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1,875,683

REGISTER FAN

Original Filed March 30, 1927

Fig. 1.

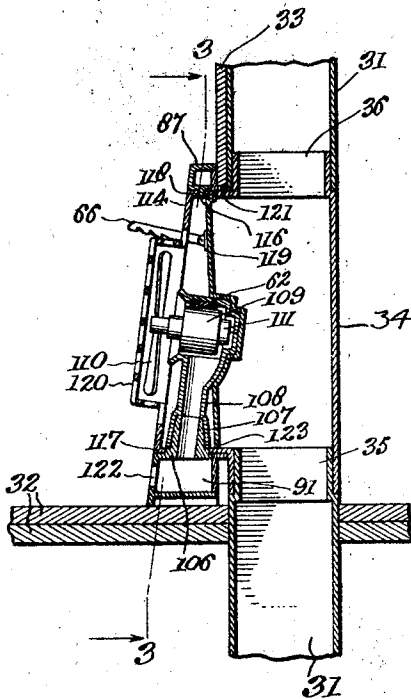


Fig. 2.

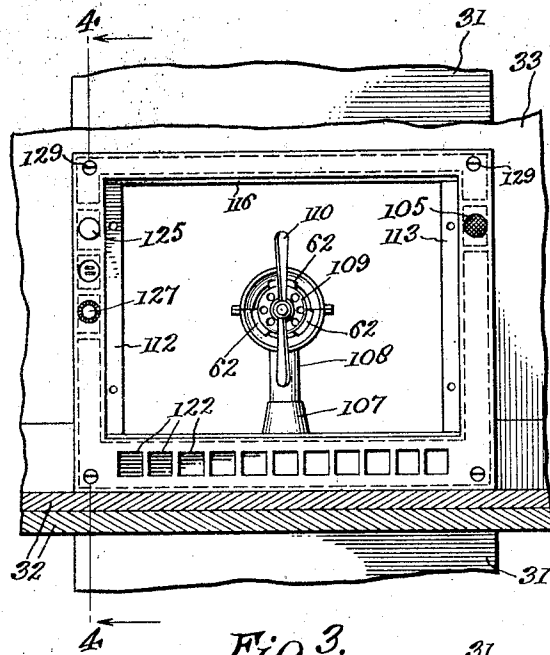


Fig. 3.

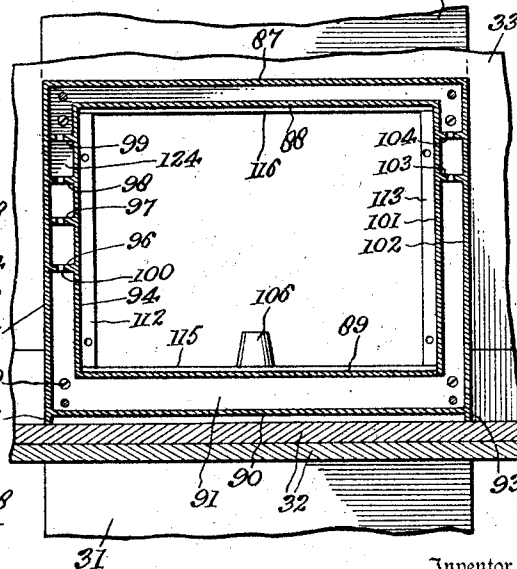


Fig. 5.

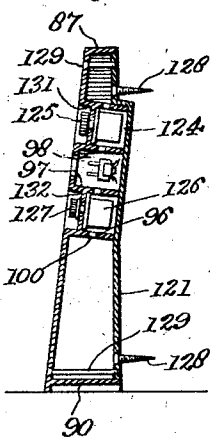
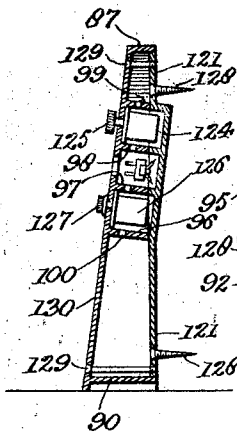


Fig. 4.



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REGISTER FAN

Original application filed March 30, 1927, Serial No. 179,704. Divided and this application filed September 19, 1929. Serial No. 393,773.

The present invention relates to improvements in register fans and is a division of my prior Patent No. 1,743,994, granted January 14, 1930.

5 An object of the invention is to provide an improved fan installation in combination with a register whereby hot air may be positively circulated through the room and in which a local circulation of air in the room
10 may be effected.

Another object of the invention is to provide a device of this character in which the grill is separate and distinct from the motor and fan installation enabling the grill to be
15 removed independently of such installation; and in which the motor and fan installation are carried by a border frame which may be installed and removed as a unit either with or without the grill.

20 A further object of the invention resides in providing an improved register fan installation in which the motor controls are carried by the border frame and are removable with such border frame, the controls being exposed
25 on the exterior of the border frame and on the outside of the grill for convenience in operation.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

30 In the drawing, wherein like symbols refer to like or corresponding parts throughout the several views.

Figure 1 is a vertical section taken through a stack, register box and register fan installation constructed according to the present invention.

40 Figure 2 is a front elevation, with parts broken away and parts shown in section of the improved device with the grill removed.

Figure 3 is a vertical section taken on the line 3—3 in Figure 1.

45 Figure 4 is also a vertical section taken on the line 4—4 in Figure 2, and

Figure 5 is a similar view showing a slight modification.

50 Referring more particularly to the drawing 31 designates a hot air stack built into

the building, the floors of which are indicated at 32 and the walls at 33. A register box is indicated at 34 having a through passage for the hot air and connecting at its lower and upper ends with sections of the hot air stack 55 31.

In Figure 1, the lower section of the stack 31 is shown as formed with an inwardly offset shouldered neck 35 about which the base of the register box 34 is adapted to fit. At
60 its upper end the register box may, if desired, be provided with a similar inwardly offset and shouldered neck 36 to receive and support the lower end of the upper adjacent section of the hot air stack 31. It is quite
65 immaterial however, to the present invention, just how the connection of register box and stack is made.

The register box is, in accordance with the usual practice, made with one or more outlets
70 or openings to a room or rooms, and in the present instance I have deemed it sufficient to illustrate the invention in connection with a single device for use in connection with
75 one room only.

Referring more particularly to Figure 3, the top portion of the border frame consists of the upper and lower spaced parallel walls 87 and 88. In like manner, the lower part of the border frame consists of upper and
80 lower spaced parallel walls 89 and 90, the spacing being greater to form a large air chamber 91. The lower wall 90 may be held elevated by the small feet 92 and 93.

One side portion of the border frame consists of the inner and outer spaced parallel
85 walls 94 and 95. Between these walls are disposed four webs 96, 97, 98 and 99, and in each of the spaced transverse webs is one or more perforations 100, setting up communication
90 between the compartments formed by these webs or division plates and forming also a through vertical passage between the side walls.

At the opposite side of the border frame are spaced inner and outer parallel walls 101 and 102, across which are the two perforated transverse webs 103 and 104, forming there-
100 between a compartment for holding the re-

ceptacle or socket for a signal or other lamp 105 shown in Figure 2.

This lamp 105 is used as a signal to indicate when the motor is in operation and to prevent its being allowed to continue to operate indefinitely through carelessness of the operator.

Returning to Figure 3, it will be seen that the rectangular border frame provides communicating horizontal and vertical passages between the spaced walls thereof. A hollow boss 106 extends upwardly from the upper wall 89 of the lower portion of the border frame, and this boss is preferably tapered to receive the socketed lower portion 107 of the hollow standard 108 which carries the electric motor 109 and fan 110.

The motor is preferably resiliently supported in the upper portion of the hollow standard 108 and space is left at the rear of the upper portion of the standard for a chamber 111 which communicates with the interior of the motor.

Referring to Figures 2 and 3, there are provided lateral flanges 112 and 113 projecting inwardly of the border frame and adapted to receive the fastenings for holding the grill 114 removably in place.

Referring again to Figure 3, shoulders 115 and 116 are shown as provided upon the lower and upper portions of the border frame, the in-turned lower and upper edges 117 and 118 of the grill fitting against such shoulders. The grill plate may simply be mounted with a slip fit in the border frame or be held therein in any desired manner.

A damper 119 is preferably carried pivotally by the upper portion of the border frame just rearwardly of the shoulder 116, as shown in Figure 1. The intermediate portion of the damper 119 is shaped to fit the particular shape given to the upper portion of the hollow post 108 which supports the fan motor. The grill plate 114 is formed with a central outstanding portion 120, of a diameter slightly in excess of that of the fan 110, the fan being received within this outstanding portion which is provided with perforations not only in its outer portions but also in its rim part.

Referring to Figure 1, a collar 121 having an angle iron cross section is fitted between the room wall 33 and the border frame 83 for closing the rear spaces in the operating lower and side portions of the border frame, the front spaces being enclosed between front walls of the border frame itself. As shown in Figure 2, the front lower portion of the border member is provided with slots 122 to admit air in the chamber 91, which communicates, as shown in Figure 1, with the hollow boss 106, by which air has free access to the chamber 111 and to the motor 109. As shown in Figure 1, there is also a shoulder 123 at the rear portion of the wall 89 to receive

there-against the forward edge of the register box.

As shown in Figures 2 and 4, a switch box 124 is shown as being placed in the upper compartment between the webs 98 and 99 and an operating handle 125 for the switch is shown on the exterior of the border frame. The lowermost compartment between the webs 96 and 97 is shown as occupied by a control box or resistor 126, having its control button 127 also located exteriorly of the border frame. In Figure 4 are also shown fastenings 128 for securing the collar 121 to the wall of the building. Furthermore, screws 129 are shown in Figure 4 for the purpose of securing the border frame to the collar 121. These screws are also shown in Figure 2. The front wall 130 of the border frame, as shown in Figure 4, acts as a flush plate or finishing plate for the outlet boxes in which the electrical devices 124 and 126 are mounted. These devices are accessible when the border frame and collar are separated, as by unscrewing the fastenings 129.

Now referring to Figure 5, the device is precisely as shown in Figure 4 except the control buttons 125 and 123 are mounted within the plane of the front flush plate 130 and there are additional walls 131 and 132 in the outlet boxes or electrical compartments for mounting the electrical devices and the control buttons 125 and 127.

The motor 109 is preferably held in the supporting device by means of interposed cushioning or resilient members 62, illustrated in Figures 1 and 2. In Figure 2 these rubber blocks or other cushioning elements 62 are shown as circumferentially separated to allow the circulation of air between the same.

In the operation of the device, hot air rises from a furnace or other source up through the stack 31 and through the register box. When the damper 119 is completely closed, as shown in Figure 1, the hot air will ascend through the stack and through the register box without being allowed to enter the room where the register fan is installed. However, through operation of the latch rod 66 the damper 119 may be pushed inwardly and swung about its upper pivotal support, whereby the lower free end will project across the stack and intercept the rising hot air, deflecting same out into the room and through the grill 114. This action will be induced by the operation of the fan 110, which is driven by the electric motor. The fan motor may be put into and out of operation by the switch button 125, and the speed of the motor and fan may be regulated by the resistor button 127.

During the operation of the fan, the fan blades 110 will not only draw in hot air from the stack 31 when the damper 119 is open, but the fan will also create a forced draft of air through the hollow pedestal 108. This

fan action draws in air through the slots 122 in the lower portion of the border frame, which air enters the chamber 91, ascends through the boss 106 and hollow pedestal 108 into the space 111 behind the electric motor 109; and thence the air is drawn through the electric motor, acting to cool the same and preventing motor overheating.

This air is quickly dispersed in the room by the action of the fan. The cooling air from chamber 111 also passes about the electric motor 109 between the rubber blocks 62. This air will serve to shield and protect the electric motor from the stack heat.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:—

1. In combination with a hot air stack and a register box, a border frame for the register box having a cold air channel therein, a grill plate fitted in said border frame, a fan and motor unit in said frame, hollow means for supporting said unit and being interiorly in communication with the air chamber in said border frame, and a damper associated with said grill plate.

2. In combination with a hot air stack and a register box, a border frame for the box having channels extending thereabout with a channel in its lower portion in communication with the room, a hollow support in communication with said channel, a motor supported in said hollow support, a fan driven by said motor, a grill plate fitted in said border frame, and an adjustable damper back of the grill plate and carried by said border frame.

3. In combination with a hot air stack and a register box, a collar extending about the opening of the box, a channel border frame also extending around the opening of the box and secured to said collar, and together forming ventilating compartments having communication with the room atmosphere and with each other, a grille plate fitted removably to the frame, a damper pivotally carried by said frame, a motor and fan unit behind the grille plate, and a hollow support for ventilating the motor and communicating with the ventilating compartments of the channel section of the frame.

4. In combination with a register box having an opening, a border frame extending about said opening, a motor and fan unit, a motor ventilating housing supporting said motor and fan unit, a hollow pedestal carried by said border frame, said border frame having a ventilating compartment communicating with the room atmosphere, said motor

ventilating housing secured to said pedestal and together forming a ventilating channel for the passage of room atmosphere about and through said motor.

5. In combination with a register box having an opening, a hollow border frame extending about said opening and having communication with the room atmosphere, a hollow pedestal carried by said border frame and interiorly communicating with said hollow border frame, a motor and fan unit, a hollow motor ventilating housing having an inlet and an outlet for the circulation of air therethrough and secured to said hollow pedestal and forming with said hollow pedestal and with said hollow border frame, communicating channels for the circulating of room atmosphere therethrough, and resilient means within said hollow motor ventilating housing for yieldably supporting said motor.

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