

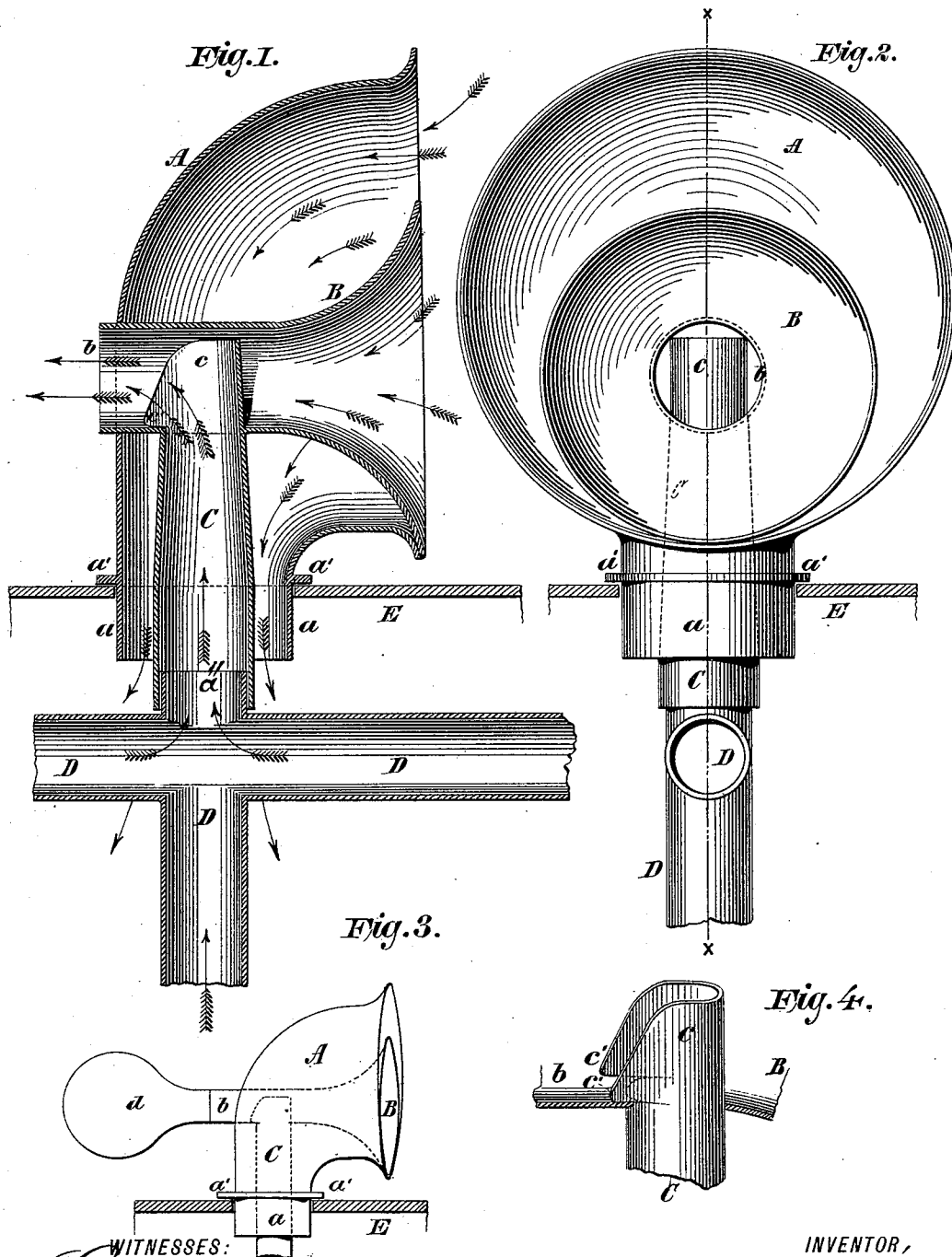
(No Model.)

F. G. JOHNSON.

VENTILATOR.

No. 394,577.

Patented Dec. 18, 1888.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

FRANK G. JOHNSON, OF NEW YORK, N. Y.

## VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 394,577, dated December 18, 1888.

Application filed January 28, 1888. Serial No. 262,199. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK G. JOHNSON, a citizen of the United States, residing in the city, county, and State of New York, have invented a new and useful Improvement in Ventilators for Ships, Public Buildings, Residences, &c., of which the following is a specification.

My invention relates to ventilators which depend for their action upon lateral currents of air outside of the places to be ventilated, especially with ships and other vessels and mines which, for ventilation, depend solely upon a downward current of air blown down through cowls, (monks' hoods,) and where there is no possible provision for lateral currents, as there is in buildings.

The object of my invention is to improve the usual cowl, as employed on ships and other vessels, in such a manner as not only to draw upward and outward (from the places to be ventilated) a current of foul air, but thereby to greatly increase the downward current of fresh air, whereby a constant free and general circulation of air takes place and is maintained wherever there is the least lateral current passing into the mouth of the cowl or funnel, which is always had by the forward motion of the vessel, or by the wind in case of an application of the device to buildings. I attain these results by the means illustrated in the accompanying drawings, in which—

Figure 1 is a sectional side view seen on the line  $x x$  of Fig. 2; Fig. 2, a front view looking into the mouth of cowl or funnel; Fig. 3, a small side sketch to show that a wind-vane may be attached at the back of the cowl to set the mouth of the same to the windward; and Fig. 4, a view to show the construction of the central part of the device, to be hereinafter described.

A is an ordinary ship-cowl or air-funnel of peculiar form commonly employed for collecting and forcing air down through the deck of vessels to supply fresh and cool air to apartments below, which of itself provides no special means for the escape of the foul and hot air, except as the fresh, cool, foul, and hot air commingle together and return through the funnel A, for in ships (with hatches down) there is no escape for air below deck.

B is a funnel of symmetrical form, as best

shown in Fig. 1, set and fastened within the cowl or funnel A. This funnel B is only about two-fifths of the size and capacity of funnel A, and, being placed at the lower (and so the least effective) part of the funnel A, it does not greatly diminish the capacity of the funnel A to convey air below deck. This funnel B extends in a right horizontal line from the front to the back of the funnel A, the mouth of the one funnel being flush with the other. The back or rear end of the funnel B passes through the back of the cowl A, with which it forms a rigid and air-tight joint, terminating with an open end,  $b$ .

Inserted into the lower side of the tubular portion of the funnel B is a tube or pipe, C, the upper end of which (within the tube of the funnel B) has a peculiar opening,  $c c' c'$ , Fig. 4, the back or rear portion of which is cut away, so that the current of air passing through the funnel B will produce more or less of a vacuum where it is cut away, and thus draw the air up through the tube or pipe C. The upper end of the tube or pipe C is small enough to allow the air to freely pass by it when passing through the funnel B, as seen in Fig. 2. The lower end of the tube or pipe C joins with a working-joint the system of conveying-pipes D D D, which are, or may be, rigidly and variously fixed, and which may extend to various apartments below deck. The lower end of the cowl A passes a short distance below the deck E E, as shown by  $a$ , and rests on a ring or shoulder fixed to the cowl, as shown by  $a' a'$ . Upon this ring or shoulder the cowl may be rotated to place its mouth toward the wind, or the cowl may be provided with a wind-vane,  $d$ , Fig. 3, so as to be turned to the wind automatically, which may be employed when the device is used for ventilating mines and various buildings.

It will be seen that the entire device, as it rests on the shoulder  $a' a'$  and as supported by the decks of ships or roofs of houses, is one rigid apparatus.

Having described the various parts and their relation to each other and the function of each, the explanation of the operation of my invention is briefly described as follows: The device being turned face to the wind, (referring to Fig. 1,) a current of air passes into and down through the cowl or funnel A,

as represented by the arrows. At the same time a current of air also passes through the funnel B, as represented by the arrows at *b*, which produces a vacuum on the back side of the top *c* of the pipe C, which produces an upward current of air through the pipe C, as represented by the arrows in and emerging therefrom. The system of conveying-pipes D D D being connected by swivel-joint *a''*, Fig. 1, to the pipe C, the foul or hot air or both are drawn from any part of any apartment to which they (the conveying-pipes D D D) may be extended, as represented by the arrows therein. Hence, by this simple device, fresh or cool air or both are carried down more freely by the foul or hot air or both being simultaneously drawn up, thus producing a constant circulation of air, a current down and a current up, by the same device, the two opposite currents being reciprocally intensified the one by the other.

I am aware that cowls or funnels are employed—such, for instance, as the cowl A, shown in my accompanying drawings—and I am also aware that communicating-pipes placed at right angles to each other are employed to produce upward currents of air by

a current passing through one to create a current in the other, as may be illustrated by the funnels B and pipes C in my accompanying drawings, and I am aware, too, that funnels in ventilators have been arranged one within another.

What I claim, therefore, as new and useful, and desire to secure by Letters Patent, is—

In a ventilator, the combination of the two funnels A and B, one within the other, the interior one, B, having its rear opening through the back of the exterior one, A, the pipe C, located within the downward opening of funnel A, and having its upper end extended up into and across the narrow passage-way of funnel B, and having the rear portion thereof within the said funnel B cut away, whereby a current of air through the said funnel B creates more or less of a vacuum behind the remaining portion of the said pipe C where it is cut away, thus creating an upward current of air in the said pipe, substantially in the manner and for the purpose described.

FRANK G. JOHNSON.

Witnesses:

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