Oct. 7, 1947. G. C. BREIDERT 2,428,544

VENTILATOR

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Fig. 1

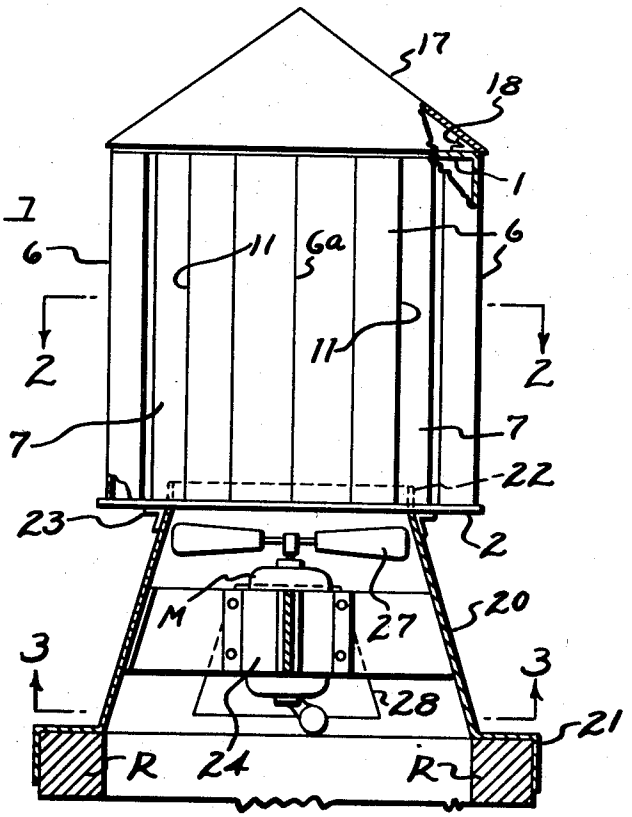


Fig. 3

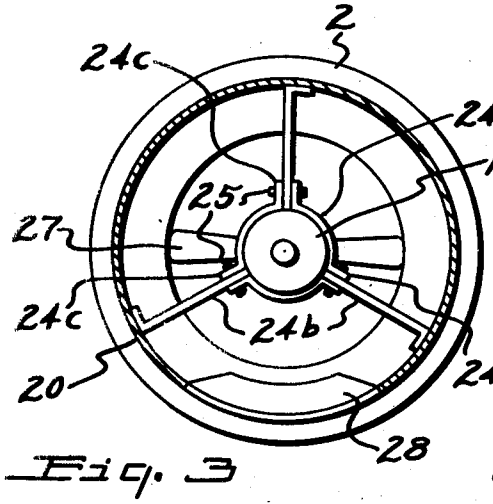
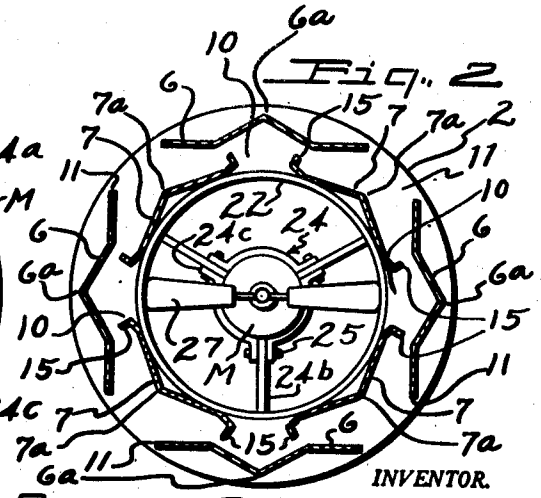


Fig. 2



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VENTILATOR

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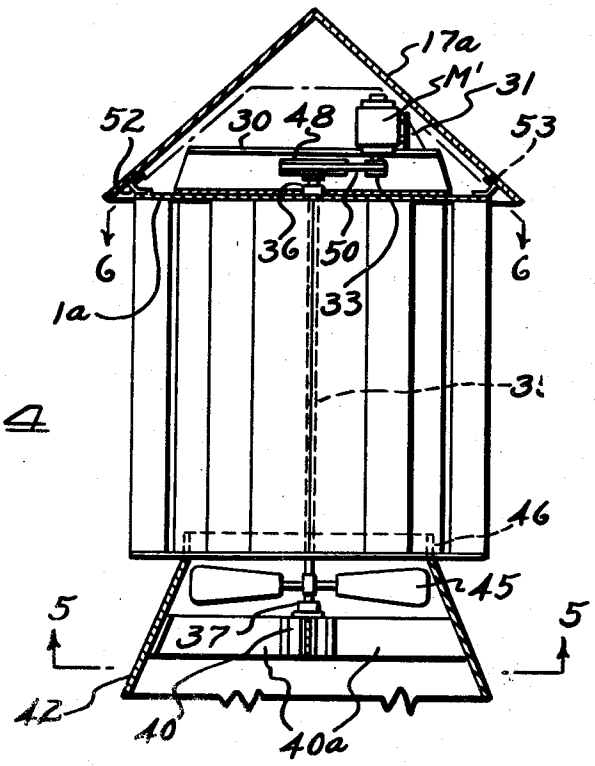


Fig. 4

Fig. 6

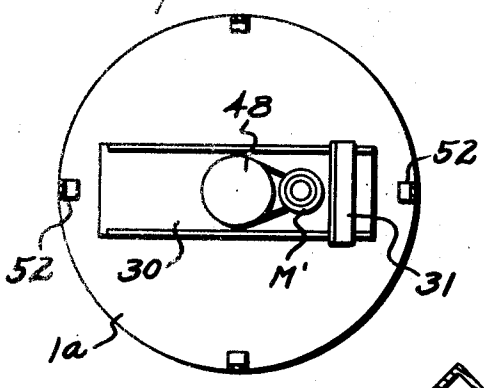
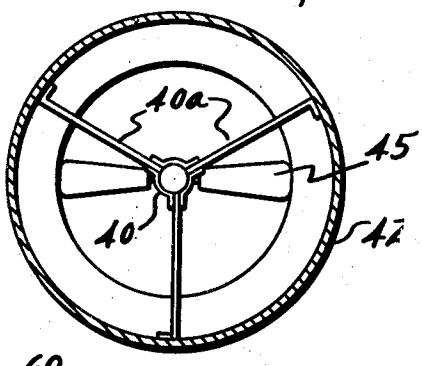


Fig. 5



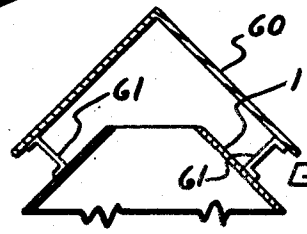


Fig. 7

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VENTILATOR

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Application April 18, 1944, Serial No. 531,561

2 Claims. (Cl. 98—43)

1

My invention has to do with ventilators of the type employed for exhausting fumes and foul air from buildings.

In my Patent No. 2,269,428, issued January 13, 1942, I show a ventilator of this type, which is adapted to be positioned on the roof of a building and in communication with the space to be ventilated by means of suitable ducts. The construction of my said ventilator is such as to cause air currents passing over the ventilator to create a vacuum on the outlet openings of the ventilator which effectively draws the fumes and foul air from the space to be ventilated.

There are times, however, when the exterior air currents are relatively light or when the foul air load to be exhausted is unusually heavy, and thus it is desirable to increase the exhausting capacity of the ventilator at those times, although, since such increased capacity is not always required, it is also desirable that the normal exhausting capacity of the ventilator be not reduced by the capacity increasing means, and it is to this general feature of utility that my present invention is directed.

It is therefore among the objects of my present invention to provide a ventilator of the wind-operated type which incorporates means for augmenting the exhausting capacity without interfering with the normal capacity when the incorporated means are not used.

It is also an object of my invention to provide a fan ventilator incorporating means for providing full efficiency of the fan despite air currents which ordinarily would materially reduce the efficiency of a fan.

It is a further object of the invention to provide, in a ventilator, a motor and fan mounting which adequately protects the working parts from exposure to rain, dust and other damaging elements.

Another object is to provide a ventilator of this character which is durable, highly efficient, and easy to manufacture, install and repair.

My invention has still further advantages and features of novelty which will become apparent from the following description of two particular embodiments thereof which I have chosen for explanatory purposes. I wish it understood, however, that the invention is not to be limited to the precise details now to be described since, in its broader aspects as defined by the accompanying claims, it is capable of being carried out in other specific and modified forms of apparatus which the following description will suggest to those skilled in the art.

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In the drawings, which will be referred to in the ensuing description,

Fig. 1 is a side elevation, partly in section;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 1 but showing a variational form of apparatus;

Fig. 5 is a section on line 5—5 of Fig. 4;

Fig. 6 is a view taken on line 6—6 of Fig. 4; and

Fig. 7 is a fragmentary section showing a further modification.

Referring first to Figs. 1, 2 and 3, I show a ventilator head having a top wall 1 and a ring-like bottom wall 2, joined by outer side baffle members 6 and inner baffle members 7, in the manner shown in my said prior patent. There are four of the sides 6 and a like number of baffles 7 in the structure shown, although this number may be varied, said members being concentrically arranged and circumferentially spaced apart to provide outlet openings 10, 11. Each of the members 6, 7 is shaped to provide, in cross section, a V-shaped bulge 6a, 7a, the baffles 6 having their side edges formed outwardly at an angle to provide deflector tips 15. Horizontal baffles are provided by the peripheral portions of the wall members 1 and 2. The spaces 10, 11 are of equal width and height. A conical hood 17 is secured to the top wall 1 as by brackets 18 and in practice I find that the height of the cone should be approximately one-half its base diameter.

The head hereinabove described is mounted on a building roof R by means of a flared tubular base or conduit 20 having attaching flanges 21 and terminating at its top end in a cylindrical neck 22, which neck terminates above the bottom wall 2 so that any moisture which might enter between the baffle members 6 and 7 will be caught by the bottom wall 2 and prevented, by means of the neck, from entering the base. The bottom wall 2 is secured to the base as by brackets 23. Within the flared portion of the base I secure a spider-shaped motor mounting suspension bracket 24 which has a central portion 24a and radial arms 24b, the arms being secured to the flanges 24c of the central portion by bolts 25. The outer angled ends of the arms are secured to the inner surface of the base as by rivets.

A conventional electric motor M is secured axially in the bracket 24 and a fan 27 is secured axially on the motor drive shaft. While the fan is substantially equal in diameter to that of the neck 22, it is disposed in the flared portion of the base below the neck so that there is a suffi-

cient clearance around the fan to compensate for the space occupied by the motor and fan, whereby the ventilator may operate at full capacity under natural draft when the motor is not being operated.

A door 28 is provided through the side of the base so that ready access may be had to repair or lubricate the motor.

By this construction, when the wind blows across the openings 11 of the ventilator head while the fan is operating, the output is increased by the natural suction of the ventilator in proportion to the wind velocity, which is an effect opposite to that which would result from use of a fan without the ventilator head; consequently, with my combination structure, the ventilator may be used with full efficiency without operating the fan when the foul air to be removed from the room is not of such quantity as to require the combined action of both the ventilator and fan, and then, when the additional capacity of the fan is required, both the natural suction of the head and the exhausting capacity of the fan may be utilized with full efficiency.

In Figs. 4, 5 and 6 I show a variational form of apparatus embodying my invention, in which the ventilator head is as before described except that here there is provided within the conical hood 17*a* a table 30 supported on the top wall 1*a* and this table carries a bracket 31 to which a vertically disposed motor M' is secured. The drive shaft of the motor extends through the table and carries a drive pulley 33.

A vertical shaft 35 extends axially through the ventilator head, being journaled adjacent its top end in a bearing 36 carried by the top wall and being journaled at its lower end in a thrust bearing 37 carried by the spider-like bracket 40 whose legs 40*a* have their angled outer ends secured to the inner surface of the flared tubular base 42 in the manner before described.

A fan 45 is secured axially on the lower end portion of the shaft 35 within the flared portion of the base below the neck 46 so that ample clearance is provided around the fan to compensate for the space occupied by the fan, bracket and thrust bearing and thereby to permit efficient operation of the ventilator without operation of the fan whenever desired.

A pulley 48 is secured on the top end of shaft 35 and this pulley is connected to drive pulley 33 by a belt 50.

To provide cooling ventilation for the motor, the peripheral edge of the top wall 1*a* and the cone is spaced somewhat apart by spacers 52 attached to the cone and top wall by screws 53.

In Fig. 7 I show a further modification wherein the parts are as shown in Figs. 4–6 except that cone 17*b* is frustrumed and a conical cover 60 is mounted over the frustrum by brackets 61 in spaced relation to cone 17*b* to permit improved ventilation for the motor M'.

The advantage of the construction shown in Figs. 4–7 is that the motor is completely isolated from the path of air passing through the ventilator and is thus protected against dust, moisture, fumes or excessive heat.

I claim.

1. A ventilating device for exhausting air from a structure, comprising a conduit adapted to be secured over an opening in the structure, said conduit tapering from its bottom to a cylindrical discharge end portion, a ventilator comprising top and bottom walls spaced apart by concentric rows of circumferentially spaced, vertically disposed baffles, said bottom wall having an axial opening into which the cylindrical portion of the conduit projects, a spider secured to the side wall of the tapered portion of the conduit and disposed transversely of the conduit, an exhaust fan member supported by the spider to rotate about an axis coaxial with the conduit, said fan being disposed in the top end of the tapered portion immediately adjacent the cylindrical portion of the conduit and being of a diameter substantially equal to the inside diameter of said cylindrical portion, and power driven actuating means operatively connected to the fan.

2. The device of claim 1 wherein the actuating means consists of a motor carried by the spider and wherein the cross-sectional area of the conduit within which are mounted the fan, motor and spider is sufficiently greater than the cross-sectional area of the cylindrical portion of the conduit to compensate for the area occupied by the fan, motor and spider.

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