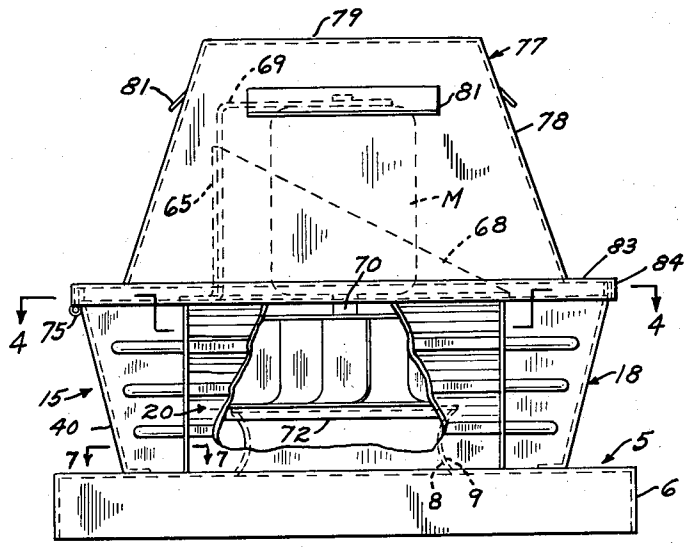
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Fig. 1.



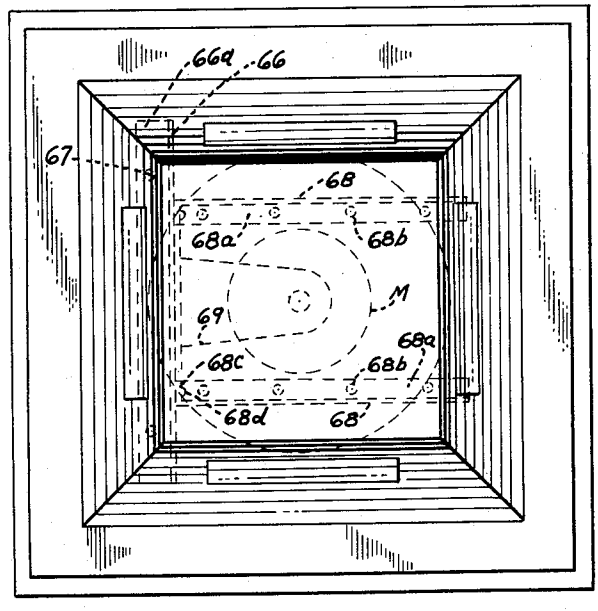


Fig. 2.

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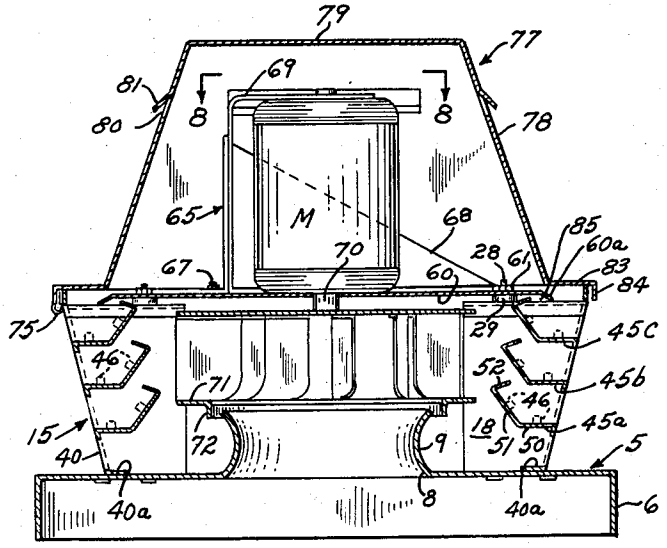
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Fig. 3.



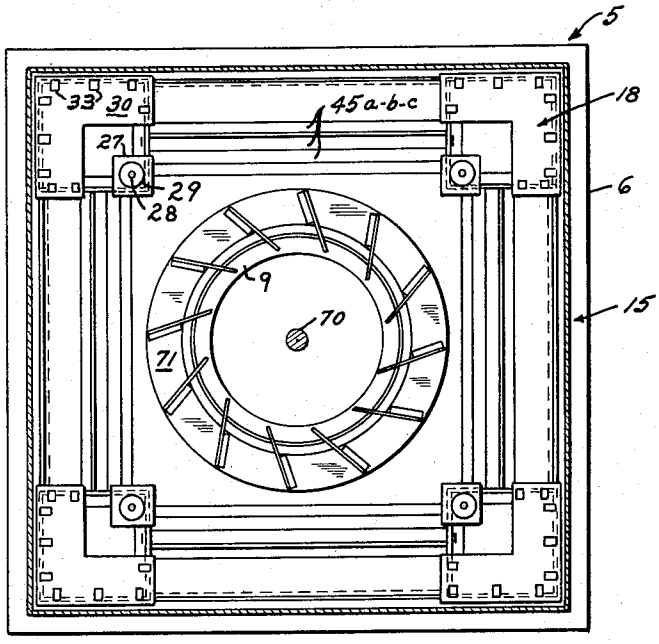


Fig. 4.

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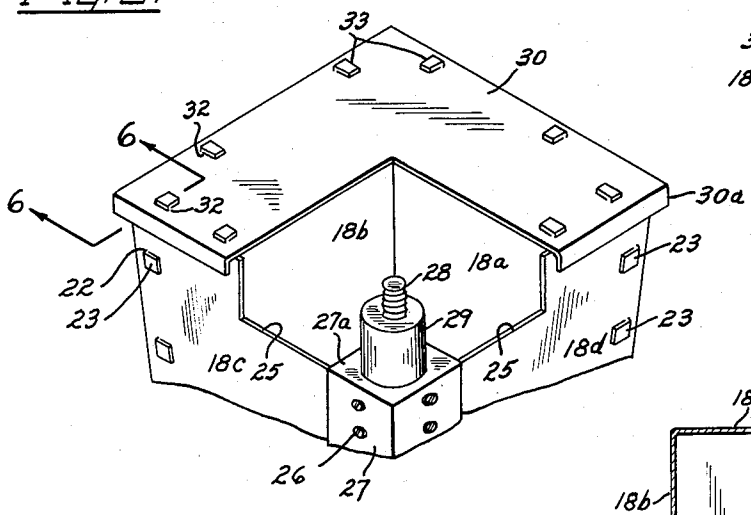
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Fig. 5.



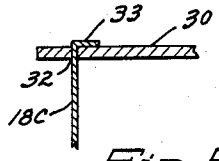


Fig. 6.

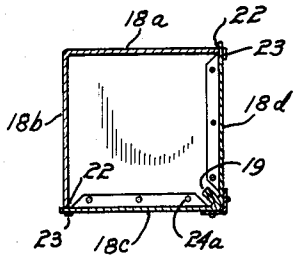


Fig. 7.

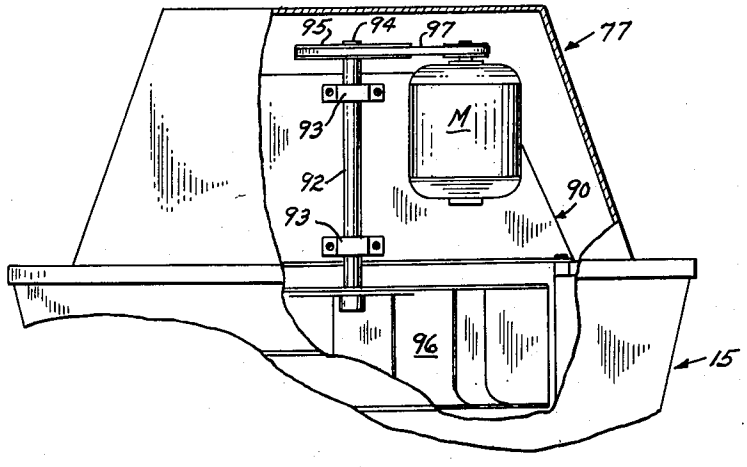


Fig. 9.

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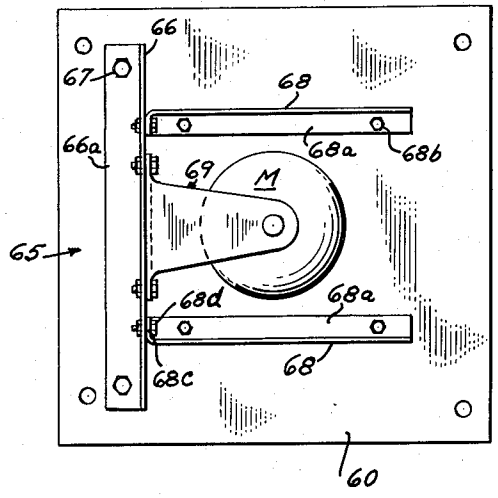


Fig. 8.

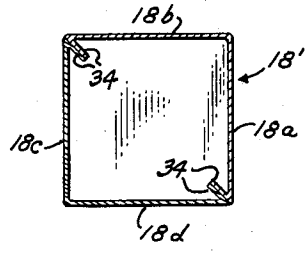


Fig. 10.

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VENTILATOR CONSTRUCTION

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Filed Nov. 3, 1958, Ser. No. 771,478
4 Claims. (Cl. 98—43)

This invention has to do with ventilator devices adapted to be mounted on the roofs of buildings for exhausting contaminated air from the buildings.

Roof ventilator devices of conventional construction are usually of rounded or cylindrical cross section so that, to make them of increased capacity, requires that their diameter and height be increased. Such devices, being mounted on building roofs, are often exposed to high winds, so that the height of a ventilator must be kept as low as possible to prevent damage from such winds. Also, a shortcoming common to those prior ventilators, of which I am aware, is that they use motor mounts which do not sufficiently damp the vibrations resulting from operation of the motor and the motor driven blower or fan, and often do not provide for adequate cooling of the motor. Another difficulty with most ventilator devices is that they use constructions requiring that their parts be produced by metal spinning operations which are relatively costly and also they require a large number of welding operations which are costly. Therefore, the aim of those working in the ventilator art has long been to overcome those shortcomings and difficulties as far as possible.

It is an object of the present invention to provide a ventilator device which, because of its construction, is particularly economical of manufacture and assembly.

A further object is to provide a ventilator device which is peculiarly adaptable to being embodied in a rectilinear construction, which enables the ventilator to be made to have relatively large capacity without increasing the width and height of the device.

Another object is to provide a ventilator having novel and advantageous motor-mounting means which effectively damps vibrations produced by operation of the motor and blower.

A further object is to provide a ventilator construction having novel means for mounting the baffle members.

Another object is to provide, in a ventilator construction, efficient means for cooling the motor employed to operate a booster fan or blower incorporated in the device.

An additional object is to provide a combination air inlet or cone and blower wheel assembly which eliminates the necessity of mounting the blower wheel within a scroll member.

A still further object is to provide a ventilator construction which is unusually durable and capable of withstanding exposure to strong winds.

Other objects and advantages will appear from the ensuing description wherein, by reference to the accompanying drawings, I describe presently preferred modes of carrying my invention into practice. However, the drawings are to be regarded merely as illustrative of said presently preferred typical embodiments and it will be understood that various changes and modifications may be made without departing from the intended spirit and scope of the invention, as more particularly pointed out in the appended claims.

In general, I achieve the objects of my invention by making my ventilator of rectilinear outline—that is of squared or rectangular cross section, having squared corner posts of substantial strength, and vertically spaced baffles or louvers preferably secured at their ends to the corner posts by ears or tabs inserted through corresponding holes in the contiguous walls of the corner posts and bent at right angles to retain the parts in assembly. The

motor is carried in an air circulation chamber by a resilient diaphragmatic plate which forms a cover for the hollow baffled or louvered body, the plate preferably being resiliently supported on the body. The blower or fan is disposed in the body, being suspended from said plate by means of the motor shaft so that it is out of contact with other parts of the device. Also I provide novel and efficient means of utilizing the normal air exhausting function of the ventilator to cause air to be drawn into the motor mounting chamber and exhausted therefrom by creating reduced pressure at the outlet from the chamber.

From the foregoing description, it will be apparent that the motor is not only constructed in such a manner that practically all vibrations resulting from its operation, as well as operation of the blower, are effectively damped, but also the motor is at all times shielded from the elements and maintained cool by air circulation. Also, the construction is such that the ventilator base, body and hood can be made of metal stampings so that all relatively costly metal spinning operations are eliminated. The cooperating ear and slot means of assembling the device further materially reduces the costs of assembly. The described construction also provides great durability and enables achieving greater capacity while making the ventilator of less width and height than would be necessary in conventional ventilator construction.

The louver construction of my ventilator renders it capable of operating purely as a gravity-type ventilator—without the use of a blower—since extraneous air currents blowing over the outside of the louvers create reduced pressures at the ventilator outlets, thus syphoning air from a building. However, the booster blower is desirable where the exhaust load is heavy or where there are little or no extraneous air currents blowing over the ventilator.

In the accompanying drawings:

FIG. 1 is a side elevation with a part being broken away for illustrative purposes;

FIG. 2 is a top plan view;

FIG. 3 is a section taken on line 3—3 of FIG. 2;

FIG. 4 is a section taken on line 4—4 of FIG. 1;

FIG. 5 is a fragmentary perspective view of a corner portion of the device;

FIG. 6 is an enlarged section taken on line 6—6 of FIG. 5;

FIG. 7 is an enlarged section taken on line 7—7 of FIG. 1;

FIG. 8 is a plan view of the motor mount;

FIG. 9 is a side elevation, with part broken away, showing a modified form of motor and driving arrangement, and

FIG. 10 is a sectional view showing a modified corner construction.

Referring now to the drawings (FIGS. 1–8), I show my ventilator as comprising a square base **5** having a depending marginal flange **6** for fitting over a curb (not shown) surrounding an opening in a building roof. The base has a central opening and carries an inlet cone ring **9** in register with the opening. While I show the base as adapted for mounting on a flat roof, it may have its bottom portion shaped to fit on the ridge of a ridge roof if desired.

Secured to the base **5**, I provide a body **15** of squared cross section and tapering from its top to the base. The body includes four corner posts **18** with a number (here shown as 3) of superimposed horizontal baffles or vanes, to be described, between and secured to the contiguous corner posts preferably in the manner to be hereinafter described.

As best shown in FIGS. 5–7, each of the posts **18** is of squared cross section and is comprised of side walls **18***a*, **18***b*, **18***c* and **18***d*. The walls **18***a*, **18***b* are preferably

integral with each other, while walls 18*c* and 18*d* are preferably separate members and have openings 22 adjacent their outer side edges for the reception of ears 23 formed integral with the contiguous edges of the walls 18*a*, 18*b*; the ears being bent at right angles against the outer surface of walls 18*b*, 18*c*, so as to retain the walls in assembly. The inner edge portions 19 of walls 18*c* and 18*d* have marginal portions bent at an acute angle and secured together, as by welding as best shown in FIG. 7, the bottom end portion of each of the walls 18*c*, 18*d* is inwardly flanged at 24 and those flanges are secured to the base, as by screws 24*a*.

Each of the walls 18*c* and 18*d* has a cut-away portion 25 and a bracket 27 is secured, as by screws 26, to the intersecting portions of walls 18*c* and 18*d*; the bracket having a horizontal top portion 27*a* to which is secured, as by means of a bolt 28, carrying a vibration damping resilient member 29 for the purpose to be described. An L-shaped cover plate 30 is provided for each post, the cover plate having along its marginal portions a number of openings 32 to pass ears 33 formed integral with the top edges of the side walls. The ears are bent at right angles against the top surface of the cover plate to secure the cover plate against the top edges of the side wall. Also the cover plate preferably has a depending marginal flange portion 30*a*.

In FIG. 10, I show a variational corner post construction wherein each of the corner posts 18′ has its walls 18*a*, 18*b* formed integral with each other and has its walls 18*c*, 18*d* formed integral with each other, and the two wall units are secured together by means of acutely angled side edge flanges 34 welded together.

The sides of the body between the corner posts are each defined by a bottom panel 40, which has a bottom marginal flange 40*a* secured, as by welding, to the base 5, and by a plurality of sets of louvers or baffles 45*a*, 45*b* and 45*c*, the ends of which baffles have projecting ears 46 which extend through corresponding openings in the contiguous side walls of the posts 18 and being bent over to retain the baffles secured to the posts.

Each of the baffles has a horizontal outer portion 50, an upwardly and inwardly inclining intermediate portion 51 and an upwardly and outwardly inclining inner portion 52. As best shown in FIG. 3, each of the inner portions 52 of the baffles 45*a* and 45*b* terminates in a plane slightly above the plane of the bottom surface of the horizontal portion 50 of the next upper baffle.

A resilient, diaphragmatic plate 60 is supported at its corner portions on vibration damping elements here shown as rubber pads 29, being secured in position thereon by having the bolts 28 project through corresponding holes in the plate and being secured by nuts 61 threaded on the bolts. The marginal portions 60*a* of the plate 60 are disposed downwardly and outwardly for the purpose to be described.

The motor M is mounted on the diaphragmatic plate 60 by a bracket 65 described as follows (FIG. 8): The bracket 65 comprises an upright plate 66 having a bottom flange 66*a* secured to plate 60 by screws 67, and the plate 66 is braced by two spaced triangular plates 68 each having a bottom flange 68*a* secured to the base by screws 68*b* and having an end flange 68*c* secured to plate 66 by bolts 68*d*. The motor is secured to the plate 66 by bracket 69. The motor has its shaft 70 extending through an opening in plate 60 and the shaft carries an air impeller, here shown as a conventional centrifugal blower wheel 71 on its bottom end within the body 15.

As best shown in FIG. 3, the bottom of the blower wheel 71 has a depending annular flange 72 defining an air inlet to the wheel into which extends the top or outlet end of the cone 9, so that air, is guided into the wheel without the necessity of enclosing the blower wheel within a conventional scroll.

Secured, by hinges 75, to the corner posts 18 at one side of the body, I provide a hood 77 whose side walls 78 converge to the flat top wall 79; the side walls having horizontally disposed inlet openings 80 shielded by portions 81 which are struck out of the side walls and bent outwardly at an angle thereto.

The hood has a horizontal marginal portion 83 which has a depending marginal flange 84 spaced outwardly from the marginal portion 60*a* of plate 60, so that as air passes out of the body between the top baffle 45*c* and flange 60*a* it will be directed outwardly beneath the marginal flange 84 of the hood and thus create a reduced pressure in the passageway 85 defined by marginal portions of the plate 60 and the hood.

In the embodiment of FIG. 9 the construction is as before described, except that here the angle iron motor-mounting bracket 90 carries a sleeve 92 secured thereto by clamps 93, and a drive shaft 94 is journaled at the sleeve and carries a pulley 95 at its top end, and also carries a conventional blower device 96 at its bottom end. The motor M′ is secured to the upright portion of bracket 90 in position laterally offset from the shaft 94, and drives the shaft by means of a belt 97.

I claim:

1. In a roof ventilator, a rectangular base having a flat top wall and a depending marginal flange, said base being adapted to engage over a curb surrounding an opening in a roof, a hollow body including four corner posts secured at their bottom ends to the top wall of said base and extending uprightly therefrom, said posts having outer side walls which converge towards said base horizontally disposed louvers secured at their ends to contiguous ones of said posts and defining the sides of said body, a resilient pad carried by the top end of each of said posts, a diaphragmatic plate overlying the interior of said body and supported at its corner portions on said pads in position spaced above the topmost of said louvers, said plate having an opening therethrough and having downwardly and outwardly disposed marginal portions, a motor supported on said plate, said motor having a shaft depending through said opening, an air impeller secured to said shaft and disposed within said body below said plate, and a cover hood mounted on said posts and enclosing said motor, said hood having a ventilation opening therein.

2. The ventilator of claim 1 wherein the inner marginal portion of each of said louvers is upwardly and outwardly disposed, wherein the inner marginal portions of the topmost of said louvers terminate in inwardly spaced relationship to the marginal portions of said plate and define therewith air outlet passageways therebetween, and wherein said hood has its marginal portions terminating in a plane spaced above the plane of the marginal extremity portions of said plate whereby to define air outlet passageways therebetween exposed to said first mentioned passageways.

3. In a roof ventilator, a hollow open ended rectangular body having corner posts and having horizontal, vertically spaced louvers in its sides secured at their ends to said posts, a cover plate resiliently supported on the top ends of said posts in covering relationship to the hollow interior of said body, in position spaced above the topmost of said louvers, said plate having a downwardly and outwardly disposed marginal portion, a hood supported on the top end portions of said posts and overlying said plate and having a ventilation opening therein, said hood having a depending marginal flange surrounding the top side portion of said body in horizontally spaced relation to the marginal portion of said plate whereby to provide therebetween an air outlet from said hood, and the topmost of said louvers having upwardly and outwardly disposed inner marginal portions spaced inwardly from the marginal edge of said plate whereby, in cooperation therewith, to deflect air passing outwardly from the interior of said body in a path extending immediately beneath the outlet end of said passageway; a motor mounted on said plate, an air impeller mounted within said body

between the sides thereof, and means operatively connecting said motor to said impeller.

4. In a roof ventilator, a hollow rectangular body adapted to be mounted in surrounding relationship to an air outlet in a building roof and having its bottom end in communication with said opening, means covering the top end of said body; said body being tapered from its top to its bottom end and having corner post portions of rectangular cross section and horizontally disposed vertically spaced side louvers secured at their ends to said corner post portions; an air impeller mounted within said body, and power means for rotating said impeller.

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