June 16, 1953 J. N. BURGAN 2,641,987

VENTILATOR

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Fig. 1.

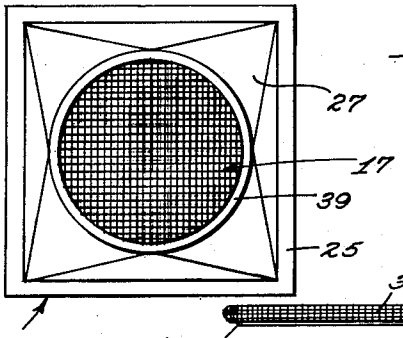

Fig. 2.

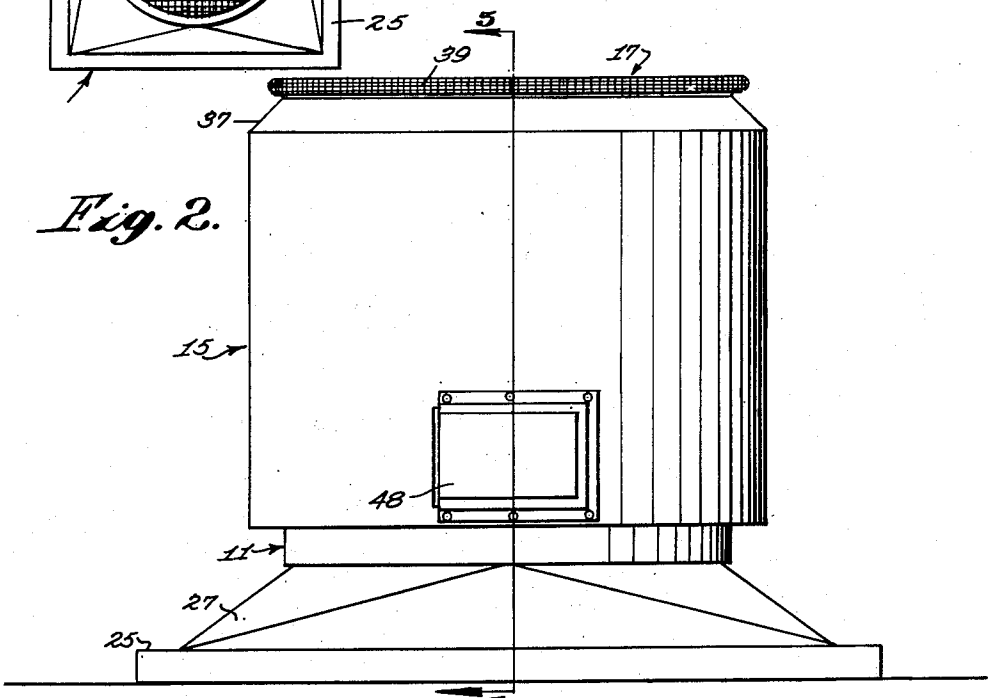

Fig. 5.

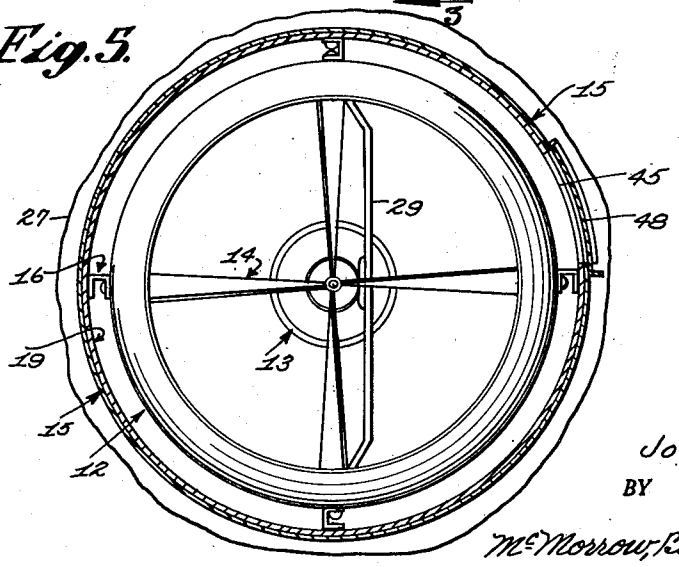

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Fig. 3.

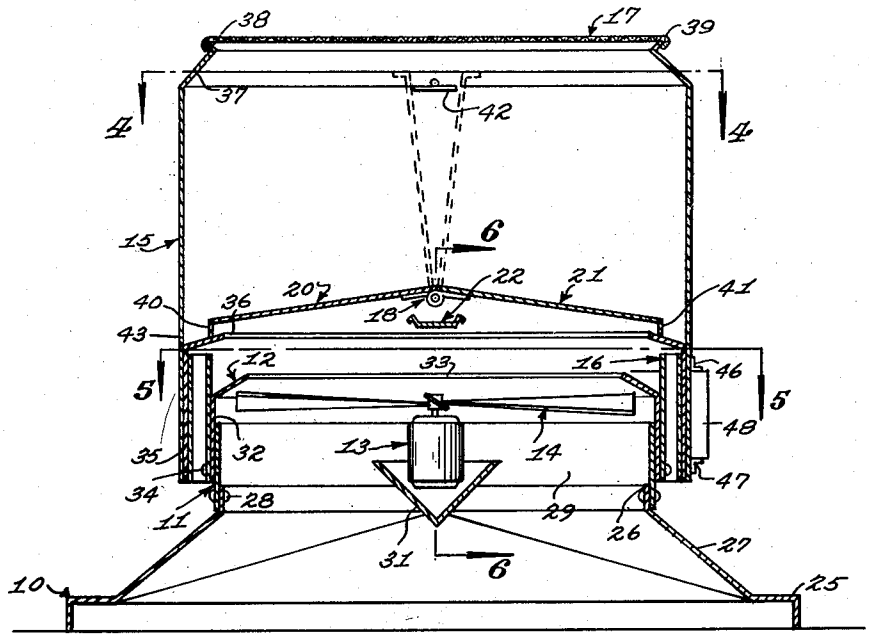


Fig. 4.

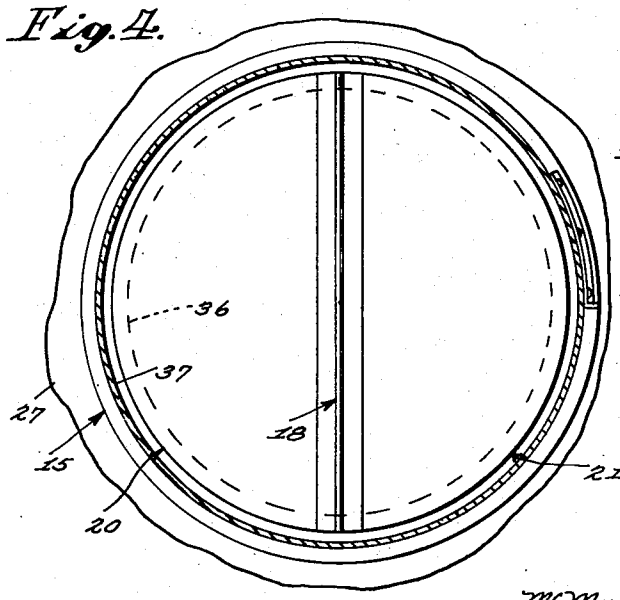
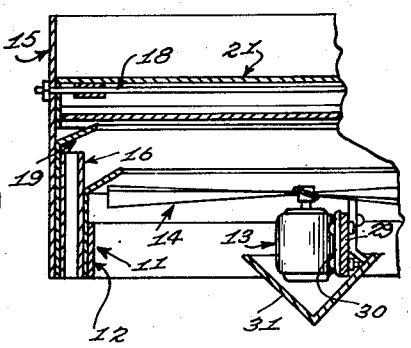


Fig. 6.



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VENTILATOR

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2 Claims. (Cl. 98—43)

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This invention relates to an improved exhaust or discharge ventilator adapted to be mounted in the roof of a building for exhausting air or gases from the interior of such a building.

It is among the objects of the invention to provide an improved ventilator including a power operated fan or blower for forcibly exhausting air therethrough and movable closure means acting to automatically close the ventilator when the blower is not operating and to open the ventilator for the passage of air therethrough when the blower is in operation; which is effective to vent air from the interior of a building both when the blower is operating and when the blower is not operating; which includes gutters for diverting moisture of precipitation and condensation from the interior to the exterior of the ventilator and a screen to keep birds and large insects out of the ventilator; which includes a door giving access to the interior of the ventilator for inspection and repair; and which is simple and durable in construction, economical to manufacture, easy to install and operate and neat and attractive in appearance.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawings, wherein:

Figure 1 is a top plan view of a ventilator illustrative of the invention;

Figure 2 is a side elevational view on an enlarged scale of the ventilator illustrated in Figure 1;

Figure 3 is a cross sectional view on the line 3—3 of Figure 2;

Figure 4 is a transverse cross sectional view on the line 4—4 of Figure 3;

Figure 5 is a transverse cross sectional view on the line 5—5 of Figure 3; and

Figure 6 is a fragmentary cross sectional view on the line 6—6 of Figure 3.

With continued reference to the drawings, the illustrated ventilator of the present invention comprises, in general, a hollow base 10, a preferably vertical cylindrical casing 11 secured to the base at the upper end of the latter and projecting upwardly therefrom, an annular baffle 12 within and secured to the casing, a fan motor 13 mounted in the casing 11, a fan 14 carried by the motor and disposed between the lower end of the casing 11 and the inwardly turned flange of the baffle 12, a cylindrical shield 15 surrounding the casing 11 and circumferentially spaced therefrom, spacers 16 supporting the shield 15 on the casing 11 with the shield extending upwardly from the casing,

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a bird screen 17 closing the upper end of the shield, a hinge 18 extending diametrically of the shield above the upper end of the casing 11, an annular gutter 19 disposed within the shield 15 at the lower end of the latter and having an inwardly directed flange at its upper end disposed immediately below the hinge 18, damper plates 20 and 21 secured to the hinge 18 and extending in opposite directions therefrom, and a gutter trough 22 extending diametrically of the shield 15 immediately below the hinge 18.

The base 10 is preferably a hollow sheet metal structure having a square or rectangular bottom flange 25, a cylindrical neck 26 spaced above the bottom flange 25 and downwardly and outwardly inclined walls 27 connecting the cylindrical neck 26 to the rectangular bottom flange 25.

The bottom flange 25 of the base is adapted to rest on the top of a flat building roof or on a suitable structure built up from a sloping roof to provide a substantially horizontal support for the base of the ventilator.

The cylindrical casing 11 surrounds the neck 26 of the base and is secured to the neck by suitable means, such as the rivets 28 extending through the neck and the casing at angularly spaced apart intervals around the neck. The cylindrical casing 11 extends upwardly above the neck 26 and a thin cross bar 29 extends chordally of the casing 11 adjacent to the location of a diameter of the casing and is secured at its opposite ends to the casing.

The fan motor 13 is mounted on the cross bar 29 by a suitable bracket 30 so that the axis of the motor shaft is substantially coaxial with the cylindrical casing 11 and a deflector 31 of inverted conical shape is secured to the bar 29 and disposed immediately below the fan motor 13 to deflect air flowing upwardly through the ventilator around the fan motor.

The fan 14 is mounted on the upper end of the shaft of the motor 13 and is disposed immediately above the upper edge of the casing 11. In the arrangement illustrated, the fan 14 has four blades spaced apart at angular intervals of approximately 90° and has a diameter only slightly less than the diameter of the casing 11.

The annular baffle 12 comprises a cylindrical portion 32 which closely surrounds and is secured to the side wall of the casing 11 and an inwardly and upwardly directed annular flange 33 at the upper edge of the portion 32 overlying the outer ends of the blades of the fan 14. The upwardly and inwardly directed annular baffle flange 33 serves to concentrate the air blast from the fan

14 against the central part of the undersides of the damper plates 20 and 21 and facilitate raising of these plates about their pivotal connection with the hinge 18 when the fan is driven by the fan motor 13.

The spacers 16 comprise vertical members of channel shaped cross section disposed at substantially equal annular intervals around the outside of the baffle 12 with their longitudinal center lines substantially parallel to the axis of the casing 11. Each of these spacers has one flange disposed against the outer side of the baffle flange 33 and secured to this baffle flange by suitable means, such as the rivets 34, and its other flange disposed against the inner side of the annular gutter 19 which surrounds and is circumferentially spaced from the baffle 12.

The gutter 19 has a cylindrical portion 35 which circumferentially and spacedly surrounds the cylindrical portion 32 of the baffle 12 and an upwardly and inwardly directed flange 36 on the upper edge of the cylindrical portion 35 which is spaced upwardly from the flange 33 of the baffle 12. The top surface of the flange 36 provides a rest for the marginal portions of the baffle plates 20 and 21, as is particularly illustrated in Figure 3.

The cylindrical shield 15 closely surrounds the portion 35 of the gutter 19 and extends upwardly above the gutter, being provided at its upper end with an inwardly and upwardly directed flange 37 terminating at its upper edge in a bead 38 to which the screen 17 is secured by suitable means such as the beaded rim 39.

The damper plates 20 and 21 are semicircular in shape with their diametrical edges extending along and secured to the plates of the hinge 18 and their arcuate edges provided with downwardly extending flanges 40 and 41, respectively, which rest on the top surface of the gutter 36 when the damper plates are in depressed position, as shown in Figure 3, and close the shield to the passage of air upwardly and downwardly therethrough.

When the fan 14 is driven by the fan motor 13 the resultant upward air blast through the baffle 12 strikes the undersides of the damper plates 20 and 21 and raises these plates to the position illustrated in dotted lines in Figure 3 to open the air passage through the shield 15 of the ventilator. A stop in the form of a flat cross bar 42 extends diametrically of the shield 15 near the uppermost portions of the arcuate edges of the shield 15 so as to limit upward movement of the plates to positions when the operation of the fan is discontinued.

When the damper plates are closed they are inclined somewhat downwardly and outwardly from the hinge 18 to drain moisture of precipitation and condensation outwardly to the annular gutter 19 from which it flows through suitable openings, as indicated at 43, to the exterior of the shield.

When the damper plates are held in upraised position by an air blast created by the fan 14, this air blast will keep moisture out of the spaces between the damper plates and the sides of the shield but moisture of condensation or precipitation may accumulate on the facing sides of the damper plates and drip through the hinge 18. In this case, the moisture will fall into the gutter trough 22 and be carried to the exterior of the shield through suitable openings in the shield at the ends of the gutter trough.

When the fan is not operating and the damper plates are in their depressed closed positions, as illustrated in full lines in Figure 3, the annular space between the baffle 12 and the gutter 19 provided by the spacers 16 constitutes an air passage through which air rising through the neck 26 of the ventilator base and through the casing 11 and above the baffle 12 may pass downwardly to the outside of the ventilator. Under these conditions, the damper plates and the flange 36 of the gutter 19 provide a roof closure for the upper end of the casing 11, and the upper end of the annular space between the baffle 12 and gutter 19, so that moisture of precipitation or condensation will not enter the casing, and any moisture condensing from the air flowing through the ventilator under these conditions will simply drain off through the annular passage surrounding the baffle 12.

A rectangular opening 45 is provided in the shield 15 near the lower edge of the shield, and the baffle 12 and casing 11 are provided with openings, not illustrated, registering with the opening 45 in the shield 15. These registering openings provide an inspection opening or window giving access to the interior of the ventilator for inspection or repair of the fan and fan motor. Grooved tracks 46 and 47 extend along the upper and lower sides of the opening 45 in the shield on the outer side of the shield and a rectangular door 48 is slidably mounted in these grooved tracks and is movable between a position in which it closes the opening 45 and a position in which it uncovers this opening.

The bird screen 17 not only keeps birds and large insects out of the ventilator but reduces the quantity of precipitation falling into the ventilator, deflecting rain and supporting snow above the damper plates so that the weight of snow is not imposed on the damper plates to interfere with their opening movements when the fan is turned on.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

Having thus described this invention, what is claimed is:

1. In a ventilator, a base, a vertical cylindrical casing open at its upper and lower ends, said casing being mounted on said base and having a sidewall rising thereabove, a motor mounted on said casing and concentrically spaced from said sidewall, said motor having a shaft extending upwardly from the motor, a fan fixed on the shaft at an upper part of said casing, an annular baffle on the upper end of said casing, said baffle including a radially inwardly and upwardly directed annular flange positioned immediately above and overlying a radially outward portion of the fan, circumferentially spaced spacers mounted on the exterior of the side wall of said casing, a vertical hollow cylindrical shield spacedly surrounding the casing and secured to said spacers, said shield being open at its lower and upper ends, said shield rising above said annular baffle and having a sidewall, an annular gutter within and secured to the side wall of said shield, said gutter including a radially in-

wardly and upwardly extending annular flange spaced above the annular flange of said baffle and overlying said spaced above said spacers, said baffle being spaced at a substantial distance below the upper end of said shield, drain means leading from said gutter to the exterior of said shield, a horizontal hinge assembly extending diametrically across the interior of the shield and secured to the shield sidewall at a level intermediate said gutter and the upper end of the shield, a pair of semi-circular damper plates having straight inner edges secured to the hinge assembly and extending from opposite sides of the hinge assembly, said damper plates having curved outer edges arranged to rest upon the annular flange of said gutter with the damper plates in radially outwardly declining closed positions in which the damper plates serve to close the shield, a stop bar secured to and extending across the interior of the shield in line with the axis of said hinge assembly, said stop bar being located above said gutter and on a level below the upper end of said shield in a position to be engaged by the curved edges of the damper plates whereby upward opening movement of the damper plates produced by air blast from the fan is limited.

2. In a ventilator, a base, a vertical cylindrical casing open at its upper and lower ends, said casing being mounted on said base and having a sidewall rising thereabove, a motor mounted in said casing and concentrically spaced from said sidewall, said motor having a shaft extending upwardly from the motor, a fan fixed on the shaft at an upper part of said casing, an annular baffle on the upper end of said casing, said baffle including a radially inwardly and upwardly directed annular flange positioned immediately above and overlying a radially outward portion of the fan, circumferentially spaced spacers mounted on the exterior of the side wall of said casing, a vertical hollow cylindrical shield spacedly surrounding the casing and secured to said spacers, said shield being open at its lower and upper ends, said shield rising above said annular baffle and having a sidewall, an annular gutter within and secured to the side wall of said shield, said gutter including a radially inwardly and upwardly extending annular flange spaced above the annular flange of said baffle and overlying and spaced above said spacers, said baffle being spaced at a substantial distance below the upper end of said shield, and a pair of semi-circular damper plates arranged so that the straight edges face each other positioned within said shield in superimposed spaced relation with respect to said gutter and having the facing straight edges hingedly connected to said shield, the curved edges of said damper plates normally resting upon the annular flange of said gutter.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,532,635	Osbun	Apr. 7, 1925
1,985,880	Blommers	Jan. 1, 1935
2,406,168	Shumaker	Aug. 20, 1946
2,439,271	Shaver	Apr. 6, 1948