

(No Model.)

J. H. WEATHERFORD.
FAN.

No. 537,657.

Patented Apr. 16, 1895.

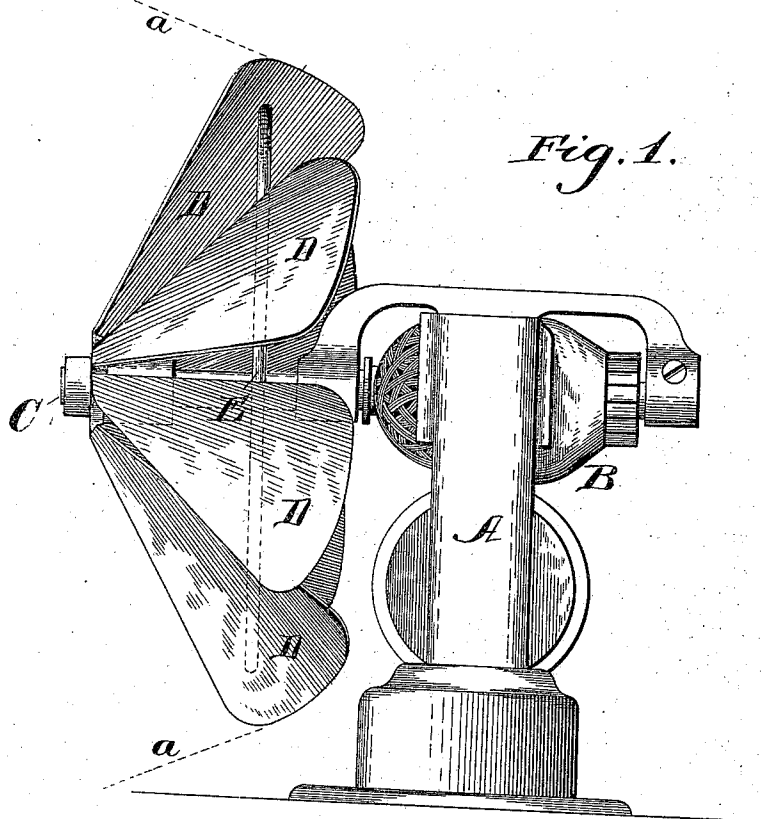


Fig. 1.

Fig. 2.

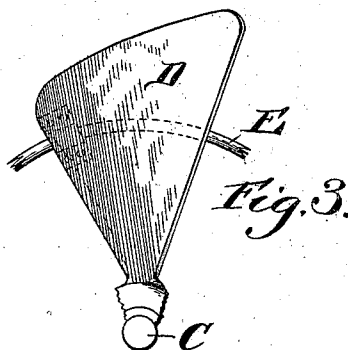
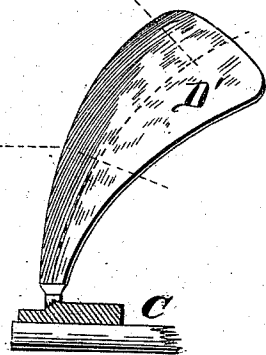


Fig. 3.

Witnesses:

J. B. McGirr.
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Inventor

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UNITED STATES PATENT OFFICE.

JOSEPH HEISKELL WEATHERFORD, OF MEMPHIS, TENNESSEE.

FAN.

SPECIFICATION forming part of Letters Patent No. 537,657, dated April 16, 1895.

Application filed October 23, 1894. Serial No. 526,727. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HEISKELL WEATHERFORD, a citizen of the United States, residing at Memphis, county of Shelby, and State of Tennessee, have invented Improvements in Fans, of which the following is a specification.

My invention relates to fans for creating artificial drafts or for ventilating purposes, and its object is to make a fan which will diffuse the air brought into circulation by the operation of the fan, sending the air out to objects situated to the side of the fan as well as to the front thereof.

In fans, as now constructed, the individual blades project from the shaft substantially at right angles to the longitudinal axis thereof, so that as the fan rotates the air is thrown from the face of the blades outward in substantially the form of what may be termed cylindrical waves. Aside from the fact that the air is not so well diffused as might be, it is obvious that the draft created by the air thrown in this manner may be and frequently is entirely too strong. By my invention, I entirely overcome these objections, by causing the air to be thrown from the fan in the form of conical or spherical waves.

Referring to the drawings: Figure 1 is a side elevation of a fan with my invention applied thereto. Fig. 2 is a side view, partly sectional, of one of the blades of the fan. Fig. 3 is an end elevation thereof.

In the drawings, A, represents the framework of an ordinary electric motor, in which framework the shaft, C, is suitably journaled.

B, represents the motor.

Instead of mounting the blades upon the shaft, as is now the custom, I bend the blades, D, in a curved line backward at an angle to the longitudinal axis of the shaft, C, as shown in Fig. 3. This angle may be greater or less, according to circulation desired, but I have found that a very effective result is obtained by placing the blades at an angle of about forty-five degrees to the shaft, which angle is that represented in Fig. 2, although it is to be clearly understood that I do not limit myself to this angle, or to any particular angle, as it is evident that this angle may be varied within wide limits without departing from my invention, which rests essentially in bending

the blades of the fan backward for the purpose defined. In the rapid rotation of the fans turned by electric motors, the strain upon the blades, when bent backward, may be so great as to cause the fan to be broken, and the blades may thus be thrown off the shaft. To prevent this, I provide a strengthening band, E, which is preferably a band of metal extending entirely around the fan, at the back, and secured to the outer edges of the blades by welding, riveting, &c. Such a band will give additional strength to the fan as a whole, and will check effectually the tendency of the blades to be thrown off by centrifugal force.

It will be seen that in the operation of a fan constructed in accordance with the principles of my invention, as above described, the air will be thrown out in the form of a cone, as indicated by the lines, *a*, and consequently, the volume of air which is brought into circulation from behind the fan is diffused to a much greater extent than in the ordinary fans, and the lines which the air takes will vary from parallel to the shaft near the hub, to an angle thereto, near the outer edge of the blade.

Various extraneous means have been devised for diffusing the air which is thrown out by ventilating or circulating fans, such as shields, or diffusing plates, placed in certain positions around the fan; but in my invention, it will be seen that I dispense with all additional devices of this kind, rendering my invention exceedingly simple in construction, while it is, in fact, more effective in operation.

While I have not shown any means for adjusting the blades on any given shaft at varying angles to the shaft, it is evident that any well known means for securing the blades adjustably to the shaft may be employed, when it is desired to vary the angle of the blades in a given instance.

I have shown my fan as operated by an electric motor but of course it is to be understood that it is applicable to any kind of a fan however operated.

I am aware that blowers have been made in which the blades thereof are inclined to the longitudinal axis of the shaft so that the blower will concentrate the air for the purpose of introducing it into a room or cham-

ber, but in such case, the blades have been bent forward and, in operation, the advancing edge is nearer the shaft than the following edge and, in such constructions, the blades
5 have been so set as to draw the air in through the front of the blower and throw it out to the rear in a concentrated blast, whereas in my construction, the blades are bent backward and the sole effect of the operation is to
10 agitate and diffuse the air in a room. I do not therefore claim broadly the combination with a rotating shaft, of blades bent at an angle to the longitudinal axis thereof, but

What I do claim as my invention is—

15 In a ventilating or circulating fan, the combination with the shaft, of a series of blades

set substantially at right angles to the longitudinal axis of the shaft, and having their outer portions bent backward at an angle to the shaft, whereby the air may be thrown out
20 in cylindrical waves from the portion nearer the hub and in spherical or conical waves from the outer portions of said blades, as and for the purpose set forth.

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

JOSEPH HEISKELL WEATHERFORD.

Witnesses:

JAS. B. HILDEBRAND,
NATHAN E. MORRIS, Jr.