(No Model.)

E. H. JOHNSON.

ROTARY FAN.

No. 354,063. Patented Dec. 7, 1886.

Fig. 1.

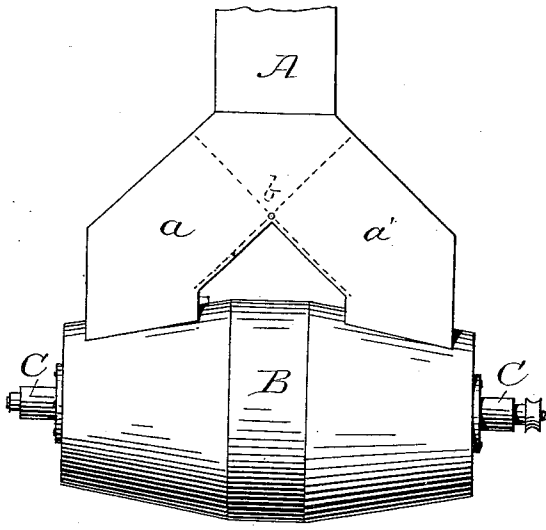


Fig. 2.

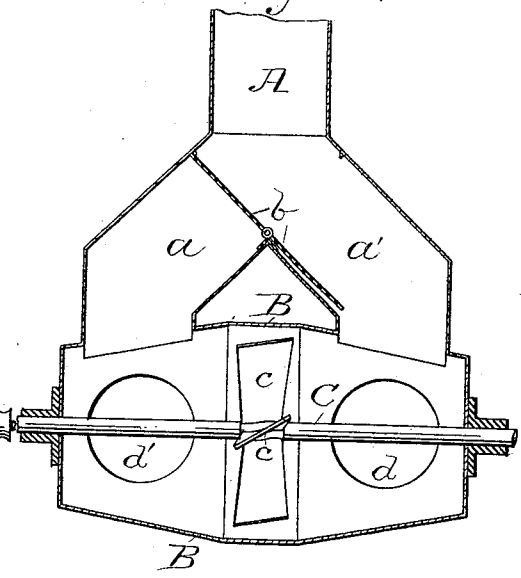


Fig. 3.

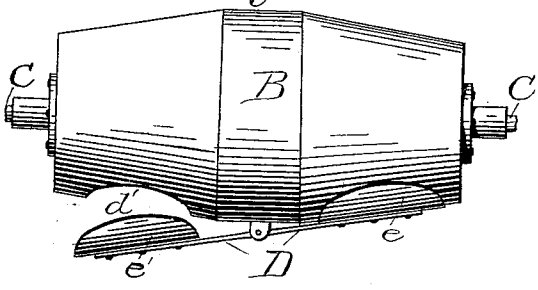
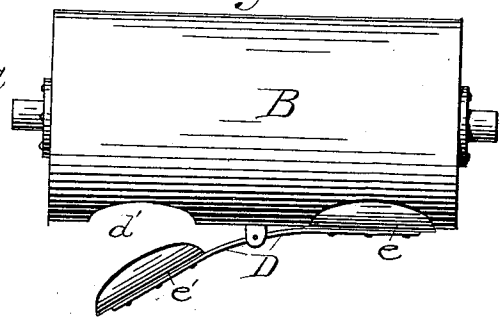


Fig. 4.



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UNITED STATES PATENT OFFICE.

ENOS H. JOHNSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO MORRIS B. DERRICK AND ANDREWS & JOHNSON ALL OF SAME PLACE.

ROTARY FAN.

SPECIFICATION forming part of Letters Patent No. 354,063, dated December 7, 1886.

Application filed April 19, 1886. Serial No. 199,409. (No mode'.)

To all whom it may concern:

Be it known that I, ENOS H. JOHNSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rotary Fans; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide an exhaust-fan which will operate just as well with the fan traveling in one direction as in the other. Fans of this kind are more especially adapted for the exhaustion of air from and the ventilation of moving cars; but my invention is so constructed that it can be used for this or any purpose in which exhaust-fans are needed.

In the drawings, Figure 1 is a plan view of my improved fan. Fig. 2 is a longitudinal horizontal section thereof, and Fig. 3 is a rear elevation; and Fig. 4 is a modified form of my improvements.

Reference being had to the drawings, A represents an inlet-pipe, which, as it approaches the fan-case B, is provided with two branch pipes, *a a'*, which diverge obliquely therefrom in different directions and at coincident angles. These branch pipes *a* and *a'* open into the case B laterally at or near the ends thereof.

Case B is of a shape corresponding to that of two truncated cones of the same size whose bases have been placed together—that is, having its greatest diameter at its center of length and tapering to a less diameter at both ends.

Running longitudinally through this case, and journaled in suitable bearings at its ends, is the shaft C. Secured to the shaft C at about the center of length of case B is the rotary fan *c*, the vanes of which are placed obliquely to the line of motion thereof.

At the angle of incidence of pipes *a* and *a'* is pivoted the automatic oscillating valve *b*, which consists of two wings extending from the pivotal pin in diametrically-opposite directions, so that when it oscillates to close one pipe it opens the other, as will hereinafter be more fully explained.

In the bottom of the case B, on either side of the fan *c*, is an outlet-opening, *d* and *d'*, and pivoted between lugs projecting downward from the case B, midway between openings *d* and *d'* and in alignment with the centers of said openings, is the connecting bar of the oscillating double valve D. On the ends of this connecting-bar are the disk-shaped valves *e e'*, which are adapted to alternately close the openings *d* and *d'*.

The operation of my invention is as follows, viz: When the fan revolves in such direction as to exhaust the air from right to left, the suction or exhaust will automatically operate valve *b* to open pipe *a'* and to close *a*, and will automatically operate double valve D to close exit-opening *d* and open exit *d'*. When the fan revolves in the opposite direction, or exhausts the air from left to right, valve *b* will open pipe *a* and close *a'*, and valve D will oscillate so as to close exit-opening *d'* and open exit *d*.

If desired, the case B may be perfectly cylindrical. If this should be made this way, the connecting-bar of the double valve would have to be bent so as to make the valves not diametrically opposite each other, but at coincident angles to the point of oscillation.

The principal feature of my invention is the fan—that is, a fan the vanes of which are oblique to the line of motion. Bearing this in mind, it will be apparent that so long as there are two inlet-openings and two exit-openings, one of each on either side of the fan, it matters little how those inlet or exit openings are arranged or where they are located; and, moreover, it matters not whether those inlet or exit openings are opened in the manner described by hand, or automatically.

What I claim is—

1. The combination, with a rotary fan the vanes of which are placed obliquely to the line of motion thereof, and a shaft on which the same is mounted, of a case having an inlet and exit opening on either side of said fan, and means for alternately opening and closing the same.

2. The combination, with a rotary fan the vanes of which are placed obliquely to the line of motion thereof, and a shaft on which the same is mounted, of a case having an exit-opening on either side of said fan, pipes *a* and

a', opening into said case on either side of the same, and valve b, designed to automatically and alternately close pipes a and a'.

3. The combination, with a rotary fan the vanes of which are placed obliquely to the line of motion thereof, and a shaft on which the same is mounted, of a case, B, having exit-openings on either side of the fan, and oscillating double valve D, for alternately closing said exit, and having inlet-openings placed on either side of said fan, and means for alternately closing them.

4. The combination, with a rotary fan the vanes of which are oblique to the line of motion thereof, and a shaft on which the same is mounted, of a case, B, having exit-openings d and d' and inlet-pipes a and a', opening into said case on either side of said fan, valve b, alternately closing pipes a and a', and oscillating double valve D, for alternately closing exit-openings a and a', substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereunto affix my signature in presence of two witnesses.

ENOS H. JOHNSON.

Witnesses:
FRANK D. THOMASON,
MORRIS B. DERRICK.