June 22, 1943. E. O. MARTINSON 2,322,302

VENTILATOR

Filed Dec. 23, 1940

Fig. 1.

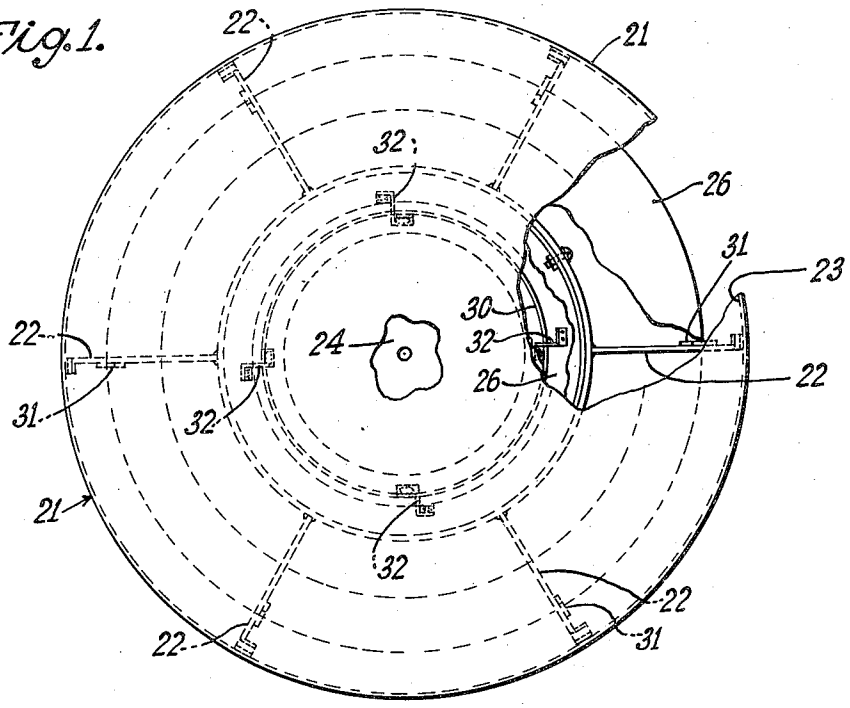
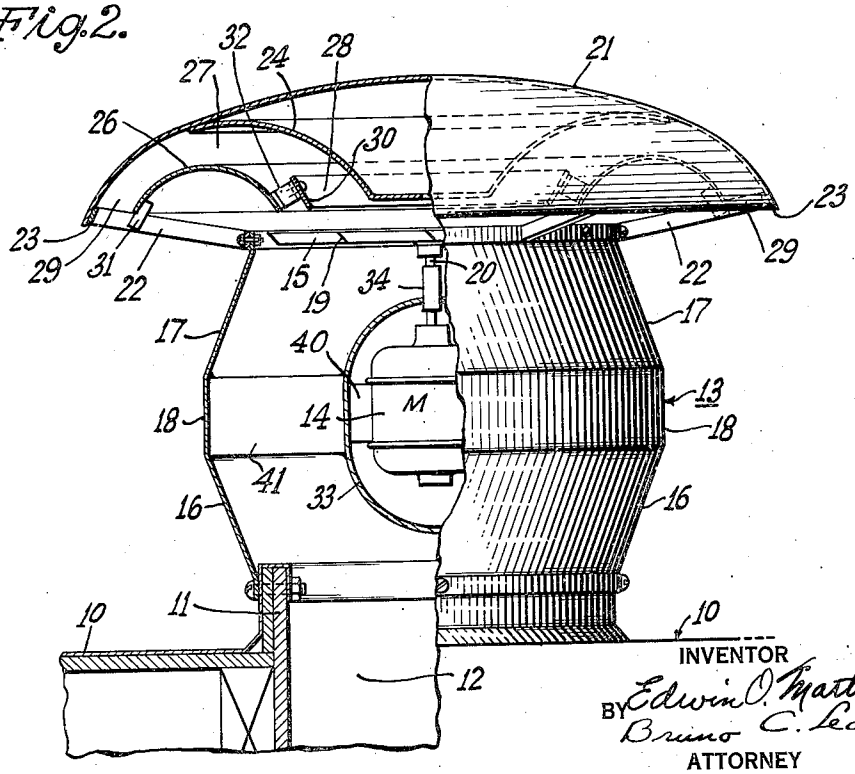


Fig. 2.



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VENTILATOR

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1 Claim. (Cl. 98—43)

This invention relates to a roof ventilator.

It is an object of this invention to provide a power flow roof ventilator capable of discharging the maximum air currents with a minimum of power.

It is a further object to provide a new combination of axial flow pressure fan and discharge cowl so coordinated that the effect produced by the fan may be utilized to the maximum in producing a flow of air.

It is a further object of this invention to provide a new and improved roof ventilator which may be utilized with an axial flow pressure fan and which will deliver the maximum current for the power employed and at the same time will be free from adverse disturbances due to atmospheric currents.

It is a further object to provide a device of the character described which when used in a ventilating system will consume as little as possible of the pressure of the system so that the ventilator may work effectively against the resistance of ducts.

It is a further object to provide a device of the character described which is substantially uniform in its results regardless of the direction of the external air currents and which will be practical in construction and neat in appearance.

The invention accordingly comprises the features of construction, combination of elements, and arrangements of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claim.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawing, in which:

Fig. 1 is a top plan view of a ventilator embodying this invention, parts being broken away more clearly to illustrate the invention.

Fig. 2 is a side elevation of the same, parts being broken away to show the construction.

In the drawing the numeral 10 designates a roof having an outlet 11 with a ventilating conduit 12. Surrounding the outlet is a shell member 13 in which there is supported a fan motor 14 driving a fan 15. The motor may be bolted to a plate 40 extending across the motor chamber 33 which is described below. The plate 40 is attached at each end to the walls of chamber 33. Because of the fact that the motor itself occupies a material portion of the conduit the shell 13 is expanded outwardly at its center so as to provide a uniform area notwithstanding the presence of the fan. This is accomplished as shown by constructing the shell of two conical portions 16 and 17 joined together by a cylindrical portion 18. This construction making it possible to form all of these members from sheet stock.

The fan 15 is of the axial discharge type, that is a type which throws its discharge along the axis and to this end is provided with blades 19 each preferably curved to afford the minimum resistance to the air current. The fan 15 is driven from the shaft 20 of the motor 14 and occupies substantially the entire cross sectional area of the shell at its topmost portion.

The shell 13 is covered by a cap 21 which is continuously convexly curved in form, as shown. This cap is supported by brackets 22 extending inwardly to the upper periphery of the conical portion 17, the brackets being such as to support an outer rim 23 substantially in alignment with or slightly above the upper edge of the conical portion 17. Within the cap 13 there is provided a central deflector 24 having its peripheral portion of such a conical contour as to form with the periphery of the cap 21 a smooth flowing surface to receive the air discharged upwardly by the fan and deflected downwardly under the peripheral rim 23 with the minimum of parasitic air currents and obstructions.

The space beneath the deflector 24 and the outer edge of the cap 21 thus constitutes a continuous channel leading from the fan and discharged downwardly on the outside. This channel is, however, preferably divided into a plurality of sections carrying substantially parallel air currents. As illustrated there is provided an annular portion 26, which in cross section is arcuate and curved to correspond with the air stream so as to provide above it a channel 27 of greater width in a radial direction at its inner end as shown at 28 than at its outer end as shown at 29 so as to compensate for the difference in radius to make the entire radial channels substantially of uniform cross section from its inner end to its outer. The inner end of this chamber which is, therefore, of considerable radial width, may in turn be further divided by a second annular deflector 30 which assists in maintaining the direction of travel of the air currents in the direction of the mean center of the channel 27.

As illustrated the partition 26 may be supported from the bracket 22 by clips 31 and the

deflector 30 may be supported from the inner end of the partition 26 by clips 32.

The inner end of the partition 26 is so situated as to divide the air discharge from the fan 15, leaving a portion of the air stream passing through the channel 27 and a portion thereof entering below the partition 26 to be deflected upwardly, outwardly and downwardly by that partition in a stream parallel to that passing through the channel.

Where it is desired to employ this ventilator in gases which may have a destructive effect upon the motor, the motor 14 may be enclosed in a closed chamber 33 carrying a sleeve 34 which may be tightly packed around the shaft. Chamber 33 may be supported in shell 13 in any desired manner such as by struts 41 whose ends are fastened to the shell 13 and to the walls of the chamber 33 respectively. In this manner the ventilator may be used even with corrosive fumes without any danger of ruining the motor, but in such case, of course, the ventilator parts and the motor compartments will be made of materials having a surface free from liability of corrosion by the atmosphere which it handles.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claim is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

An electric motor-driven weather-proof ventilator having in combination a vertical shell adapted to extend upwardly through a roof and having a constricted portion at its upper end, a central chamber within said shell extending axially below the constricted portion of the vertical shell and spaced from the shell walls, a motor within said chamber and completely enclosed thereby and having a shaft extending upwardly out of said chamber along the axis of the shell, an axial flow exhaust fan carried by said shaft in the plane of the constricted portion of the shell, radial supports extending out from the shell at the upper end thereof, a dome of larger diameter than the shell carried by the outwardly extending supports and having its outer edge substantially on a level with the upper edge of said shell, an inverted frustro-conical deflector axially disposed on the underside of said dome, an annular deflector ring carried by the said outwardly extending supports having a curved cross section and having its outer peripheral portion substantially parallel to the outer peripheral portion of said dome, and spaced between said dome and the upper end of said shell, and having its inner peripheral portion substantially parallel to the surface of said conical deflector whereby said frustro conical deflector and said annular deflector direct any drops of moisture or wind-borne spray away from the motor shaft and whereby the discharge of said fan is divided into two concentric annular air streams.

EDWIN O. MARTINSON.