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HEATING AND VENTILATING UNIT.
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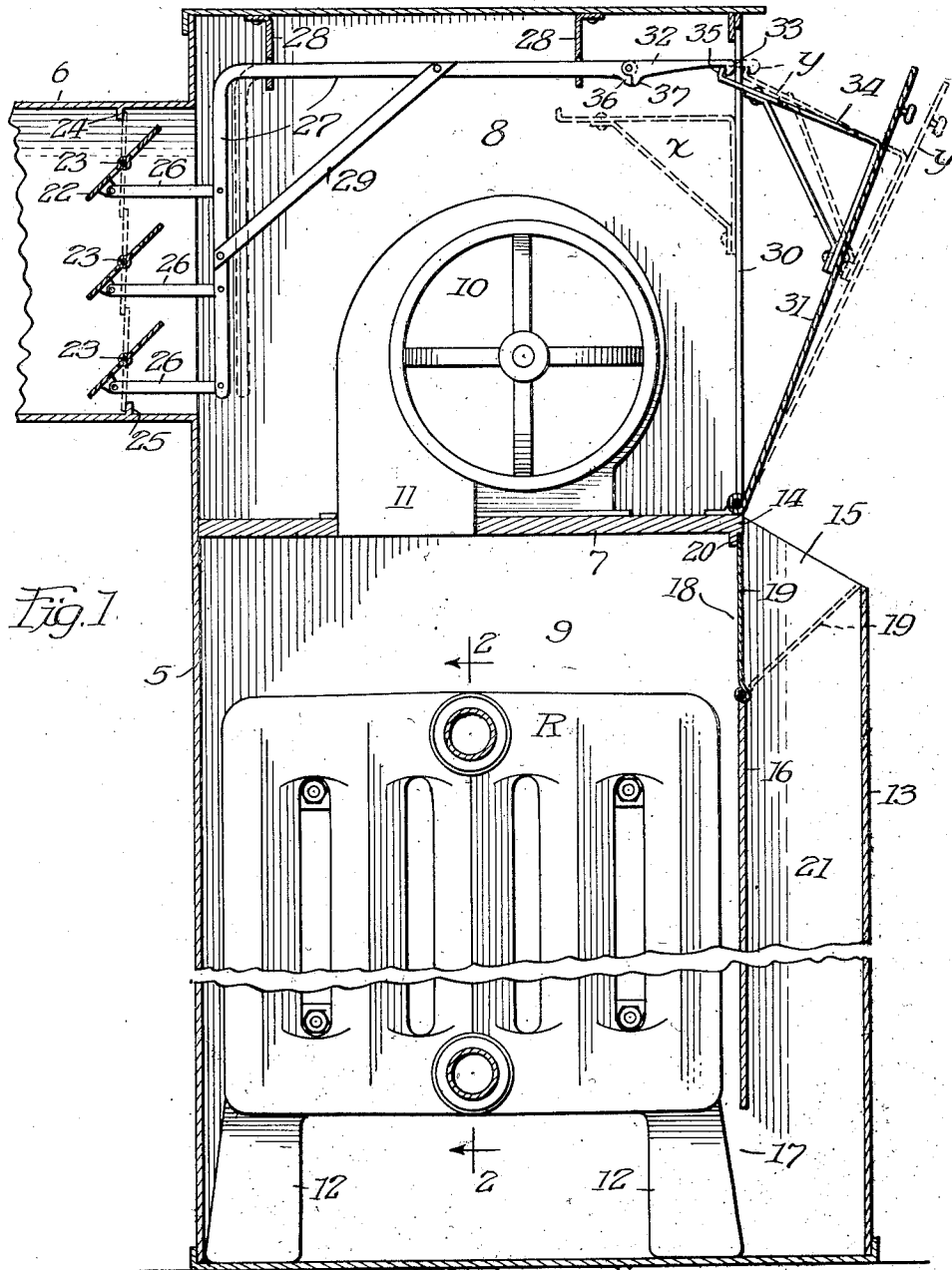


Fig. 1

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UNITED STATES PATENT OFFICE.

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HEATING AND VENTILATING UNIT.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILFRED SHURTLEFF, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented a certain new and useful Improvement in Heating and Ventilating Units, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to heating and ventilating units, particularly to that class in which cold air is circulated by a fan in contact with heating mechanism within a housing to be heated before delivery to the room or building.

Devices of this class usually comprise a housing having an air duct which is connected with an air inlet such as a window opening, the outside air being received and blown through the housing to be heated before delivery from the device. It is sometimes not desirable to draw any cold air from the outside but to recirculate the air in the room through the heating device so as to insure a uniform temperature.

One of the important objects of my invention is therefore to provide a construction and arrangement in a heating and ventilating unit for adapting it for disconnection from the exterior and providing air inlet thereto from the room in which the unit is placed, the arrangement being preferably such that upon opening or closing of the inlet from the room the inlet from the exterior is respectively closed or opened.

Another object of the invention is to provide means for preventing interference of the heated air delivered from the unit with the air flowing into the unit from the room when the inlet from the exterior is closed.

The above and other features of my invention are clearly shown on the accompanying drawings in which—

The figure is a vertical sectional view of my improved heating and ventilating unit.

The unit shown comprises the rectangular housing 5 having the inlet duct 6 extending from its rear wall to be connected in practice with some inlet for receiving air from the outside of a room or building, such, for example, as a window opening. A floor 7 separates the blower compartment 8 from

the heating compartment 9 of the housing, 55 and in the compartment 8 the blower 10 is supported on the floor 7 and has its outlet 11 extending downwardly through the floor 7 into communication with the compartment 9. In the compartment 9 is the radiator 60 structure R which is mounted on legs 12. The front wall 13 of the heating compartment 9 is set a distance forwardly of the front wall 14 of the compartment 8 so as to leave the outlet 15 from the heating com- 65 partment 9. Between the side walls of the housing 5 and in front of the radiator structure is the partition 16 which is separated from the floor of the housing by the space 17, and from the floor 7 by the space or 70 passageway 18. Hinged along the upper edge of the partition 16 is a damper 19 which may be swung against the abutment 20 to close the passageway 18, or may be swung to any position in the opening 15 75 between this abutment 20 and the wall 13. When the damper 19 is against the abutment 20 the outlet 15 is closed against the direct outflow of cold air from the blower, and all the air thrown in by the blower must 80 pass downwardly into contact with the radiator structure to be heated, and then will flow through the passageway 17 and through the passageway 21 and outlet 15 into the room. If the damper is swung forwardly 85 against the wall 13 the outlet 15 will be closed against the passageway 21 and all the air delivered by the blower will flow directly through the outlet 15 into the room. When the damper is set to any intermediate 90 position, there will be a corresponding proportioning of cold air and heated air.

In the duct 6 a row of louvers are mounted on spindles 23 extending horizontally across the duct, the louvers when swung to 95 substantially vertical position abutting with each other at their edges, and the upper and lower edges engaging with the abutments 24 and 25 to close the duct 6 against the inflow of outside air. Links 26 extend 100 between the louvers and the vertical member of the L-shaped frame 27 whose horizontal member is supported in the guide brackets 28 so that the frame is horizontally shiftable, a diagonal bar 29 connecting the frame 105 members to strengthen the frame.

In the front wall 14 of the blower compartment 8 is the opening 30 for which is

provided the door 31 hinged along its lower edge. Hinged to the front end of the frame 27 and forming a continuation thereof is the latch lever 32 which has a downwardly extending hook 33 at its front end. Secured on the bar 31 is the arm 34, having at its end the upstanding flange or hook 35, the latch hook 33 being in the path of the hook 35. When the door 31 is closed (dotted lines *x*, of the figure) frame 27 will be in its inner position as shown in full lines, in the figure, the louvers being open so that the blower draws in cold air from the outside of the room. Now when the door 31 is opened a distance (full lines, of the figure) the hook 35 on the arm 34 will come into engagement with the latch hook 33, and upon further outward movement of the door (dotted lines *y*, of the figure) the frame 27 will be drawn outwardly a sufficient distance to cause closure of the louvers 22 so that the blower will have to receive air from the room through the opening 30. When the door is swung to such open position it will be above the warm air outlet 15 and will serve as a deflector. It has been found that if the door is swung to a certain angle, for example 30 degrees, it will so deflect the air from the outlet 15 that this air will not be drawn directly back into the device by the blower, but the warm air from the outlet 15 will be thrown laterally into the room. The warm air from the outlet 15 is deflected laterally into the room and thoroughly mixed with the other air therein and this mixed air is then recirculated through the heating device until the temperature in the room is uniform.

If it is desired to stop such recirculation and again connect the device to receive outside air, the door 31 is closed, and during the final closing movement the door engages with the latch 32 which projects outwardly through the opening 30 and shifts the frame 27 inwardly to cause reopening of the louvers.

If the blower and its driving motor are to be inspected, repaired, or removed, access can be readily had thereto through the opening 30 by fully opening the door 31. After the door is opened sufficiently to pull out the frame 27 and close the louvers, the latch 32 is raised and released from the arm 34 so that the door can then be swung downwardly the full distance. The abutments 36 and 37 on the frame 27 and latch 32 respectively, prevent the latch from rotating below horizontal position and hold the latch in this position so that it may be engaged by the arm 34 when the door is again closed and the latch raised by engagement of the rounded front face of its hook 33 with the hook 35 of the arm 34.

By adjusting the damper 19 while the door 31 is open for recirculation, the air of the room can be recirculated directly

through the device or to include the radiator compartment to be further heated. Adjustment can also be made of the louvers, the door and the damper to get any desired combinations of outside air supply, recirculation and heating.

I do not desire to be limited to the exact construction, arrangement and operation shown and described, as modifications are possible which would still come within the scope of my invention.

I claim as follows:—

1. In a heating and ventilating unit, the combination of a housing comprising a blower compartment, and a heating compartment below said blower compartment, said blower compartment being provided with outside and inside air inlet openings, and closures therefor, and said heating compartment being provided with an outlet opening, adjacent the inside air inlet opening of said blower compartment, and shut off from direct communication therewith by the inside air inlet closure and members connecting said outside and inside air inlet closures to effect the operation of one by the other.

2. In a heating and ventilating unit, the combination of a housing comprising blower and heating compartments communicating with each other, outside and inside air inlet openings communicating with said blower compartment, and dampers in said openings, members connecting said inlet dampers acting to close the outside air damper when the inside air damper is opened beyond a predetermined amount, and a damper mounted in an outlet opening in said heating compartment adjacent to said inside air inlet damper, the latter acting as a deflector for the air discharged from said heating compartment.

3. In a ventilating device of the class described, the combination of a housing having an outside air inlet and an inside air inlet, a blower between said inlets, a damper in said outside air inlet, an outlet opening for said housing, a door structure for said inside air inlet mounted above said outlet opening and serving as an air deflecting member when in open position, and actuating mechanism for said outside air damper adapted to be engaged by the inside air inlet door for effecting the closure or opening of the outside air inlet damper.

4. In a ventilating device of the class described, the combination of a housing having an outside air inlet and an inside air inlet and an outlet immediately below said inside air inlet, a blower within said housing, a damper in said outside air inlet, a damper for said inside air inlet comprising a hinged structure adapted when in open position to form a deflecting plate for said air outlet, and means for connecting said

inlet dampers to effect the opening and closing of said fresh air damper when said inside air damper is opened and closed.

5 5. In a ventilating unit of the class described, the combination of a housing having an air inlet and a discharge outlet adjacent thereto, means for drawing air in through said inlet and discharging it

through said outlet, a heating device within said housing, and a door for said inlet adapted when in open position to form a deflector for deflecting the discharged air from said air inlet.

In witness whereof, I hereunto subscribe my name this 5th day of March, A. D. 1919. 15

WILFRED SHURTLEFF.