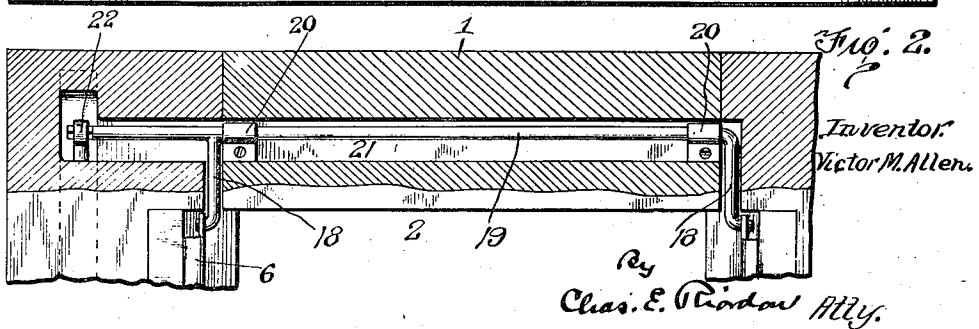
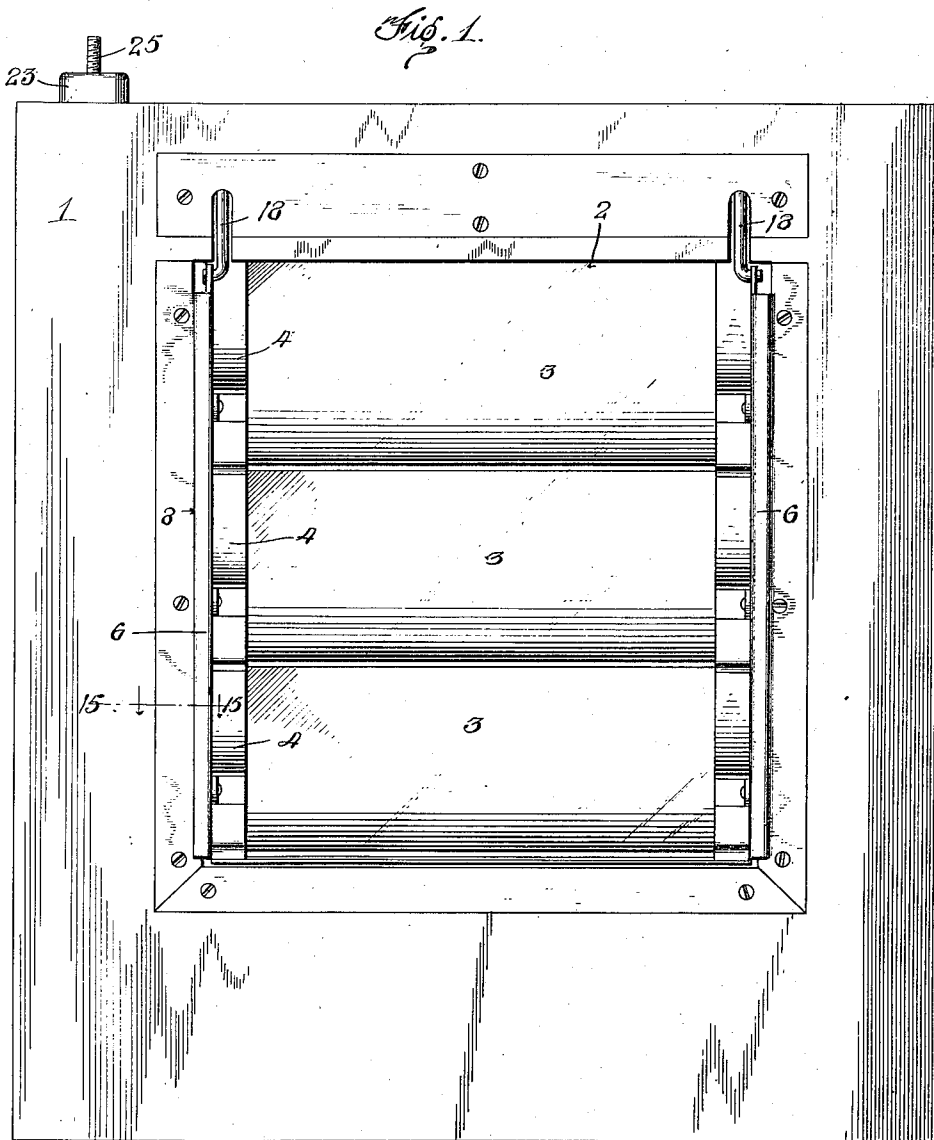


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 AUTOMATIC WINDOW VENTILATOR.
 APPLICATION FILED APR. 5, 1919.

1,335,929.

Patented Apr. 6, 1920.

5 SHEETS—SHEET 1.



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Fig. 3.
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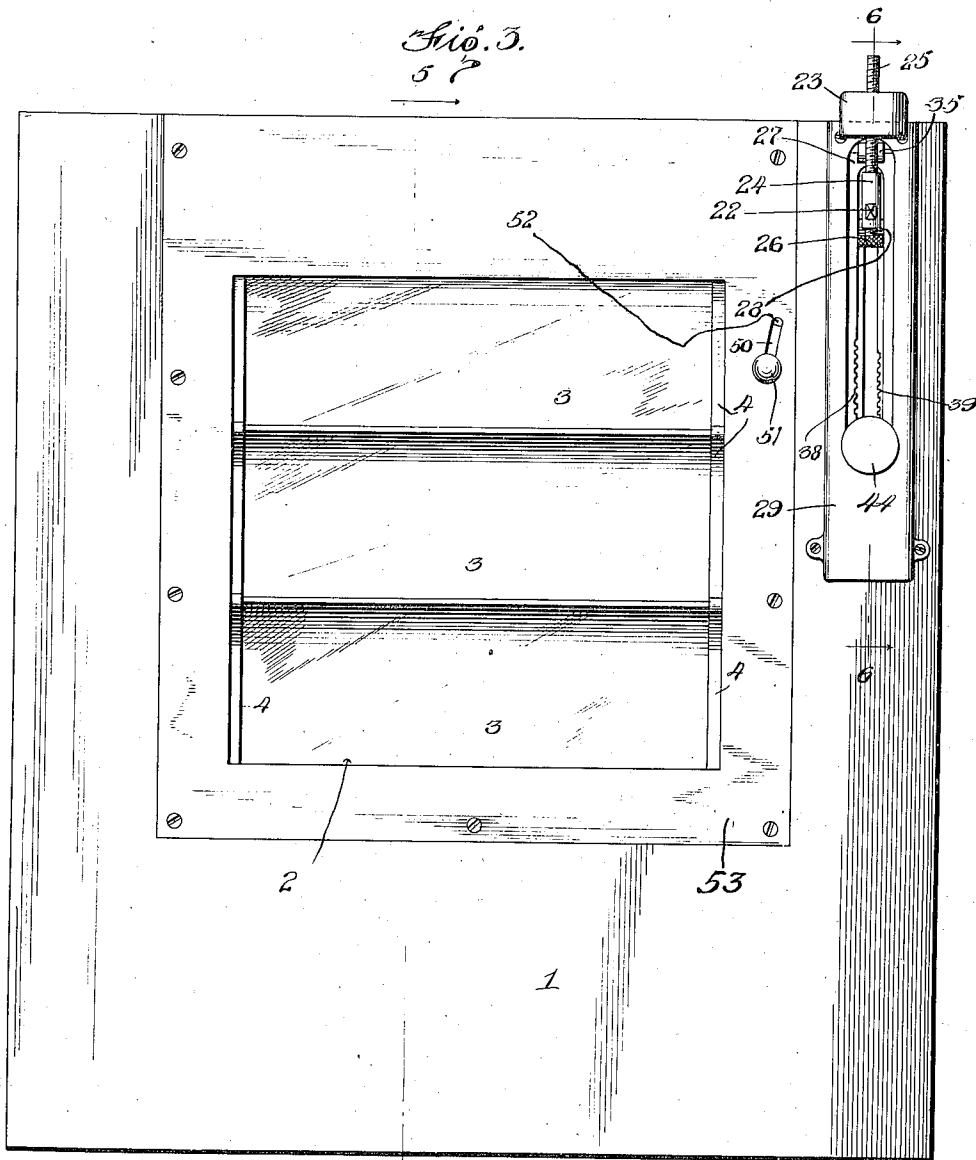
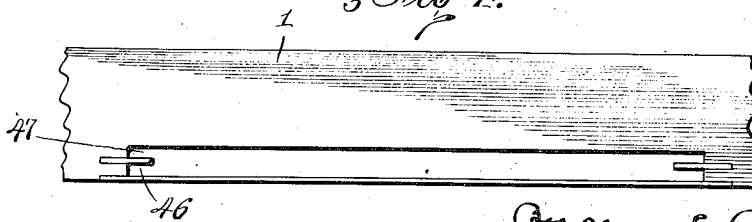


Fig. 4.
58



Inventor:
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By Chas. E. Riordan

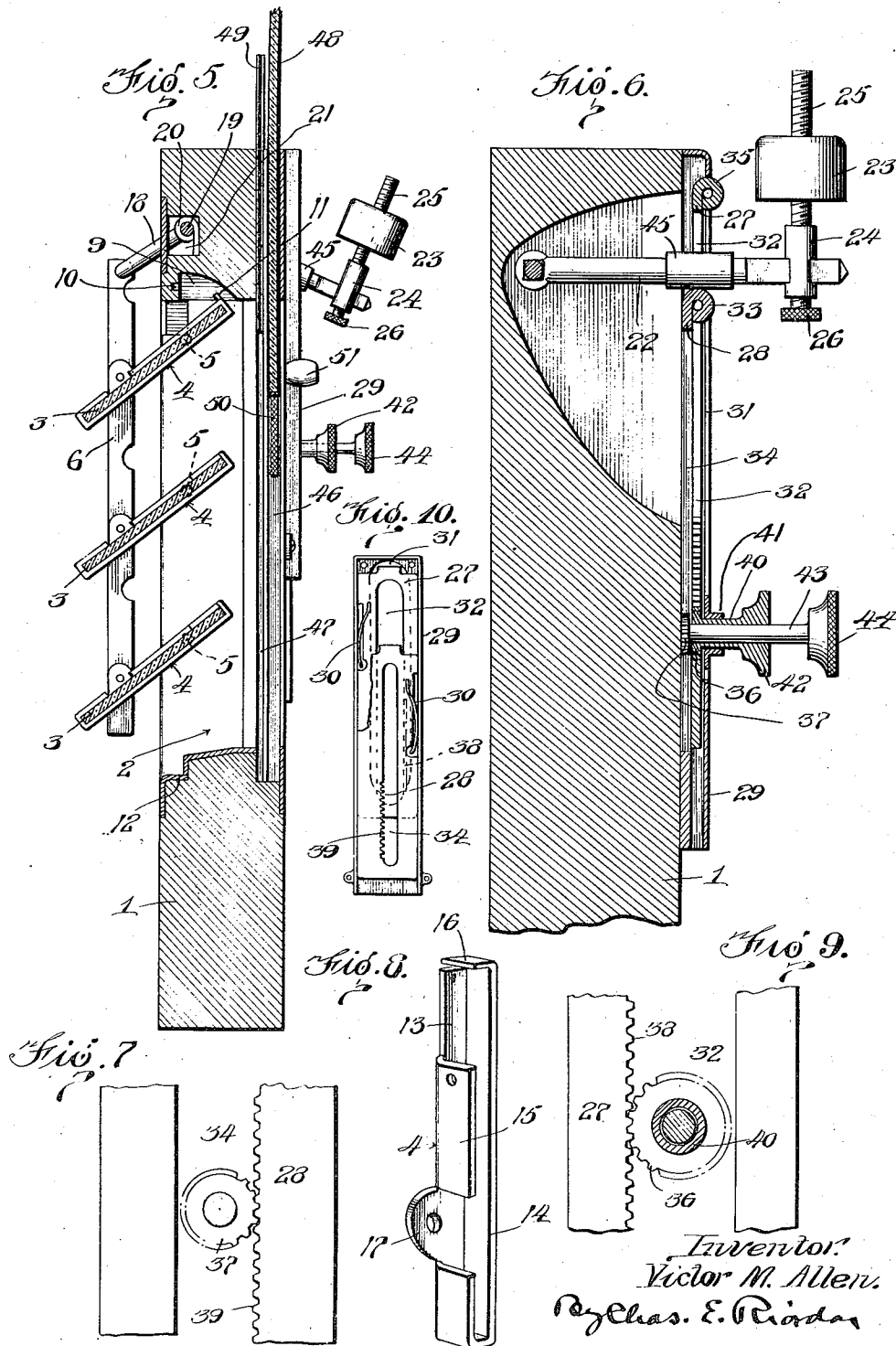
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5 SHEETS—SHEET 3.



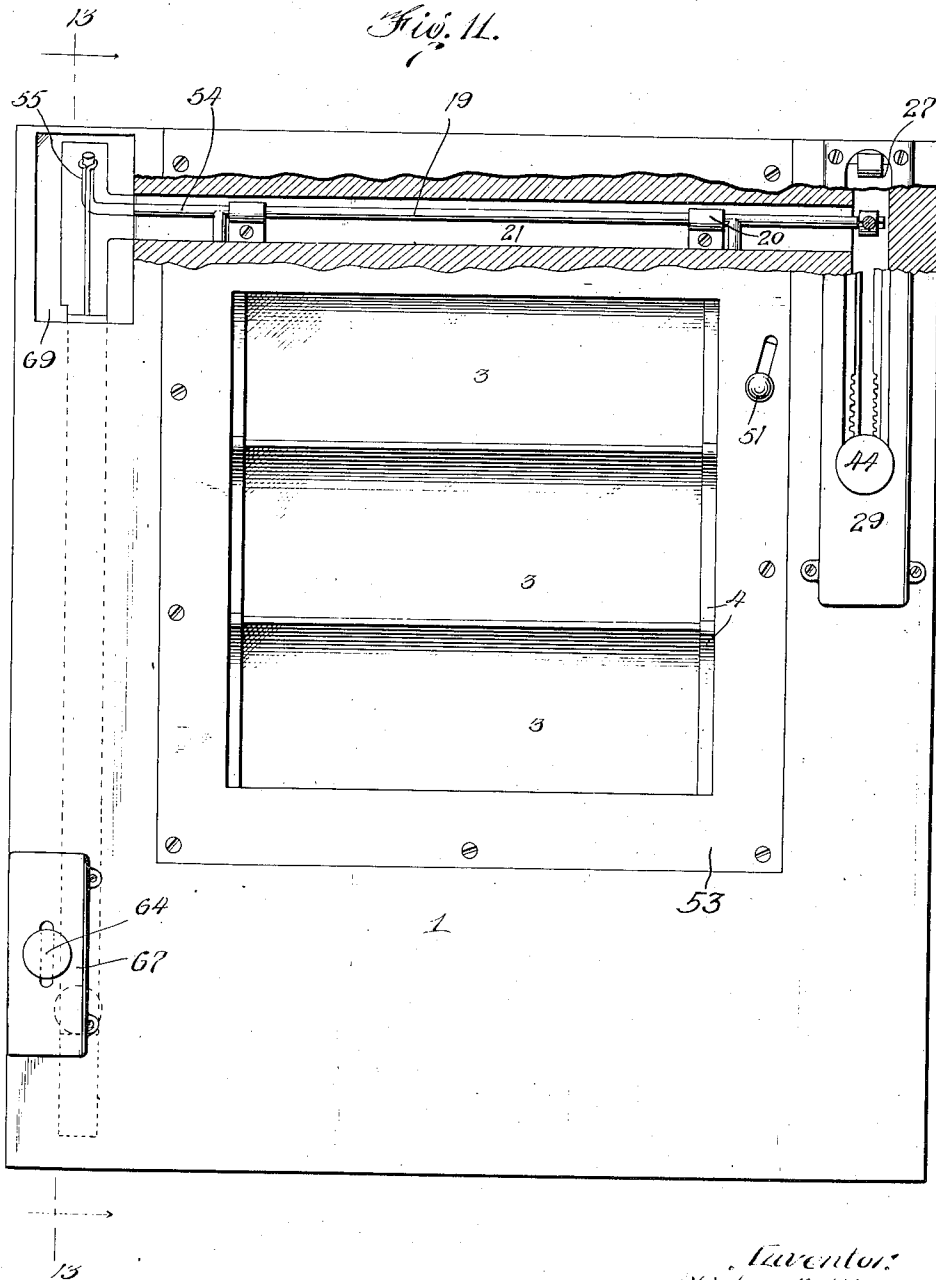
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5 SHEETS—SHEET 4.



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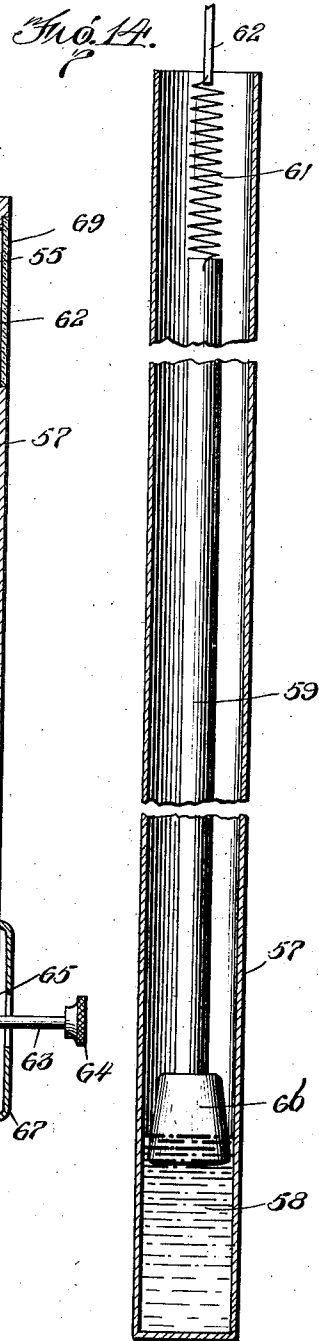
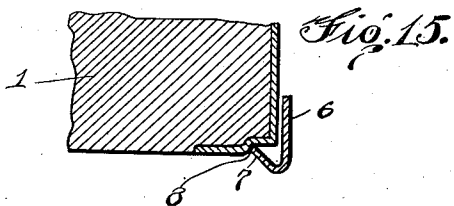
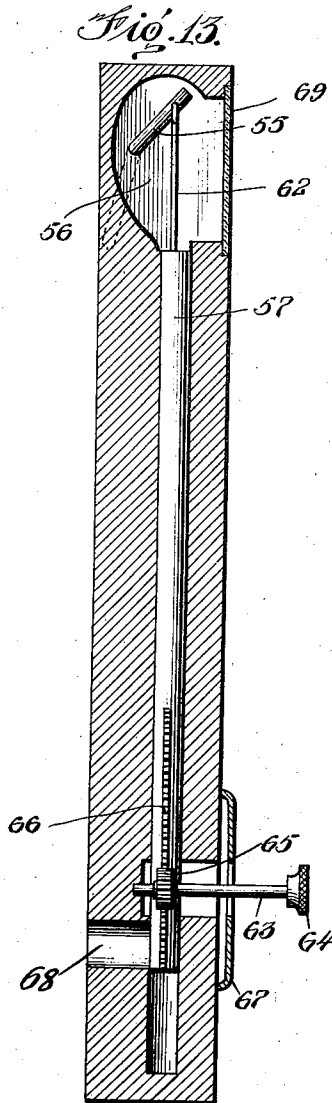
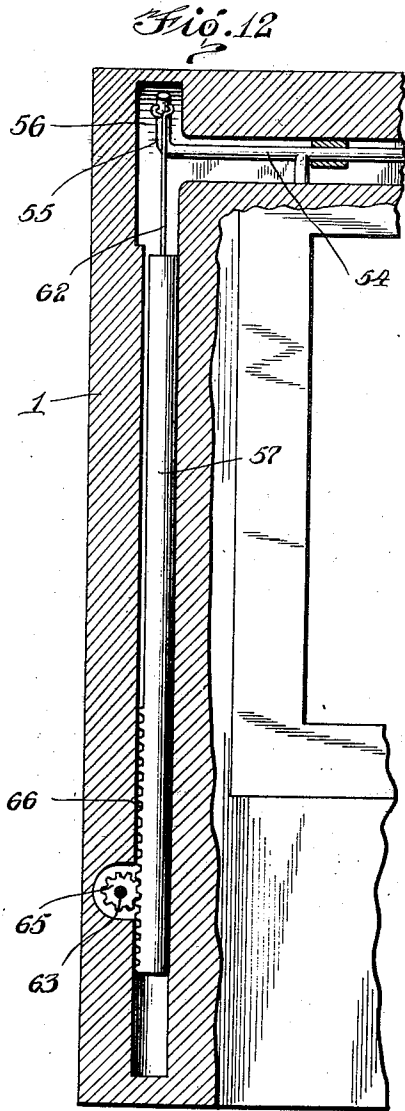
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

VICTOR M. ALLEN, OF WAVERLY, NEW YORK.

AUTOMATIC WINDOW-VENTILATOR.

1,335,929.

Specification of Letters Patent.

Patented Apr. 6, 1920.

Application filed April 5, 1919. Serial No. 287,858.

To all whom it may concern:

Be it known that I, VICTOR M. ALLEN, a citizen of the United States, and a resident of Waverly, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Automatic Window-Ventilators, of which the following is a specification.

This invention relates to automatic window ventilators, and has for its object to provide a device of this kind with improved means for adjusting the panels of the ventilator so that they may be partially or entirely closed by a high wind but will be automatically opened again to a predetermined extent after the wind has subsided.

A further object is to construct the counterbalance for the panels in such a way that the leverage of said counterbalance will increase as the weight of the panels increase in being moved from closed to open position.

Another object is to provide means adapted to be operated from the inside of the window for setting limits for the automatic movements of the panels whereby the latter may be initially adjusted to normally stand open at any desired extent and to close entirely or to any desired degree under the action of the wind.

The invention also contemplates the use of a sash in connection with the ventilator and the provision of means for locking said sash at different adjustments so as to cover the ventilator to any desired degree for further determining the amount of air admitted according to climatic conditions.

Another object is to provide temperature controlled means for automatically actuating the ventilator panels so as to move them toward closed position when the temperature drops to a predetermined extent and to move them back again to normal position when the temperature rises once more. Means for adjusting said temperature controlled means to bring it into automatic operation only when certain temperatures are reached may also be provided.

Other objects will appear as the description proceeds.

The invention will be first hereinafter described in connection with the accompanying drawings, which constitute part of this specification, and then more specifically defined in the claims at the end of the description.

In the accompanying drawings, wherein

similar reference characters are used to designate corresponding parts throughout the several views—

Figure 1 is an elevation of a window ventilator constructed substantially in accordance with the present invention, looking at the same from the outside.

Fig. 2 is a broken vertical section through the upper part of the frame of the ventilator to show the rock shaft for controlling the movements of the panels.

Fig. 3 is an elevation of the ventilator from the inside.

Fig. 4 is a broken top edge view of the ventilator frame to show the grooves to receive the sash and the screen.

Fig. 5 is a central vertical section through the ventilator, showing the panels in open position and the sash partially lowered.

Fig. 6 is a vertical section taken through the upper portion of the frame of the ventilator and the center of the adjustable stops or slides for regulating the extent to which the panels may be opened.

Fig. 7 is a detailed view of the gear and rack for adjusting the lower stop or slide.

Fig. 8 is a detailed perspective view of one of the panel supports.

Fig. 9 is a detailed view of the gear and rack for adjusting the upper stop or slide which controls the extent of movement of the panels.

Fig. 10 is a detailed elevation of the casing for the adjustable stops or slides looking at the same from the inner face thereof which is presented to the frame of the ventilator, and showing the means for retaining said slides in set positions.

Fig. 11 is a broken inside elevation of a modified form of ventilator provided with temperature controlled means for actuating the panels.

Fig. 12 is a broken sectional view through the part of the frame in which the temperature controlled device is arranged the section being taken vertically from side to side of the frame.

Fig. 13 is a section taken vertically from front to back through the same parts.

Fig. 14 is a detailed section vertically through the mercury tube and float supported weight which constitute essential parts of the temperature controlled device; and

Fig. 15 is a detailed cross section through one of the edges of the ventilating openings in the frame, showing the weatherproof

flange on one of the strips which connect the panels for operation in unison.

Referring first to Figs. 1 to 10, inclusive, 1 designates a frame which may be of any suitable dimensions to fit in a window, and 2 the ventilating opening through said frame. A plurality of horizontal panels 3 of glass or other transparent material are carried in supports 4 which are pivoted at 5 to the inner lateral edges of said ventilating opening in the frame. The lower edge of each panel overlaps the upper edge of the next lower panel on the outside when closed, and said panels are pivoted nearer their upper edges so that they will be normally closed by gravity.

The ends of the panels are connected together below their pivots 5 by strips 6 by which all of the panels are actuated in unison. Each of these strips is provided with an inwardly turned flange 7, Fig. 15, which engages a groove 8 in the side of the ventilating opening 2, when the panels are closed, for keeping out the weather. The upper edge of the ventilating opening overlaps the upper edge of the top panel, as at 9, Fig. 5, and has a horizontal groove 10 in its inner face to receive an outwardly projecting packing strip 11 on the outer face of the upper edge portion of the top panel, when the latter is closed, in order to make the top as well as the side of the ventilator weatherproof. The lower edge of the bottom panel when closed overlaps a sill 12, at the bottom of the ventilating opening 2, and fits loosely enough to permit any water which may be forced through between the overlapping panels by a heavy wind to run out and be discharged on the outside of the ventilator instead of entering the room.

As illustrated in Fig. 8 each of the supports 4 for the transparent panels 3 is preferably made of a single piece of sheet metal bent to form a base portion 13 to cover the end of the panel, flanges 14 and 15 to engage the inner face, lower edge and part of the outer face of the panel, a tongue 16 to engage the upper edge of the panel, and a pivot lug 17, formed as an extension of the base 13 between the flanges 14 and 15. The tongue 16 is bent out of the way when the panel is inserted into the support, and afterward turned back to the position shown for retaining said panel in the support.

The strips 6 are connected at their upper ends respectively to crank arms 18 depending from a rock shaft 19 journaled in suitable hinge lugs 20 and housed in a recess 21 in the upper portion of the frame over the opening 2, as shown, in Fig. 2. On one end of the rock shaft there is fixed a lever 22 extending beyond the inner face of the frame and carrying a weight 23 for counterbalancing the panels and yieldingly holding them open against the force of gravity

which, as has been already explained, serves to hold them normally closed. The weight 23 is vertically adjustable on a carrier 24, as by engaging screw threads 25, on the latter, or otherwise, and said carrier is horizontally adjustable along the lever 22, being retained in adjusted position by a set screw 26 or the like. This double adjustment of the weight on the lever provides for increasing leverage as the panels are opened and said lever swings downward, so as to offset the increased weight of the panels as they are swung upwardly toward fully opened position, as indicated in Fig. 5. In this figure it will be seen that the weight is farther removed from the fulcrum on the rock shaft 19 measuring in a horizontal line, than when the lever is horizontal as in Fig. 6. The weight 23 may be set to nicely counterbalance the panels so that a slight wind will close them, as in a hospital where it is desirable to keep the patients out of any draft, or said weight may be adjusted to hold the panels open against all but strong winds so as to permit the air to enter when only moderate winds are blowing, which would be desirable in gymnasiums where persons are exercising, for instance.

It is desirable to limit the movements of the panels, as will be readily appreciated, so that they will not be entirely opened or closed under varying climatic conditions. This may be done in the present invention through the use of a pair of adjustable slides or stops 27 and 28, the former adapted to limit the upward movement of the lever 22 and consequently the extent of closing of the panels, while the latter slide 28 is designed to limit the downward movement of the lever and the extent of opening of the panels. These slides are mounted in a casing 29 which is suitably secured to the inner face of the frame 1, and they are retained in adjusted position by leaf springs 30 interposed between the edges of the slides and the sides of the casing, as shown in Fig. 10. The casing has a slot 31 through which the lever 22 extends. The slide 27 also has a slot 32 through which the lever extends and into which the head 33 or stop proper on the slide 28 projects. The slide 28 has a slot 34 registering with the slot 32 but of different width.

The slide 27 has also a head or stop proper 35, which may project into the slot 31 in the casing 29. The slides may be adjusted vertically by means of pinions or gears 36 and 37 meshing respectively with racks 38 and 39 on opposite edges of the slots 32 and 34. The gear 36 is mounted on a tubular spindle 40 journaled at 41 in the casing 29, and having a milled head 42 for rotating said spindle and gear. The gear 37 is mounted on a spindle 43 running through the hollow spindle 40 and carry-

ing a milled head 44 for rotating said gear. In this way the upper and lower stops 33 and 34 may be readily adjusted by rotating the corresponding heads 42 and 44.

5 The lever 22 may be provided with a buffer 45 of rubber or other suitable material to prevent direct contact between the said lever and the stops 33 and 34 and eliminate objectionable noise of metal striking against metal which would be caused thereby. Any or all other striking parts of the device may also be equipped with buffers or sound deadeners, if desired.

10 At the inner edge of the opening 2 grooves 46 and 47, Figs. 4 and 5, are provided for the insertion of a sash 48 and a screen 49, respectively. It will be understood that either the screen or sash or both may be used or not as may be desired. When the sash is used it may be fastened at any point by a wedge-shaped clamp block 50, having its sash-engaging edge serrated as shown in Fig. 5 and controlled by a knob 51 projecting through and guided in an inclined slot 52 in a metal frame 53 surrounding the opening 2 in the frame 1, as also shown in Fig. 3.

Referring to Figs. 11 to 14, inclusive, the structure of the ventilator there shown is the same as already described except that additional mechanism is provided for automatically actuating the panels according to the temperature. The rock shaft 19 is provided with an extension 54 having a crank arm 55 housed in the upper end portion of a vertical recess 56 in the side of the frame 1. In the lower part of said recess there is adjustably arranged a vertical tube 57 containing a suitable amount of mercury 58. A weight in the form of a rod 59 is supported on the surface of the mercury by a float 60, and the upper end of said weight is connected to the crank arm 55 by a coiled spring 61 and wire 62. The tube 57 may be adjusted bodily up and down in the recess 56 by means of a spindle 63 carrying a milled knob 64 at its outer end and a gear 65 on its inner end portion, said gear meshing with a rack 66 on the tube.

By this means the tube may be adjusted as desired to correspond with normal temperatures, so that when the temperature fluctuates the rise or fall of the mercury will raise or lower the weight 59 and act upon the rock shaft 19 through the spring 61 and wire 62, to move the panels of the ventilator toward open or closed position. The rock shaft is normally balanced so nicely by the counterbalance 23 and weight 59 that the raising of said weight will bring the counterbalance 23 into play to move the panels toward open position, while the fall of the weight 59 will exert sufficient pull on the arm 55 to overcome the counterbalance

and swing the panels toward closed position. In this way a drop in temperature will automatically result in fully or partially closing the panels, while a rise in temperature will have the effect of opening said panels. This feature of the invention is especially useful in Northern States where considerable changes in temperature occur during the night, and the ventilator may be automatically closed to protect sleepers from the cold and opened again to admit air when the temperature moderates.

The spindle 63 may extend through a metal plate 67 secured to the inner face of the frame 1. The lower end portion of the recess 56 is in communication with the outside of the frame through a bore or opening 68, Fig. 13, so that the outside temperature may act directly upon the mercury containing portion of the tube 57. A transparent panel 69 is preferably placed on the inside of the frame 1 opposite the crank arm 55, so that when the mercury tube is adjusted, the result of such adjustment may be observed on the position of said arm. The spring 61 cushions the action of the weight 59 on the panels, so that sudden temperature changes will not cause the latter to be broken.

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

1. In a window ventilator, the combination with a movable panel, of means for counterbalancing said panel for normally holding it in open position but permitting it to close under the action of high winds, said counterbalancing means exerting a greater leverage as the panel becomes farther open for the purpose specified.

2. In a window ventilator, the combination with a panel pivoted to swing on a horizontal axis, of a rock shaft having a crank arm, means of connection between said crank arm and the panel, a lever secured to said rock shaft, and a counterbalancing weight adjustable vertically on said lever for the purpose specified.

3. In a window ventilator, the combination with a panel pivoted to swing on a horizontal axis, of a rock shaft having a crank arm, means of connection between said crank arm and the panel, a lever secured to said rock shaft, and a counterbalancing weight adjustable vertically and horizontally on said lever for the purpose specified.

4. In a window ventilator, the combination with a panel pivoted to swing on a horizontal axis, of a rock shaft having a crank arm, means of connection between said crank arm and the panel, a lever secured to said rock shaft, a counterbalancing weight on said lever, and an adjustable stop for limiting the movement of said lever.

5. In a window ventilator, the combination

tion with a panel pivoted to swing on a horizontal axis, of a rock shaft having a crank arm, means of connection between said crank arm and of the panel, a lever secured to said rock shaft, a counterbalancing weight on said lever, and adjustable stops for limiting the movement of said lever in both directions.

6. In a window ventilator, the combination with a panel pivoted to swing on a horizontal axis, of a rock shaft having a crank arm, means of connection between said crank arm and the panel, a lever secured to said rock shaft, a counterbalancing weight on said lever, adjustable stops for limiting the movement of the lever in opposite directions, racks on said stops, and concentric gears for actuating said racks.

7. In a window ventilator, the combination with a panel pivoted to swing on a horizontal axis, of a rock shaft having a crank arm, means of connection between said crank arm and the panel, a lever secured to said rock shaft, a counterbalancing weight on said lever, adjustable stops for limiting the movement of the lever in opposite directions, racks on said stops, concentric gears for actuating said racks, a spindle for rotating one of said gears, and a tubular spindle surrounding the first mentioned spindle for rotating the other gear.

8. In a window ventilator, the combination with a panel pivoted to swing on a horizontal axis, of a rock shaft having a crank arm, means of connection between said crank arm and the panel, a lever secured to said rock shaft, a counterbalancing weight on said lever, an adjustable slide having a slot through which the lever extends and which serves as a stop for limiting the movement of the lever in one direction, and another adjustable slide having a portion arranged in the slot of the first slide to serve as a stop for limiting the movement of the lever in the opposite direction.

9. In a window ventilator, the combination with a panel pivoted to swing on a horizontal axis, of a rock shaft having a crank arm, means of connection between said crank arm and the panel, a lever secured to said rock shaft a counterbalancing weight on said lever, an adjustable slide having a slot through which the lever extends and which serves as a stop for limiting the movement of the lever in one direction, another adjustable slide adapted to serve as a stop for limiting the movement of the lever in the opposite direction, the second slide also having a slot in line with the slot in the first slide, racks on opposite edges of said slots, and gears meshing with said racks for adjusting the slides.

10. In a window ventilator, the combination with a panel pivoted to swing on a horizontal

axis, of a rock shaft having a crank arm, means of connection between said crank arm and the panel, a lever secured to said rock shaft, a counterbalancing weight on said lever, adjustable slides carrying stops for limiting the movement of the lever, a casing for housing said slides, means for adjusting the slides in the casing, and leaf springs interposed between the slides and casing for retaining said slides in set positions.

11. In a window ventilator, the combination with a movable panel, of a mercury tube, a weight in said tube, a float supporting the weight on the surface of the mercury, and operative means of connection between said weight and the panel for moving the latter toward open or closed position as the mercury rises or falls.

12. In a window ventilator, the combination with a movable panel, of a mercury tube, a weight in said tube, a float supporting the weight on the surface of the mercury, operative means of connection between said weight and the panel for moving the latter toward open or closed position as the mercury rises or falls, and means for adjusting the mercury tube vertically for the purpose specified.

13. In a window ventilator, the combination with a movable panel, of means for counterbalancing said panel for yieldingly holding it in open position, a mercury tube, a float on the surface of the mercury in the tube, and means of connection between the float and counterbalancing means, including a coiled spring for the purpose specified.

14. In a window ventilator, the combination with a frame, of a plurality of panels pivoted in said frame, strips pivotally connecting the panels together for causing them to move in unison, and flanges on said strips to overlap the frame, when the panels are closed, for the purpose specified.

15. In a window ventilator, the combination with a frame having grooves in its edges, of a plurality of panels pivoted in said frame, strips pivotally connecting the panels together for causing them to move in unison, and flanges on said strips to overlap the edges of the frame and engage in the grooves therein, when the panels are closed, for the purpose specified.

16. In a window ventilator, the combination with a frame having an undercut recess in its upper edge with a groove in its face, of a panel pivoted in the frame to swing on a horizontal axis and having its upper edge adapted to enter said recess in the frame when the panel is closed, and a strip arranged along the upper edge of the panel to engage the groove in the face of the recess for the purpose specified.

VICTOR M. ALLEN.