Jan. 19, 1954 C. L. AMMERMAN 2,666,378

VENTILATOR

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Fig. 1

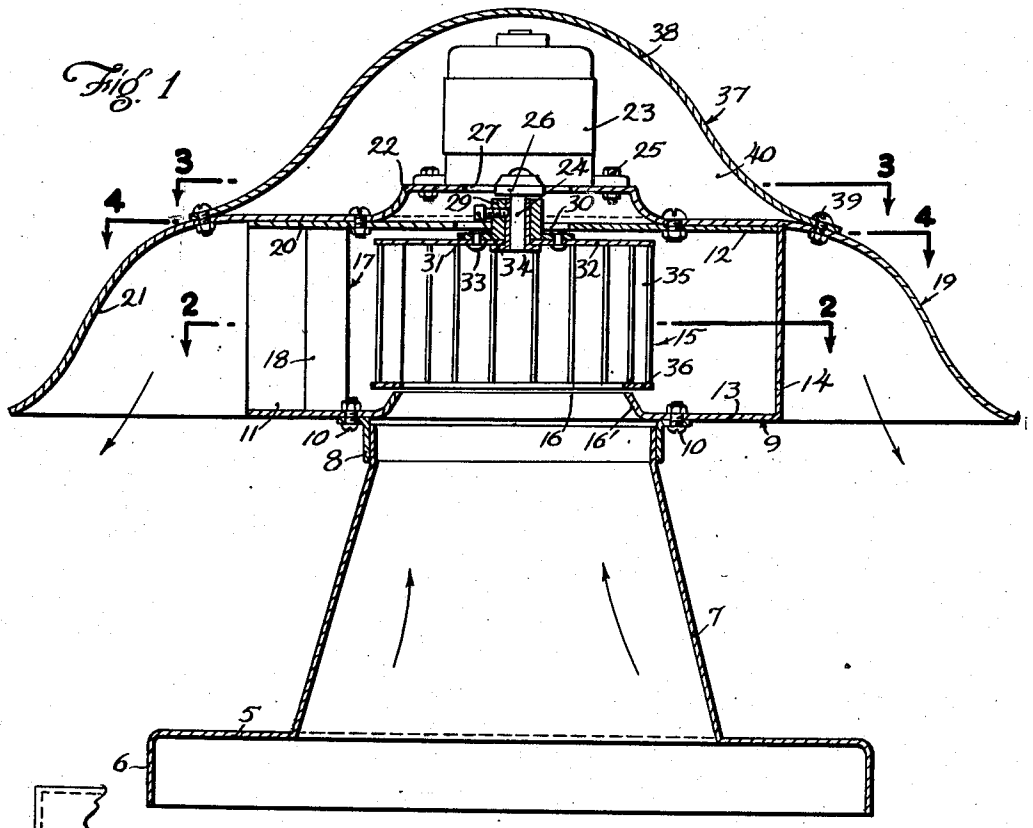
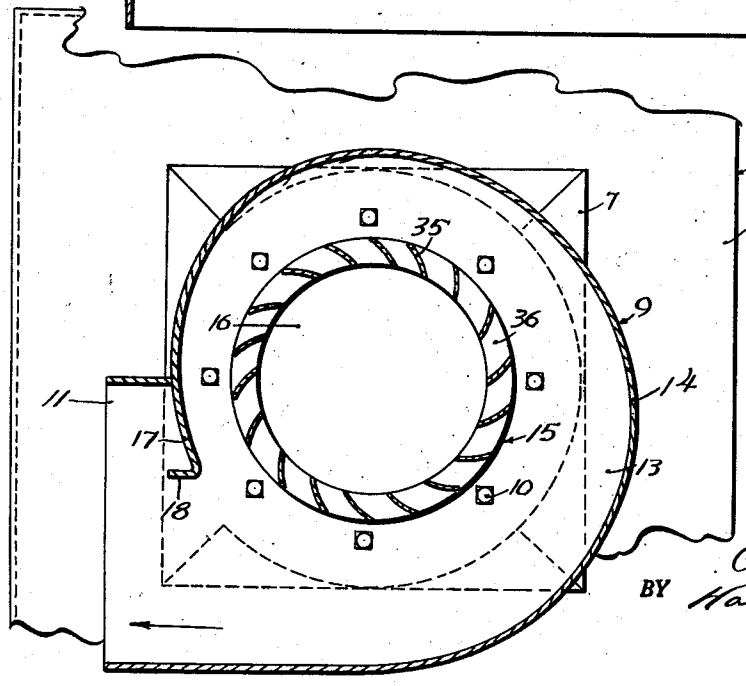


Fig. 2



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Fig. 3

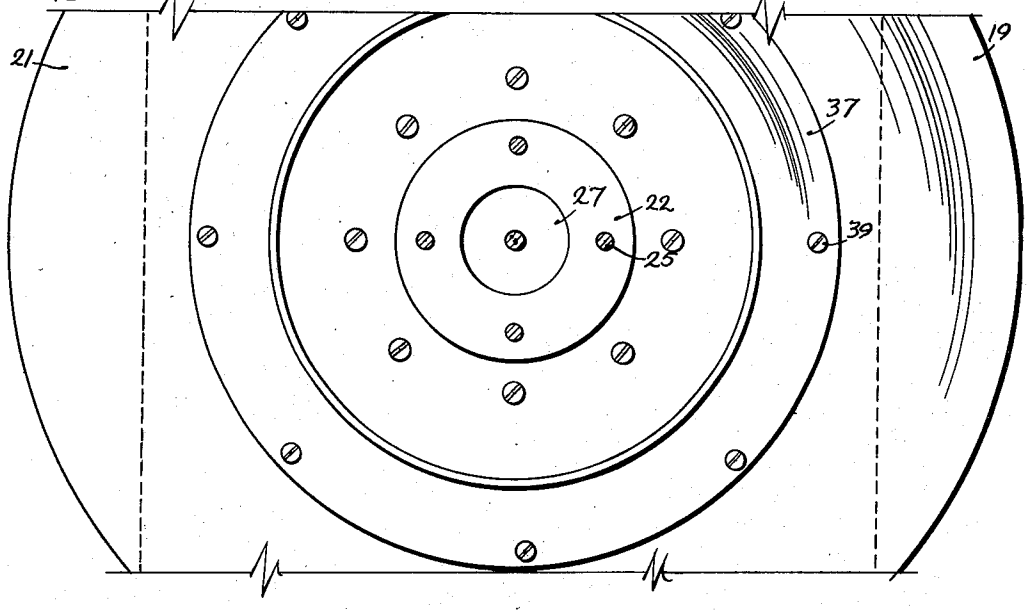
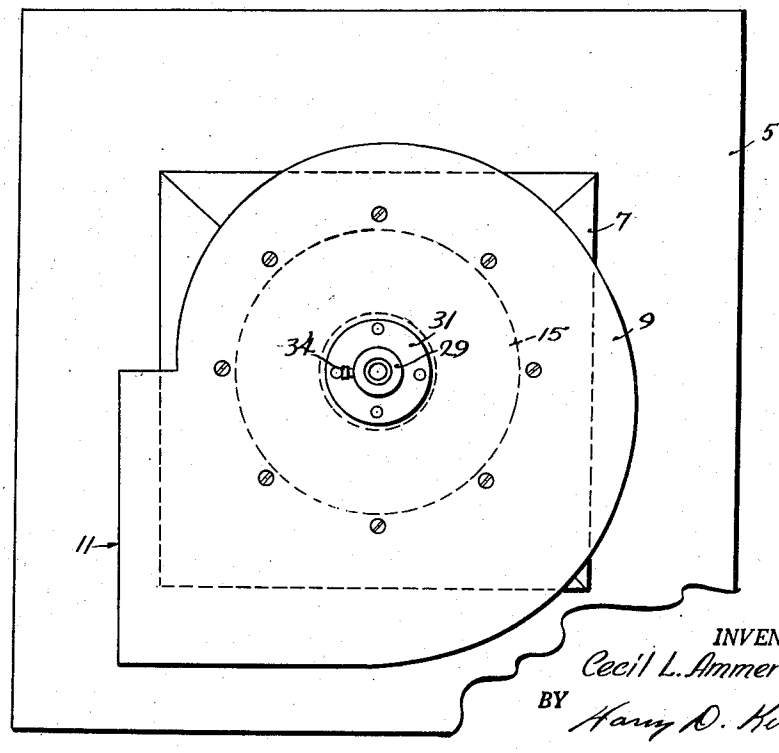


Fig. 4



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Patented Jan. 19, 1954

2,666,378

UNITED STATES PATENT OFFICE

2,666,378

VENTILATOR

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Application March 22, 1952, Serial No. 278,062

1 Claim. (Cl. 98—43)

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My present invention relates to improvements in ventilators of the type disclosed in my United States Letters Patent No. 2,571,513, issued October 16, 1951.

An object of this invention is to provide a natural draft ventilator supplemented by a motor-driven fan.

Another object is to provide a novel ventilator in which the motor for operating the fan is entirely out of the line of air flow.

Still another object is to provide a novel storm band having a novel motor base or mount.

A further object is to provide a novel fan housing having a break-out plate.

A still further object is to provide a novel arrangement of a motor and a fan to facilitate the mounting and the cooling of the motor.

Another object is to provide a ventilator having aerodynamically correct curves that cause air to freely flow through and out of the ventilator to atmosphere by natural draft or when supplemented by a motor-driven fan without causing turbulence or back pressure.

Other objects will be apparent from the following description, reference being had to the drawings.

To the above end, generally stated, the invention consists of the novel devices and combination of devices hereinafter described and defined in the claim.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a view principally in vertical section taken centrally through the improved ventilator; and

Figs. 2, 3, and 4 are views partly in plan and partly in horizontal section taken on the lines 2—2, 3—3 and 4—4 of Fig. 1, respectively.

The numeral 5 indicates a flat sheet metal base having a capping flange 6 and a central upstanding upwardly tapered throat 7 that is square at its lower end and round at its upper end. This tapered throat 7 affords the air intake of a venturi. When the ventilator is installed, its base 5 rests on a curbing built into a roof structure with the capping flange 6 overlapping said curbing to form a weather-tight joint between the ventilator and the curbing. Also, when the ventilator is installed, the throat 7 forms an extension of a stack through which air is drawn and discharged to the atmosphere by the ventilator. For the purpose of this case, it will not be necessary to show the curbing and the stack as

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they are conventional and form no part of this invention. A ring 8 formed of an angle bar has one of its flanges turned downwardly, encircles the upper end portion of the throat 7 and is secured thereto. The other flange of the ring 8 is turned outwardly.

A horizontally disposed fan housing 9 rests centrally on the ring 8 and is secured thereto by stove bolts 10. This housing 9 has a discharge throat 11 and the top and bottom members 12 and 13 thereof are flat and parallel. The side wall 14 of the housing 9 is in the form of a scroll that extends from one side of the throat 11 to the other. The side wall 14 progressively increases in diameter from the short side of the throat 11 to the long side thereof. In other words, this diameter progressively increases in the direction of the rotation of a sirocco fan 15 journaled in the housing 9.

A large hole 16 in the housing bottom member 13, coincident with the throat 7, affords a passageway from said throat to the interior of the housing 9. The edge portion of the housing bottom member 13 surrounding the hole 16 is curved outwardly and upwardly to afford an annular stiffening member 16' for said bottom member.

A break-out plate 17 in the throat 11 is formed by extending the side wall 14 into the throat 11 on the short side thereof. The vertical edge portion of the break-out plate 17 is turned outwardly in the throat 11, as indicated at 18. The purpose of the break-out plate 18 is to prevent air discharged into the throat 11 and out of the maximum force of the fan 15 from being drawn into the housing 9 by the fan 15 and recirculated.

Resting on the housing top member 12 is a storm band 19 capping the housing 9 and formed of a single sheet of metal. The storm band 19 comprises a flat horizontal head member 20 and an annular apron 21 encircling said head member. The apron 21 is outwardly and downwardly inclined on a reverse curve to substantially the plane of the bottom member 13 of the housing 9. Stove bolts 19' detachably secure the storm band 19 to the housing 9. In some instances, it might be desirable to eliminate the housing top member 12 and secure the housing side member 14 to the storm band head member 20.

The head member 20 of the storm band 19, at its center, is upwardly offset to afford a flat motor base or mount 22. The head member 20 is curved upwardly to the motor mount 22 to stiffen the storm band 19. An electric motor 23 which rests on the mount 22, with its armature shaft 24 in a depending position, is secured to the

mount 22 by stove bolts 25. The lower bearing 26 of the motor 23 extends through a large hole 27 in the motor mount 22 and the armature shaft 24 extends into a sleeve 28 in a hub 29. This hub 29 extends through a large hole 30 in the housing top member 12 and has on its lower end an outturned flange 31 that rests on the top member 32 of the fan 15 and is secured thereto by rivets 33.

The fan 15 is secured to the armature shaft 24, to be rotated thereby, by a set screw 34 having threaded engagement with the hub 29, extends through a hole in the sleeve 28 and impinges the armature shaft 24. The fan blades 35 are circumferentially spaced about the top member 32 and are secured to their upper ends thereto. These blades 35 are secured at their lower ends to a flat ring 36 that has a working clearance with the stiffening member 16'.

It will be noted that there is considerable space between the motor 23 and the fan 15 which greatly facilitates the cooling of said motor and the manipulation of the stove bolts 25 in mounting the motor 23 on the mount 22 or in removing the same therefrom.

The motor 23 is covered by an annular cap 37 having a central upwardly bulged portion 38 and outwardly of this bulge portion the cap 37 is outwardly and downwardly curved and rests at its perimeter on the storm band 19. Stove bolts 39 detachably secure the cap 37 to the storm band 19. The space within the cap 37 affords a motor compartment 40.

The novel shape of the apron 21 permits a free flow of air from the throat 11 to atmosphere and at the same time prevents wind from blowing into the throat 11 and the housing 9, thus interfering with the flow of air from the throat 11 and the operation of the fan 15. This apron 21 also prevents rain or snow from being blown into the throat 11 and the housing 9.

While there are herein disclosed but a limited number of embodiments of the structure, process and product of the invention herein presented, it is possible to produce still other embodiments without departing from the inventive concept herein disclosed, and it is desired, therefore, that only such limitations be imposed on the appended claim as are stated herein, or required by the prior art.

What I claim is:

In a ventilator, a base having an upstanding central intake throat that is upwardly tapered to an annular member, the side wall of which is parallel to the axis of the throat, a fan housing having parallel top and bottom members and a side wall perpendicular to the top and bottom members, said housing having a discharge throat between said top and bottom members perpendicular to the axis of the intake throat, the side walls of the housing progressively increasing in diameter from one side of the discharge throat to the other, an annular flange fixed to the bottom member of the housing capping the annular member of the intake throat and removably supporting the housing thereon, said housing bottom member having a large hole concentric with the axis of the intake throat, the bottom member surrounding the hole therein being upwardly offset to afford a stiffening member therefore, a storm band comprising a flat horizontal head member and an apron on said head member resting on the housing top member and extending to the outer edge thereof, said apron being outwardly of the housing and extending from said top member substantially to the bottom member and in cross-section being in the form of a reverse curve, the central portion of the body member being upwardly offset to afford a motor base, said head member being detachably secured to the housing top member, an electric motor mounted on the motor base with its armature shaft extending into the housing, a sirocco fan in the housing fixed to the armature shaft of the motor and a cap encasing the motor and resting on the apron and detachably secured thereto.

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