March 29, 1949. H. B. HAWES 2,465,533

VENTILATOR

Filed Dec. 8, 1945

Fig. 1.

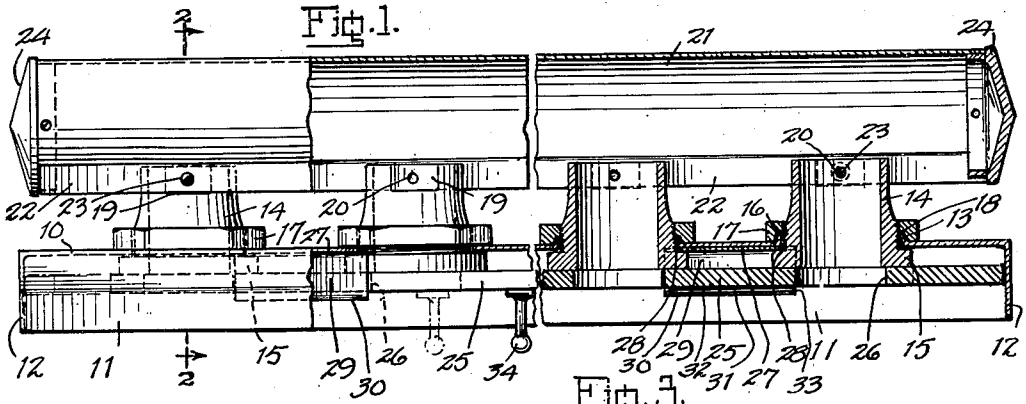


Fig. 3.

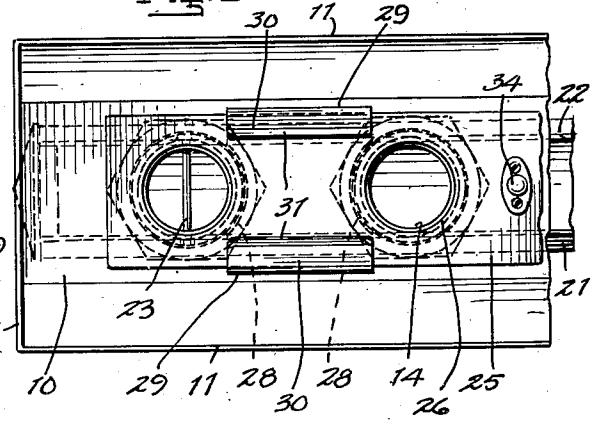


Fig. 2.

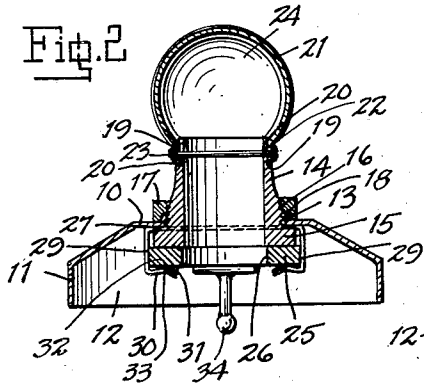


Fig. 4.

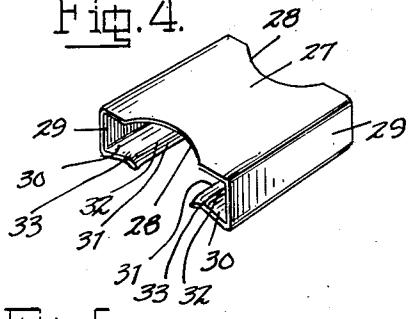


Fig. 6.

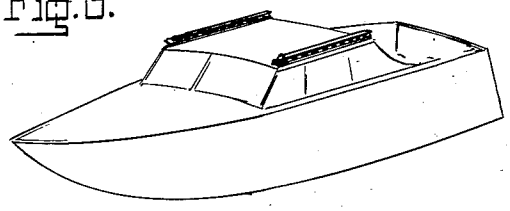


Fig. 5.

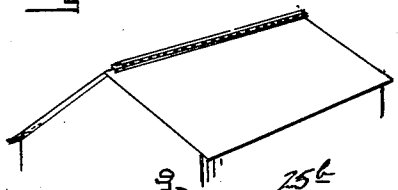


Fig. 7.

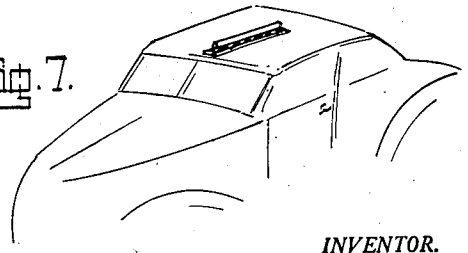


Fig. 8.

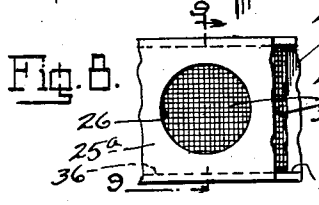
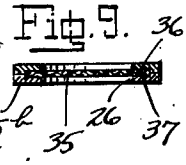


Fig. 9.



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VENTILATOR

Harold B. Hawes, Fairfield, Conn.

Application December 8, 1945, Serial No. 633,752

7 Claims. (Cl. 98—42)

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The present invention relates to a ventilator, particularly of the type disclosed in my co-pending application for Roof ventilator, Serial No. 566,548, filed December 4, 1944, now Patent #2,438,166, dated March 23, 1948, and which consists of an elongated ventilator unit adapted to be mounted along an elongated opening in the roof of an enclosed structure such as a house, automobile, boat, or the like. In general, this type of ventilator comprises a horizontally extending base having a series of vertically disposed longitudinally spaced upstanding pipe members through which air is adapted to flow vertically between the interior and exterior of the structure, and a longitudinally extending cap member disposed over the upper ends of the pipes and extended downwardly at each side thereof with its lower edge in parallel spaced relation to the base, so that transverse air flow spaces are provided between the pipe members having entrance openings at each side provided by the spaces between the base and the edges of the cap member.

It is an object of the present invention to provide improved damper means for regulating, or entirely closing off, the flow of air between the interior and exterior of the structure, and which will be normally out of the path of the air flow through the ventilator, so that it will not interfere therewith through baffling and the creation of eddies.

Another object is to provide a damper in the form of a slide member arranged interiorly of the ventilator structure, so that it will be effectually protected from the deteriorating effect of rain and snow.

A further object is to provide improved guide and retaining means for the damper adapted to yieldably press the damper into contact with the lower ends of the pipe members, and which is adapted to be conveniently assembled through cooperation with the retaining means of the pipe members.

With the above and other objects in view, an embodiment of the invention is shown in the accompanying drawings, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawings:

Fig. 1 is a fragmentary view of the ventilator, partially in side elevation and partially in vertical section.

Fig. 2 is a vertical sectional view, taken along the line 2—2 of Fig. 1.

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Fig. 3 is a bottom plan view of the left hand end portion of the ventilator, as seen in Fig. 1.

Fig. 4 is a perspective view of one of the guide and retaining members employed.

Figs. 5, 6 and 7 are perspective views, respectively, showing the application of the ventilator to the roof of a building, to the roof of a boat, and to the roof of an automobile.

Fig. 8 is a fragmentary plan view of a modified form of a damper slide.

Fig. 9 is a sectional view taken along the line 9—9 of Fig. 8.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, the ventilator unit comprises a base 10 formed of sheet metal provided with longitudinal side walls 11—11 and end walls 12—12. This base member is adapted to be constructed of any suitable length, depending upon the particular installation, and is adapted to be secured in weather tight relation over a longitudinal opening provided in the roof of the ventilated structure. In longitudinally spaced relation along the length of the base, there is provided a series of circular openings, each having an upwardly bent rim flange 13, and in each of which is secured a pipe member 14. Each of these pipe members is provided at its lower end with an outwardly extending flange 15 engaging the underside of the ventilator base and with external screw threaded portion 16 extending a short distance above the base, the external surface of the pipe between the threaded portion and the top edge being preferably curved upwardly and inwardly. A clamping nut 17 is screwed upon the threaded portion 16 of the pipe and in cooperation with the flange 15 secures it in clamped relation with the base. The clamping nut is provided at its under side with a tapered recess 18 in which is engaged the rim flange 13, the thickness of the nut causing the flange to be tightly pressed against the pipe member to provide a tight weather seal. Adjacent the upper end of the pipe there are provided at its transversely opposed sides flats 19—19 for mounting the cap member, as will presently more fully appear, transversely aligned holes 20—20 being provided within the flat portions for receiving a securing bolt for the cap member 21.

The cap member is of cylindrical form, open at under side, and provided along the longitudinal sides of the opening with vertically disposed flanges 22 substantially of the depth of the flats 19 and adapted to seat therein. The thickness of

the flats preferably corresponds to the thickness of the material of the cap member, so that in the assembled relation the outer surfaces of the flanges 22 are substantially flush with the surfaces of the pipe members. The lower edges of the flanges 22, which are spaced below the upper ends of the pipe members are in upwardly spaced parallel relation to the base, so that the longitudinal spaces between the flanges 22 and the base constitute entrances at each side of the ventilator to the transverse air flow passages between the pipe members. The cap member is secured to the pipe members by means of bolts 23 engaged through the holes 20 of the pipe members and in each end of the cap member there is secured a closure member 24. While each of the pipe members is preferably provided with the holes 20, for the purpose of standardization in production, the bolts 23 need only be provided at suitable intervals along the length of the cap member to effectually secure it.

The arrangement is such that normal transverse flow of air currents through the spaces between the pipe members causes a suction or asperating effect on the cap member of a relatively high order. This in turn draws streams of air upwardly through the pipe members, and in combination with the natural upward flow of high temperature air within the roof enclosure, results in rapid ventilation of the enclosed structure. The cap member protects the open ends of the pipe members against the entrance of vertically falling rain, as well as diagonally or horizontally driven wind swept rain, the latter being carried below the upper ends of the pipe members through the air flow spaces.

The damper means according to the invention, comprises an elongated slide member 25, in the form of a flat rectangular strip of such material, as light-weight metal, hardwood, Bakelite, or other suitable plastic, and the like, and provided at spaced points corresponding to the spacing of the pipe members with circular openings 26, preferably slightly larger in diameter than the internal diameter of the pipe members and adapted in the fully open position to register with the lower ends of the pipe member. The damper member is guided and retained by means of a series of flat topped spring clip members 27, provided at suitable intervals along the length of the ventilator, each being provided in each end with arcuate recesses 28 and adapted to be engaged with the under surface of the base 10 between two adjacent pipe members with its end portions extended between the flanges 15 of the pipe members and the base 10, the recesses 28 embracing the screw threaded portions 16 of the pipe members above the flanges 15, so that upon clamping of the pipe members by means of the nuts 17 the clip member is securely fixed in place. At each of the longitudinal sides of the clip member there is provided a downwardly extending guide wall 29 adapted to engage the longitudinal side walls of the damper and provided with inwardly extending spring flanges 30 bent upwardly at a slight angle and then bent downwardly at its inner edge to form a lip 31 so that a line contact ridge 32 is provided for yielding engagement with the under surface for the damper. This ridge being parallel to the direction of the sliding movement of the damper, it effectually presses the damper into firm contact with the lower sides of the pipe members while enabling it to be longitudinally moved with very little effort. The ends of the lips 31 are preferably deflected downwardly

slightly, as at 33, so that the end edges are out of engagement with the surface of the damper, and therefore do not offer frictional or scraping resistence to its movement. The length of the damper is less than the longitudinal distance between the two end walls 12 of the base an amount equal to the length of movement of the damper between fully open and fully closed positions, so that the end walls may act as stops for the damper as it is moved between these positions.

A handle 34 is provided on the damper at a convenient location so that it may be manually moved back and forth. Obviously any suitable means may be provided for direct or remote operation of the damper, as for instance chains, cords, or levers connected thereto in any suitable known manner.

As shown in full lines in Fig. 1 the damper is in fully open position with its right hand end in abutting relation with the right hand end wall 12 of the base. In the fully closed position, as shown by the dot-and-dash lines, the left hand end is in abutting relation with the left hand end wall 12 of the base. In order to regulate the amount of air flow through the pipes, the damper may be disposed in any desired position between its fully open and fully closed positions.

In Figs. 8 and 9, I have illustrated a modified form of damper slide comprising upper and lower laminations 25^a and 25^b and an intermediate lamination 35 formed of wire screen and extending over the openings 26. The wire screen is preferably in the form of a strip slightly narrower than the damper slide and seated in complementary recesses 36 and 37 provided in the meeting faces of the laminations 25^a and 25^b. The contacting marginal surfaces of the laminations may be cemented or otherwise suitably secured together. This form of screened damper effectually prevents dirt and insects from passing through the ventilator.

I have illustrated and described preferred and satisfactory embodiment of the invention, but it will be understood that changes may be made therein, within the spirit and scope thereof, as defined in the appended claims.

What is claimed is:

1. In a ventilator, the combination with a base adapted to be mounted over an elongated opening and having a series of longitudinally spaced pipe members having their inner ends downwardly extending from said base and providing a series of longitudinally spaced air flow passages, of a longitudinally movable damper slide engaged with the inner ends of said pipe members having a series of longitudinally spaced openings adapted to register with said pipe members in the open position of said slide and having solid closure portions between said openings adapted to register with said pipe members in the closed position of said slide, and guide and retaining means for said slide secured at the under side of said base having downwardly extending longitudinal side flanges adapted to guidingly engage the longitudinal side edges of said slide, and spring retaining portions integral with and extending inwardly from said side flanges adapted to yieldably engage the under side of said slide to press it in engagement with the inner ends of said pipe members.

2. In a ventilator, the combination with a base adapted to be mounted over an elongated opening and having a series of longitudinally spaced pipe members having their inner ends

downwardly extending from said base and providing a series of longitudinally spaced air flow passages, of a longitudinally movable damper slide engaged with the inner ends of said pipe members having a series of longitudinally spaced openings adapted to register with said pipe members in the open position of said slide and having solid closure portions between said openings adapted to register with said pipe members in the closed position of said slide, and a series of guide and retaining members for said slide secured at the under side of said base, each having downwardly extending longitudinal side flanges adapted to guidingly engage the longitudinal side edges of said slide, and spring retaining portions integral with and extending inwardly from said side flanges adapted to yieldably engage the under side of said slide to press it in engagement with the inner ends of said pipe members.

3. In a ventilator, the combination with a base adapted to be mounted over an elongated opening and having a series of longitudinally spaced pipe members having their inner ends downwardly extending from said base and providing a series of longitudinally spaced air flow passages, and each of said pipe members having clamping means engaged with the under side of said base, of a longitudinally movable damper slide having a series of longitudinally spaced openings adapted to register with said pipe members in the open position of said slide and having solid closure portions between said openings adapted to register with said pipe members in the closed position of said slide, and a series of guide and retaining members for said slide each comprising a top plate portion adapted to be engaged with the under side of said base between two adjacent pipe members with its marginal end portions disposed and clamped between said base and said clamping means of said two adjacent pipe members, downwardly extending longitudinal side flanges adapted to guidingly engage the longitudinal side edges of said slide, and spring retaining portions integral with and extending inwardly from said side flanges adapted to yieldably engage the under side of said slide to press it in engagement with the inner ends of said pipe members.

4. In a ventilator, the combination with a base adapted to be mounted over an elongated opening and having a series of longitudinally spaced pipe members having their inner ends downwardly extending from said base and providing a series of longitudinally spaced air flow passages, and each of said pipe members having clamping means engaged with the under side of said base, of a longitudinally movable damper slide having a series of longitudinally spaced openings adapted to register with said pipe members in the open position of said slide and having solid closure portions between said openings adapted to register with said pipe members in the closed position of said slide, and a series of guide and retaining members for said slide each comprising a top plate portion adapted to be engaged with the under side of said base between two adjacent pipe members with its marginal end portions disposed and clamped between said base and said clamping means of said two adjacent pipe members, the end edges of said plate portion having arcuate recesses adapted to embrace said pipe members, downwardly extending longitudinal side flanges adapted to guidingly engage the longitudinal

side edges of said slide, and spring retaining portions integral with and extending inwardly from said side flanges adapted to yieldably engage the under side of said slide to press it in engagement with the inner ends of said pipe members.

5. In a ventilator, the combination with a base adapted to be mounted over an elongated opening and having a series of longitudinally spaced pipe members having their inner ends downwardly extending from said base and providing a series of longitudinally spaced air flow passages, of a longitudinally movable damper slide having a series of longitudinally spaced openings adapted to register with said pipe members in the open position of said slide and having solid closure portions between said openings adapted to register with said pipe members in the closed position of said slide, and a series of guide and retaining members for said slide secured at the under side of said base, each having downwardly extending longitudinal side flanges adapted to guidingly engage the longitudinal side edges of said slide, and spring retaining portions integral with and extending inwardly from said side flanges adapted to yieldably engage the under side of said slide to press it in engagement with the inner ends of said pipe members, each of said spring retaining portions including an inwardly and upwardly inclined outer spring portion and an inwardly and downwardly inclined lip portion, the junction between said spring and lip portions constituting a line contact bearing surface for engagement with said damper slide.

6. In a ventilator, the combination with a base adapted to be mounted over an elongated opening and having a series of longitudinally spaced pipe members having their inner ends downwardly extending from said base and providing a series of longitudinally spaced air flow passages, of a longitudinally movable damper slide having a series of longitudinally spaced openings adapted to register with said pipe members in the open position of said slide and having solid closure portions between said openings adapted to register with said pipe members in the closed position of said slide, and a series of guide and retaining members for said slide secured at the under side of said base, each having downwardly extending longitudinal side flanges adapted to guidingly engage the longitudinal side edges of said slide, and spring retaining portions integral with and extending inwardly from said side flanges adapted to yieldably engage the under side of said slide to press it in engagement with the inner ends of said pipe members, each of said spring retaining portions including an inwardly and upwardly inclined outer spring portion and an inwardly and downwardly inclined lip portion, the junction between said spring and lip portions constituting a line contact bearing surface for engagement with said damper slide, the end portions of said bearing surface being deflected downwardly.

7. In a ventilator, the combination with a base adapted to be mounted over an elongated opening and having a series of longitudinally spaced pipe members having their inner ends downwardly extending from said base and providing a series of longitudinally spaced air flow passages, and each of said pipe members having a clamping flange at its lower end engaged with the under side of said base, and a clamping nut engaged with the upper side of said base, of a longitudinally movable damper slide having a series of

longitudinally spaced openings adapted to register with said pipe members in the open position of said slide and having solid closure portions between said openings adapted to register with said pipe members in the closed position of said slide, and a series of guide and retaining members for said slide, each comprising a top plate portion adapted to be engaged with the under side of said base between two adjacent pipe members with its marginal end portions disposed and clamped between said base and the clamping flanges of said two adjacent pipe members, downwardly extending longitudinal side flanges adapted to guidingly engage the longitudinal side edges of said slide, and spring retaining portions integral with and extending inwardly from said side flanges adapted to yieldably engage the under side of said slide to press it in engagement with the inner ends of said pipe members.

HAROLD B. HAWES.

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