

(No Model.)

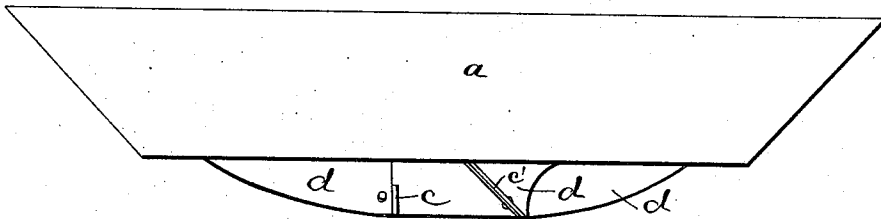
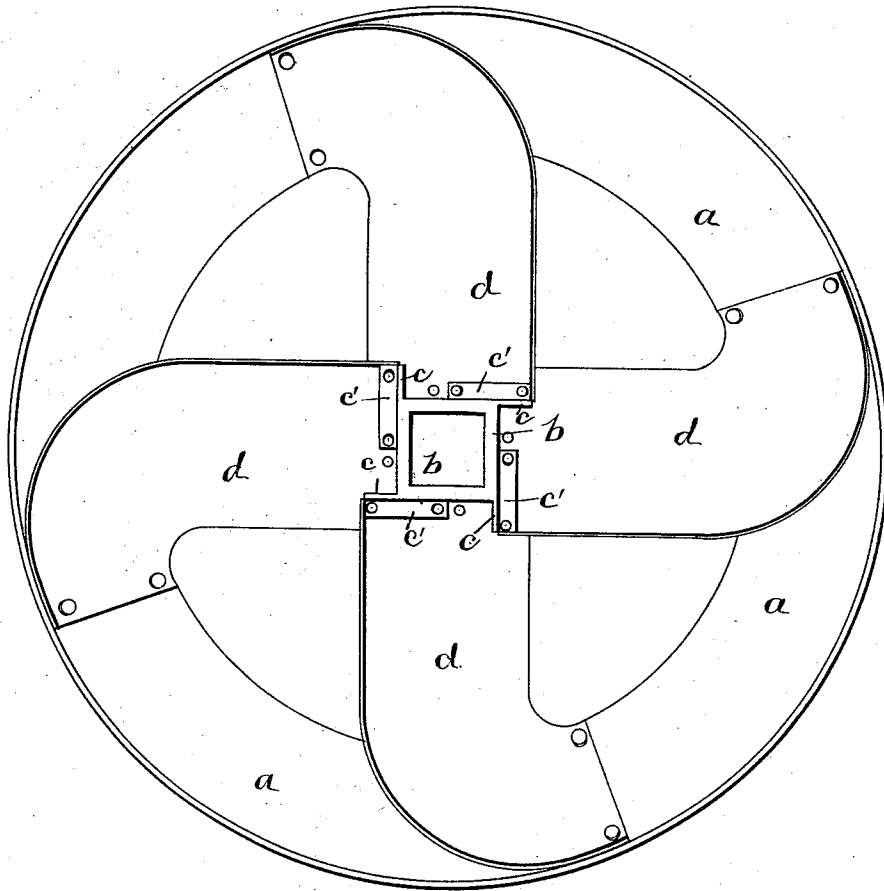
2 Sheets—Sheet 1.

D. BENNETT.  
VENTILATING FAN.

No. 536,998.

Patented Apr. 9, 1895.

*Fig. 1*



*Fig. 2*

WITNESSES:

*H. B. Bradshaw*

*A. L. Phelps*

INVENTOR

*Darius Bennett.*

BY

*Staley and Shepherd*  
ATTORNEYS.

(No Model.)

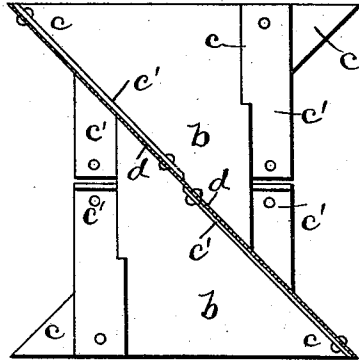
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*Fig. 3*



WITNESSES:

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INVENTOR

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# UNITED STATES PATENT OFFICE.

DARIUS BENNETT, OF NELSONVILLE, OHIO.

## VENTILATING-FAN.

SPECIFICATION forming part of Letters Patent No. 536,998, dated April 9, 1895.

Application filed September 22, 1893. Serial No. 486,232. (No model.)

*To all whom it may concern:*

Be it known that I, DARIUS BENNETT, a citizen of the United States, residing at Nelsonville, in the county of Athens and State of Ohio, have invented a certain new and useful Improvement in Ventilating-Fans, of which the following is a specification.

My invention relates to the improvement of ventilating fans and has particular relation to that class of fans which are employed for the purpose of driving air into mines, and exhausting it therefrom.

The objects of my invention are to provide a fan of this class of superior construction and arrangement of parts; to so construct the same as to create a strong current and propel a large volume of air by the comparatively low speed of the fan and to produce other improvements which will be more specifically pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a face or end view of my improved fan. Fig. 2 is a side elevation and Fig. 3 is a detail view of the fan hub shown in elevation and showing a cross section of one of the fan vanes connected therewith.

Similar letters refer to similar parts throughout the several views.

*a* represents the circular fan wall or rim, which as shown in the drawings, is of a substantially truncated cone shape.

*b* represents the central fan hub the body of which is as indicated in the drawings, square in cross section and the central shaft opening of which may be round or square as shown. From each face of the hub *b* adjoining opposite sides thereof and adjacent to each end thereof projects outwardly at right angles with the plane of said hub face, an angular flange or wing *c*, the inner edge of which is inclined at an angle of forty-five degrees, as shown. Secured to or formed with the hub body and with each of the wings *c*, is an outwardly projecting rib *c'*, the latter extending in an inclined or diagonal direction from the outer end of said wing along the inclined edge of the latter and terminating at the center of the width of and near the center of the length of that face of the hub body which is adjacent to the face from which projects the wing

*c*. From this arrangement it will be seen that the inner end portions of two of the ribs *c'* will be arranged on each face of the hub. These ribs *c'* although running in parallel directions are, as shown, arranged slightly out of alignment with each other. It will thus be seen that the inner ends of each pair of ribs although terminating at the center of the width of the hub will be slightly separated.

*d* represents the fan vanes. These vanes of which there are four as shown, are in the form of blades the inner end of one of which crosses diagonally each face of the hub body, said vane end being secured partially to one side of one of the ribs *c'* and partially to the opposite side of the remaining rib *c'* of one face of the hub. By this connection it will be seen that the inner end of the vane has half of its width provided with a bearing on one side, while the remaining half of its width is provided with a bearing on the opposite side.

As shown in the drawings, the support above described for the inner end of each of the fan vanes serves to retain the latter at an incline of substantially forty-five degrees, which incline is retained throughout the length of the vane. The outer ends of these vanes curve forwardly as shown to meet the inner surface of the rim *a*, to which they are secured, tangentially.

As indicated in Fig. 2 of the drawings, the fan vanes are also inclined from their points of connection with the inner surface of the rim, in the direction of the rear or smaller end of said rim, thus causing part of the hub and parts of the vanes to project rearwardly or outwardly beyond the line of the smaller end of the rim *a*.

The fan herein described is adapted to be mounted upon a suitable shaft upon which is keyed or otherwise secured the hub *b*, motion being imparted to said shaft in any desired or well known manner.

From the construction which I have shown and described, it will be seen that the air caught by the fan vanes will owing to the rapid rotation of the latter in conjunction with the inclines of said vanes, be driven outward through the larger end of the casing or rim. This movement of the air will also be assisted

by the incline or flare of the wall of the rim. It will be observed that the incline or depression of the fan vanes which results as described in their projection past the smaller  
5 end of the rim, substantially increases the length of the air catching surface of the vanes and causes the gathering by the latter of a large volume of air which is propelled rapidly  
10 along the inclined surfaces of said vanes and rim out through the open end of the latter.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a ventilating fan the combination of  
15 the truncated cone shaped rim, a squared hub body and parallel ribs *c'* extending as described to the center of the width of each face of said hub and out of alignment with each other, of the fan vanes the inner ends of which  
20 are secured as described to the opposite sides

of said ribs and the outer ends of which are secured to the inner surface of said rim, said fan vanes being inclined at an angle of substantially forty-five degrees with the hub as and for the purpose specified. 25

2. In a ventilating fan the combination with the truncated cone shaped rim and a central hub therefor, of fan vanes secured at their inner ends to said hub and at their outer ends to the inner surface of said rim, said fan vanes  
30 being inclined at an angle of substantially forty-four degrees with the hub and also inclined in the direction of the smaller end of the rim substantially as and for the purpose specified.

DARIUS BENNETT.

In presence of—

R. H. JACKSON,  
FRANK PATTON.