

June 4, 1940.

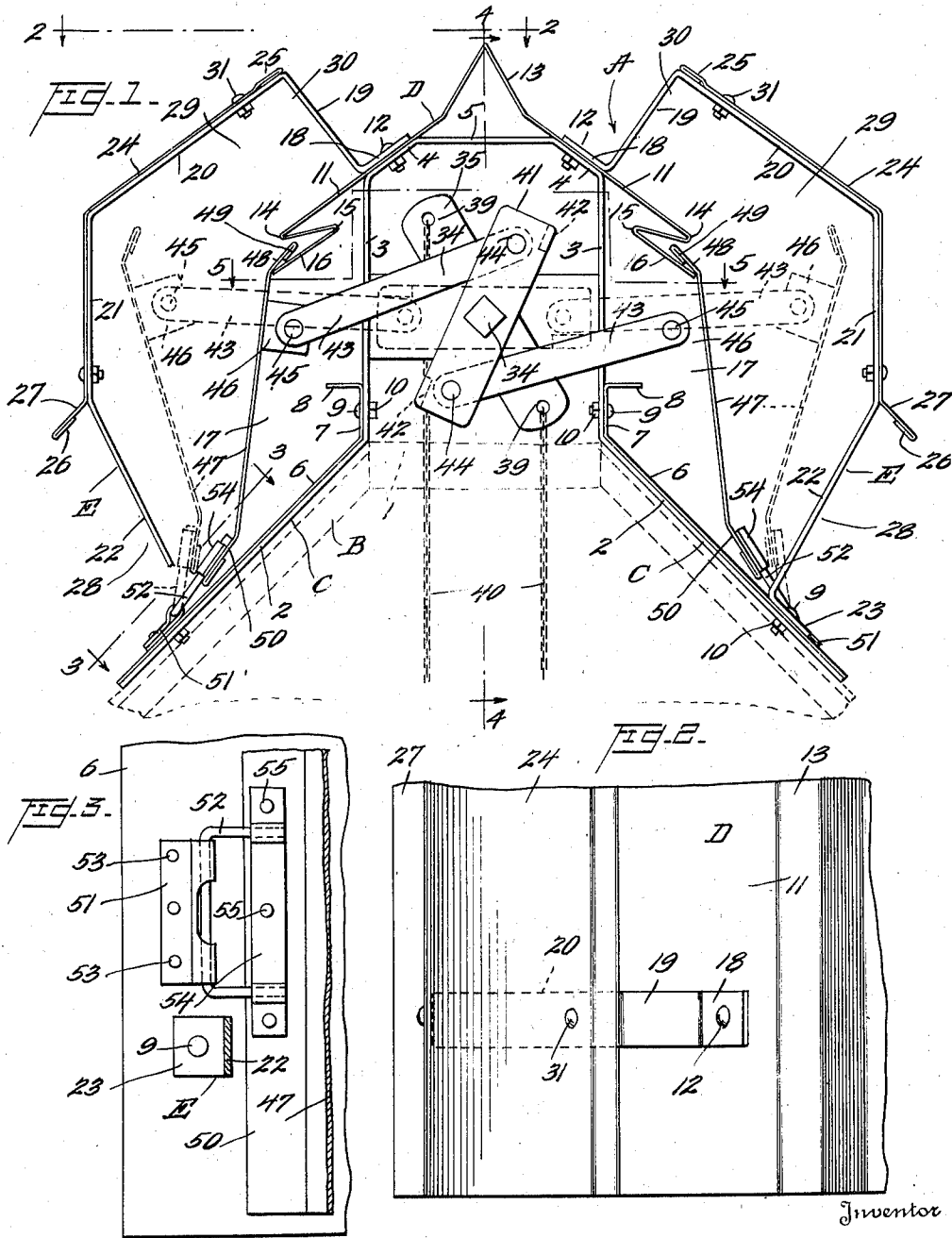
C. L. SCHILLING

2,203,444

VENTILATOR

Filed Aug. 20, 1937

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 4.

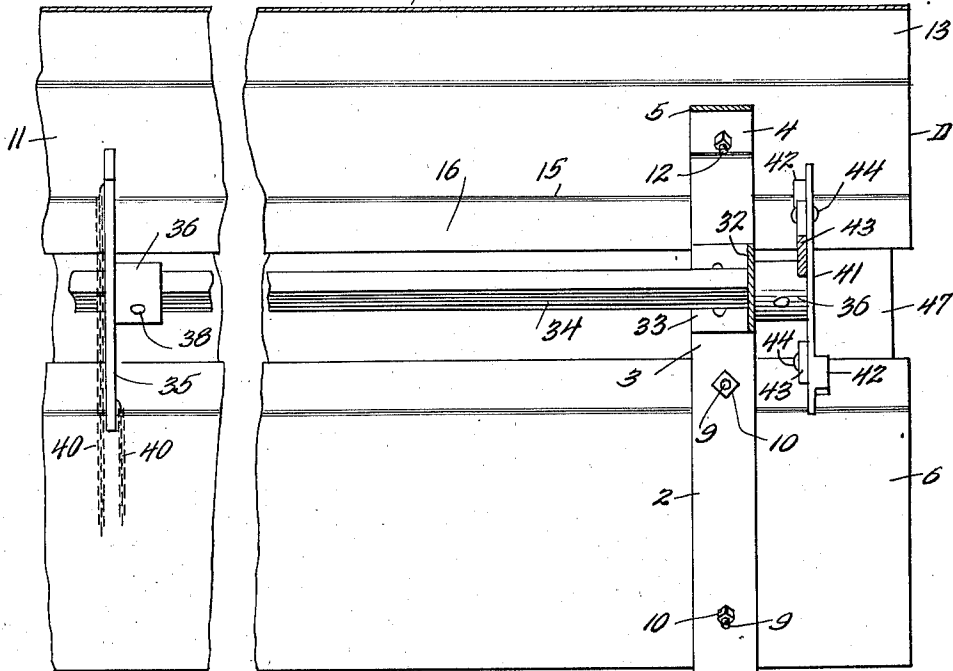
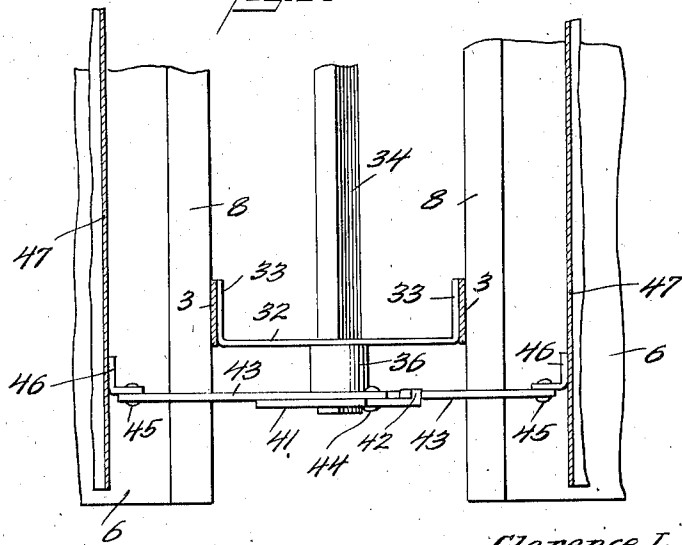


FIG. 5.



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334

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# UNITED STATES PATENT OFFICE

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## VENTILATOR

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Application August 20, 1937, Serial No. 160,048

9 Claims. (Cl. 98-42)

Generically this invention relates to ventilators but it more particularly is directed to roof ventilators designed to present an architectural effect and providing protection against access of snow or rain to the interior of the building.

One of the principal objects of this invention is the provision of a ventilator adapted to be positioned on the roof of a building adapted to permit passage therethrough of air as it moves across the building and is compressed by contact with the roof to draw the air from the interior of the building and discharge it to the surrounding atmosphere, and to prevent the ingress of rain and snow to the interior of the building.

Another important object of this invention is the provision of a roof ventilator designed to effect maximum ventilation by reason of unique air injector passage means and means for controlling the passage of air therethrough.

Another important object of this invention is the provision of a ridge ventilator for roofs having air passage means communicating with the interior of the building and passages intercommunicating therewith through which is directed air moving across the building for effecting withdrawal of air from the interior of the building, and means for controlling said withdrawal of air as desired.

An important object of this invention is the provision of a roof or ridge ventilator having external air passages through which is adapted to pass air moving over said building, and interior air passages communicating with the interior of the building and with said external passages, whereby the air will be drawn from the interior of the building by the air passing through said external passages, and damper means mounted in the external passages and adapted when in open position to constitute air compression or injector means and movable to closed position to close the interior passages, the construction of said ventilator being such that snow and rain may freely pass through said external passages without entering the building even when the damper members are in open position.

A further important object of this invention is the provision of a roof ventilator having passages for the free passage of air therethrough from the exterior of the building, and interior passages communicating with the interior of the building and with the exterior passages, and means operable from the interior of the building to seal said interior passages and constituting air compression or injector means to intensify the passage of air through said external passages

thereby effecting a maximum ventilation to the building.

With these and other objects in view, which will become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which like characters of reference indicate like parts throughout the several figures, of which:

Fig. 1 is an end elevation of my improved ventilator operatively positioned;

Fig. 2 is a plan view taken on the line 2-2 of Fig. 1;

Fig. 3 is an elevation on the line 3-3 of Fig. 1;

Fig. 4 is a vertical section on the line 4-4 of Fig. 1;

Fig. 5 is a horizontal section taken on the line 5-5 of Fig. 1.

The roof ventilators with which I am familiar have proven deficient in many respects such as marring the architectural appearance of the building, preventing free access of air currents over the roof and through the device, preventing the free passage of snow and water through the device without entering the building, and simplified and efficient damper means for controlling the ventilation of the building, and it was to overcome such deficiencies, and to provide a simplified ventilator structure designed to project only slightly above the normal ridge or roof, having external air passages adapted to permit the free passage therethrough of air moving across or over said building and snow or rain as the case may be, air passages communicating with the interior of the building and with said external passages, and damper means expeditiously operable from the interior of the building movably mounted in said external passages adapted when in closed position to seal said interior passages and when in open position to constitute compressor or injector means to intensify the passage of air to the exterior passages and the outflow of air from the building through said passages that I designed the ventilator structure forming the subject matter of this invention.

In the illustrated embodiment characterizing this invention there is shown a ventilator A suitably positioned over the ridge of a roof B formed with a longitudinal opening 1.

The ventilator A is formed slightly spaced from each end with integral supporting frame members C comprising flaring end portions 2 conforming to the pitch of the roof B upon which

they are adapted to be supported, said portions extending vertically from the edges of opening 1 forming the parallelly disposed supporting standards 3, and inwardly forming the inclined supporting sections 4 connected at their upper ends by horizontal section 5.

Mounted on portions 2 are the roof flange or flashing elements 6 formed with upwardly extending vertical portions 7, adapted to seat against upright members 3, terminating in lateral or right angular flanges 8, said members 6 being secured to said frame members C by bolts 9 carrying threaded nuts 10, said flanges 6 adapted to overlie roof B and the vertical portion 7 constituting vertical wall portions of opening 1, through which air is directed from the interior of the building, as will be apparent.

Spaced above opening 1 and mounted on the inclined portions 4 of frame member C is the cover or cap member D. Said cover comprises the oppositely extending inclined apron-like portions 11 adapted to seat on and be secured to the inclined portions 4 by threaded bolts 12, and connected at their upper ends by the integral ridge section 13. The lower ends of members 11 project downwardly and outwardly beyond vertical standards 3 of frame member C to points 14 and then inwardly and upwardly to points 15 and downwardly and outwardly forming damper seats 16, the space between seats 16 and flanges 8 constituting longitudinal openings 17, forming with opening 1 air passages from the interior of the building for the outflow of air.

A pair of frame members E mounted on opposite sides of frame members C in vertical superimposed relation at each end of the ventilator A, are formed at their upper ends with flange portions 18 adapted to seat on members 11 overlying sections 4, to which they are attached by bolts 12 and with upwardly and outwardly extending portions 19, downwardly inclined sections 20, perpendicular sections 21, and the inwardly inclined sections 22 terminating in the outwardly and downwardly extending flange sections 23 adapted to seat on roof flanges 6 and are secured thereto and to frame sections 2 by bolts 9, as will be apparent.

Mounted on sections 20 and 21 of frame members E and conforming thereto in configuration are the metallic wind band members 24, having their upper edges bent inwardly upon themselves as at 25 and their lower edges as at 26, said lower edges extending downwardly and outwardly in substantial parallelism with flanges 23, forming the apron members 27 extending in substantial parallelism with roof flanges or flashings 6, forming air inlet openings 28 for the exterior air passages 29, and terminating in outlet openings 30, as and for a purpose directly more fully appearing. Said members 24 are secured to frame E by threaded bolts 31.

A supporting member 32 formed at its ends with right angular parallelly extending flanges 33 adapted to be riveted or otherwise secured to the vertical sections 3 and journaled in said members centrally of their length is a rod 34, in the present instance square, but which may be round or of any desired configuration. This rod 34 extends substantially the length of the ventilator or ventilator section. Where it is desired to employ a plurality of ventilator sections forming a continuation substantially throughout the length of the roof, said rod sections may be suitably connected so as to simultaneously operate throughout the length of the combined

sections as desired. In order to effect the desired clockwise and anti-clockwise rotation of said rod a cross-piece or lever 35 formed, in the present instance, with a hub portion 36 is mounted on said rod substantially central of its length if only one section is used and, substantially central of the length of the combined rods where a plurality of sections are employed, and rigidly secured to said rod by set screw 32. Suitably connected to apertures 39 in opposite ends of the crosspiece or lever element 35 are the respective chains 40 for operating said rod as above described.

Mounted on each end of the rod of a respective ventilator or section is a cross-piece or lever element 41 formed at one corner on its under surface with a stop lug 42, and with the exception of lug 42, is similar to member 35 and formed with a similar hub portion 36 similarly secured to rod 34. To each end of member 41 is pivotally connected one end of a link member 43 by bolts 44, the other end of said links being pivotally connected by bolts 45 to lugs 46 suitably secured to injector-damper members 47 adjacent their upper ends so that links 43 will operate through openings 17, as and for a purpose directly more fully described. Said stop lug 42 is adapted to engage one edge of the links 43 when lever member 41 has been brought into alignment with links 43, to maintain said links and lever 41 in rigid aligned and extended position and the damper members 47 in open or injector operating position, as clearly shown in dotted lines in Fig. 1. A pull on the chain 40 effects clockwise movement of said member 41 retracting link members 43 and moving members 47 to closed position and in engagement with seats 16.

The damper members 47 are formed at their upper ends with inwardly extending inclined flange elements 48 with their free edges bent inwardly upon themselves as at 49, said ends adapted to seat against members 16 and project within the portions folded at 15 so as to close the opening 17 to prevent the outflow of air from the interior of the building through said openings and at the same time prevent water and snow from entering said opening. The lower edges of members 47 are formed with outwardly and downwardly extending flange members 50 with their edges folded inwardly upon themselves similar to 49. Inwardly of frame members E is positioned a hinge section 51 looped about a U-shaped rod 52 and secured to the roof flange or flashing element 6 by rivets or other suitable fastening means 53. The free ends of said hinge rod 52 are rigidly secured by a metal strip 54 shaped over said ends and secured to member 49 by rivets 55 or welded or secured in any suitable manner. The length of the parallelly extending ends of hinge member 52 are sufficient to space the lower edges of flange members 50 above hinge elements 51 and flanges 6 so as to elevate said edges sufficient to present a continuous opening at each side of the device for the free passage of water and snow when members 47 are in open position, so as to prevent the same from damming or overflowing into the building. These openings also permit sufficient quantities of air flowing across the building to pass through and intercept the air streams flowing from the interior to the exterior passages 29 to prevent stoppage of said openings by the accumulation of extraneous matter intermediate members 47 and flashing elements 6.

*Operation*

The operation of the device would seem to be clear from the above description, but it might be well to further state that when the ventilator A is operatively positioned on a ridge roof and over the opening formed therein and with the damper elements 47 closed there can be no ventilation and the building is sealed. However, when it is desired to effect ventilation of the building it is only necessary to pull down chain 40 attached to one end of element 35 rotating rod 34 in anti-clockwise direction and through the instrumentality of members 41 moving links 43, operable through openings 17, into horizontal alignment with each other and with member 41, lug 42 contacting the edge of link 43 limiting the anti-clockwise movement of said member 41 and maintaining said links and member in rigid extended position so as to maintain the damper or injector members 47 in open position, as shown in dotted outline in Fig. 1, and when said members are so positioned the air moving over the roof of the building is compressed and entering a respective passage 29 strikes member 47 and is compressed between said member and the wind band or air deflector member 24 and is injected under further compression by said member into the upper portion of passages 29 to be discharged through opening 30 into the surrounding atmosphere and which effects withdrawal of the air from the interior of the building through the passage formed by opening 1 and lateral openings 17 or one of said openings to be intermingled with said injected air stream to accelerate the outflow of air from said interior through one of said outlet openings 30 of passages 29, depending upon the direction of the wind, as will be apparent.

To cut off the ventilator it is only necessary to pull the opposite chain 40 connected to lever 35, thereby effecting clockwise movement of rod 34 and member 41 to retract links 43 and move damper elements 47 to closed position with ends 48 engaging seats 16 whereby openings 17 are sealed.

It will also be observed that the lower edges of flanges 50 of members 47 are spaced from the base plates or flashing elements 6 sufficiently to permit the passage of rain and snow therethrough when the injector-damper members 47 are in open position and, at the same time, permitting sufficient air to enter behind members 47 to carry any extraneous matter, such as leaves and the like that may lodge behind said members 47, to the air stream from the interior of the building flowing from opening 17, to be caught by the exterior air stream flowing through passage 29 and thereby removed from the ventilator, and assisting the exterior air stream in drawing the air from the interior and accelerating the outflow thereof to the surrounding atmosphere.

From the above it will be apparent that I have designed a roof ventilator preferably mounted on the ridge type of roof but which is also adapted for flat roofs by simply employing triangular blocks or frame structures on opposite sides of the opening 1 on which the ventilator may be mounted as in the case of the ridge roof.

It will be further observed that I have designed a ventilator adapted if desired to extend substantially the full length of the building or at one or more locations as desired, and so designed that it will not project but a few inches above the normal roof ridge, will not mar the architectural design or appearance of the building, preferably

constructed from metal, and comprising a rigid construction adapted to withstand high wind velocities without damage to the ventilator or supporting roof and having interior and exterior communicating air passages, and damper means 5 mounted in the exterior passages movable in one direction to closed position to cut off and seal the interior passages and to open position in the other direction to constitute injector means for compressing and injecting the exterior air stream 10 to the discharge openings of said passages to effect outflow of the air from the interior of the building, as will be well understood, said device comprising few parts, simple in construction, 15 adapted to effect a maximum ventilation combined with pleasing architectural effect, manufacturable at a minimum of cost, having positive damper control, and efficient for the purposes intended.

Although in practice I have found that the form 20 of my invention illustrated in the accompanying drawings and referred to in the above description as the preferred embodiment, is the most efficient and practical; yet realizing the conditions concurrent with the adoption of my invention will 25 necessarily vary, I desire to emphasize that various minor changes in details of construction, proportion and arrangement of parts, may be resorted to within the scope of the appended claims without departing from or sacrificing any of the 30 principles of the invention.

Having thus described my invention, what I desire protected by Letters Patent is as set forth in the following claims:

1. In combination with a roof having a ventilating opening, a ventilator disposed over the opening and comprising base plates adapted to form a continuation of the opening, a cover disposed above said opening and forming with said base plates lateral openings communicating with said first mentioned opening, deflector members spaced from said cover and base plates forming exterior passages intersected by and overlying said lateral openings and having exterior inlet and outlet openings, and dampers mounted in said passages movable to closed position to seal said lateral openings and to open position to constitute with said deflector members exterior air compressing and ejecting means for the exterior air passing through said passages intermediate said dampers and deflectors. 50

2. In combination with a roof having a ventilating opening, a ventilator disposed over the opening and comprising base plates on opposite sides of the opening, an angular cover disposed above said opening and forming with said base plates lateral openings communicating with said first mentioned opening to form interior air outlet passages, deflector members overlying and spaced from said lateral openings forming exterior air passages having exterior inlet and outlet openings, movable damper members mounted in said passages, and means connecting said movable members adapted to close said members and seal said lateral openings and adapted to maintain said members in open position to constitute with said deflector members air ejector means, whereby the exterior air passing through said outer passages is compressed between said damper members and deflector members and injected to accelerate the outflow of air from said lateral openings to said exterior passages. 70

3. The combination with a roof having a ventilating opening, a ventilator disposed over the opening and comprising a pair of base plates, 75

an angular cover disposed in spaced relation above said opening and adapted to prevent rain flowing vertically therein and forming with said base plates lateral openings communicating with said first mentioned opening, deflector elements spaced from and overlying said lateral openings forming exterior air passages, dampers mounted in said exterior passages and connected to said base plates, means operable through said lateral openings and connecting said dampers, and means connected to said connecting means adapted to move said dampers to close said lateral openings and to open position to form with said deflector elements air compressing passages within the exterior passages to effect acceleration of the air stream flowing through said passages, and between said deflector elements and dampers whereby to withdraw the air from said lateral openings as the accelerated air passes thereover.

4. In combination with a roof having a ventilating opening, a ventilator disposed over the opening and comprising a pair of base plates forming a continuation of the opening, an angular cover disposed above said opening and having damper seats adapted to form with said base plates lateral openings communicating with said first mentioned opening, angular deflectors laterally positioned with respect to said lateral openings forming exterior air passages having exterior air inlet and outlet openings, dampers movably mounted in said passages, means connecting said dampers adapted when moved in one direction to engage said dampers with said seats to close said lateral openings and when operated in the opposite direction to move said dampers to and maintain the same in open position to form with said deflectors air restricted passages within said exterior passages to accelerate the air stream flowing therethrough, whereby air moving over the roof will be directed into the exterior and restricted passages and ejected from said latter passages to draw the interior air through said first mentioned opening and lateral openings and accelerate the outflow of such air.

5. In combination with a roof having a ventilating opening, a ventilator disposed over the opening comprising a pair of base plates forming a continuation of said opening, a cap member mounted above said opening supportingly connected to said base plates and forming in connection therewith lateral openings communicating with said first mentioned opening forming interior passages, deflector members overlying said lateral openings is spaced relation therewith and forming exterior air passages having inlet openings intermediate the deflector members and roof, dampers movably mounted in said exterior passages constituting when in closed position closures for sealing said lateral openings and when in open position forming in conjunction with said deflector members air compressing ejector means adapted to accelerate the passage of the air through said exterior passages intermediate said dampers and deflector members and the outflow of air from the interior passages into said exterior passages and to the surrounding atmosphere, and means connecting said dampers and operable through said lateral openings to move said dampers from open or air compressing position to closed or lateral opening sealing position.

6. In combination with a roof having a ventilating opening, a ventilator disposed over the opening comprising a pair of base flashing plates secured to said roof and forming a continuation

of the opening, an angular cover disposed above said opening forming with said flashing plates lateral openings communicating with said first mentioned opening, deflector members overlying and spaced from said lateral openings forming exterior passages having inlet openings intermediate said members and flashing plates, members mounted in said passages movable to closed position to close said lateral openings and to open position to constitute air ejector means, the mounting of said movable members being such as to in open position constitute with said deflector members air compressing means to accelerate the passage of the air adjacent to said lateral openings whereby to withdraw the air from the openings as the accelerated air passes thereover and permitting the free passage of rain and snow through said exterior passages and sufficient air between said members and base plates to prevent an accumulation of extraneous matter, said movable members when in closed position constituting closure means for said lateral openings.

7. In combination with a roof having a ventilating opening, a ventilator disposed over the opening comprising base members, a cover disposed above said opening, wind deflector elements spaced from the base members and cover forming exterior air passageways having inlet openings between said elements and base members, said cover and base members forming interior lateral passageways communicating with said opening and with said exterior passageways, dampers mounted in said exterior passageways and movable in one direction to close said lateral openings and in the opposite direction to constitute with said deflector elements exterior air compressing and ejecting means to accelerate the passage of the air adjacent to the lateral openings, whereby to withdraw the air from said lateral openings as the accelerated air passes thereover.

8. In combination with a roof having a ventilating opening, a ventilator disposed over the opening and provided with lateral venting outlets, deflectors in connection with said ventilator to direct an air stream over each of said outlets, damper members located between the outlets and deflectors, said damper members being operable in one direction to close the openings and in the opposite direction to intercept and compress in conjunction with said deflectors the air stream flowing across said outlets and effect their acceleration adjacent to said outlets whereby to withdraw the air from the outlets as the accelerated air passes thereover.

9. A ventilator adapted to be disposed over an opening in a roof or the like, said ventilator having an opening adapted to register with said roof opening, a cover disposed over the ventilator opening, base plates on opposite sides of said ventilator opening and forming with said cover lateral openings communicating with the ventilator opening, deflector members spaced from said cover and base plates forming exterior passages intersected by and overlying said lateral openings, and dampers mounted in said passages movable to closed position to seal said lateral openings and to open position to constitute with said deflector members exterior air compressing means to accelerate the air passing intermediate said dampers and deflectors, whereby to withdraw the air from said lateral openings as the accelerated air passes thereover.

CLARENCE L. SCHILLING.