(Model.)

W. H. A. DAVIDSON.

VENTILATOR.

No. 489,466. Patented Jan. 10, 1893.

Fig. 2.

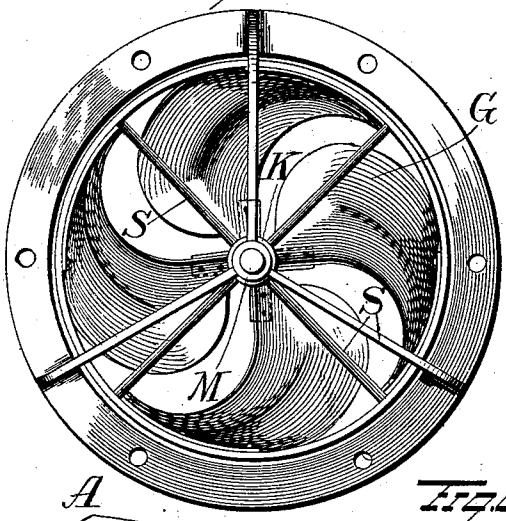
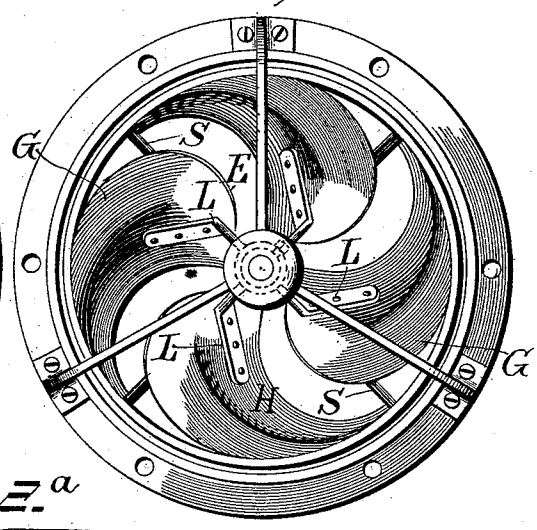


Fig. 1.



A

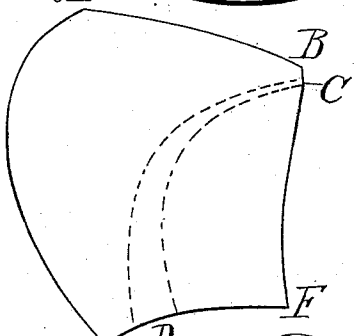


Fig. 2a.

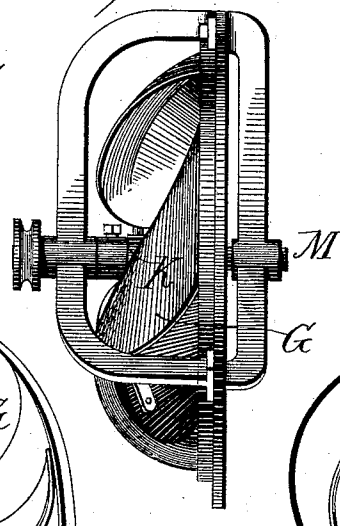


Fig. 3.

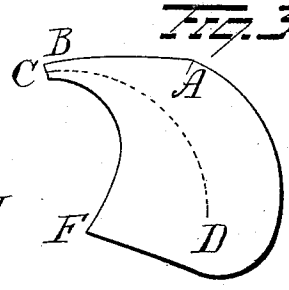


Fig. 4a.

Fig. 4.

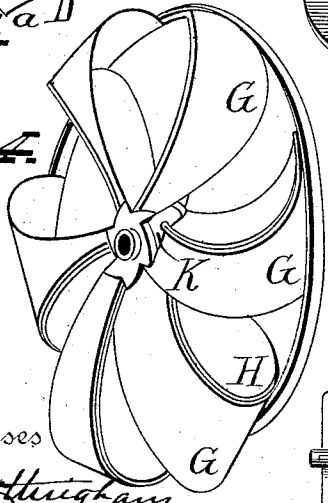
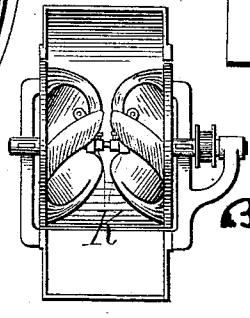


Fig. 6.



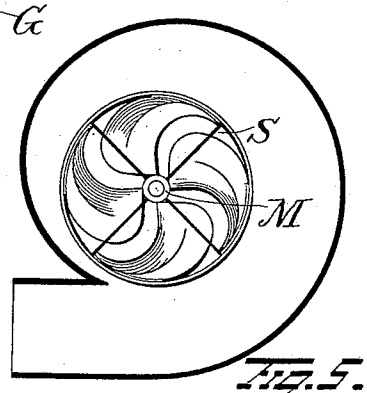


Fig. 5.

Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. A. DAVIDSON, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE DAVIDSON VENTILATING FAN COMPANY, OF SAME PLACE.

VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 489,466, dated January 10, 1893.

Application filed June 9, 1891. Serial No. 395,629. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM H. A. DAVIDSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Ventilators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in ventilating fans, the object being to provide a fan which will be as light as possible and easy running and one which will accomplish with few parts what heretofore has required more parts and greater complexity in construction.

A further object is to create a partial vacuum in the rear of the fan and in advance of the incoming and advancing current or column of air.

A further object is to make as compact a fan or wheel as possible and to increase the velocity and the volume at the same time and to deliver the currents in such a manner as to meet with a minimum resistance from the atmosphere at the discharge face of the fan or wheel.

A further object is to provide a fan of such construction that a comparatively large volume of air will be displaced with the expenditure of a minimum of power, and still further objects are to prevent dead centers, lessen friction, prevent as far as possible the obstruction of light and finally to so construct a fan that the first and greatest draft in cutting the air will be close to the axle.

With these several objects in view my invention consists in certain novel features of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in front elevation. Fig. 2 is a rear view. Fig. 2ª is a view in side elevation. Fig. 3 is a detached view of the preferred form of blade or templet. Fig. 4 is a view of a modification. Fig. 4ª is a view of the form of blade employed in this modified form of fan. Fig. 5 is a view showing the fan mounted in a blower case, and Fig. 6 is a sectional view showing a blower case provided with two fans.

The templet or blade required to produce the best results and subserve my objects is preferably shaped substantially as shown in Figs. 3 and 4ª. The blank shown in Fig. 3 is adapted to be bent along the dotted line until the edge B—A is in the same line and plane with the edge C—F. When thus bent the blade or templet is in shape for attachment to the other parts of the fan. It is secured at point F to the hub K and is set diagonally thereto. It is also secured to the hub by a brace L. At the outer edge B—A it is secured to a peripheral ring. Different numbers of these blades may be employed just so they do not overlap one another. It will be observed from the foregoing and from the drawings that a blade constructed after this fashion has a scoop shape and being set diagonally at the hub, the rounded edge is the first to enter the air, it being in advance of the rest of the blade in the rotation of the wheel or fan. Thus the first contact or cut is at a point near the hub where the greatest power lies. The blade bent as set forth presents a convex and concave surface on each side, and in consequence after the air is once cut it glances off diagonally and from the rapid rotation of the wheel is caught by the angle formed by the central crease in the blade, and discharged rearward in lines approximately parallel with the axle of the fan or wheel. It will be further observed that the blades are so placed relative to one another that they at no point overlap and hence as the fan or wheel rotates the light is not obstructed, neither does one blade take the air or a portion of it from another.

The fan or wheel is strengthened by means of spokes S and the shafting is revolubly supported in a suitable frame as shown.

In the form of blade or templet shown in Fig. 4ª the bend extends from point C to the edge at point D. In this construction the braces L are dispensed with, one entire edge of the blade or templet being secured to the hub. In this construction as well as in the former construction the air is first cut by the edges E of the blades and on account of the

gradual inclining or sloping of the blades it is deflected forward through the fan on an incline at first and until again deflected by the portions H of the blades striking and pushing it forward and the outer portion of surface G abutting against it which together results in turning the air from an oblique or diagonal course to a straight course or in lines parallel with the axle. The construction thus combines in a single set of blades the pulling and pushing of the air which hitherto it has been considered necessary to employ two sets of blades to accomplish.

In the modification shown in Fig. 5 my fan is shown in a blower case for the purpose of giving pressure to the air as well as agitating it and starting it in circulation. In this construction it will be noticed that the air opening is equal in diameter to the diameter of the fan, this being rendered possible from the fact that there is no back pressure of air. The result is that the fan is driven with less than the usual amount of power and more air is agitated and it is discharged with equal pressure.

In the modification shown in Fig. 6 two fans are employed and the air is taken in on both sides of the case instead of one side only. It is discharged in the usual way.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention and hence I do not wish to limit myself to the exact construction herein set forth, but,

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

1. In a ventilating fan or wheel, a blank bent diagonally into two planes, and bounded on two edges with converging curved lines, the other two edges bounded by converging substantially straight lines, substantially as set forth.

2. In a ventilating fan or wheel, the combination with a hub and peripheral ring, of blades bent diagonally into two planes and having two converging curved edges and two converging substantially straight edges, the straight edges secured to the hub and ring, the attachment at the ring being in rear of that at the hub.

3. A ventilating fan or wheel composed of a series of blades each bent diagonally into two planes, two edges converging on curved lines and two in substantially straight lines, substantially as set forth.

4. In a ventilating fan or wheel the combination with a hub and ring, of blades composed of blanks of sheet metal bent diagonally into two leaves, one edge of each blade secured to the ring and one edge extending from the ring more or less directly to the hub, said edges being in the same plane with the ring, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM H. A. DAVIDSON.

Witnesses:
C. S. DRURY,
V. E. HODGES.