Aug. 16, 1938.

A. K. WHITAKER

2,127,100

VENTILATOR (UNITARY TYPE)

Filed July 1, 1936

FIG. 1

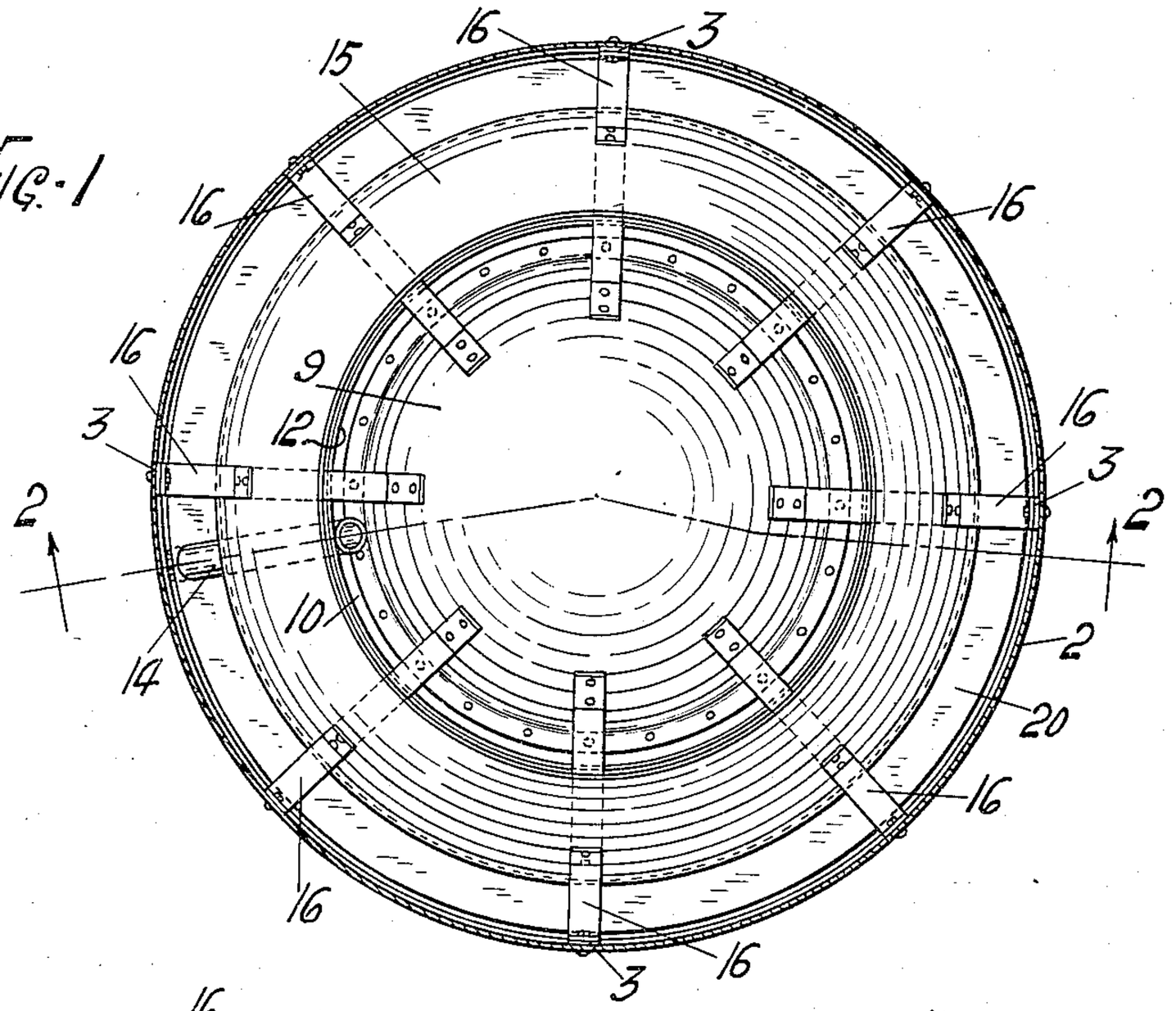

FIG. 2

Inventor

ANTON K. WHITAKER

By Albert L. Ely

Attorney

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VENTILATOR (UNITARY TYPE)

Anton K. Whitaker, Cuyahoga Falls, Ohio, assignor to The Burt Manufacturing Company, Akron, Ohio, a corporation of Ohio

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2 Claims. (Cl. 98—84)

The present invention relates to the construction and design of ventilators and particularly to ventilators of the individual or unitary type, it being the general purpose of the invention to improve upon ventilators of this type both in structural and also in operative features, as will be more fully set forth herein.

One of the specific objects of the invention is to design a ventilator which will secure a free and unobstructed passage of the air upwardly from the building through the ventilator, the necessary elements which prevent the entrance of rain or snow being so rearranged as to allow for the freer passage of air without sacrifice of weather-proofness.

A further object of the invention is to provide means whereby currents of air from the outside of the ventilator are directed through the ventilator in such manner as to secure an aspirating or suction effect which will increase the efficiency of the ventilator and assist in exhausting air from the building.

Another object of the invention is to improve upon the structural features of a ventilator of this type to make a stronger, lighter unit.

While the invention is illustrated and described as applied to a round ventilator of the unitary type, it will be apparent that the features of design may be applied to a ventilator of rectangular or any desired form, and that changes and modifications may be incorporated in the design and construction without departing from the essential features of the invention as disclosed and set forth herein and as particularly described in the claims.

In the drawing is shown the best known or preferred form of the invention, in which

Fig. 1 is a plan view of the round type of unitary ventilator embodying the principles of the invention, a portion thereof being in section on the line 1—1 of Fig. 2; and

Fig. 2 is a vertical cross-section through the ventilator on the line 2—2 of Fig. 1.

It will be apparent from the description of the invention as applied to a circular ventilator that the design and arrangement give a greater capacity for air movement than obtained in former ventilators of this type, so that fewer units are required to secure a given amount of ventilation and the cost of properly ventilating a building is thereby reduced. This result is secured by the freer flow which is due to the rearrangement of the elements and to the fact that wind striking the ventilator is conducted through the ventilator to set up a siphoning or aspirating action within the ventilator and increases the exhaust efficiency.

In the form of the invention shown, the eduction pipe or air shaft is indicated at 1. This is mounted upon the roof of the building by means of any suitable adapter which is not illustrated. Surrounding the ventilator is the storm or windband 2, the lower edge of which is shown at approximately the level of the top of the eduction pipe 1, but which may be located below the top of the pipe if desired. The windband is somewhat larger in diameter than the eduction pipe and is preferably concentric with the pipe and supported therefrom by a plurality of diagonal braces 3, the lower ends of which are secured to the top of the air shaft and the upper ends to the inside of the windband somewhat below its upper edge. This detail of construction is quite important from a structural standpoint as it is usual in installations of this character to support the windband from the central cone. The construction illustrated makes a stronger and lighter unit. The lower edge of the windband is braced by a plurality of lateral arms 6 which extend from the top of the air shaft to the lower inside edge of the windband. As shown, these arms incline upwardly.

In the center of the ventilator and over the air shaft is located the inverted director cone 8, the outer rim of which extends beyond the limits of the air shaft. This cone directs the upwardly moving current of air toward the discharge opening. Above the director cone 8 and secured therein is the cone-shaped ventilator top 9, which is seated within the director cone so that a trough 10 is provided about the upper edge of the cone to catch water, snow and debris which might enter the ventilator. The upper edge of the director cone may be flanged, as at 12, to prevent overflow into the ventilator. A discharge spout 14 is secured at the base of the trough and is extended downwardly and outwardly to discharge water and debris outside of the ventilator.

It will be seen that a free passageway is provided past the director cone and into the air shaft. This must be obstructed to prevent the entrance of rain or snow into the ventilator. In the older ventilator constructions, this has been accomplished by placing a baffle between the director cone and the top of the air shaft. A baffle located in this position affords a substantial obstruction to the free flow of air upwardly through the ventilator and has greatly lowered its efficiency. By the improved construction, the

baffle, which is indicated by the numeral **15**, is placed above the upper edge of the director cone and between the director cone and the upper edge of the windband. This baffle **15**, as will be seen, effectively shuts out the rain and yet is not located so as to impede the upwardly moving currents of air passing through the ventilator. It is preferably a conical band supported by divided braces **16** which extend from the ventilator top to points near the upper edge of the windband. For ease of construction the braces **16** and **6** are attached to the windband and air shaft, respectively, at the points of attachment of the diagonal supporting braces **3**. As the baffle **15** extends beyond the limits of the air shaft, water flowing therefrom is discharged outside of the ventilator.

The path of the air moving upwardly through the ventilator is indicated by the dotted lines A, these lines showing that the air in its upward movement moves in easy curved paths out of the ventilator. This gives the efficient exhaust of air which is characteristic of this new form of ventilator and avoids any abrupt turns or curves which in the earlier types of ventilators hindered the free movement, setting up eddy currents or inducing back drafts through the air shaft.

Located at the base of the ventilator is the band **20**, which, for convenience, may be supported by the diagonal lower braces **6** and is in general conical form. This band is spaced an appreciable distance from the inner surface of the windband. Being inclined upwardly, air currents which enter the ventilator from the bottom are directed upwardly against the interior of the windband and thence rise upwardly around the interior thereof and pass upwardly around the outer edge of the baffle **15**. This construction generates vertically moving air currents which act with a suction or aspirating effect to draw the air upwardly through the ventilator and thus aid materially in increasing the effectiveness of the ventilator. Such air currents are indicated by the letter B. As they move upwardly and out of the ventilator they induce a swifter movement of the air upwardly in the air shaft. The inner edge of the band **20** is either spaced from the air shaft, or discharge openings are made at this point to permit water to drain out of the ventilator. As is shown in the drawing, any space between the inner edge of the band **20** and the eduction pipe is very narrow so as to discharge water, but is not spaced sufficiently to permit the entrance of any appreciable upwardly moving currents of air about the eduction pipe. Were the inner edge of the band spaced at any substantial distance from the pipe, upwardly moving currents of air at this point would set up eddy currents at the top of the eduction pipe which would lessen the effectiveness of the ventilator.

The design and construction of the band **20** give the ventilator new and improved functions, for it utilizes currents of air on the outside of the ventilator to assist in raising the efficiency of the ventilator by directing those currents through the ventilator so that they have a suction or aspirating effect. Any entrance of these outside currents into the air shaft is effectually prevented.

It will be apparent that the improved type of ventilator eliminates those abrupt changes in the direction of the upwardly moving air currents through the ventilator which result in loss of energy and reduction of velocity and discharge. This ventilator has a more free flow of air than other ventilators of this general type. The lower air baffle **20** not only prevents the discharge of air beneath the windband, but creates the suction effect which increases the efficiency of the ventilator in the manner set forth. The mechanical construction of the ventilator is superior to previous designs.

These and other advantages will be apparent from the description which has been given, it being expressly understood that the invention is not limited to the details and to the exact design as modifications and improvements may be made without departing from the essentials of the invention. It will be evident that in adapting the invention to a rectangular ventilator, the shape of the various parts will have to be adapted thereto, but this will not effect the operation of the invention or its design and principles of construction. Wherever the words "cone" or "conical" are used in the description or claims, it will be understood that they are intended to cover pyramidal or other shapes.

What is claimed is:

1. A ventilator of the unit type comprising an air shaft and an outer windband spaced therefrom, a director cone above the air shaft and below the top of the windband, and a ring-shaped baffle located entirely below the upper edge of the windband, and between the top of the windband and the cone and adapted to prevent the entrance of rain into the interior of the ventilator.

2. In a unitary ventilator construction, an air shaft, a windband surrounding the air shaft, supporting members extending from the top of the shaft directly to the upper portion of the windband, braces extending inwardly from the top of the windband, a director cone suspended from the braces, a baffle supported upon the braces and located in the space between the cone and the inner wall of the windband, secondary braces extending from the top of the air shaft to the lower edge of the windband, and a conical ring supported on the secondary braces, the outer edge of the ring being spaced from the inner wall of the windband.

ANTON K. WHITAKER.