July 9, 1940. D. H. KING 2,207,671

VENTILATING APPARATUS

Filed July 30, 1937

Fig. 1

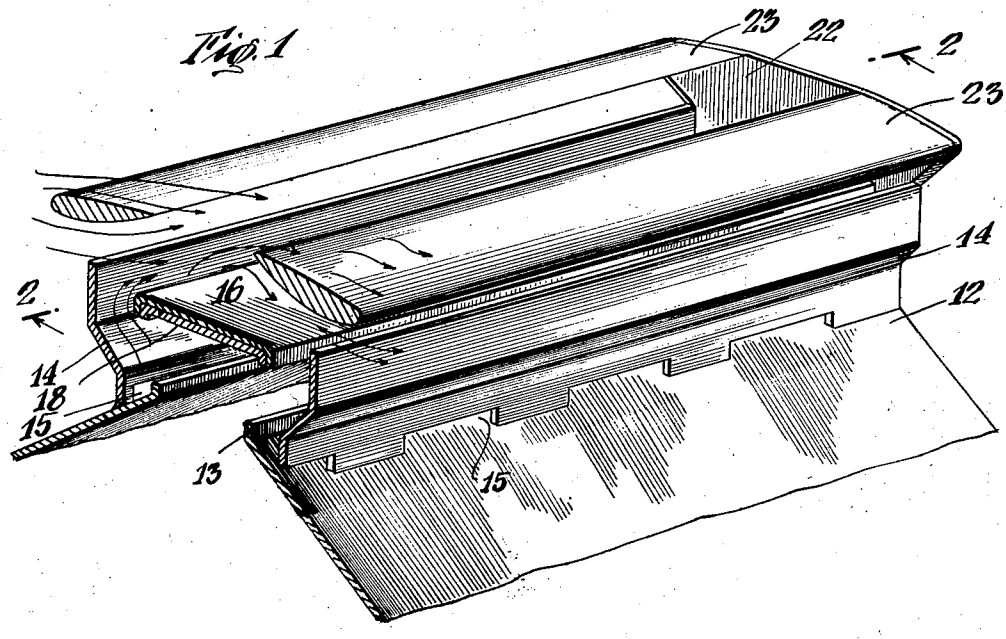
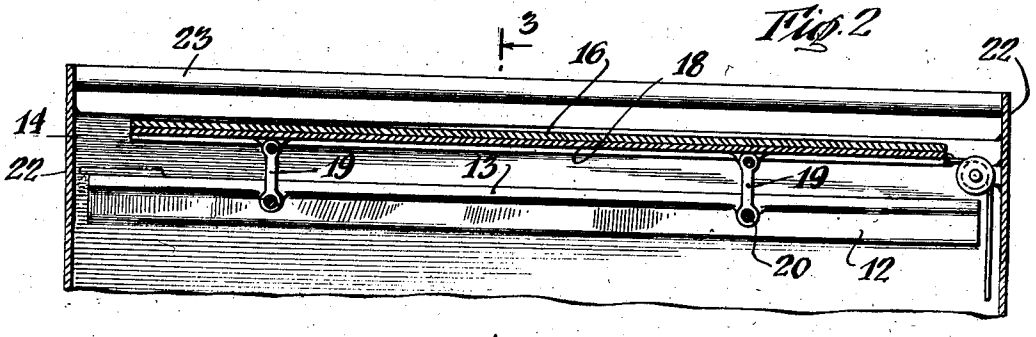


Fig. 2



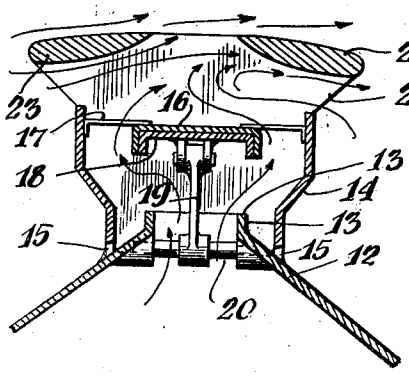


Fig. 3

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VENTILATING APPARATUS

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4 Claims. (Cl. 98—42)

This invention relates to a structurally and functionally improved ventilating apparatus, and in its broader aspects aims to provide an apparatus which may be associated with virtually any type of exhaust passage to assist in the discharge therefrom of fluid of any desired character.

It is an object of the invention to furnish an apparatus of the type indicated and which may be associated with a given installation so that the normal discharge from a duct passage or opening will be increased to a material extent.

A further object is that of providing an apparatus of this type which will embrace substantially no moving or power driven parts. As a consequence there will be no cost of maintenance in connection with this apparatus and when once installed, it will function for practically indefinite periods without any need of replacement or repair.

While as afore brought out the present invention may be employed in association with virtually any type of fluid, it is primarily intended to utilize the same in ventilating apparatus wherein air, smoke, noxious gases, or similar fluids are to be discharged into the atmosphere or into an air stream.

While not limited—except where hereinafter indicated in the claims—the present invention aims to provide, for one of its most preferred and specific aspects, a roof ventilator which may be of the ridge type. In installations of this character, as heretofore provided, it is well understood by those skilled in the art that while a considerable discharge of air was effected, such discharge in certain instances did not reach the desired volume. This is because the wind currents sweeping across the ventilator have, due to peculiarness of design, set up back pressures and eddy currents which have materially impaired the operation of the ventilator.

By means of the present invention these down drafts, pockets, objectionable currents, and other factors contributing to the improper functioning of the ventilators are virtually eliminated. Accordingly, by a readily installed and economical construction the discharge vent or opening has exhausted through it a maximum amount of fluid so that in many instances it is even feasible to dispense with a power discharge apparatus (such as blowers and fans) by simply substituting therefor a structure provided in accordance with the teachings of the present invention.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating practical embodiments of the invention, and in which:

Fig. 1 is a fragmentary perspective view of a ventilator such as would be employed in connection with buildings;

Fig. 2 is a sectional side view thereof taken along the lines 2—2 and in the direction of the arrows of Fig. 1;

Fig. 3 is a transverse sectional view taken along the lines 3—3 and in the direction of the arrows of Fig. 2.

Referring primarily to Figs. 1 to 3 where there has been shown a preferred embodiment of the invention, the numeral 12 indicates the faces of a roof which, as illustrated, may be inclined upwardly to normally provide a ridge. A gap or slot is furnished between the upper edges of portions 12 and this may be defined by an upwardly extending flange portion 13. At points short of the flange portion further side walls 14 may be provided, these side walls being furnished with openings 15 adjacent their lower edges. Between the side walls 14 and at points adjacent their upper edges a panel 16 may be disposed. If this panel is to be immovably mounted, it may be supported by brackets 17 extending from the inner faces of side walls 14. In the case of such type of mounting, it is preferred that a damper panel 18 be nested within panel 16, such damper panel being conveniently mounted upon links 19 having their outer ends pivotally secured to the under face of panel 18, their inner ends being coupled to rotatably mounted shafts 20. A mechanism such as an actuating cord or chain 21 may be attached to panel 18 and serve to move the same from a position at which it lies in intimate contact with the upper edges of flange 13 and seals the opening defined thereby to a position such as has been shown in Figs. 1 and 2.

The end walls 22 which are preferably provided are conveniently extended above the upper edges of walls 14. These end walls may serve as a mounting for air foils 23. These air foils may define any proper, well known, and convenient section, preferably having the greatest lift characteristics, and they are mounted in inverted fashion with their leading edges conveniently projected well beyond the outer faces of walls 14 and their trailing edges disposed above panel 16 and substantially spaced from each other.

With the structure heretofore identified under numbers 11 to 23 inclusive, mounted upon the upper face of an enclosure to be ventilated, it follows that if damper panel 18 is in the position shown, the action of heat will cause the air

to exhaust between walls 11, the space defined by flange 13, and through spaces existing between walls 14 and panel 16. Such exhausting of the air would, in itself, be appreciable. However, incident to the provision of the inverted air foils it follows that with any air flow in either direction transverse to Fig. 3, the suction effect will be materially accelerated. The suction effect just mentioned is the result of a current of air striking the leading edge of the air foil and passing across the convex surface, which results in an increase in velocity in air flow, with an accompanying decrease in pressure. The surrounding air at atmospheric pressure naturally moves to the area of reduced pressure, and in the present instance that air movement occurs from within the building ridge where air normally ascending, due to heat, is at atmospheric, or substantially atmospheric, pressure. While, of course, panel strips of a configuration different from that indicated at 16 might be employed, it has been found that a plane surface located immediately below or substantially in the plane of the upper edges of walls 14 and in the particular relationship illustrated in Figs. 1 to 3, appears to create a maximum effect.

Finally, with reference to Figs. 1 to 3, it is to be noted that merely one type of roof ventilator has been shown, but that numerous other types of ventilators might be provided with structures designed in accordance with the teachings of the present invention. In any event, however, it is preferred that similar to the disclosure in U. S. patents to McDerment, 2,072,461 and 2,079,576, as well as the disclosure of Dexter Patents 1,611,605 and 1,917,218, an opening or slot be furnished which is centrally divided by a body which furnishes openings between the side faces of that body and the inner faces of adjacent side walls. This need not necessarily be the case, but if such a general structure is adopted, it is, moreover, preferred that, as shown, the panel be slightly below the upper edges of the side walls and present a substantially plane surface. Also, by having two air foils, spaced properly, it is substantially immaterial whether the prevailing air currents are from left to right or from right to left, in that the air foils will not functionally conflict and will cooperate to a maximum extent to assure a major discharge of fluid to be exhausted. In one satisfactory embodiment, as shown, the leading edge of the air foil extends at least slightly in advance of the opening with which it is to cooperate, while its trailing edge extends slightly beyond the rear of the same. This proportioning of the parts also gives adequate protection against the ready entry of rain or snow during inclement weather.

From the foregoing, it will be appreciated that, among others, the several objects of the invention, as afore noted, are achieved. Obviously, numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

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

1. An apparatus of the character described including, in combination, a pair of spaced side walls adapted for mounting adjacent a roof opening, a substantially horizontal panel interposed between and below the top of said side walls and spaced from the inner faces thereof, and a pair of air foils mounted beyond the top of said side walls and overlying the spaces between said side walls and the adjacent edges of said panel.

2. An apparatus of the character described including, in combination, a pair of spaced side walls adapted for mounting adjacent a roof opening, a substantial horizontal panel presenting a substantially flat outer surface interposed between and below the top of said side walls and spaced from the inner faces thereof, and a pair of air foils mounted beyond the top of said side walls and overlying the spaces between said side walls and the adjacent edges of said panel.

3. An apparatus of the character described including, in combination, a pair of spaced side walls adapted for mounting adjacent a roof opening, a substantially horizontal panel presenting a substantially flat outer surface interposed between and below the top of said side walls and spaced from the inner faces thereof, and a pair of air foils mounted beyond the top of said side walls and overlying the spaces between said side walls and the adjacent edges of said panel, the outer face of said panel being disposed inwardly of the plane into which the outer edges of said side walls extend.

4. An apparatus of the character described including, in combination, a pair of spaced side walls adapted for mounting adjacent a roof opening, a substantially horizontal panel interposed between and below the top of said side walls and spaced from the inner faces thereof, a pair of air foils mounted beyond the top of said side walls and overlying the spaces between said side walls and the adjacent edges of said panel, and a damper panel disposed inwardly of said first named panel to substantially seal the opening between said side walls when in closed position.

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