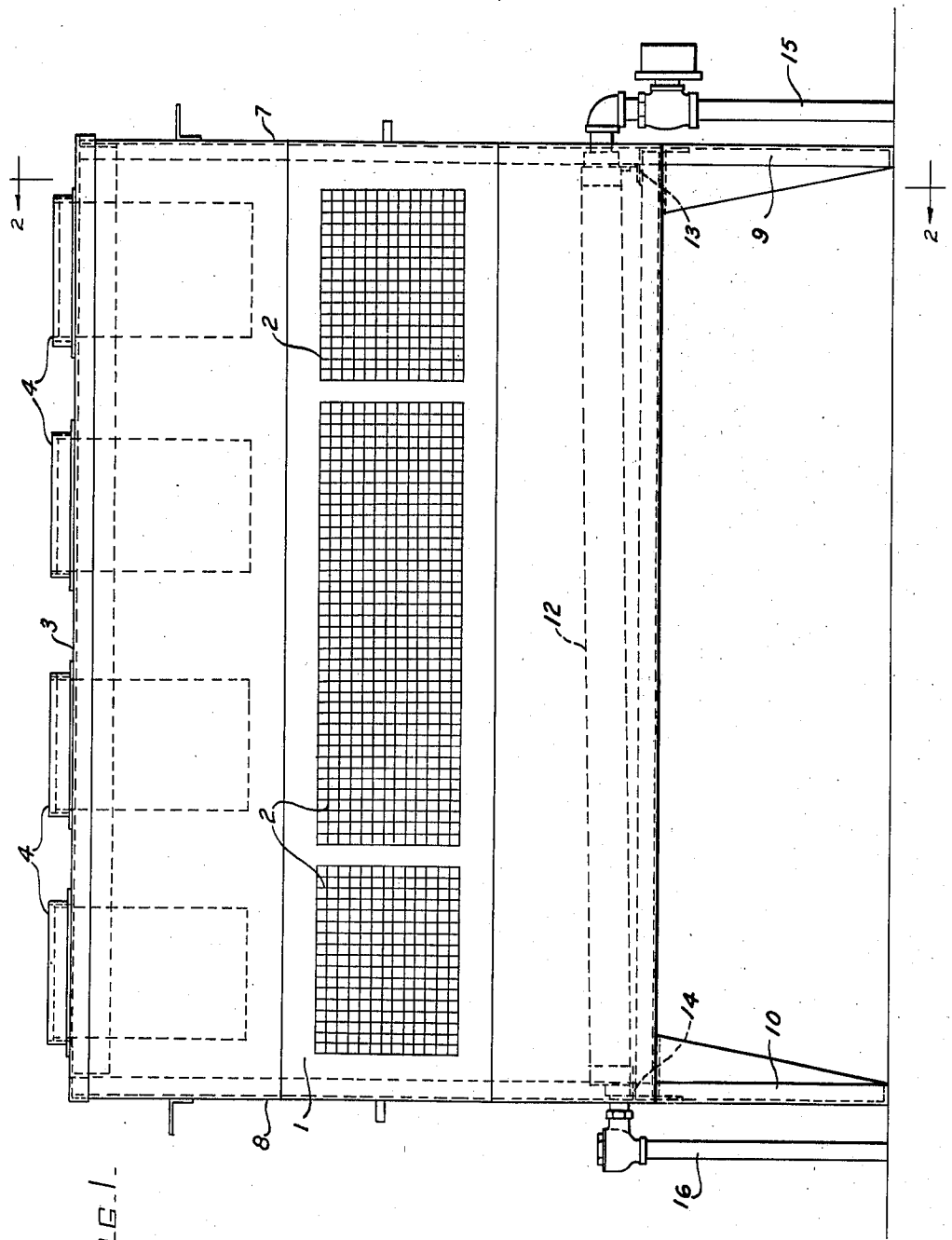


FIG. 1.

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FIG. 2.

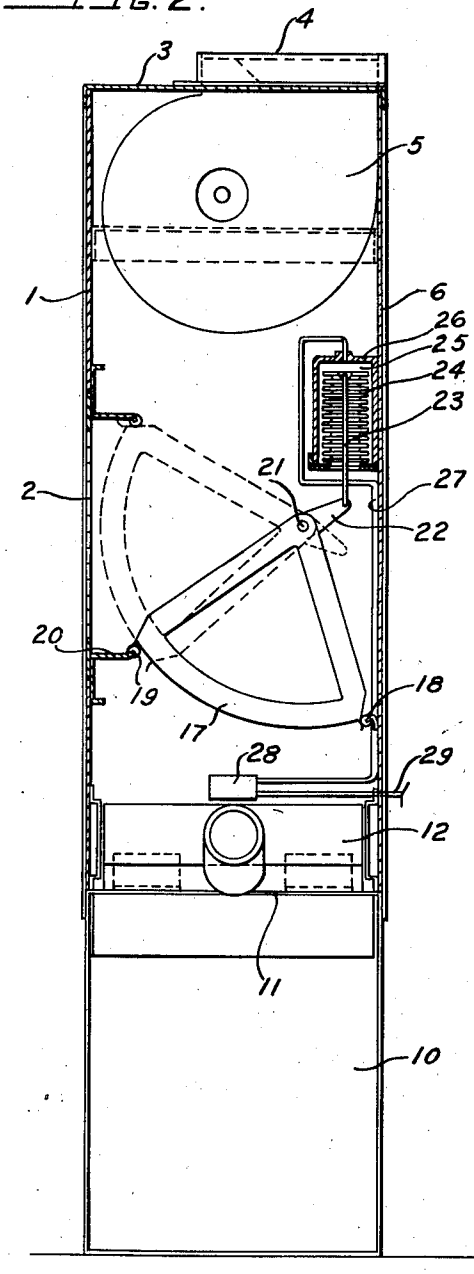
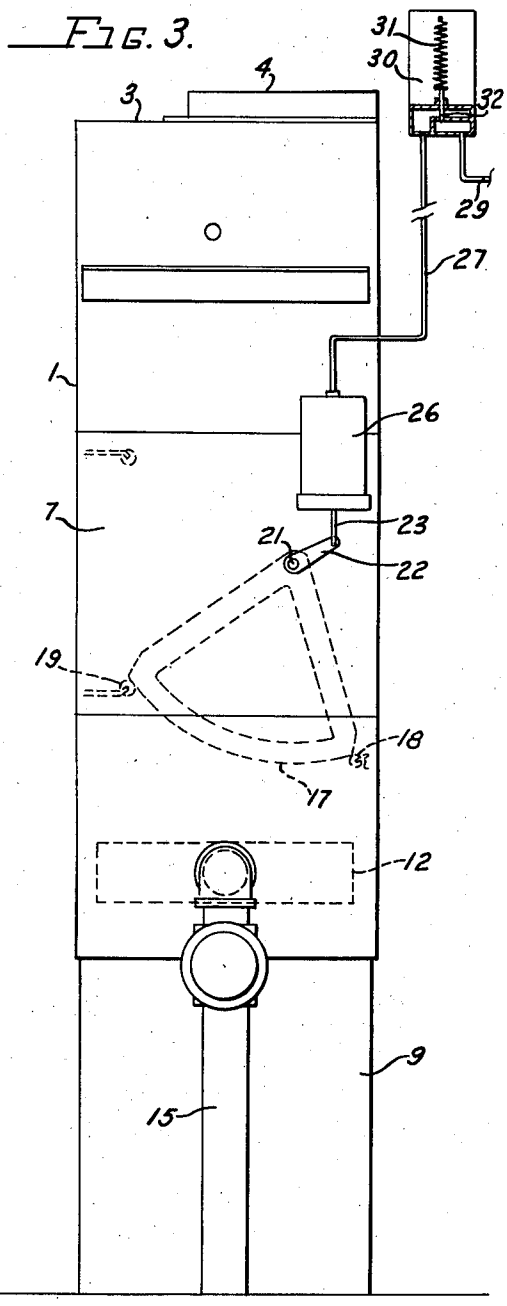


FIG. 3.



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Patented Apr. 18, 1933 1,904,918

UNITED STATES PATENT OFFICE

WARREN EWALD, OF COLUMBUS, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BUCKEYE BLOWER COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF DELAWARE

HEATING AND VENTILATING APPARATUS

Application filed February 15, 1932. Serial No. 593,178.

My invention relates to heating and ventilating apparatus and, in particular, to heating and ventilating apparatus for the recirculation of either heated or unheated air.

Particularly, it is my object to provide a heating and ventilating unit, through which the air may be circulated either over a radiator or to one side of the radiator, the flow of air being controlled by a single damper which may be positioned to either close off the recirculated air and direct all of it over a radiator, or close off the radiator and direct all of it through the unit without going over the radiator, or proportion the air over the radiator or passing to one side of the radiator.

It is a further object of my invention to locate a thermostat adjacent to the radiator within the cabinet containing the radiator for controlling the position of the damper in order to maintain uniform temperature discharge from the unit.

It is a further object to provide a thermostatic control adjacent to the outside of the casing of the unit or remote therefrom, which will control the position of the damper.

Referring to the drawings:

Figure 1 is a front elevation of the apparatus embodying my invention;

Figure 2 is a section on the line 2—2 of Figure 1 showing the thermostat within the casing which controls the position of the damper;

Figure 3 is a side elevation of the unit heater and ventilator showing the room thermostat partially in section, which may be located on the outside of the casing of the unit or at a remote point therefrom of the room in which the unit heater and ventilator is located.

Referring to the drawings in detail, the casing of this unit heater and ventilator comprises a front wall 1 having a recirculation grille opening or openings 2, a top 3 having an air exit opening 4 which is supplied with air by the blower 5. 6 designates the back of the casing. 7 and 8 designate the right and left hand end walls of the casing when viewing the unit from the front.

The unit is preferably supported on legs or end plates generally designated 9 and 10 at either end of the unit. The bottom of the unit is open as at 11. Above this opening there is suspended a radiator 12 on the brackets 13 and 14. The radiator is supplied with steam through the line 15, the other end of the radiator being connected with an exit pipe 16. Above the radiator is pivoted a damper arcuate in form as at 17, which position is shown in full lines in Figure 2, and engages with a sealing member 18 on the room wall 6 and with a sealing member 19 on the bracket 20 carried on the inside of the front wall 1.

This damper is pivoted at 21 and is actuated by a lever 22 connected to a pitman 23 carried on a bellows 24 which is subjected to air pressure in the chamber 25 in the casing 26. Air pressure is supplied thereto through the line 27. Air pressure is admitted upon the actuation of the thermostat 28 which may be located directly over the radiator or at any other point within the casing. When the temperature drops below a predetermined point, the thermostat 28 is actuated in the usual manner to admit air through the supply line 29 to the line 27 and thence on top of the bellows 24 in the chamber 25 to move the damper 17 to close off the recirculation opening 2, either wholly or partially.

When the temperature reaches a predetermined point, the thermostat will close allowing the damper by gravity to return to its initial position, wholly or partially shutting off the hot air passing over the radiator. The blower 5 has a common means for moving the air either through the opening 11 or the opening 2. The bellows casing

26 may, as in Figure 3, be mounted on the exterior of the unit heater and ventilator casing, in which event an exterior thermostat 30 may be located either above the unit heater and ventilator on one side thereof, or at a remote point therefrom.

The thermostatic element 31 controls the valve member 32 so that air pressure from the line 29 may flow through the thermostat 30 into the line 27 and thence to the casing 26 for actuating the damper 17.

When the thermostatic element 31 is in hot expanded position, it will close the valve member 32 cutting off the air pressure, and will allow gravity to close the damper. When the room becomes cold, the thermostatic element 31 will contract, lift the valve member 32, admit air pressure to move the damper to close off, either wholly or partially, the recirculation opening 32 and thereby circulate the air over the radiator 12.

It will be understood that any form of damper actuating mechanism, thermostats and the like can be used. Diagrammatic forms have been shown purely by way of illustration.

It will be observed that, in the unit heater and ventilator of my invention, a number of exit ports or openings 4 have been provided. The damper 17 may be a continuous damper or there may be separate dampers for the several recirculation openings 2, of which there are a plurality. Separate control mechanism may be employed, if desired, for these separate dampers for the inlet openings and exit openings thereby controlling the distribution of air, as well as the temperature of the air if the air is delivered in different parts of the room or to different rooms.

My unit heater and ventilator is, therefore, adapted for both controlling the temperature of air in a single room and for distributing the air to a plurality of rooms, if that is desired, or delivering the air to different parts of the same room.

It will be understood that I desire to comprehend within my invention such modifications as may be necessary to adapt it to varying conditions and uses.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In combination, a relatively narrow vertically-disposed casing having an air inlet opening at the bottom, a side inlet and a top air outlet, means of supporting the casing above the floor, a radiator disposed across the bottom inlet, a swinging damper adapted to either control the bottom inlet or the side inlet or partially control both, said damper being located between the inlets and the outlet, a blower adjacent the outlet, and a thermostat over the radiator, and means controlled thereby for actuating said damper.

2. In combination, a relatively narrow vertically-disposed casing having an air inlet opening at the bottom, a side inlet and a top air outlet, means of supporting the casing above the floor, a radiator disposed across the bottom inlet, a swinging damper adapted to either control the bottom inlet or the side inlet or partially control both, said damper being located between the inlets and the outlet, a blower located adjacent the outlet, a thermostat in the casing, and means controlled thereby for actuating said damper.

3. In combination, a casing having a bottom inlet, a side inlet and a top outlet, a blower adjacent the top outlet, a radiator adjacent the bottom inlet, a damper pivoted between the blower and radiator adapted to control the two inlets, thermostatic means affected by the air passing through the blower for controlling the position of the damper, and means controlled by said thermostat for actuating the damper in one direction.

4. In combination, a casing having a bottom inlet, a side inlet and a top outlet, a blower adjacent the top outlet, a radiator adjacent the bottom inlet, a damper pivoted between the blower and radiator adapted to control the two inlets, thermostatic means affected by the air passing through the blower for controlling the position of the damper, and means controlled by said thermostat for actuating the damper in one direction, said damper being actuated in the other direction by gravity.

5. In combination, a casing having a bottom inlet, a side inlet and a top outlet, a blower adjacent the top outlet, a radiator adjacent the bottom inlet, a damper pivoted between the blower and radiator adapted to control the two inlets, thermostatic means affected by the air passing through the blower for controlling the position of the damper, and means controlled by said thermostat for actuating the damper in one direction, said damper being actuated in the other direction by gravity, said thermostat being located exterior of the casing.

6. In combination, a casing having a bottom inlet, a side inlet and a top outlet, a blower adjacent the top outlet, a radiator adjacent the bottom inlet, a damper pivoted between the blower and radiator adapted to control the two inlets, thermostatic means affected by the air passing through the blower for controlling the position of the damper, and means controlled by said thermostat for actuating the damper in one direction, said damper being actuated in the other direction by gravity, said thermostat being located exterior of the casing remote therefrom.

7. In combination, a casing relatively high and shallow, means for supporting the casing above the floor, the casing having a bottom inlet opening, a plurality of side openings and a plurality of top exit openings, a blower associated with said top exit openings above the side inlet openings, damper means controlling the passage of air through the air inlet openings, and thermostatic means adapted to control said damper means whereby the passage of air and the temperature thereof may be regulated through the respective inlet openings and exit openings.

In testimony whereof, I affix my signature.

WARREN EWALD.