Dec. 19, 1939. L. H. BEAN 2,183,955

AUTOMATIC VENTILATOR

Filed Aug. 29, 1938 2 Sheets-Sheet 1

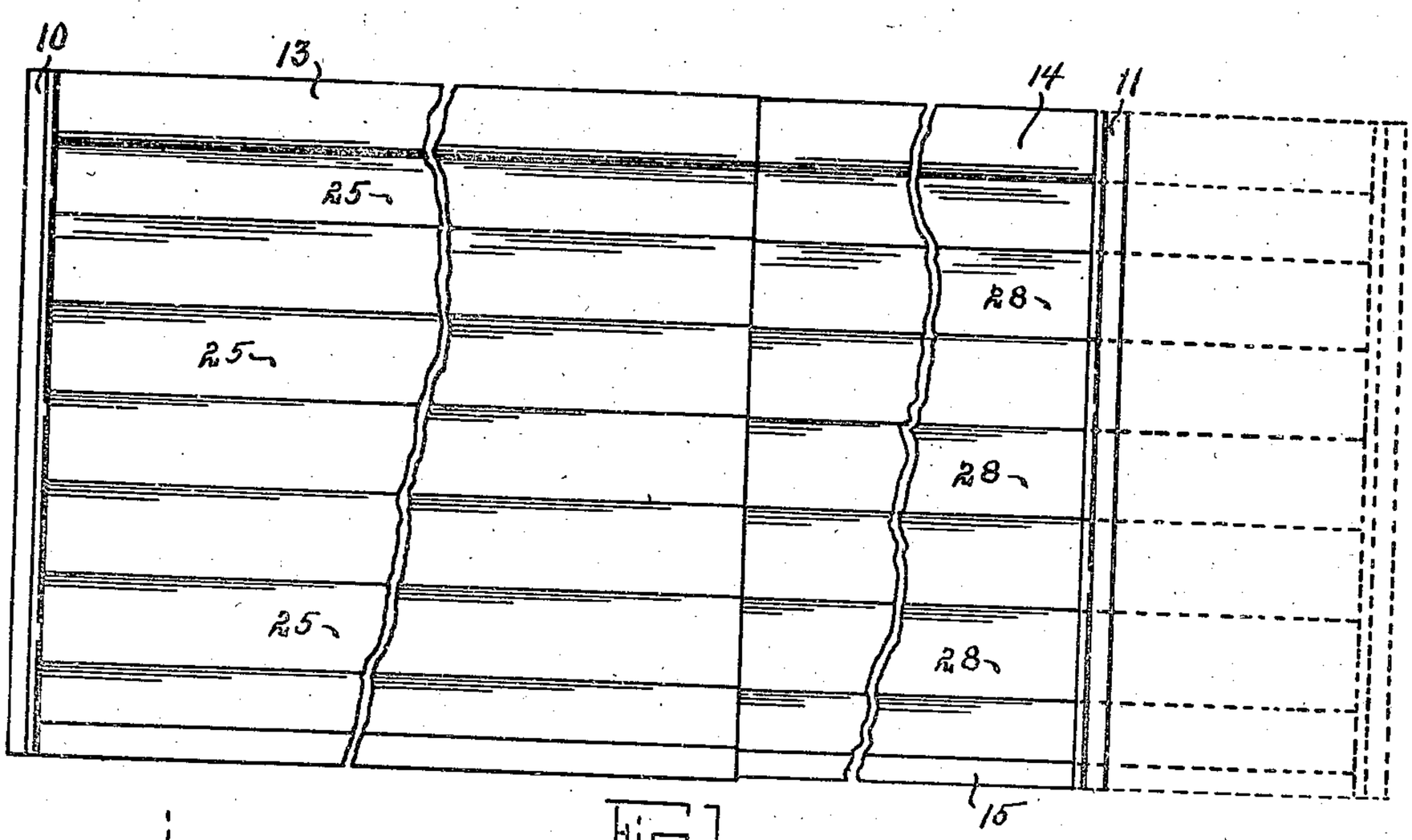

Fig. 1

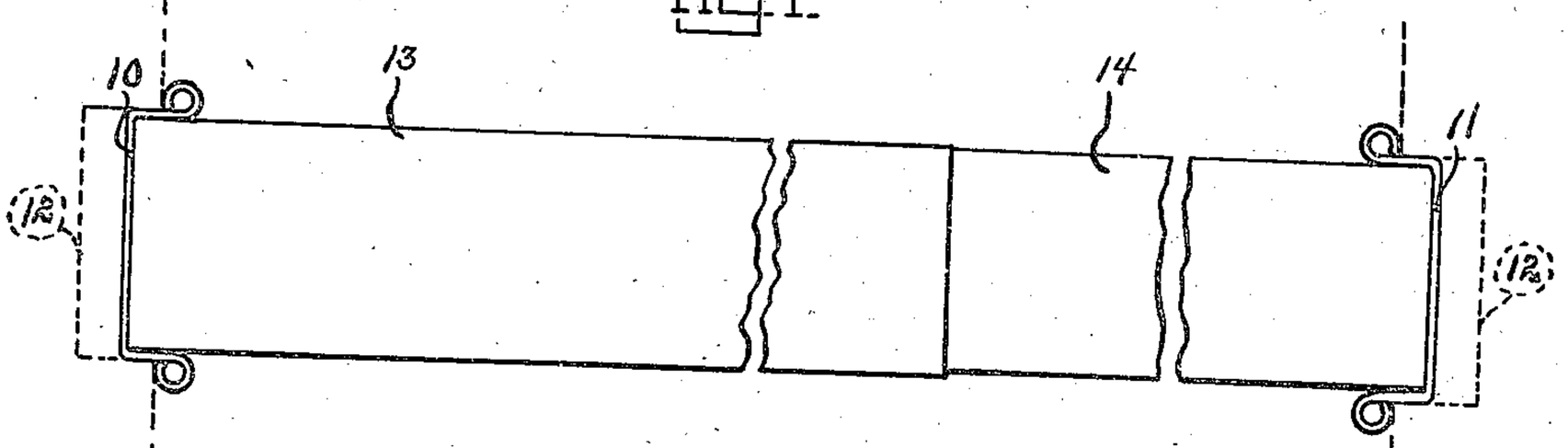

Fig. 2

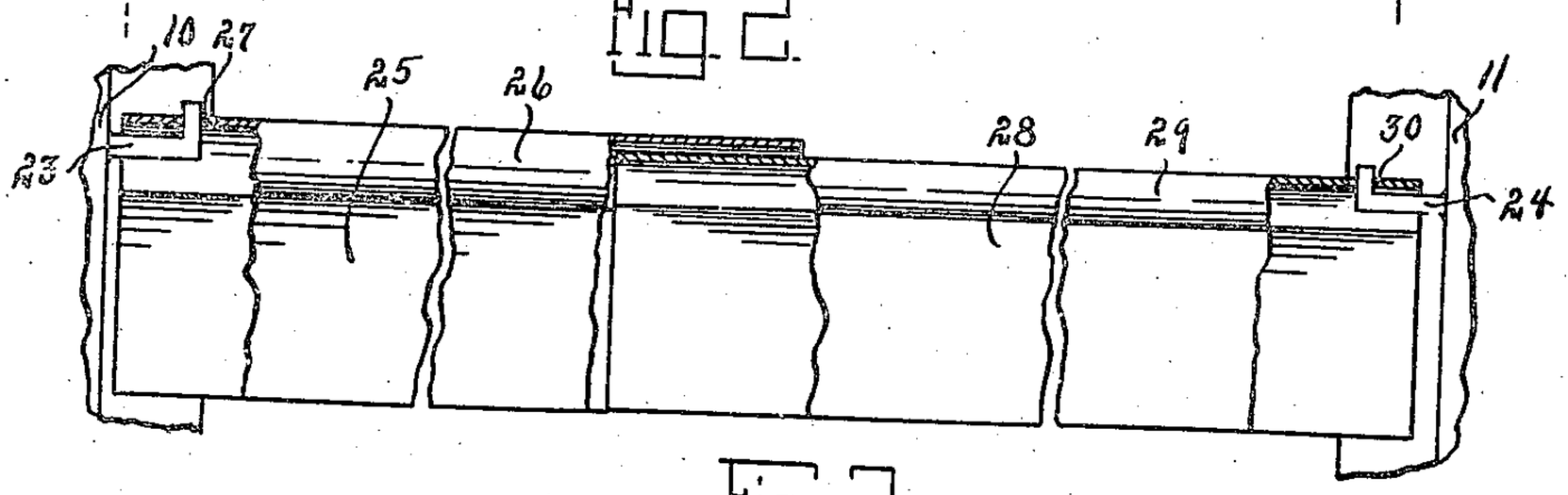

Fig. 3

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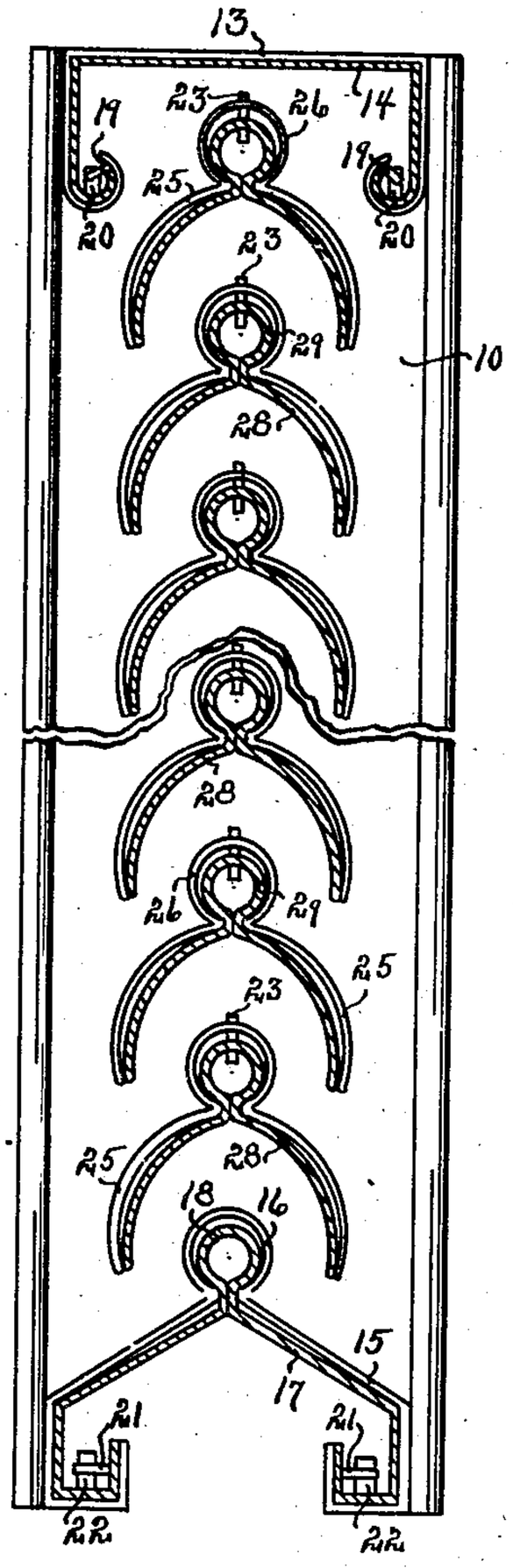

Fig. 4.

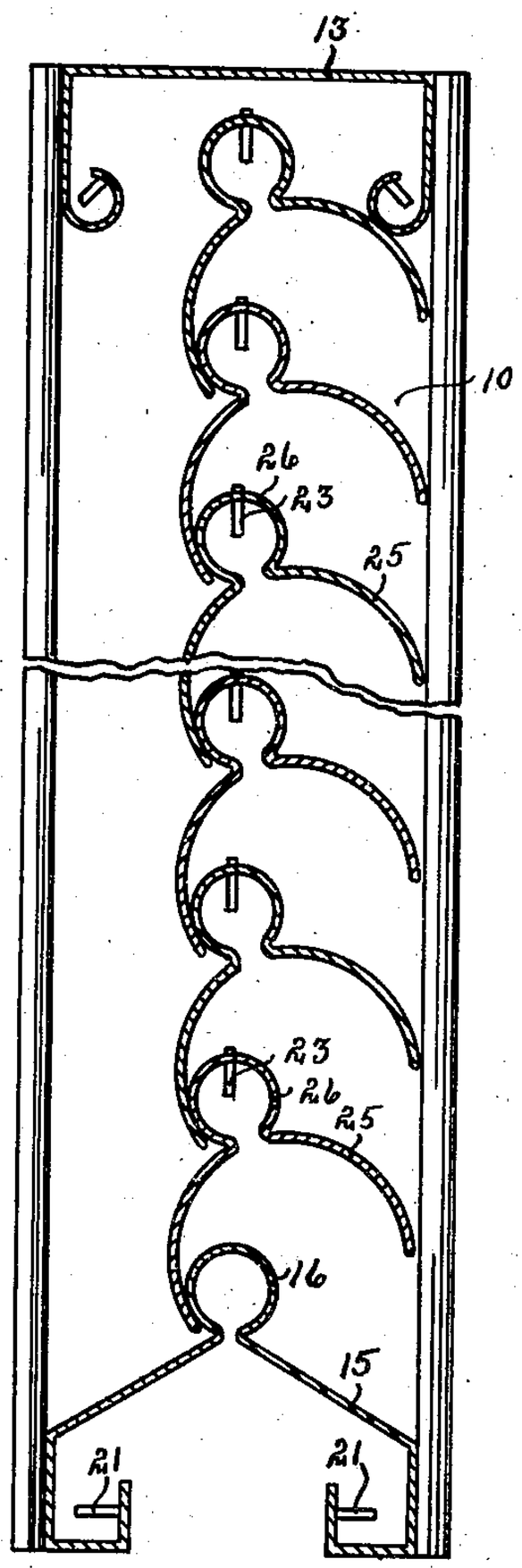

Fig. 5.

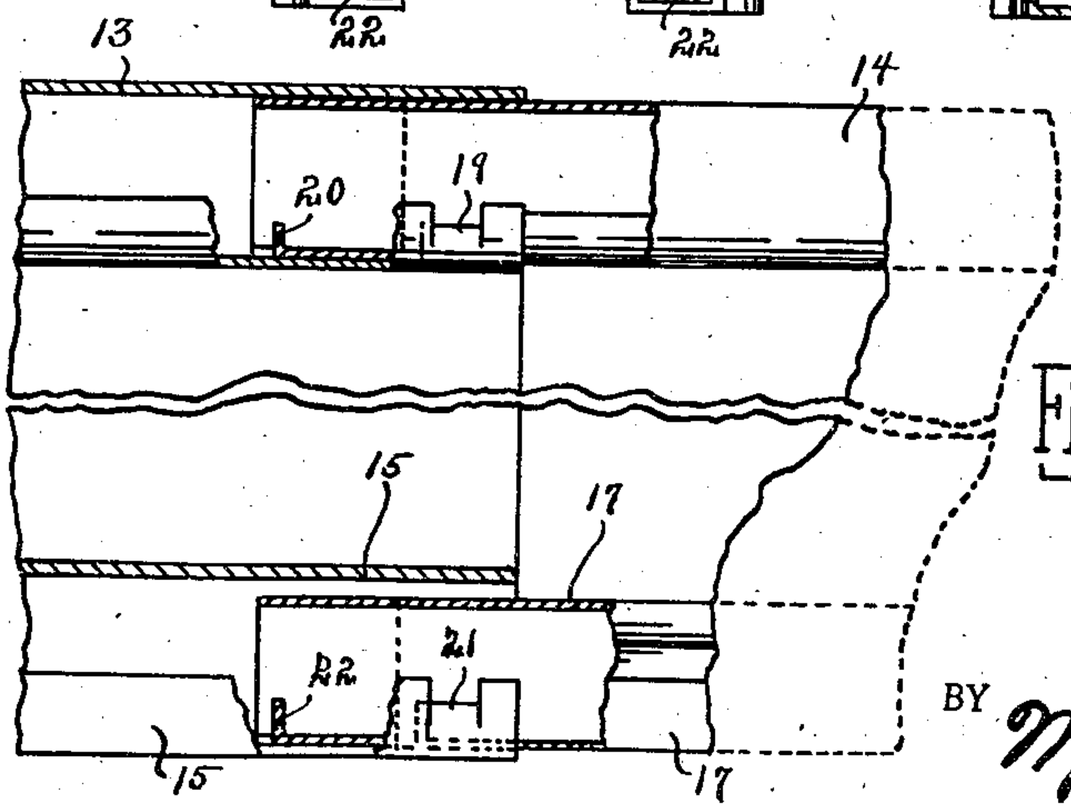

Fig. 6.

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UNITED STATES PATENT OFFICE

2,183,955

AUTOMATIC VENTILATOR

Leslie H. Bean, Des Moines, Iowa

Application August 29, 1938, Serial No. 227,318

3 Claims. (Cl. 98—99)

The principal object of my invention is to provide a ventilator for windows and like openings that automatically yieldingly closes when subjected to storm or a bad wind and then automatically opens after the storm has passed or wind has gone down.

A further object of my invention is to provide an automatic ventilator that approaches a closed condition relative to the force of draft passing through it.

A still further object of my invention is to provide an automatic ventilator that may be easily and quickly adjusted to fit various window or like widths.

A still further object of this invention is to provide an automatic ventilator that is economical in manufacture and durable in use.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Fig. 1 is a side view of my ventilator shutter with sections cut away and with dotted lines to illustrate its telescoping feature for fitting various window widths.

Fig. 2 is a top plan view of my device with dotted lines showing how it fits into a window frame.

Fig. 3 is a side view of one of the vanes of the device.

Fig. 4 is a cross sectional view of my ventilator with its movable vanes in open positions.

Fig. 5 is a cross sectional view of my device with its movable vanes in closed positions.

Fig. 6 is a front sectional view of my device more fully illustrating the stop means.

There are many types of ventilator shutters for window openings on the market. Such shutters are usually of the rigid type having a frame which engages the bottom and sides of the window frame and the under edge of the window. The objections to these ventilators, however, are that the amount of air passing through them depends entirely upon the force of the wind and they do not automatically close during a bad wind storm. I have overcome such objections by providing an adjustable window ventilator that automatically regulates and controls the amount of air passing through it and in case of bad storms, automatically closes, thereby eliminating the necessity during such times of manually removing the same from the window frame and shutting the window.

Referring to the drawings, I have used the numerals 10 and 11 to designate the two vertical frame end portions of my device. These two end portions have their center portions restricted to enter a window frame 12 as shown by dotted lines in Fig. 2. The numeral 13 designates an upper portion of the frame of the device rigidly secured to the upper end of the member 10. This member 13 extends horizontally and is of inverted trough construction having its lower side edges curved inwardly as shown in Fig. 4. A similar member 14 extends horizontally from and is rigidly connected to the upper end of the member 11. This upper frame portion 14 is also of inverted trough construction and has its two lower edges bent and curved inwardly. The inverted trough 14, however, is slightly smaller than the inverted trough 13 for permitting this member 14 to slide within and telescope within the member 13 as shown in Fig. 4. The numeral 15 designates the lower portion of a frame rigidly secured to the lower end of the member 10. This member 15 extends horizontally from the member 10 and is of inverted U-shaped construction in cross section having its top sloping upwardly from both sides and terminating in a semi-circle portion 16 as shown in Fig. 4. The two lower edges of this member 15 each extend first inwardly and then upwardly to form a channel. The numeral 17 designates a quite similar member rigidly secured to the lower end of the member 11. This member 17 extends horizontally from the member 15 and also has its top extending inwardly and upwardly from its two sides and terminating in a circle or bead 18 as shown in Fig. 4. The dimensions of this member 17 are slightly less than the dimensions of the member 15 in order that the member 17 will slidably extend into and telescope within the member 15 as shown in the drawings. The lower edges of the frame member 17 extend inwardly and rest within the lower portions of the member 15 and the member 18 slidably extends within the member 16. From this construction it is obvious that a telescoping frame is provided having a side portion 10, a top portion consisting of members 13 and 14, a side 11, and a lower portion consisting of the members 15 and 17. Such a telescoping frame may be slidably extended or compressed to fit various window openings. This telescoping feature also makes possible the placement in or removal from a window frame casing as shown in Fig. 2. To prevent the complete

removal of the left section of the frame from the right section, I have provided stop means. In the curved side edges of the member 13, I have cut and bent ears 19 which are capable of being engaged by projections 20 cut and formed in the curved portions of the side edges of the member 14 as shown in Fig. 6. These members 19 are near the forward end of the member 13 and the projections 20 are near the forward end of the member 14. Obviously, the projections 20 will engage the ears 19 to prevent the complete withdrawal of the right side of the frame portion from the left side portion as far as the upper portion of the frame is concerned. The lower portion of the frame has similar stop means in that ears 21 are cut and bent in the forward end of the side edges of the member 15 and upwardly extending projections 22 are formed in the forward end of the side edges of the member 17 as shown in Fig. 6 and Fig. 4. These stop projections 20 and 22 prevent the complete withdrawal of the two frame sections from each other. The numeral 23 designates a plurality of spaced apart vertically arranged bracket projections on the inner side of the member 10. The numeral 24 designates a similar bracket projection extending from the inner side of the member 11 and directly opposite the bracket projections 23 respectively. These bracket projections 23 and 24 extend horizontally inwardly and then upwardly as shown in Fig. 3, and are centrally located relative to the frame portions 10 and 11. The numeral 25 designates a plurality of movable shutter vanes. Each of these vanes are inverted U-shaped in cross section having a semi-circle portion 26 at their centers as shown in Fig. 5. From this top center-circular portion the vanes extend downwardly and outwardly in curved paths. The numeral 27 designates a hole in the top of each of the elongated shutter vanes near the left end of each of the shutter vanes. On each of the bracket projections 23 is a shutter vane and this is accomplished by the upwardly extending portion of each of the bracket projections 23 extending through an opening 27 of a shutter vane. The bracket projections 23 are so spaced apart, and the shutter vanes are of such dimensions that the lower side portions of a shutter vane will extend in spaced relationship around the portion 26 of the shutter vane just below it as shown in Fig. 5. The lowermost of the shutter vanes 25 has its two lower sides loosely embracing the portion 26 of the member 15. As the center of gravity of each of the shutter vanes is below their pivot point on the brackets 23, these shutter vanes will normally suspend in positions as shown in Fig. 4. The numeral 28 designates the shutter vanes operating on the bracket projections 24 of the member 11. These shutter vanes 28 are in construction exact duplicates of the shutter vanes 25 except, they are slightly smaller in order to telescope and engage with the shutter vanes 25 as shown in Fig. 4. These shutter vanes 28 also have a center circular portion 29 similar to the portion 26 of the vanes 25. The portion 29 of the shutter vanes 28 slidably extend into the portions 26 of the shutter vanes 25. The numeral 30 designates an opening in the upper end portion of each of the shutter vanes 28 for receiving the upwardly extending portions of the brackets 24. By this construction, a shutter vane 25 engages a shutter vane 28 directly opposite from it and each such pair of shutter vanes provides to all intents and purposes a single elongated shutter vane suspended at one end by a bracket 23 and at the other end by a bracket 24. By the shutter vanes 25 being slidably connected to the shutter vanes 28, the complete device may be extended or telescoped for purposes of use.

Under normal conditions when my device is in an opening, the shutter vanes will be held by gravity in normal positions as shown in Fig. 4 and air will pass under the one side edge of the shutter, thence upwardly around the upper portion of the shutter just below it, and then downwardly and outwardly and through my ventilator. However, if the air velocity is seriously increased, it will move the lower ends of the shutters inwardly, thereby restricting the openings through which the air previously normally passed. This restriction of the openings through the device will at all times be relative to the velocity of the air passing through the device. If the velocity reaches storm proportions, it will move the lower sides of the shutters on the side of the wind completely inwardly to engage the center portions of the shutters directly below each shutter as shown in Fig. 5, thereby completely automatically closing my ventilator. Obviously, my ventilator acts as an automatic valve for controlling the flow of air in either direction through the device. As soon as the velocity of the air decreases to a point where gravity is the stronger of the two, the vanes will accordingly open and again permit circulation of air through the device. The owner may safely forget its installation as it will automatically regulate or completely cut off the amount of air passing through it. There is no cost to the operation of my device inasmuch as it functions entirely by the force of gravity as opposed to the force of the air current passing or attempting to pass through it. My device is easily manufactured as all of its parts may be stamped and bent from sheet metal material. When the device is partially closed or closed, the lower sides of the elongated shutters at the bottom of the device approach or engage the portions 16 and 18 of the frame and the uppermost shutters will approach or engage the curved lower side edges of the frames 13 and 14.

Some changes may be made in the construction and arrangement of my improved automatic ventilator without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a device of the class described, a frame, a plurality of shutter vanes each inverted U-shaped in cross section and having a circular housing along its center line, a second plurality of shutter vanes each inverted U-shaped in cross section and having a bead along its center line; said bead of each of said second mentioned shutter vanes slidably engaging the circular housing of one of said first mentioned shutter vanes.

2. In a device of the class described, a frame, a plurality of shutter vanes each inverted U-shaped in cross section and having a circular housing along its center line, a second plurality of shutter vanes each inverted U-shaped in cross section and having a bead along its center line; said bead of each of said second mentioned shutter vanes slidably engaging the circular housing of one of said first mentioned shutter vanes, and a means for pivotally mounting each set of shutter vanes in said frame.

3. In a device of the class described, a frame,

a plurality of shutter vanes each inverted U-shaped in cross section and having a circular housing along its center line, a second plurality of shutter vanes each inverted U-shaped in cross section and having a bead along its center line; said bead of each of said second mentioned shutter vanes slidably engaging the circular housing of one of said first mentioned shutter vanes; each of said shutter vanes having an opening in its end portion adjacent said frame, and a plurality of projections on said frame engaging the openings in said shutter vanes respectively.

LESLIE H. BEAN.