(No Model.) 2 Sheets—Sheet 1.

J. M. BLACKMAN.

VENTILATOR WHEEL OR FAN.

No. 261,128. Patented July 18, 1882.

Fig. 1.

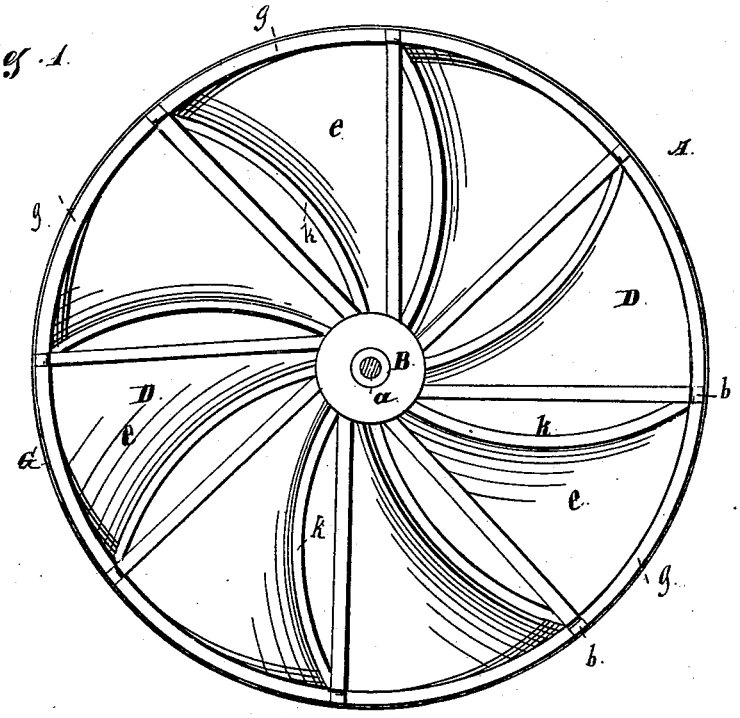
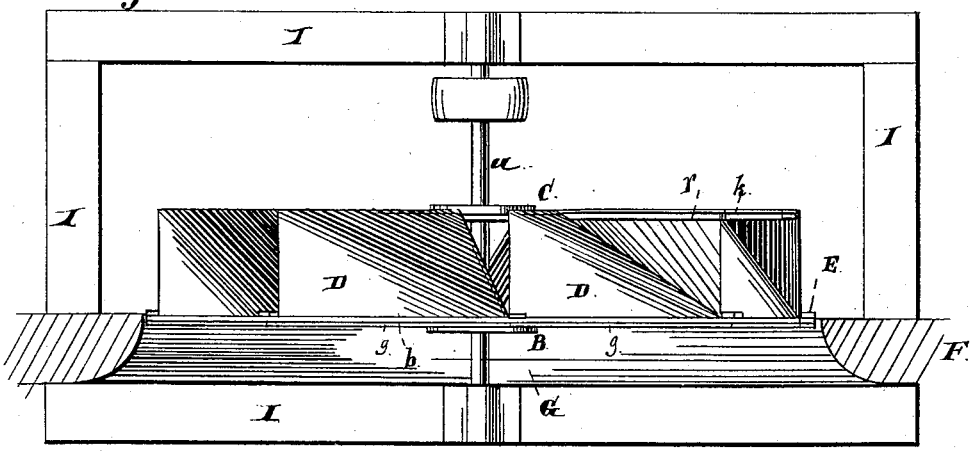


Fig. 2.



Witnesses:
Albert H. Adams.
Edgar F. Bond

Inventor:
James M. Blackman

(No Model.) 2 Sheets—Sheet 2.

J. M. BLACKMAN.

VENTILATOR WHEEL OR FAN.

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Fig. 3.

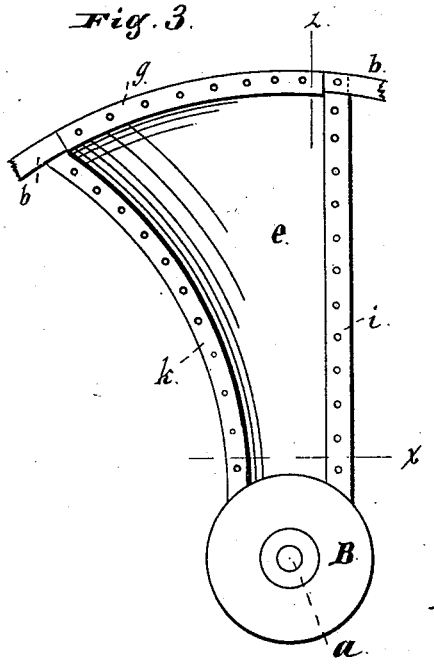


Fig. 6

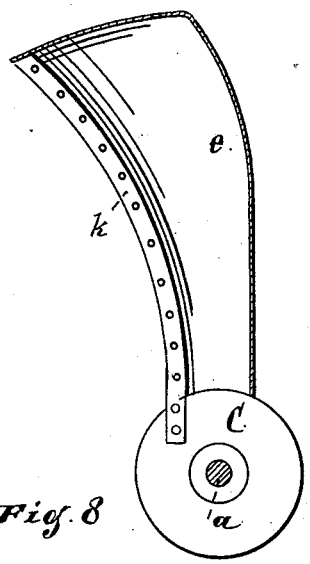


Fig. 7

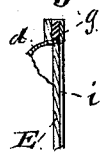


Fig. 8

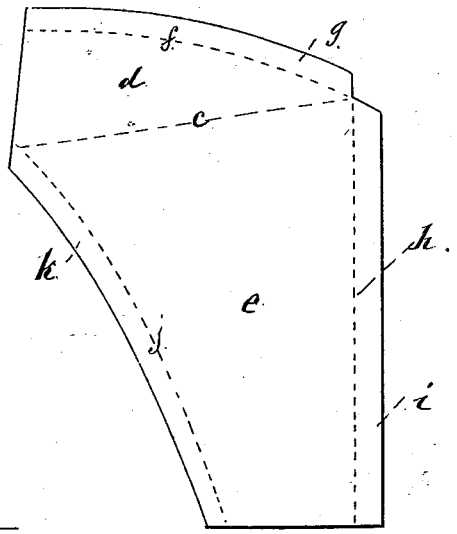


Fig. 4.

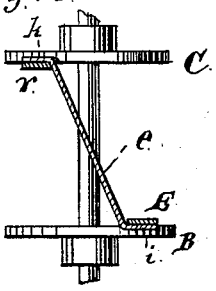
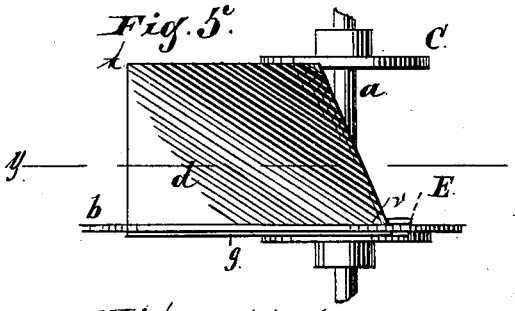


Fig. 5.



Witnesses:
Albert H. Adams.
Edgar P. Bond

Inventor:
James M. Blackman

UNITED STATES PATENT OFFICE.

JAMES M. BLACKMAN, OF CHICAGO, ILLINOIS.

VENTILATOR WHEEL OR FAN.

SPECIFICATION forming part of Letters Patent No. 261,128, dated July 18, 1882.

Application filed April 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. BLACKMAN, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented new and useful Improvements in Ventilator Wheels or Fans, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation, showing the outside of the fan. Fig. 2 is a top view, the wall where the fan is located being shown in section. Fig. 3 is an elevation of one wing as seen in Fig. 1. Fig. 4 is a section on line *x* of Fig. 3. Fig. 5 is a top view of a single wing, or it may be called a top view of the wing shown in Fig. 3. Fig. 6 is a section at line *y* of Fig. 5. Fig. 7 is a section at line *z* of Fig. 3, looking to the right. Fig. 8 represents the form of the blanks from which the sheet-metal parts of the wings are formed.

My invention relates to ventilator wheels or fans which are used for the purpose of forcing air out from buildings and other places. As the wings of such fans have heretofore been constructed their outer ends have been left open, and they have been so formed that they do not operate to catch and draw air into the fan at the ends of the wings; but, on the other hand, a portion of the air gathered by the fan falls over the ends of the wings back into the room, instead of being thrown out therefrom, especially when the speed of the fan is great.

The leading object of my invention is to obviate this difficulty, which I accomplish by giving to the ends of the wings a new and improved construction, covering the space which has heretofore been left between the diagonal end of the wing and the outside of the wheel, as hereinafter fully set forth.

My invention further consists in combining my improved wings with other parts of the fan, as herein set forth.

In the drawings, A represents my improved ventilator-wheel, which is mounted upon a shaft, *a*, supported in suitable bearings.

B C are two disks secured to the shaft *a*.

D are the wings of the wheel, and they are scroll-shaped.

In manufacturing these fans I secure a suitable number of ribs, E, to the disk B, the upper ends of which may be provided with a set-off, as shown in Fig. 7. I then secure a flat circular rim or ring, *b*, to these ribs E. I also provide a series of curved ribs, *r*, for the other edge of the fan, secured at their lower ends to the disk C.

Fig. 8 represents a blank from which each wing is made. The upper part of this blank is to be bent over and forward along the dotted line *c* at nearly right angles to the other portion of the blank. For convenience I mark this portion of the blank which is to be so bent over *d* and the remaining portion *e*. After the portion *d* has been bent over, as described, its upper edge is to be bent over and upward along the dotted line *f*, forming a flange, *g*. The right-hand edge of the part *e* is to be bent over along the dotted line *h*, forming another flange, *i*, and the other edge of the blank is to be bent over along the dotted line *j*, forming another flange, *k*. These two flanges *i* and *k* stand in opposite directions. The flange *i* of each wing is to be bolted upon the face of one of the ribs E. The flange *g* of each wing is to be bolted to the rim *b*. The flanges *k* are to be secured to the ribs *r*. The lower end of the wing is to be in a diagonal position, as represented in Fig. 4.

As similar fans have heretofore been made the wings have been so formed that the outer end of each wing has terminated near the dotted line *c* of Fig. 8, and the space between such line and the outer rim or edge of the fan has been left open. The end of the wing so formed will not catch and draw air into the fan; but the air will escape from the fan at this point when the motion is rapid. The part *d* entirely covers this heretofore open space, and this part *d*, when the fan is in motion, will catch and draw air into the fan, even when the motion is very rapid.

The leading feature of my invention is found in so constructing the wings of the fan that the space which has been heretofore left open between the rim of the fan and the diagonal outer end of the wing will be covered by that part of the wing marked *d*. I find by actual use that fans constructed with wings thus made are much more efficient than when the ends of the wings are left open, as heretofore.

In Fig. 2 I have shown a wall, F, of a room

with an opening, G, therein, through which air is to be discharged from the room by the revolution of the fan. The front edges of the wings I place in one plane and the rear edges in another plane. For wheels four feet or less in diameter I use eight wings, and for wheels of larger size I ordinarily use ten wings. The wheel may be driven in any well-known manner. The wings can be made from sheet metal.

If a line should be drawn from the point *t*, Fig. 5, to the opposite diagonal corner, *v*, of the wing, such line would correspond substantially with the line *c* of Fig. 8, and the wings of ventilator-fans of this class have heretofore terminated at such line. The leading feature of my invention consists in so forming each wing that the space between the line indicated as above and the rim *b* of the fan will be covered by the part *d*.

In Fig. 2, I are the parts of a frame on which the fan is mounted, or may be supposed to be mounted, as a model.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a ventilator-fan, the scroll-shaped wings D, arranged in the wheel in a diagonal position, and each provided at its outer end with the part *d*, covering the space between the outer end of the part *e* of the wing and the rim *b*, substantially as and for the purposes specified.

2. In a ventilator-fan, the combination of the disks B C, ribs E, rim *b*, and wings D, each wing being provided with a part, *d*, covering the space between the outer end of that part of the wing marked *e* and the rim *b*, substantially as and for the purpose specified.

JAMES M. BLACKMAN.

Witnesses:
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ALBERT H. ADAMS.