Aug. 11, 1964 B. L. BRISTOL 3,143,953

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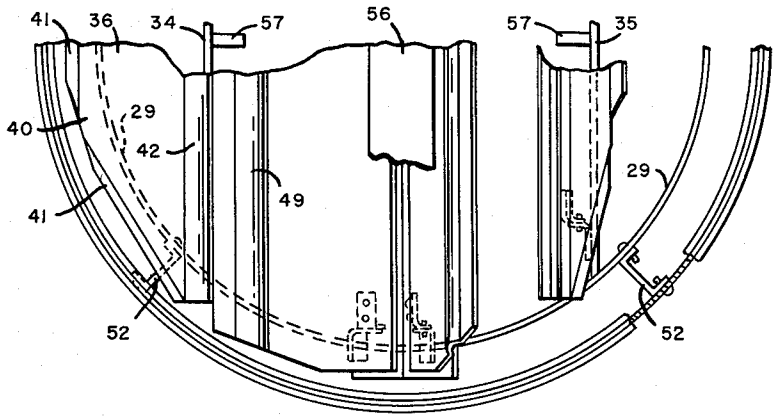


FIG. 2

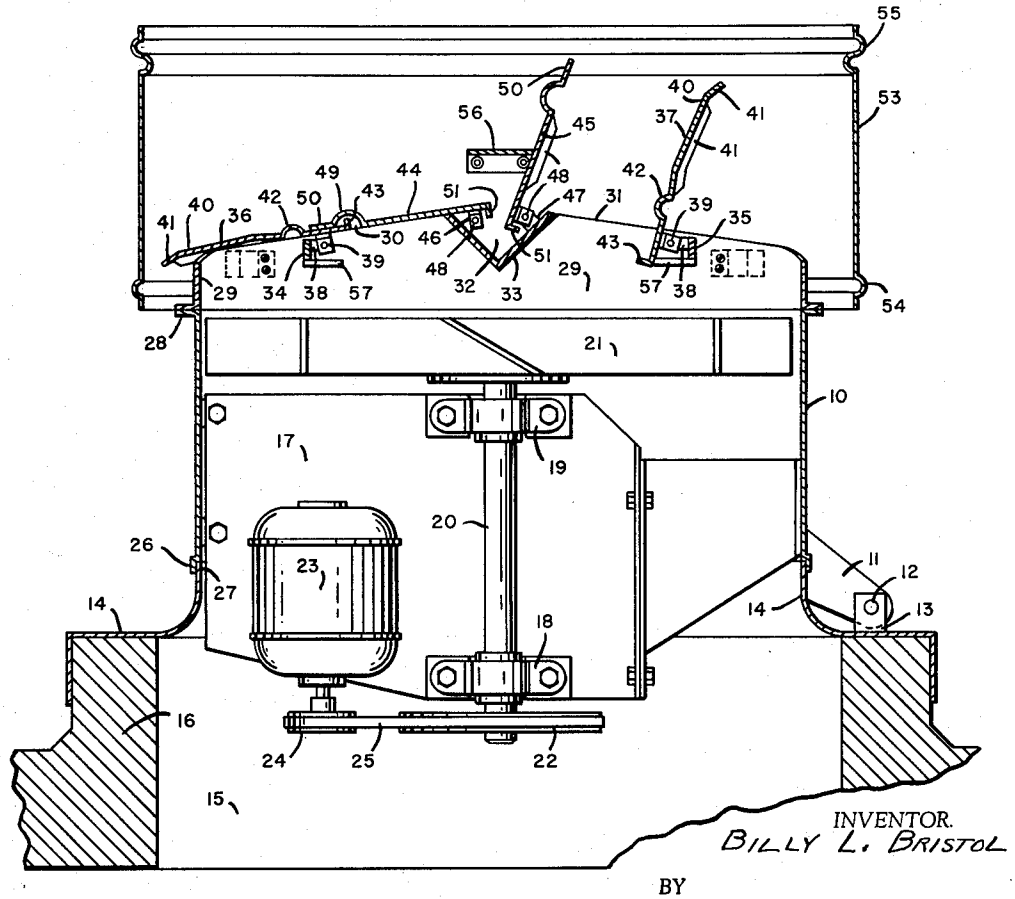


FIG. 1

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This invention relates to roof ventilators and particularly to a new and improved vertical discharge roof ventilator.

Roof ventilators for many industrial buildings discharge the exhaust material downwardly onto the roof by deflectors that are intended to prevent the entrance to the building of snow, rain and high velocity gusts of wind. Experience has shown that exhaust materials such as dust, oil or grease laden or contaminated air should not be discharged downwardly onto the roof because they attack the roofing and shorten its life.

The principal object of the present invention is to provide a vertical discharge roof ventilator that will overcome the above as well as other problems.

Another object of the invention is to produce such a ventilator including a hinged housing providing free access to all operating parts from the roof, for ease of inspection, lubrication and maintenance.

Still another object of the invention is to provide such a ventilator that is weatherproof and capable of discharging air above the roof at high velocity.

Another object of the invention is to provide such a ventilator in which gravity operated damper means is automatically forced open when the fan is operating and drops into closed position when the fan is shut off, and when in closed position, the damper prevents rain, sleet or snow from entering the building.

A housing, which may be a hollow cylindrical shell, may be hinged to a roof in a manner such that its peripheral edge mates with a flange surrounding an opening passing through the roof of a building. A mounting plate within the housing may support a motorized fan unit, the fan of which may be arranged in a horizontal plane at the upper end of the housing.

In one aspect of the invention, an extension may be attached to the upper end of the housing, and its upper edge may be formed by two angularly disposed planes intersecting on its longitudinal axis. Diametrically opposed V-notches may be formed in the wall of the extension at the point of intersection of said planes and an angle member may extend from one notch to the other. Bars, parallel to and spaced from the V-notch angle member, may extend across the opening of said extension. All of the parallel members divide the opening into a plurality of passages i.e. four in the present embodiment.

In another aspect of the invention, separate damper means may be hinged to each of the parallel members such that the free ends of those on each side of the notched angle member overlap.

In still another aspect of the invention, the overlapping free ends of the damper means may be provided with interlocking sealing means to prevent the passage of rain, sleet, snow or dirt through the opening covered by the damper means.

In still another aspect of the invention, an open ended, hollow, cylindrical stack may surround, and be fixed to the extension by brackets. The stack may be of a greater diameter than that of the extension, thereby providing an annular opening between the two for the passage of water that drains from the closed damper means.

The above, other objects and novel features of the vertical discharge ventilator will become apparent from the following specification and accompanying drawing which is merely exemplary.

In the drawing:

FIG. 1 is a sectional elevational view of a ventilator to which the principles of the invention have been applied; and

FIG. 2 is a top plan view of the ventilator shown in FIG. 1.

Referring to the drawing, the principles of the invention are shown as applied to a vertical roof ventilator including a hollow housing **10** which in the embodiment disclosed is shown as a hollow cylinder. A bracket **11** fixed to the housing **10** may be mounted at its one end on a pivot pin **12** supported by a bracket **13** that is fixed to a flanged member **14** surrounding an opening **15** within a roof **16** of a building.

A vertically arranged supporting plate **17** may be mounted in the housing **10**, and it may support spaced, aligned bearings **18**, **19** in which may be journaled a shaft **20**, to one end of which shaft a fan **21** may be fixed and to the opposite end of which a pulley **22** may be fixed. The plate **17** may also support a motor **23**, to the output shaft of which another pulley **24** may be fixed. A belt **25** may drivingly engage pulleys **24** and **22**. The fan **21** may be located in a horizontal plane at the upper end of housing **10**.

The lower edge of housing **10** may include an offset flange **26** adapted to receive the upper edge **27** of flanged member **14**, providing a seal between the housing **10** and member **14** when the parts are in the position shown in FIG. 1. It is apparent that the housing **10** can be pivoted about pin **12** for providing free access to the motor **23** and bearings **18** and **19** for ease of inspection, lubrication and maintenance.

The top of housing **10** may include a flange **28** to which is fixed a flanged extension **29** of the housing **10**. The extension **29** may be a hollow cylinder having its top edge lying on two angularly disposed intersecting planes, providing surfaces **30** and **31** that intersect in the longitudinal axis of the housing **10**. Aligned, V-shaped notches **32** may be located diametrically opposite each other at the point on the longitudinal axis of extension **29** where surfaces **30** and **31** intersect. An angle member **33** may extend between the notches **32** and may be welded to the sides thereof. Bars **34** and **35**, arranged in parallel relation to angle member **33**, may also extend across the opening of extension **29** and may be welded or otherwise fastened to the walls of such extension. The angle member **33** and bars **34** and **35** divide the opening in extension **29** into four passageways, although any number, of course, can be provided.

Dampers **36** and **37** may be pivoted to bars **34** and **35** by bracket means **38** and pins **39**. Since these two dampers are identical, only damper **36** will specifically be described. The damper **36** may be formed of sheet metal and may include an edge portion **40** that overhangs a portion of the upper peripheral edge of the extension **29**, and which edge may be deflected downwardly to drain water therefrom. The damper **36**, in the embodiment disclosed, is shown as having a trapezoidal form in which outer peripheral portions **41** thereof are deflected downwardly from the main body of the damper. The damper **36** may also include a strengthening bead **42** and a rear edge **43** that is bent upwardly at substantially a right angle to the main body of damper **36**.

Other damper means **44** and **45** may be hinged to opposite walls of the angle member **33** by brackets **46**, **47** and pins **48**. The damper means **44** and **45** are identical and, therefore, only damper means **44** will specifically be described. It may also be formed from sheet metal and may be substantially trapezoidal in form. The damper **44** may include a hollow bead **49** and an outer peripheral portion **50**, which latter overlaps and rests on the portion of damper **36** between edge **43** and

bead 42. It is apparent that when dampers 36 and 44 are closed, the interlocking fitting between bead 49 and edge 43 provides sealing means preventing the entrance to the building of water, sleet, snow, etc. Additionally, the damper 44 may have an edge 51 that is bent downwardly at substantially right angles to the main body portion of damper 44, and it covers the pivot pin mounting 47, 48 to prevent its being unduly exposed to the elements.

The extension 29 may be provided with brackets 52 that support a tubular stack element 53 having reinforcing beads 54, 55 formed therein. The stack element 53 may extend upwardly beyond the open position of the damper means 36, 37, 44 and 45.

Limiting means in the form of a plate 56 may extend between the walls of the stack element 53 and may lie above the angle member 33 in position to limit the extent of opening movement of damper means 44 and 45. Also, pins 57 may be fixed to bars 34 and 35 to limit the extent of opening movement of damper means 36 and 37.

With the apparatus in the condition shown in FIG. 1, energizing motor 23 will rotate fan 21, causing exhausting of air from within the building having the roof 16, and will force the dampers 36, 37, 44 and 45 to their open positions so that the exhaust is directed upwardly away from roof 16. Upon de-energizing motor 23, the damper means will gravitate to their closed positions and prevent the leakage of water or snow into the building having roof 16.

Although the various features of the new and improved vertical ventilator have been shown and described in detail to fully disclose one embodiment of the invention, it will be evident that changes may be made in such details and certain features may be used without others without departing from the principles of the invention.

What is claimed is:

1. In a vertical discharge ventilator, a vertical housing means adapted to be mounted on the roof or the like, said housing means having open ends; a fan mounted in said housing means in a horizontal plane and extending substantially across the opening therein; means for rotating said fan; a horizontal trough shaped median member

mounted on said housing means and extending across said opening above said fan; support members mounted on said housing means extending across said opening above said fan on either side of said median member, said members being parallel to and spaced from said median member and the wall of said housing means and defining a plurality of passageways; outer damper means; means for pivoting said outer damper means adjacent said support members; a pair of damper means pivoted adjacent to said median member, said damper means pivoted to said median member overlapping the other damper means when in closed positions, the outer edges of said damper means extending over the upper edges of said housing means, one of said outer damper means and the adjacent damper of said pair of dampers facing in one direction when opened and the other two dampers facing in the opposite direction when opened, and means on said damper means coacting when in closed damper positions to provide a seal.

2. A discharge ventilator as defined in claim 1 having a tubular stack means mounted on said housing, surrounding said damper means and extending to an elevation greater than that of said damper means when the latter are in open position.

3. A discharge ventilator as defined in claim 1 wherein there is a main support having an aperture with edges upon which one of the open ends of said housing is adapted to rest, the edges of said aperture having means for sealingly engaging said housing, and means for pivotally mounting said housing on said support, whereby when said housing is pivoted thereon to open position, said fan and motor will move therewith.

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