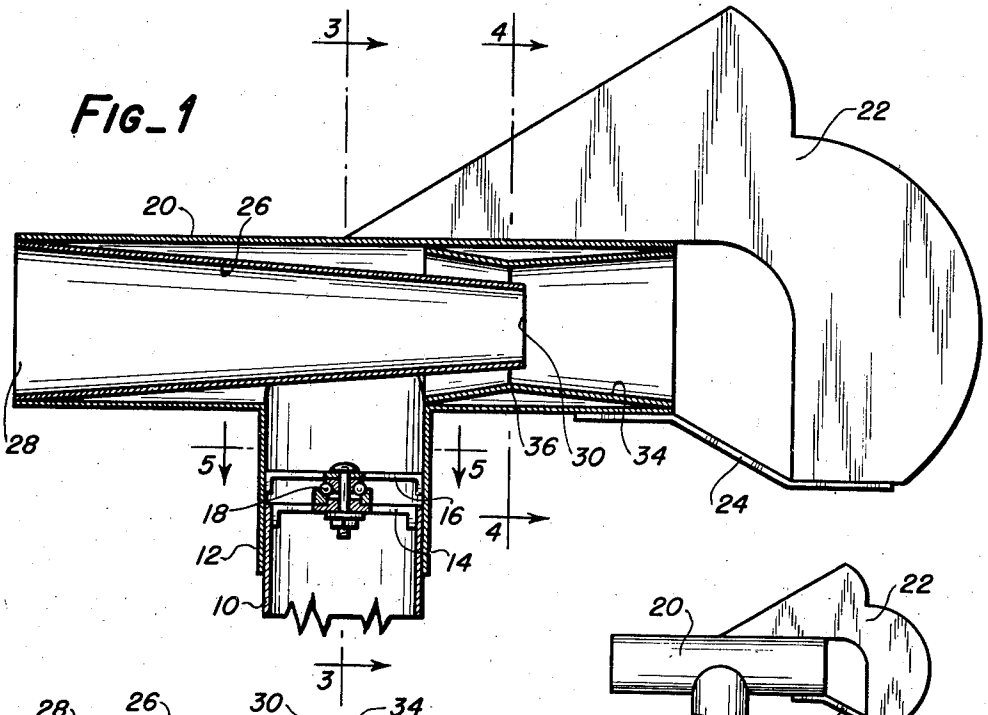
June 20, 1944. C. J. WELLER 2,351,794

VENTILATOR

Filed May 16, 1942

FIG_1



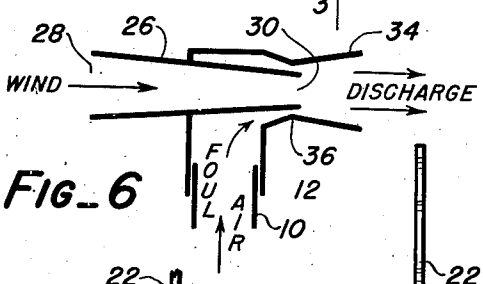


FIG_6

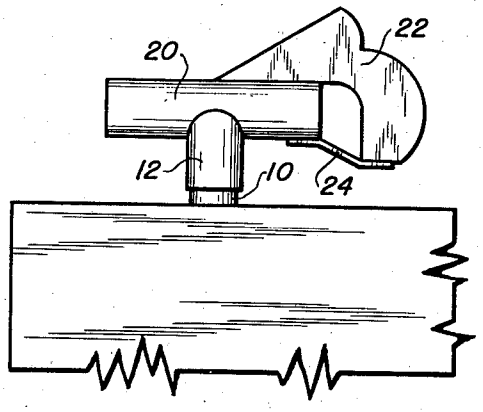


FIG_2

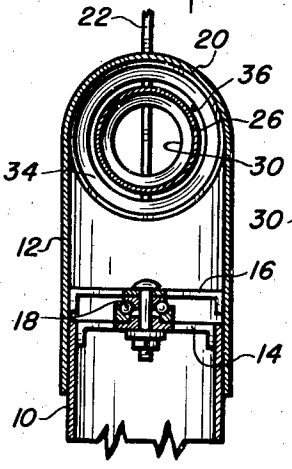


FIG_3

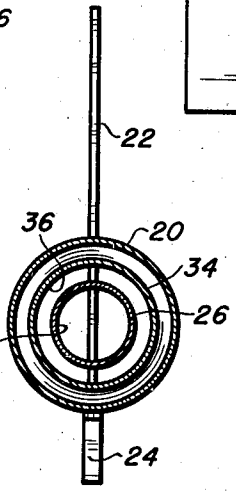


FIG_4

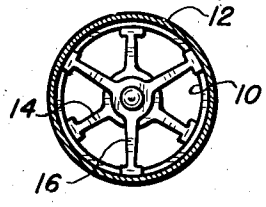


FIG_5

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UNITED STATES PATENT OFFICE

2,351,794

VENTILATOR

Charles J. Weller, Coulee City, Wash.

Application May 16, 1942, Serial No. 443,182

1 Claim. (Cl. 98—70)

In the prior art there are many ventilators that are operable to extract foul air from a building or the like by the passage of wind currents around the outside of a nozzle or draft tube. These devices of the prior art are characterized by a relatively low efficiency and, in many instances, are extremely complex structures that are difficult and expensive to manufacture, and to maintain in operation.

It is an important object of my invention, having in mind these and other defects of the prior art, to provide a ventilator having a high degree of efficiency, that is simple and easy to construct and to operate.

Another object of my invention is the provision of a ventilator operable by the passage of wind currents to create a higher degree of suction than has before been obtainable for the rapid and efficient withdrawal of foul air and gases from an associated draft tube.

A further object of the invention is the provision in a ventilator of a wind nozzle that will create a suction producing a withdrawal of air through a draft tube, which flow is enhanced over that normally obtainable by conventional structures.

The foregoing objects and other ancillary thereto I prefer to accomplish as follows:

According to the preferred embodiment of my invention, I mount a nozzle in the windward end of a wind tube that is associated with a riser or draft tube. Specifically this nozzle is arranged within the wind tube to extend across the point of communication between the draft tube and the wind tube for the purpose of creating a suction therebeyond on the leeward side of this point of communication for drawing air from the draft tube. The arrangement of the nozzle, the draft tube and the wind tube is also an important feature of my invention. Adjacent the discharge end of the nozzle and in the lateral tube, I also mount a Venturi nozzle having its throat slightly windward of the discharge of the wind nozzle. When air currents are passing through the wind nozzle to create suction at its discharge end the suction enhances the normal suction at the end of the the wind tube to effect an increased and efficient withdrawal of foul air through the draft tube.

Novel features that I consider characteristic of my invention are set forth with particularity in the appended claim. The invention itself, however, both as to organization and its operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment read in connection with the accompanying drawing, in which

Figure 1 is a vertical longitudinal sectional view of my ventilator,

Figure 2 illustrates my ventilator in elevation as it would appear when mounted upon a roof structure,

Figure 3 is a vertical sectional view taken on line 3—3 of Figure 1,

Figure 4 is a vertical sectional view taken on line 4—4 of Figure 1,

Figure 5 is a cross-section taken through the draft tube on line 5—5 of Figure 1, and

Figure 6 is a schematic showing of certain of the elements of the invention.

In construction, my ventilator may be formed of any suitable sheet material, and it is customary to employ galvanized iron or other moisture resistant metals. Throughout the drawing, I have shown the various tubes and nozzles as being circular or conical in shape, but it will be clearly seen and is to be understood that the cross-sectional shape of these elements may be rectangular or any other practical shape or form without departing from the principles of the invention. A strong, durable ventilator may be created from relatively thin metal by the use of the circular cross-section because of the enhanced strength imparted by tubular structures. My invention is particularly adapted for use in oscillating or rotary type ventilators that may turn or be turned with respect to the direction of the wind.

Accordingly, a preferred embodiment of my invention, referring to Figures 1 and 6 particularly, is constituted by a draft tube 10 upon which is rotatably mounted a sleeve 12. A spider 14 in the upper end of the draft tube and a spider 16 in the sleeve joined by a suitable frictionless bearing 18 positioned between the hubs of the spiders provides oscillation. Thus the sleeve 12 will be seen to be mounted for free rotation on the tube 10. Laterally across the upper end of the sleeve 12 is mounted the wind tube 20, in a T construction which provides a relatively balanced structure.

To the right in the showing of Figure 1 a wind vane 22 is attached to the wind tube 20. The vane extends somewhat in the leeward direction therefrom, and it may be braced at its lower edge by member 24. Due to the free rotatability of the sleeve 12 when wind currents are directed at the lateral wind tube, the vane will tend to bring

the wind tube into alignment with the wind currents.

In the windward end of the wind tube I mount a convergent nozzle **26**. The mouth **28** of the nozzle **26** is shown to completely fill the windward end of tube **20**. The convergent or discharge end is relatively smaller in cross-section than the wind tube. The length of the nozzle is sufficient to position the discharge end **30** leeward of the point of communication between the draft tube and the lateral tube. In other words, the nozzle extends into the wind tube and across the communication opening with the draft tube.

As shown in Figure 1, a Venturi nozzle is also fitted into the lateral tube on its windward end. This venturi is designated by the numeral **34** and has a throat **36** which is preferably positioned slightly to the windward of the discharge end of nozzle **26**, or between nozzle end **26** and the opening from the draft tube.

Assuming that the ventilator is mounted upon a roof structure and is disposed in moving air currents, wind will pass along the outside of the lateral tube and also will enter nozzle **26**. The wind passing outside of the lateral or wind tube will create a suction at the rear end of the lateral tube and of the venturi **34**. Wind entering the nozzle **26**, due to the convergent walls, compresses to convert the wind pressure into increased velocity of the air. Also, the specific volume of the air increases. Upon discharge of the compressed air from the nozzle, a suction is created at or adjacent the discharge end of the nozzle, slightly leeward of the throat of the venturi. It will be seen that the discharge pressure of the air leaving or exhausting from the nozzle will be slightly lower than the air within the chamber in which it is exhausted and the result will be a suction at this point to enhance the previously mentioned suction and to efficiently withdraw foul air from the draft tube.

As the wind changes the vane will tend to conform to the directional flow of the wind, and the mouth of the nozzle **26** will always be directed up-wind. This rotary motion is facilitated by the use of the frictionless bearing **18**.

Having thus described my invention, I claim:

A ventilator, comprising: an upright draft tube, a wind tube laterally disposed on the upper end of the draft tube and in communication therewith, a wind nozzle in the windward end of the wind tube having its discharge end leeward from the point of communication between the draft and wind tubes, and a Venturi nozzle in said wind tube and having its smallest cross-sectional area to windward of the discharge end of the wind nozzle.

CHARLES J. WELLER.