April 15, 1958 G. C. BREIDERT ET AL 2,830,527

VENTILATOR

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FIG. 1.

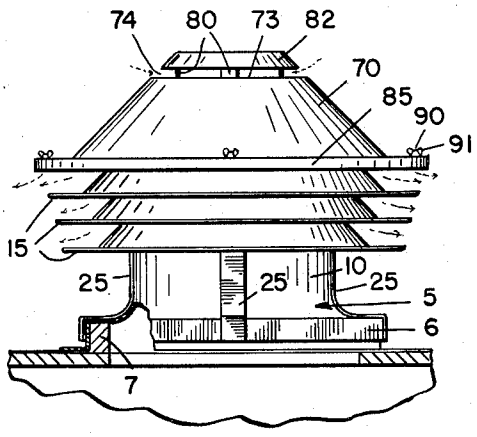

FIG. 2.

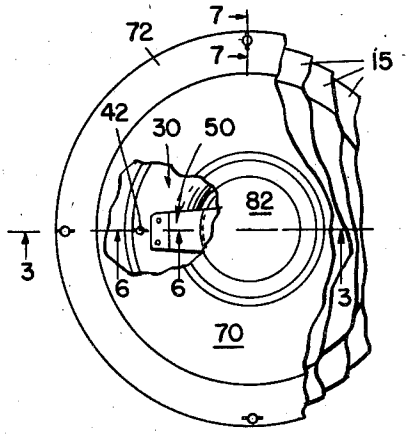

FIG. 3.

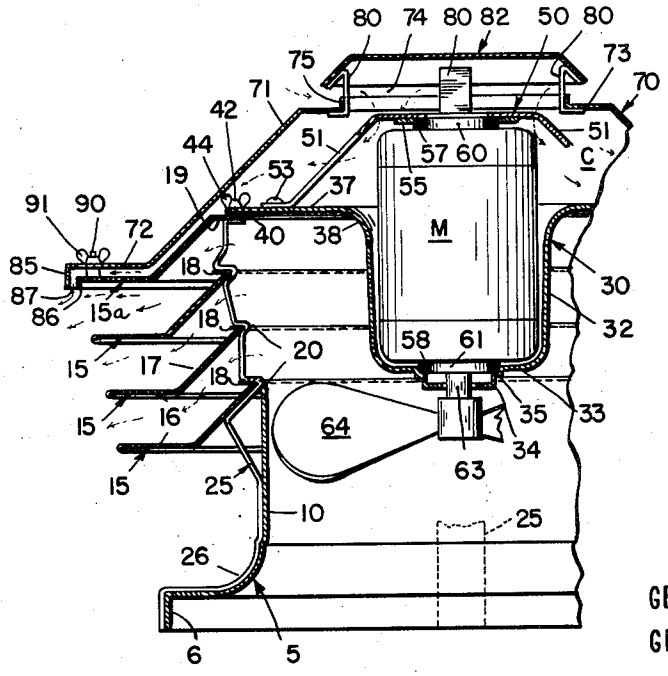

FIG. 4.

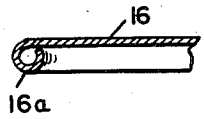

FIG. 5.

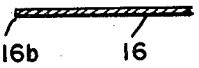

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FIG. 6.

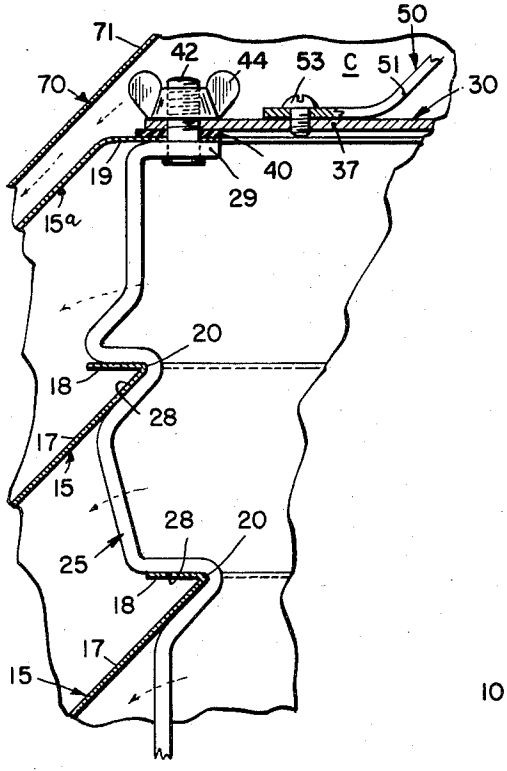


FIG. 7.

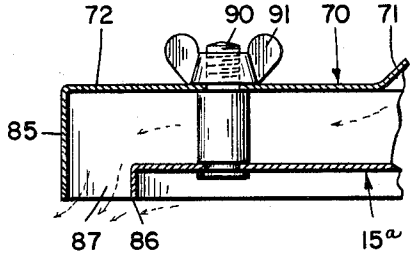


FIG. 8.

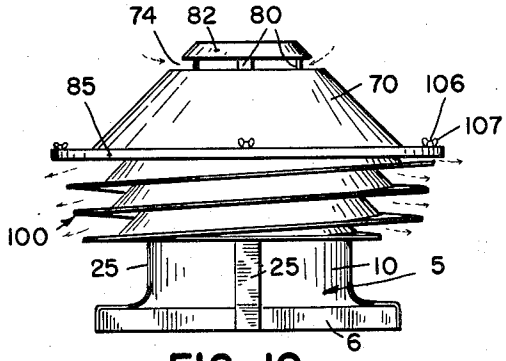


FIG. 10.

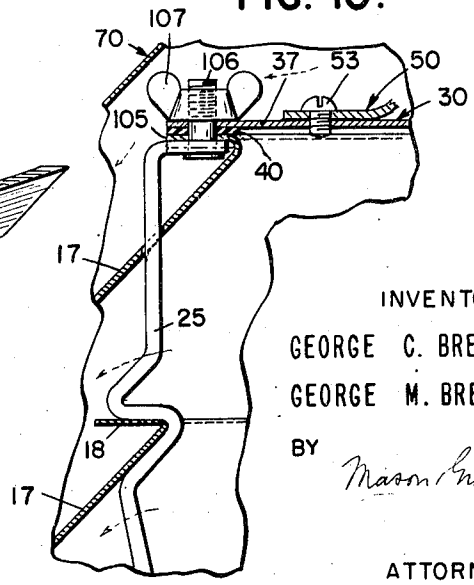
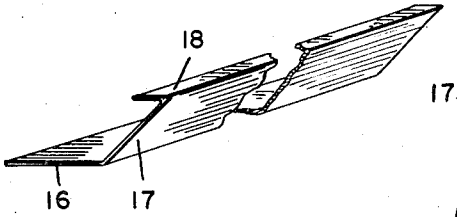


FIG. 9.



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VENTILATOR

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Application November 29, 1954, Serial No. 471,641

4 Claims. (Cl. 98—31)

Our invention has to do with ventilator devices.

In the use of gravity type ventilator heads on buildings to exhaust air from the buildings, reliance is placed upon extraneous air currents blowing about the ventilator head to cause the latter to siphon air from the building. Where the ventilating loads are heavy, however, booster fans or blowers are used, which are mounted in the ventilator head. Difficulties have been experienced in mounting the fan or blower and its motor in the head in such a way that the motor is effectively cooled and the unit is readily accessible for repair or replacement. Also, difficulties have been experienced in the respect that when the ventilator head is being operated strictly as a gravity-type head, the internal area of the head occupied by the motor has been such that the motor provides an obstruction which materially reduces the efficiency of the head.

It is an object of our present invention to provide a ventilator head which may be utilized either as a gravity type, or as a fan or blower actuated type, or as a combination of both types, without the motor providing an efficiency reducing obstruction to the passage of air through the head.

It is a further object to provide a ventilator head incorporating novel motor mounting and cooling means.

It is another object to provide a ventilator head wherein the blower or fan unit, including the motor, may be readily removed or inserted through the top of the ventilator head without disturbing the mounting of the head on the roof or the like.

A still further object is to provide a ventilator head having novel means for retaining and spacing horizontal baffle plates in relatively spaced relationship.

Other objects and advantages will appear hereinafter.

While we shall point out in the appended claims the features of our invention which we believe to be new, we shall now, for the purpose of explanation, describe a presently preferred embodiment of our invention for which purposes we shall refer to the accompanying drawing, wherein:

Fig. 1 is a side elevation, with a part broken away for illustrative purposes;

Fig. 2 is a top plan view, with parts broken away for illustrative purposes;

Fig. 3 is an enlarged vertical section taken on line 3—3 of Fig. 2;

Fig. 4 is an enlarged fragmentary section of a baffle plate;

Fig. 5 is an enlarged fragmentary section of a modified baffle plate;

Fig. 6 is an enlarged vertical section taken on line 6—6 of Fig. 2;

Fig. 7 is an enlarged fragmentary section taken on line 7—7 of Fig. 2;

Fig. 8 is a side elevation of a modified form of ventilator;

Fig. 9 is a perspective of a baffle plate before it is formed into circular form; and

Fig. 10 is an enlarged fragmentary section of Fig. 8.

Referring now to the drawing: the numeral 5 denotes a base having a depending annular flange 6 adapted to fit

over a conduit 7 communicating with an air duct through which air is exhausted, as from a building. Typically, such an air duct will discharge through the roof of a building. The base merges into a cylindrical neck portion 10 which serves as an orifice for the air impeller to be described.

Supported from the neck, by means to be described, we provide a plurality of annular baffle plates or rings 15 and plate member 15*a* which forms part of the cover structure to be described. Each of the baffle plates has a horizontal annular outer portion 16 which merges into a diagonally, upwardly and inwardly disposed frustoconical portion 17 which, in the case of the three lower baffles, terminates at its inner edge in a horizontally, outwardly disposed annular flange 18. In the case of cover portion 15*a*, a frustoconical portion terminates in a horizontally inwardly disposed flange 19. The frusto-conical portion 17 of each of the baffle plates defines an axial opening 20 providing an air passageway, the openings of said baffle plates being coaxial.

The baffle plates progressively increase in outside diameter from the bottom one thereof to the top one—that is, the next to the bottom baffle plate is larger in inside and outside diameter than the bottom baffle plate, and the third from bottom baffle plate is larger in inside and outside diameter than the next lower baffle plate. The cover portion 15*a* is larger in outside diameter than the next lower plate but its inside diameter is relatively smaller.

It will be understood, of course, that while we show a ventilator having three baffle plates, a greater or lesser number of plates may be used. It is our preference to use not less than three baffle plates.

For supporting the baffle plates and cover assembly in vertically spaced relationship, we provide longitudinally disposed spacer strips 25, preferably four in number, equidistantly spaced apart circumferentially of the head of the ventilator. Each of those strips 25 is preferably composed of a flat strip of metal having a lower portion 26 bent to conform to the cross sectional shape of the neck and base and is secured thereto as by spot welding. Thence each spacer strip is bent or stamped to provide longitudinally spaced, outwardly opening V-shaped pockets 28 into which fit the intersecting portions 17, 18 of the baffle plates, said portions being preferably spot welded to the spacer strips in those pockets.

As shown in Fig. 6, each of the spacer strips terminates at its top end in a horizontal, inwardly disposed portion 29 atop which the horizontal annular flange portion 19 of the top baffle plate rests.

A cup-shaped motor housing 30 (Fig. 3) has a cylindrical side wall 32, a bottom wall 33 presenting a recessed central portion 34 providing an upwardly facing, annular shoulder 35, and has a horizontally disposed annular top flange 37 intersecting the cylindrical portion in a curved portion 38 to facilitate admitting cooling air to the motor, as will be described.

As best shown in Fig. 6, the marginal portion of the flange 37 of the motor housing is superimposed on the flange 19 of the member 15*a*, a resilient, rubber-like ring 40 being sandwiched between the marginal portion of the flange 37 and the flange 19. The flanges 37 and 19 and the ring 40 have registering holes therethrough to receive circumferentially spaced studs 42 carried by the top end portions 29 of the spacer strips, and are clamped in assembly by an easily removable wing nut 44. A motor hold-down plate 50 has legs 51 secured to the flange 37, as by screws 53.

The top portion of the plate 50 has a ring-shaped depending boss 55 to retain a vibration damping resilient, rubber-like ring 57. A like resilient, rubber-like ring 58 rests against the shoulder 35, so that the motor M is retained in the motor housing by having its end bosses

60 and 61 fitted in the rings 57, 58. The motor shaft 63 projects downwardly through the bottom wall of the motor housing to carry an air impeller 64, here shown as being a conventional axial fan, although of course a conventional centrifugal blower could be used as the impeller. Preferably, the motor housing terminates substantially in the plane of the top end of the neck 10, and is arranged concentrically in the air passageway defined by the baffle plates.

It will be observed that the motor housing is exposed to the upwardly moving air in the passageway to effect a cooling of the motor.

To provide circulated outside air around the motor, we provide a top wall 70 which has a frusto-conical portion 71, an annular horizontal peripheral flange portion 72, and a horizontal inner flange 73 terminating in an annular vertically disposed flange 75 to which brackets 80 are secured, as by spot welding, to support a cover cap 82 in spaced relation to the top edge of the flange 75, to provide an air inlet to the chamber C defined by the top wall and the motor housing.

The annular flange portion 72 of the top wall terminates at its outer edge in a depending annular flange 85, while the member 15*a* terminates at its outer edge portion in a depending annular flange 86 providing an annular air outlet 87 from the chamber C.

The top wall 70 is retained in position, with the horizontal portion 72 spaced from the horizontal portion of the topmost baffle plate and flange 85 spaced from flange 86, by means of circumferentially arranged spacer bolts 90 and wing nuts 91.

Thus, in addition to the cooling of the motor by the upwardly moving air stream in the ventilator head, the motor is further cooled by outside air being circulated in the chamber C to which the motor is exposed. As the impeller is rotated by the motor, the air is withdrawn from the conduit 7 and forced outwardly between the baffle plates and between the top baffle plate and member 15*a*, and as the air is thus forced over the depending annular flange 86, it creates a reduced pressure in the chamber C, inducing air into the chamber through the opening 74. The motor is thoroughly insulated from the motor housing and hold-down plate by the rings 57, 58, so as to dampen vibrations resulting from operation of the motor, and the motor housing is insulated from the remainder of the structure by the resilient rings 40 to further dampen vibration. Also, the motor is freely accessible by simply removing the top wall 70 and the hold-down plate 51, and the impeller may be rendered accessible by unscrewing the wing nuts 44 and removing the entire motor mount.

Where the baffle plates are of relatively large diameter, we find it desirable to strengthen their peripheral portions by rolling the peripheral edge to provide a bead 16*a*, as shown in Fig. 4. Where relatively small diameter baffle plates are used, their peripheral edges 16*b* may be flat, as shown in Fig. 5.

In Fig. 8 we show a modified form of ventilator wherein the parts are as before described except that, instead of using separate baffle plates, the baffles are provided by first stamping or otherwise forming a strip of metal into the shape shown in Fig. 9 having the portions 16, 17, 18, and then the length of metal is formed into a spiral 100, as shown in Fig. 8, the lower portion of the spiral being supported from the neck 10 by the spacer strips 25. Here the marginal portion of the flange 37 of the motor mount is superimposed on the flange portion 105 of the top convolution of the baffle member, with a resilient, rubber-like vibration damping ring sandwiched therebetween, the assembly being retained by circumferentially spaced bolts 106 and wing nuts 107.

We claim:

1. In a ventilator, a tubular base member providing an axial air inlet, baffle members each having a flat annular outer portion and a frusto-conical inner portion

terminating in an outwardly disposed annular flange, means securing said baffle members in vertically spaced, parallel relationship, said latter means comprising circumferentially spaced strips secured at their bottom ends to said base and presenting longitudinally spaced V-shaped portions in which the inner edge portions of said baffle members are disposed, a motor housing having a downwardly embossed cylindrical portion providing a motor-receiving pocket and having an annular top peripheral flange supported from the topmost of said baffle members, a motor supported in and coaxial with said pocket, said baffles together defining an upwardly flaring axial air passageway surrounding said pocket and defining radial air passageways therebetween, a frusto-conical top member supported in vertically spaced relationship to the top one of said baffle members, said top member defining with said motor housing an air chamber to which said motor is directly exposed, and means providing an air inlet and an air outlet for said chamber.

2. A ventilator device comprising, in combination, a base providing a vertically disposed air inlet neck, a horizontally disposed baffle member having a central opening defining a vertical air passageway communicating with said neck, said baffle member having a flat horizontally disposed outer marginal portion, a cover member defining an air circulation chamber and providing a portion overlying said vertical air passageway, said cover member having a flat, horizontally disposed outer marginal portion and having means providing an air outlet from said chamber discharging downwardly entirely around the periphery of said latter marginal portion, a motor mounted in said chamber, an air impeller disposed in said neck, means operatively connecting said motor to said air impeller, and means supporting said baffle member and said cover member with their said outer marginal portions in vertically spaced parallel relationship with the periphery of said outer marginal portion of said baffle member substantially directly underlying the periphery of said outer marginal portion of said cover member whereby said outer marginal portions together guide transversely moving air currents horizontally immediately beneath said air outlet so as to create reduced pressure at said outlet.

3. The ventilator device of claim 2 wherein said flat outer marginal portion of said cover member has a vertically downwardly disposed peripheral flange defining the inner side of said outlet and terminating below the plane of said flat outer marginal portion of said cover member.

4. The ventilator device of claim 2 wherein said cover member has an inwardly-upwardly disposed inner portion adjoining the inner edge portion of its said flat outer marginal portion; wherein said baffle member has an inwardly-upwardly disposed inner marginal portion defining said vertical air passageway and disposed in vertically spaced parallel relationship to and extending upwardly into said inner portion of said cover member; and, wherein said baffle member has an outwardly disposed flange bounding the inner edge of its said inner marginal portion whereby to prevent said transversely moving air currents from passing over said inner edge.

References Cited in the file of this patent

UNITED STATES PATENTS

637,520	Middleton	Nov. 21, 1899
1,409,199	Roth	Mar. 14, 1922
1,722,825	Roethel	July 30, 1929
2,571,513	Ammerman	Oct. 16, 1951
2,605,693	Hansen	Aug. 5, 1952

FOREIGN PATENTS

15,102	Great Britain	1894
228,734	Germany	Nov. 15, 1910
732,348	France	Sept. 19, 1932
423,724	Great Britain	Feb. 6, 1935