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2,323,178

VENTILATING UNIT

Filed Jan. 9, 1941

2 Sheets-Sheet 1

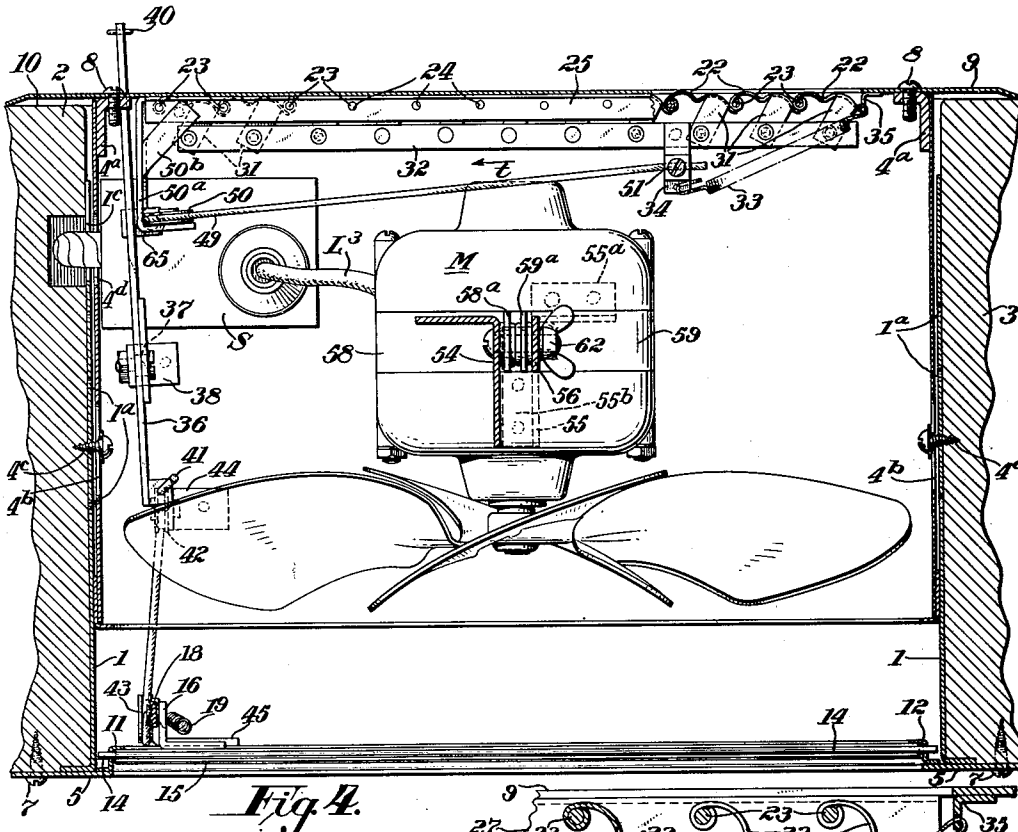


Fig. 4.

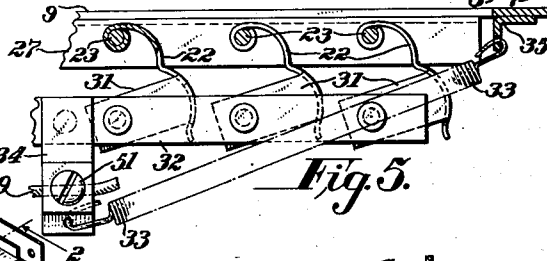


Fig. 5.

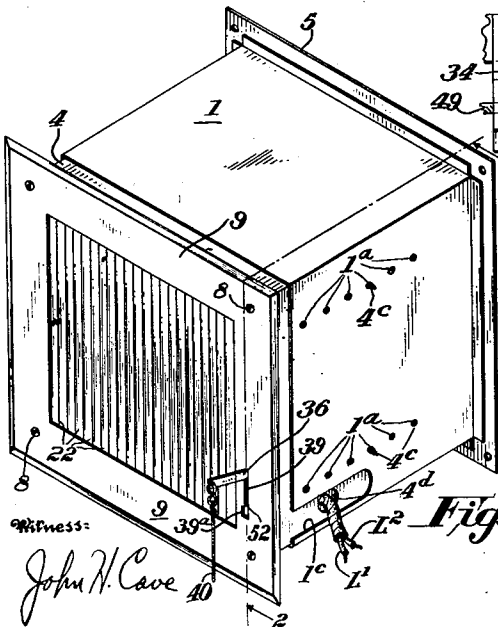


Fig. 1.

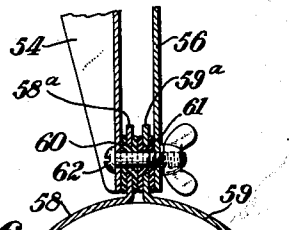


Fig. 6.

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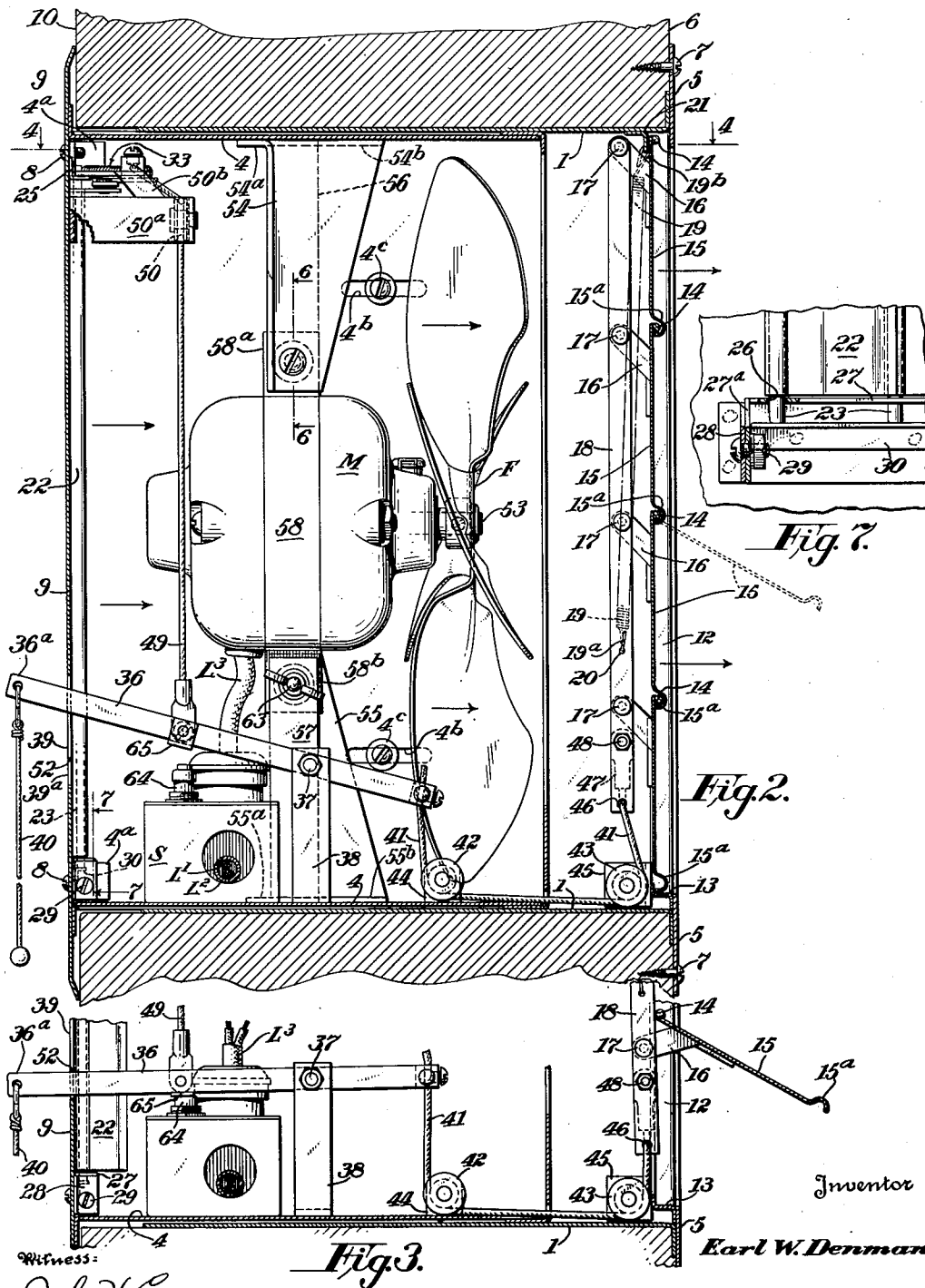
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VENTILATING UNIT

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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VENTILATING UNIT

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3 Claims. (Cl. 98—116)

This invention relates to ventilating units of that type which comprises a box-like casing adapted to be installed in an opening extending through a wall of a room and containing an electrically driven fan designed to effect a flow of air through said casing. Such devices may be built into a wall during the construction of the wall or they may be inserted into an opening cut in an existing wall. They are commonly installed in the outside walls of kitchens and function as exhaust fans to draw off cooking odors and the like and discharge the same to the outside atmosphere.

The invention has as an object to provide an improved unit of this nature having the usually relatively wide horizontally disposed and tiltable water-shedding louvers on that end of the unit which is exposed to the weather but having on its opposite end, which is visible within the room, a materially greater number of relatively narrow and vertically disposed louvers. While such vertically disposed inside louvers function, as do the horizontal outside louvers, to open and close an end of the casing, they are far more pleasing in appearance.

Another object of the invention is to provide, in a ventilating unit of this nature, simplified means, operable from within the room for simultaneously opening both the horizontal outside louvers and the vertically disposed inside louvers and for closing the electric circuit connected with the fan, thereby to start the fan.

A still further object of the invention is to provide an improved ventilating unit of the telescoping box type and to provide improved means for supporting the electric fan element in one of the box sections.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

Fig. 1 is a perspective view of my improved ventilating unit.

Fig. 2 is a vertical sectional view taken substantially on the line 2—2 of Fig. 1 with the louver- and switch-actuating lever in its inoperative position and showing the unit as inserted in a wall under construction.

Fig. 3 is a detail sectional view similar to the lower portion of Fig. 2 but showing the louver-

and switch-actuating lever in its operative or louver-opening and switch-closing position.

Fig. 4 is a horizontal sectional view taken substantially on the line 4—4 of Fig. 2, also showing the unit as inserted in a wall under construction.

Fig. 5 is an enlarged detail sectional view also taken on the line 4—4 of Fig. 2 illustrating more particularly the means for opening and closing the inside vertically arranged louvers.

Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 2 showing one of the vibration dampening mounts for the fan-driving motor.

Fig. 7 is a detail sectional view taken substantially on the line 7—7 of Fig. 2, illustrating the means for supporting the lower ends of the vertical louver-supporting rods.

Referring more specifically to the drawings, the invention is disclosed as embodied in a ventilating unit comprising an outer, substantially square sheet-metal box-like element 1 adapted to be located within a hole 2 formed in a wall 3 and a similar, but smaller sheet-metal box-like element 4 telescopically mounted within the element 1. The outer element has attached thereto, in any suitable manner, such, for example, as by spot welding, a flange plate 5 adapted to engage the outer surface 6 of the wall and to be secured thereto by screws 7. The inner element 4 has fixed to it, angle brackets 4^a to which is secured, by screws 8, a face plate 9 adapted to engage the inner surface 10 of the wall.

In order that the casing elements 1 and 4 may be adjusted axially to adapt the unit to walls of various thicknesses, the outer casing element 1 is provided with a series of aligned screw holes 1^a and the inner element 4 is provided with complementary screw slots 4^b. Screws 4^c passed through the slots 4^b and threaded into an aligned screw holes 1^a serve to secure the two sections together with the plates 5 and 9 in contact with the outer and inner faces, respectively, of the wall 3.

Secured to the inner face of the plate 5, at opposite sides of the member 1, are sheet-metal louver-supporting bars 11 and 12, substantially Z-shaped in cross section, connected together at their lower ends by a similar bar 13. If desired, the bars 11, 12 and 13 may be made as a single continuous element. Journaled horizontally in bearing apertures provided by the bars 11 and 12 are rods 14 to which are secured the upper marginal portion of horizontally disposed outside louvers 15. The lower marginal portion of each louver 15 is formed with an outwardly pressed semi-circular portion 15^a designed, in the closed

position of the louver, to embrace the pivot rod 14 of a lower louver. When the louvers are closed the portion 15^a of the lowermost louver fits within the bar 13, as shown in Fig. 2.

Each louver 15 has secured to its inner face an inwardly and upwardly extending arm 16, each pivotally connected, at 17, to a vertically disposed and vertically movable louver-actuating bar 18. A coil-spring 19, having its lower end 19^a offset and engaging in an aperture 20 in the bar 18 and its upper end 19^b engaging an angle-bar 21 secured within the housing element 1, normally holds the bar 18 elevated, thereby maintaining the outer louvers 15 closed, as shown in Fig. 2. Downward endwise movement of the bar 18 under the influence of means later to be described, swings the arms 16, and the louvers 15 attached thereto, about the axes of the rods 14 and causes the louvers to be opened, as indicated in Fig. 3. The outside louvers are so constructed and arranged that even in their open position they will shed water, thus protecting the inside of the unit against rain, snow and the like.

The face-plate 9 carries a series of vertically disposed louvers 22, each of which is secured upon a rod 23 journaled at its upper end in apertures 24 formed in an angle bar 25 secured, as by spot-welding, to the inner face of the plate 9. At their lower ends (see Fig. 7) the rods 23 are journaled in apertures 26 formed in, an angle-bar 27, also secured upon the inner face of the plate 9. For convenience of manufacture and assembly, the angle-bar 27 has its ends 27^a bent perpendicular to the longitudinal axis of the bar and fitted between brackets 28 secured, as by spot welding, to the inner face of the plate 9. The ends 27^a of the bar 27 are removably secured to the brackets 28 by bolts 29. To limit the downward movement of the rods 23, thereby to maintain the bottom ends of the louvers 22 spaced slightly above the angle-bar 27, the lower ends of the rods are arranged to rest upon the upper surface of an angle-bar 30, welded or otherwise secured to the inner face of the angle-bar 27. This mounting of the inside louvers 22 and substantially all of their actuating mechanism on the attachable face-plate 9 is an important feature of this invention as it permits of convenient assembly of the parts, it being necessary only to connect thereto the cable 49 after all the other mechanism has been separately assembled on the face-plate.

Each louver 22 has secured to it an arm 31 which, as shown most clearly in Figs. 4 and 5, is pivotally connected to a horizontally disposed louver-actuating bar 32. A coil-spring 33, connected at one end to an arm 34 welded or otherwise secured to the bar 32 and at its opposite end to an angle-bar 35 secured upon the inner face of the plate 9, normally holds the bar 32 in the position shown in Fig. 4, thereby maintaining the louvers 22 closed. Endwise movement of the bar 32, in the direction indicated by the arrow *t* in Fig. 4, in opposition to the spring 33 swings the louvers 22 to their open position shown in Fig. 5.

The inner and outer louvers 22 and 15, respectively, are adapted to be opened simultaneously by means of a manually actuable lever 36, pivotally mounted, at 37, on a standard 38 secured to and extending upwardly from the lower horizontal wall of the casing element 4. One end 36^a of the lever 36 projects through a slot 39 in the face-plate 9 into the room and has attached thereto a pull-cord 40. The opposite end of the

lever has connected thereto one end of a flexible element such as a cable 41 which passes beneath and in contact with idler rollers 42 and 43 journaled in brackets 44 and 45 secured within the casing elements 4 and 1, respectively. The other end of the cable passes through an aperture 46 in the lower end of the outside louver actuating bar 18 and has attached thereto a connector element 47 secured, at 48, to the bar 18.

Connected to the lever 36 intermediate the pivot 37 and the end 36^a is one end of a cable 49 or other flexible element which extends upwardly and over an idler pulley 50. From the pulley 50 the cable extends substantially horizontally and has its opposite end connected, at 51, to the arm 34 on the bar 32. The pulley 50 is rotatably journaled on a bracket 50^a secured to the inner face of the plate 9 and braced from the angle-bar by a brace 50^b.

From the foregoing it will be perceived that when the end 36^a of the lever 36 is pulled downwardly, the cables 41 and 49 will move the louver-actuating bars 18 and 32 endwise, in opposition to the springs 19 and 33, thereby opening the louvers 15 and 22.

As shown most clearly in Fig. 1 the slot 39 in the face-plate 9, through which the lever 36 extends, is formed at its lower end with an offset portion 39^a into which the lever may be drawn so as to lie beneath the shoulder 52. With the lever in that position, the shoulder 52 holds the lever depressed in opposition to the springs 19 and 33 and maintains the louvers open. To close the louvers it is only necessary to move the lever 36 out of the notch portion 39^a whereupon the springs 19 and 33 will close the louvers.

Mounted centrally within the casing section 4 is a rotary suction fan *F* adapted to draw air in through that end of the casing containing the inside louvers 22 and discharge it from the opposite end of the casing through the louvers 15 to the outside atmosphere. The fan *F* is secured upon the shaft 53 of an electric motor *M* securely yet noiselessly mounted within the casing. The means for mounting the motor comprises two sheet-metal angle brackets 54 and 55 each having transversely arranged feet secured, as by spot welding, to the inner faces of the upper and lower walls, respectively, of the casing section 4. The transversely arranged feet of the bracket 54 are indicated at 54^a and 54^b, in Fig. 2, while the corresponding feet of the bracket 55 are indicated at 55^a and 55^b in Figs. 2 and 4. This angle bracket construction is not only desirable for supporting the motor and fan when in use but is particularly useful in rigidly maintaining them in their proper position in the casing during shipment or other rough handling of the unit. Cooperating with the brackets 54 and 55 in supporting the motor are strap-metal brackets 56 and 57 also secured to the upper and lower walls of the casing section 4 and extending parallel with their companion brackets 54 and 55, respectively. Surrounding the motor *M* are two semicircular clamp members 58 and 59 having upwardly extending ears 58^a and 59^a, respectively, and similar downwardly extending ears of which only the ear 58^b of the clamp-member 58 is shown. The ears 58^a and 59^a are arranged between the brackets 54 and 56 and, as shown most clearly in Fig. 6, carry vibration dampening rubber bushings 60 and 61 against which the brackets 54 and 56 bear under the influence of a clamp-screw 62. At their lower ends the clamp-members 58 and 59 are similarly connected through the medium of vibration

dampening bushings to the brackets 55 and 57, the parts being clamped together by a clamp-screw 63.

From the foregoing it will be understood that the motor M is rigidly mounted in the casing member 4 and that the vibration dampening bushings will prevent vibrations and sounds produced by the motor from being transmitted to the casing which, in the absence of such dampening means, would serve as a sounding board to amplify such sounds.

Electric current to operate the motor M may be received from any suitable source and transmitted to the motor through conductors L¹, L² which connect into a switch-box S. From the switch-box the current flows to the motor through a suitable multiple conductor L³.

A hole 4^a in the sidewall of the casing element 4 and an aligned open-ended slot 1^c in the corresponding sidewall of the casing element 1, permit passage of the electrical conductors L¹, L² without preventing assembly and telescoping adjustment of the casing elements.

The switch-box S contains a conventional normally-open make-and-break switch (not shown) designed to be closed by the downward movement of an upwardly spring-pressed plunger 64 mounted therein and to be opened by upward movement thereof.

Secured to the side of the lever 36 is an angle plate 65 having a portion adapted, during the downward movement thereof, to engage and depress the switch-closing plunger 64, as shown in Fig. 3. Thus as the lever is pulled downwardly to open the louvers 15 and 22 the switch is closed and the motor is started and the fan is rendered effective. Conversely, as the lever 36 is released and permitted to move upwardly, the louvers are closed and the plunger 64 is permitted to move upwardly to break the circuit and stop the motor.

While the improved ventilating unit has been shown and described as embodied in an opening formed in a wall during the construction of the wall, it is to be understood that it also may be installed in an opening cut in a previously built wall. In this latter case the opening into which the unit is inserted will be slightly larger than the unit and the walls of the opening will not contact the outside walls of the unit as shown in Figs. 2 and 4.

From the foregoing it will be perceived that I have provided an improved ventilating unit having the desirable horizontal outside louvers and vertical inside louvers with a single lever and suitable connections for simultaneously controlling both sets of louvers and the fan-driving motor and having also other novel and desirable features.

Having thus set forth the nature of the invention, what I claim herein is:

1. A ventilating unit comprising a sheet-metal open ended tubular casing adapted to be secured within an aperture in a wall, a set of horizontally disposed louvers pivotally mounted in one end of said casing, a vertically disposed louver-actuating bar connected to each of said louvers, a spring connected to said bar and normally urging it in a direction to close said louvers, a frame-like face-plate removably secured to one end of said casing and formed with a substantially square central opening, horizontally disposed angle-bars secured to the inner surface of said face-plate above and below said opening, a plurality of vertically arranged louver-supporting rods journaled in apertures formed in said angle-bars, a vertically disposed louver attached to each rod and normally closing said opening, an arm projecting horizontally from each louver, a horizontally disposed louver-actuating bar pivotally connected to each of said arms, a spring normally urging said last named bar in a direction to close said vertical louvers, a lever mounted on a horizontal pivot in said casing, and flexible elements connecting said lever with each of said louver-actuating bars to shift them endwise in opposition to said springs, thereby simultaneously to actuate both sets of louvers.

2. A ventilating unit as set forth in claim 1 in which one idler roller is rotatably journaled on a bracket secured to the inner surface of said face-plate and another idler roller is rotatably journaled on a bracket secured to the bottom wall of said casing, and in which two flexible elements connected to said lever at opposite sides of its fulcrum point each pass about one of said idler rollers and is connected to one of said louver-actuating bars, thereby simultaneously to actuate both sets of louvers by a single movement of said lever.

3. A ventilating unit comprising a sheet-metal casing including a pair of telescopic open ended tubular elements, one of said casing elements being provided with a hole and the other provided with an elongated open-ended slot aligned with said hole, a set of pivotally mounted louvers carried by opposite ends of said elements, an electric fan mounted within said casing for effecting a flow of air therethrough, means for securing said elements together in various positions of adjustment including an elongated aperture formed in the side walls of one of said elements, a plurality of screw holes formed in the other of said elements in alignment with said aperture, a screw passing freely through said aperture and threaded into a selected one of said screw holes, and an electric conductor passing through said hole and slot in said casing elements and connected with said electric fan.

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