March 25, 1924. 1,488,345

T. A. JENKINS

VENTILATOR

Filed March 17, 1922 2 Sheets-Sheet 1

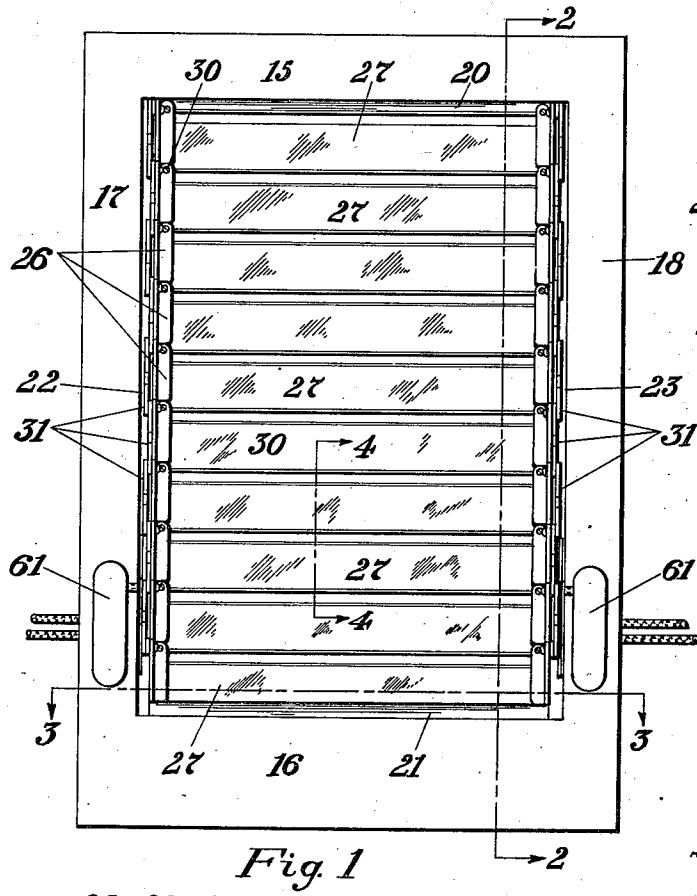


Fig. 1

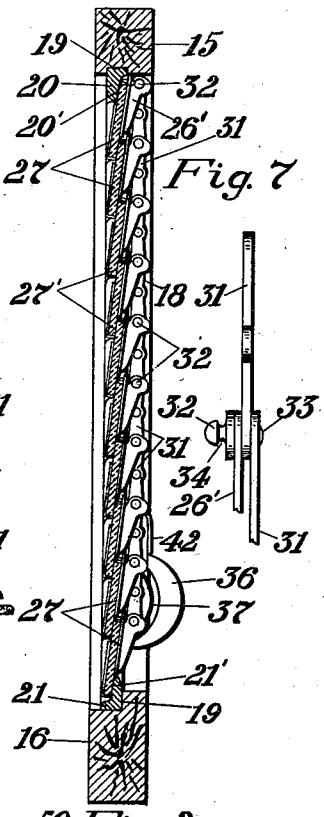


Fig. 7

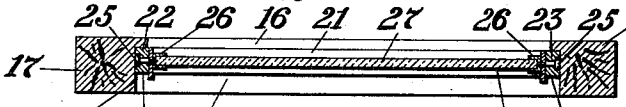


Fig. 3

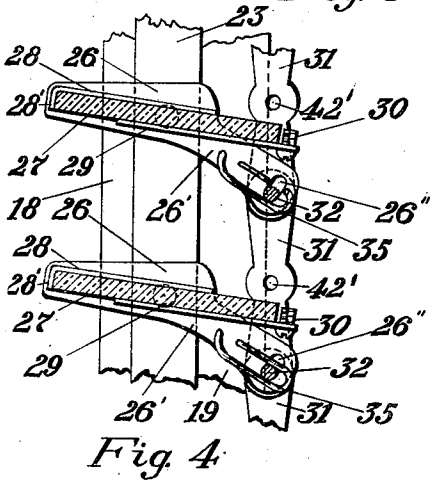


Fig. 4

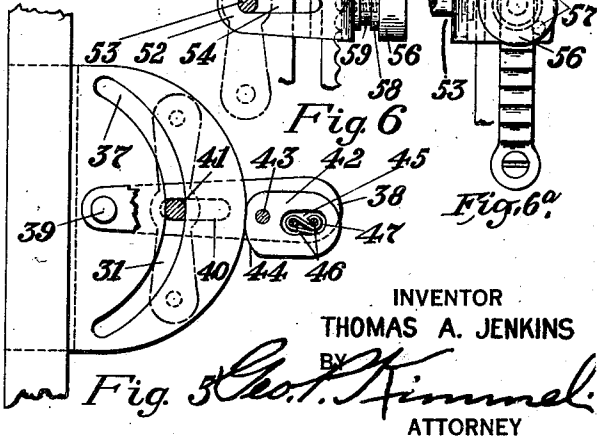


Fig. 6

Fig. 6a

Fig. 5

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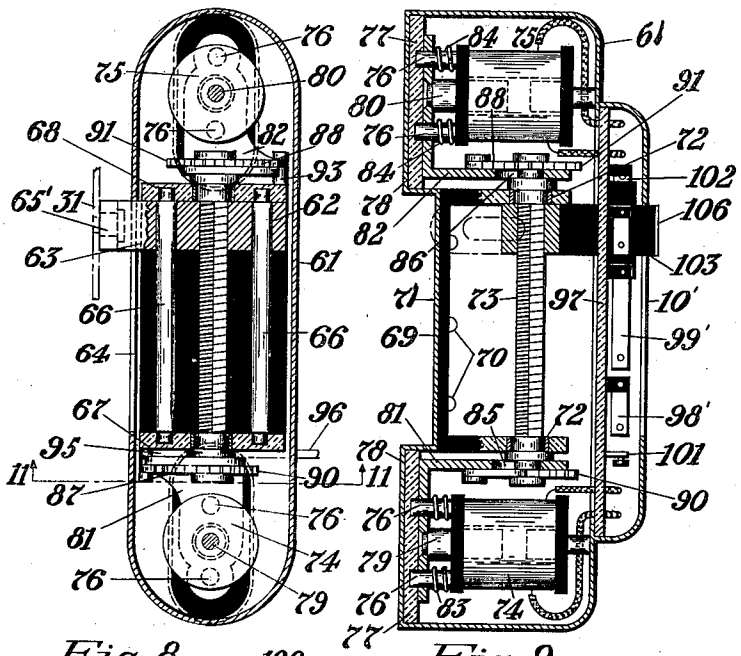


Fig. 8

Fig. 9

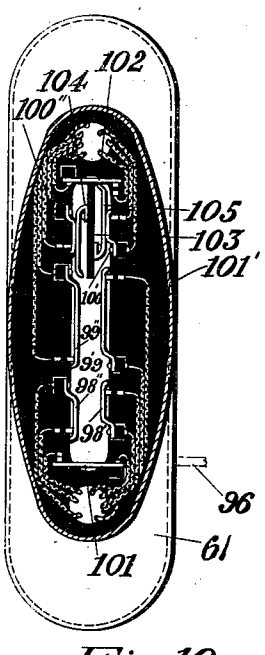


Fig. 10

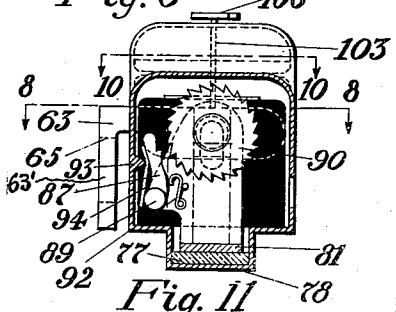


Fig. 11

Fig. 13

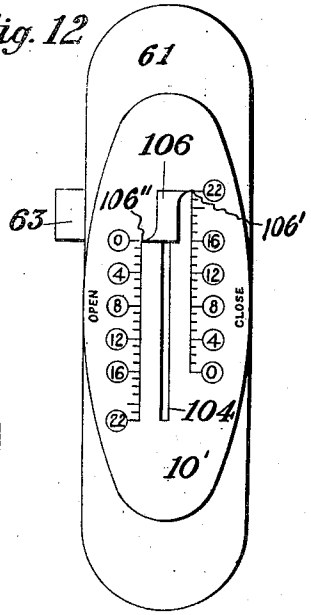


Fig. 12

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Patented Mar. 25, 1924. 1,488,345

UNITED STATES PATENT OFFICE.

THOMAS A. JENKINS, OF JERSEY CITY, NEW JERSEY.

VENTILATOR.

Application filed March 17, 1922. Serial No. 544,540.

To all whom it may concern:

Be it known that I, THOMAS A. JENKINS, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Ventilators, of which the following is a specification.

This invention relates to ventilators generally, and more particularly to a type which are adapted for use in the ventilating of buildings of all descriptions, railway cars, tube or terminal cars, automobiles, vehicles, air craft of all descriptions, ships of all descriptions, and in any other place where it is desirable, necessary or possible to ventilate.

The basic object of this invention is the use of glass in any and all of its forms, and the dominating materialistic factor thereof is for the purpose of affording light to the interior of buildings, cars, vehicles, air craft or ships to be ventilated, and in the case of translucent or opaque glass ventilators being used to afford the lighting of such interiors, in addition to the ventilation thereof, without the necessity of providing shades, or other similar means to prevent the interiors from being open to view from the outside thereof.

A further object of the invention is to provide for the manufacture of ventilator elements from glass in all its forms, such as, transparent, translucent, opaque or otherwise, also milk glass, frosted glass, ground glass, colored glass, wired glass or the like.

A further object of the invention is to provide for ventilators of the class set forth, and which may be in the form of windows, doors, panels, sky-lights, partitions and the like.

Another object of the invention is to provide for the forms of ventilators as hereinbefore stated, and which are so formed or otherwise constructed and arranged as to be perfectly air tight when closed.

A further object of the invention is to provide for ventilators of the class set forth, wherein the same are each constructed and arranged to provide a plurality of movable sections which are capable of being manipulated from full closed to full open position, or adjusted to any desired degree at points between said full closed and open positions, whereby an interior may be ventilated as may be desired or necessary.

A further object of the invention is to provide, in a manner as hereinafter set forth, an automatic electrical operating means, applicable to a ventilator, for the purpose of opening and closing the latter. The said electrical means comprising a system of circuits controlled by a thermostat of any desired or suitable form. The said thermostatic and electrical control means acting on the ventilator to shift it to closed or opened position or between such positions.

Another and equally important object of the invention is to provide for ventilators of the type mentioned, and one of a construction and arrangement such as readily adapts the same for substitution in lieu of the present form of window sash structures, the same functioning as the day lighting medium of the interior of a room, compartment or the like, and in a manner to be rain and air proof when inoperative, also, rain proof when opened to a limited degree, and capable of manipulation for the desired ventilating purposes, and which, when made from an opaque glass, dispenses with the use of shades and curtains whereby to give the desired privacy to the interior.

With the foreging and other objects in view, the invention resides in the certain novel and useful construction and arrangement of parts as will be hereinafter more fully described, set forth in the appended claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is an elevation of a window or the like having a preferred embodiment of the improved ventilator applied thereto,

Fig. 2 is a vertical transverse section taken on the line 2—2 of Figure 1 showing the device equipped with manually operated means,

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1,

Fig. 4 is an enlarged fragmentary section taken on the line 4—4 of Fig. 1 in open position,

Fig. 5 is an enlarged elevation, partly section, of a manually operated device for effecting the adjustment of the ventilating plates to any desired or predetermined position between the fully closed and opened positions thereof.

Fig. 6 shows a fragmentary side elevation,

partly in section, of a modified form of the manually actuated means for operating the ventilator plates to and from normally closed position, and Fig. 6ª a front elevation of such modified means,

Fig. 7 is an enlarged detail of the leverage system which is common to all forms of the ventilator plates, operating means or devices as herein contemplated,

Fig. 8 is a longitudinal section taken on the line 8—8 of Fig. 11, and shows a preferred embodiment of the electrically operated mechanism for effecting the adjustment of the ventilator plates of a ventilator,

Fig. 9 is a longitudinal section taken on the line 9—9 of Fig. 11,

Fig. 10 is another longitudinal section taken on the line 10—10 of Fig. 11,

Fig. 11 is a sectional view taken on the line 11—11 of Fig. 8,

Fig. 12 is a front elevation of one of the housing of the electrical actuating units, and showing an arrangement of graduated scales or indications thereof and as associated with a movable member whereby to indicate the positions of adjustment of the ventilator or ventilators of a ventilating system, and,

Fig. 13 is a diagrammatical plan view of the circuit connections of a one unit ventilator system.

Referring to the drawings, wherein similar characters of reference designate corresponding parts throughout the several correlated views thereof, and more particularly to Figs. 1 to 5 of the same, the ventilator per se comprises a main rectangular frame formed of upper and lower horizontal bars or members 15 and 16, and vertical side bars or members 17 and 18, and which may be in the nature of a window casing; window sash frame to be fitted into the opening of a window casing in lieu of the usual sash frame or frames thereof; a door frame to be fitted into the opening of a door casing; a sash frame to be fitted into its opening or openings of a sky-light casing in lieu of the usual forms of such sky-light sashes; a partition frame to be used for subdividing interiors into compartments, rooms or the like; or of any other form of frames designed to be used in connection with buildings, cars, vehicles, air craft or ships for lighting and ventilating the interiors thereof, or of giving entrance to or exit from the same.

As shown, the several bars 15, 16, 17, and 18 on the main frame are channeled as at 19 inwardly from one of their side faces, and fitted into this channel way is an auxiliary frame, formed of the upper and lower bar or members 20 and 21, and the vertical side bars 22 and 23, the auxiliary frame being centered with respect to the opposite sides of the main frame and has its inner side abutting the opposed inner wall of the channel way 19, substantially in the manner indicated. Spaced equidistantly along the vertical side bars 22 and 23 of the auxiliary frame are pairs of alined pivot members or pins 24, which are headed at their outer ends as 25 and have the headed portions 25 preferably countersunk inwardly of the outer faces of the side bars 22 and 23, so as to be retained in position against displacement when the auxiliary frame, of which the side bars 22 and 23 are a part thereof, is fitted into the main frame. Secured on the free ends of the pivot pins 24, projecting from the opposed inner faces of the vertical frame bars 22 and 23, are elongated metal clips 26, which are cooperative in pairs to engage over the complemental ends of transversely disposed ventilator plates 27.

These metal clips 26 are each formed of an elongated metal plate engaged on the projecting end of a pivot pin 24 at a point intermediate its ends, and having flange portions 28 and 29 extending angularly from the inner of its faces. These flange portions 28 and 29 are spaced apart one in a plane parallel to the other, but in offset overlapping relation, the lower end of the flange 28 extending for a distance below the plane of the lower end of the flange 29 and having its extreme lower end portion bent to provide an angularly disposed portion 28′ extending across the space between the flange portions 28 and 29 in a manner to engage under the lower edge of the end of a ventilator plate 27 positioned between the latter.

With a ventilator plate 27 supported in position in a pair of the clips 26, the overlapping ends of the flanges 28 and 29 extend to either side of the longitudinal center of the ventilator plate 27, while the upper end of the flange 29 projects above the upper edge of the latter and this projected end portion is formed with an opening through which is threaded a screw 30 having its threaded shank engaging over the upper edge of the ventilator plate 27, whereby the latter is removably retained in position in the clips 26, substantially as is shown in Fig. 4. In their normal positions of operation, the several ventilator plates 27 are disposed in slightly inclined and overlapped relation one with respect to the other, and in a manner to completely close the opening of the auxiliary frame. As shown in Fig. 2, the upper and lower bars or members 20 and 21, of the auxiliary frame, are paneled as at 20′ and 21′, respectively, to snugly seat therein the adjacent edge portions of the upper and lower ventilator plates 27, whereby a substantially air and weather proof contact is effected between the opposed surfaces thereof, while the opposed surfaces of the overlapping edge portions of all of the several ventilator plates 27 are preferably roughened as at 27′ to similarly effect air and weather proof contact therebetween.

For effecting the simultaneous operation of the glass ventilator plates 27 to and from normally closed position, and the adjustment of the same in any desired open position between the full opened and closed positions thereof, the several metal clips 26, supporting the opposite ends of the plates 27, are each formed with angularly offset arm portions 26′, which are provided with transversely extended slotted openings 26″ slightly inward of their opposite ends, and the arms 26′ of the opposite sets of clips 26 are connected together by suitable lever systems or links for the purpose. These lever systems each consists of a suitable number of lever members 31 having their adjacent ends connected together by means of pivot pins or studs 32, which also pivotally engage in the slotted openings 26″ of the arms 26′, while the outer ends of the upper and lower lever members are also pivoted directly to the arms 26′ of the upper and lower of the clips. As shown in Figure 7, the outer ends of the pivot pins or studs 32 are riveted or swaged as at 33 to prevent the accidental disengagement therefrom of the attached lever ends, but are not riveted or swaged at their inner ends, whereby to facilitate the insertion or withdrawal of the same from operative position. The pivot pins or studs 32 are provided with annular grooves 34 in the portions thereof projecting through the slotted openings 26″ of the clip arms 26′ and the opposite sides of the grooves 34 are engaged by looped retaining springs 35, which are secured in position on the arms 26′, substantially as is shown in Fig. 4. The purpose of the springs 35 is to facilitate the assembly of the parts, or the dismounting of the same for replacement and repair, as it is apparent that, by disengaging the springs 35 from the grooves 34 of the pins or studs 32 the latter are free to be withdrawn from their engaged positions, when the links or levers 31 will be detached one from the other and from the arms 26′ of the metal clips 26, and consequently, to effect the assembly of the parts, the adjacent ends of the links or levers 31 will be arranged in overlapping relation with the pivot openings thereof in alinement one with the other and in registry with the slotted openings 26″, of the clip arms 26′, whereby the pins 32 will be inserted through the alined or registering openings and the grooved ends thereof snapped into engagement with the spring loops 35. The springs 35, slots 26 and pivot pins 32 function to produce a tensioning effect and which serves to eliminate rattling of the slats as well as maintaining the slats tightly closed.

Referring now to Figures 2 and 5, I have shown therein one form of a manually actuated means for operating the ventilator plates 27 to and from their normally closed positions, and the same comprises a metal plate 36 secured in convenient position at the inner side of one of the vertical bars, of the main frame, and is provided with an arcuate slot way 37 whereby to function as a quadrant for accurate guidance for a hand lever 38, which is attached at its inner end to a pivot pin 39 passed through the plate 36 at a point on the radius of the curve defined by the slot ways 37 and medially between and substantially in the plane of the opposite ends of the latter. Formed on the longitudinal center of the lever 38, is an elongated slot way 40 whose length is such as to continuously register with the arcuate slot way 37 of the quadrant throughout the springing movement of the lever 38 on its pivot 39, and passed through both of these slot ways 37 and 40 is a pivot pin 41, which is engaged in a suitable opening 42′ of the particular link or lever 31 adjacent which the quadrant 36 may be positioned. This peculiar arrangement of the pivot connections 39 and 41, of the hand lever 38, with respect to the quadrant 36 and one of the links of one of the leverage systems for actuating the ventilator plates 27, admits of a much shorter hand lever 38 being utilized for the operation of the latter and consequently, also admits of a more compact, durable and efficient construction through the operating means or mechanism as a whole that would otherwise be the case. To retain the hand lever 38 in any of its desired positions of operation, a finger piece 42 is pivoted as at 43 on the inner side of the lever, and has its inner end edge formed to provide a cam surface 44 cooperative with the opposed curved edge of the quadrant 36. Immediately inward from its outer end, the finger piece 42 is provided with a slotted opening 45 disposed on the longitudinal center thereof, and into which is projected a pair of spaced pins 46 around which is trained a spring element 47 which has a free end portion disposed in contact with one wall of the slotted opening 45 whereby to normally maintain the cam surface of the finger piece 42 in frictional contact with opposed edge of the quadrant 36. The finger piece 42 is disposed lengthwise on the handle portion of the lever 38, and with one of its side edges projecting beyond the adjacent side edge of the lever 38 and its pivot pin 43 is excentrically disposed in a manner whereby by grasping the handle of the lever 38 and the outer end portion of the finger piece 42, the latter will be rocked on its pivot 43 against the tension of the spring 47, so that the cam surface 44 will be moved out of frictional contact with the edge of the quadrant 36, when the lever 38 may be freely swung to any desired point between the limits of the slot way 37. With the lever 38 moved to desired position, the hand of the operator

will be removed from the finger piece 42, when the spring 47 will return the latter to its locked position.

In Fig. 6, I have shown a modified form of the manually actuated means or mechanism, and, in this instance of the invention a rack bar 48 is secured at one side of the front face of the main frame by means of screws or the like 49 engaged through eyes formed in angularly offset portions 50 provided at the opposite ends thereof for the purpose. Movably along the ribbed or toothed face of the rack bar 48, is the angularly disposed portion 51, of a substantially L shaped actuating member, which has its other portion 52 extending inwardly of the opening of the main frame at one side of the bar 48 and pivotally coupled to one of the links or levers 31, by means of a pivot pin 53. The inwardly extending portion 52, of the actuating member, is provided with an elongated slot 54 disposed on its longitudinal center and with which the pivot pin 53 is engaged, whereby the latter slides lengthwise of the slot way correspondingly with the swinging movements of the links or levers 31, when the actuating member is moved along the rack bar 48 for effecting the desired opening and closing movements of the ventilator plates 27. The actuating member is manipulated along the line rack bar 48, by means of an adjusting screw 55 inserted inwardly of the angular portion 51 and in line with the ribbed or toothed face of the bar 48, so that, with the screw 55 in partially inserted position, the headed portion 56 thereof will be grasped for the desired movement of the actuating member, and, when fully threaded inwardly of the portion 51, it will have its inner end engaged between an adjacent pair of the ribs or teeth of the bar 48 to lock the actuating member in its adjusted position. Secured in the outer face of the portion 51, of the actuating member, by means of a screw or the like 57, and surrounding the shank of the adjusting screw 55, is a collar 58 having an annular groove 59 in its outer peripheral face and in which are engaged the headed ends of a pair of screws or pins 60 depending from the under side of the headed portion 56, of the adjusting screw 55, whereby the latter is prevented from being entirely unscrewed from its engagement in the portion 51 during the ordinary manipulation of the same in effecting the adjustment of the actuating member along the rack bar 48.

Referring now to Figs. 1 and 8 to 13, inclusive, wherein is shown an electrically operated system of ventilation for the actuation of one or more ventilator units, and whereby the automatic regulation or adjustment of the ventilator or ventilators is preferably accomplished by means of thermostatic circuit closers, whereby each ventilator of the system may be either individually or collectively adjusted thereby and correspondingly for any predetermined setting of the said circuit closers. In this instance of the invention, and as is shown in Fig. 1, an electrically actuated mechanism, enclosed in a suitable housing 61 is secured in position at each side of the front or inner face of the main frame of a ventilator for simultaneous cooperation with the oppositely disposed link or lever systems controlling the opening and closing movements of the glass ventilator plates 27. Each of these actuating mechanisms is enclosed within the housings or casings 61 and comprises a traveling member or bar 62 having an arm 63 projecting outwardly of a longitudinally disposed slot way 64, formed in one of the side walls of the casing or housing 61, and a portion 63′ depending from the free end thereof for the engagement therewith of one of the links or levers 31 of the link or leverage system with which it is associated. Formed in the depending portion 63′ is a vertically elongated slot 65, outwardly through which is inserted a pivot pin 65′ to be engaged in an opening 42′ of a link or lever 31, which arrangement allows for the proper swinging movements of the links or levers 31 for effecting the opening and closing movements of the ventilator plates 27, and correspondingly for the travel of the member or plate 62 within the housing. The member or bar 62 is slidably mounted on a pair of parallel guide rods 66, which are spaced apart to either side of the longitudinal center of and within the casing or housing 61, and are supported at their opposite ends in partition walls 67 and 68 disposed transversely of the latter and spaced equally inward from the opposite end walls thereof. These partition walls 67 and 68 are preferably formed of an insulating material, and constitutes the angularly disposed end portions of a substantially U-shaped insulating member 69, which is secured in position within the casing or housing 61 by means of rivets or the like 70 and with its connected portions supported on an inwardly depressed wall portion 71 on the bottom wall of the latter, and medially between the opposite ends thereof. Journalled at points inwardly of its opposite ends, in bearing sleeves 72 supported in suitably formed openings of the partition walls 68 and 69, is a screw threaded shaft 73, which is disposed in a horizontal plane common to the guide rods 66 and in equidistantly spaced parallel relation between the same. This shaft 73 is threaded through the traveling bar or member 62, whereby, upon reverse movements of rotation being imparted to the shaft the bar or member will be moved along the guide rods 66 correspondingly, and during the reversed direc-

tions of travel of the bar or member 62 the link or lever systems connected thereto will be actuated to effect the opening and closing movements of the ventilator plates 27, after the manner as hereinbefore described for the same by the manipulation of the manually actuated means.

The reversed directions of rotation of the shaft 73 is effected through the medium of a pair of electro-magnets 74 and 75 located in the opposite ends of the housing or casing 61. These electro-magnets 74 and 75 are disposed in vertical position, and are each mounted on the upper ends of a pair of spaced pins of short guide rods 76 rising from and having their lower ends embedded in bodies of insulating material 77 covering the inner surfaces of the downwardly depressed portion 78 of the bottom wall of the casing or housing at the opposite ends thereof. Movably mounted in the lower ends of the bores of the electro-magnets 74 and 75 are iron core pieces or plungers 79 and 80, respectively, which are each secured at their lower ends to one of the arms of a pair of substantially L shaped members 81 and 82, which have their other arms extending upwardly of the casing or housing 61 between the partition walls 67 and 68 and the electro-magnets 74 and 75. The lower arms are disposed horizontally of the opposite end portions of the housing or casing 61, and between the lower ends of the electro-magnets 74 and 75, and the bodies of insulating material 77, and are provided with openings engaged over the guide rods 76 whereby to be vertically movable thereon, when the core pieces or plungers 79 and 80 are drawn upwardly of the bores of the electro-magnets 74 and 75. Suitable compression springs 83 and 84 are positioned on the respective pairs of guide rods 76, and normally act to hold the horizontal portion of the members 81 and 82 and the core pieces 79 and 80 in their lower-most positions. The vertical portions of the members 81 and 82 are each formed to provide vertically disposed slot ways 85 and 86, respectively, which are engaged over extended reduced portions formed at the opposite ends of the screw shaft 73, and mounted at one side of these slot ways are pawls 87 and 88, which are pivoted in position on the vertical portions of the members 81 and 82 on pivot pins 89 and in a manner to be cooperative with respective ratchet wheels 90 and 91, keyed on the opposite ends of the screw shaft 73 and correspondingly with the individual operations or movements of the members 81 and 82, under the influence of the electromagnets 74 and 75. These pawls 87 and 88 are normally held free from engagement with the ratchet wheels 90 and 91, by means of small springs 92 bearing against the proper sides thereof at points immediately adjacent their pivots 89 and are to be moved into proper engagement with the ratchet wheels 90 and 91 during the upward movement of the respective members 81 and 82, by the action of fixed cam elements 93 acting on opposed and suitably inclined surfaces 94 provided on the pawls 87 and 88, the cam elements 93 being secured in position on one of the side walls of the housing or casing 61 for the purpose, while the inclined surfaces 94 are preferably in the form of angularly bent strips of spring metal fastened in position on the pawls 87 and 88, substantially as is shown.

In the operation of these mechanisms, and with the same electrically connected in circuit with a suitable source of current supply, and either of a manually actuated or thermal circuit closer, upon the closing of the circuit to the electro-magnet 74, of the mechanisms located at the opposite sides of a ventilator, the same will be energized, and as to draw the core pieces 79 thereof inwardly of the bore whereby the members 81 will be lifted vertically against the tension of the coil springs 84. This lifting movement of the members 81 will cause the pawls 87 to be forced into engagement with their respective ratchet wheels 90 by the action of the cam elements 93, when, further lifting of the members 81, will effect the rotation of the ratchet wheels 90 and consequently the screw shaft 73. This rotation of the shaft 73 moves the traveling bar or member 62 along the same, and in a direction to operate the lever 31 for the opening of the ventilator plates 27. With the ventilator plates 27 in open position, by now closing the circuit to the electro-magnets or solenoids 75, the action of the parts will be the same, but the shaft 73 will be rotated in a reversed direction, so as to move the bar or member 62 back to its initially inoperative position, during which movement, the ventilator plates 27 will be swung to closed position.

In case the electrical mechanism should, for any reason, get out of order, a spur gear 95 is mounted adjacent the ratchet wheel 90, on the screw shaft 73 (see Fig. 8), and is arranged in mesh with a second spur gear 96, which is positioned within the housing or casing 10, so as to have a portion of its periphery project outwardly of a suitably slatted opening formed in one of the side walls of the housing, for the purpose of being rotated by hand.

For effecting an automatic control of the opening and closing of the ventilators of a system successively to any one of several positions between fully opened and fully closed positions thereof, the housing or casing 61 has its top wall formed to provide an elongated opening, preferably oval in form and centered with respect to the opposite ends thereof, and this opening is closed by a plate 97 of an insulating material,

which is enclosed within a cover portion 10'. Mounted on the plate 97 are longitudinally lined sets of spring switches arranged in pairs, one pair for each thermostat to be used for effecting the gradual opening of the ventilators, the individual switches of each pair thereof designated 98', 98''; 99', 99''; and 100', 100'', respectively, which are correspondingly associated with and have their stationary contacts connected electrically to the thermostat devices 98, 99, and 100, as shown in Fig. 13, and the movable spring blades of the same electrically connecting the electro-magnets 74 and 75 of the ventilator operating mechanisms, one set of the said switches 98', 99', and 100', controlling the operation of the electro-magnets 74 for effecting the opening movement or movements of the ventilators, and the other set of switches 98'', 99'', and 100'' controlling the operation of the electro-magnets 75 for effecting the closing movements thereof. Located at the opposite ends of the alined sets of switches 98', 98''; 99', 99''; and 100', 100''; are limiting switches 101 and 102, the switch 101 effecting the opening of the electrical circuit at the limit of the opening movement of the ventilators, and the switch 102 at the limit of the closing movement thereof. Carried on the traveling bar or member 52, of each of the electrical operating mechanisms within the housings or casings 61, is an arm 103, of insulating material, and this arm is projected upwardly through a slot way formed in the insulating switch plate 97 and a similarly formed slot way 104 formed in the cover portion 10', for sliding movement therein during the movement of the bar or member 62. These slot ways are disposed in the plane of the longitudinal center of the housing or casing 61, so that the movement of the arm 103 is between the oppositely disposed spring switches 98', 98''; 99', 99''; and 100', 100''; and whereby suitable spring arms 104 and 105, carried at the opposite sides of the insulating arm 103, will actuate the spring blades of these several switches to closed position, with respect to their stationary contacts, correspondingly with the movement of the bar or member 62. At the limit of the movements of the arm 103, carried by the traveling member or bar 62 and in the opposite directions of travel thereof, the same will effect the opening of the limiting switches 101 and 102 correspondingly therewith, whereby to assure the opening for the deenergizing of the electro-magnets 74 and 75 at the full opened or full closed positions of the ventilator plates 27.

Referring now to Fig. 13, wherein I have shown a single ventilator plate actuating mechanisms as having its electro-magnets 74 and 75 connected in on separate controlled circuits, which are common to a single source of current supply *b* and which may be either opened or closed by means of manually operated circuit closers such as the push buttons *c* and *d*, or by the maximum and minimum temperature controlled switch contacts of the thermostatic circuit closers 98, 99 and 100 for the automatic operation of the same and correspondingly for different predetermined temperatures of the interior of buildings, cars, automobiles, air craft or ships, on which the ventilating system is installed. Connected in the separate circuits of the electro-magnets 74 and 75 are pair of electro-magnetically actuated switches *e* and *f*, which are arranged to operate for the closing of the circuits correspondingly for the closing of one or the other of the switch buttons *c* and *d*. As example of the utilizing of temperature variations for the operation of the ventilators, it will be assumed that a room or interior is kept at 60 degrees, and for this purpose the thermostat will be set at the minimum of 60 degrees, when the plates 27 of the ventilator or ventilators of the system will be closed, and correspondingly for a variation of 5 degrees plus or minus, whereby to effect the opening of the ventilator plates 27 to half open or other predetermined position upon a rise in temperature from 60 degrees to 65 degrees, and if the temperature rise is to 70 degrees, the opening of the ventilator plates 27 will be to full open or other maximum predetermined position. Now, when the temperature drops to 65 degrees, the thermostat will effect the closing of the electro-magnet of circuit to the electro-magnet or magnets 75 for the return of the ventilator plates 27 to partially predetermined closed position, and upon a drop to 60 degrees will further cause the latter to return to fully closed positions, whereby the room or interior will be maintained at a comfortable temperature with continuous supply of fresh air. A manually operated double throw switch *g* is employed to disconnect the thermostat circuit or circuits from the ventilator *a* and to allow for the control of the latter by the push buttons *c* and *d*, or vice versa. It will be understood that, when the thermostat 98, 99, and 100 are properly adjusted, only one circuit therefrom can be closed at a time, whereby the proper movements of the ventilator plates 27 of the system may be accomplished.

Carried at the end of the insulated arm 103 projecting outwardly of the slot way 104 in the cover portion 10' of the housing or casing 61, is an indicator member 106 preferably in the form of a small flat plate reversely curved at its opposite side edges to provide oppositely and outwardly extended corner portions 106' and 106'', each cooperative with complemental scales of grad-

uations extending parallel at opposite sides of the slot way 104, on the outer face of the cover portion 10′ whereby the positions of adjustment of the ventilators of a system may be readily observed and noted when desired.

From the foregoing, it will be readily apparent that, while preferred embodiments of the ventilating system have been described and illustrated herein in specific terms and details of construction, arrangement and operation, various changes in and modifications of the same may be resorted to without departing from spirit of the invention or the scope of the claims appended hereto.

Having thus fully described the invention, what is claimed is:—

1. A ventilator comprising a frame, a set of panel supports pivotally connected to each side of and arranged within the frame, the supports of one set aligning with the supports of the other set, each of said supports formed with an angularly disposed slotted arm, a panel mounted in each pair of aligning supports, a set of levers associated with each set of supports, pivot members connecting the ends of said levers together and to said arms, springs carried by the arms and bearing against said pivot members, and actuating means for said levers for opening and closing said panels with respect to each other, said pivot members being grooved for the reception of said springs and said springs overlapping said pivot members.

2. A ventilator comprising a frame, a set of panel supports pivotally connected to each side of and arranged within the frame, the supports of one set aligning with the supports of the other set, each of said supports formed with an angularly disposed slotted arm, a panel mounted in each pair of aligning supports, a set of levers associated with each set of supports, pivot members connecting the ends of said levers together and to said arms, springs carried by the arms and bearing against said pivot members, an electrically operated actuating means for said levers for opening and closing said panels relatively to each other, and a thermostatic controlling element for said electrically operated means, said pivot members being grooved for the reception of said springs and said springs overlapping said pivot members.

In testimony whereof, I affix my signature hereto.

THOMAS A. JENKINS.