

E. E. HARGREAVES.
EXHAUST-FAN.

No. 174,813.

Patented March 14, 1876.

Fig. 1.

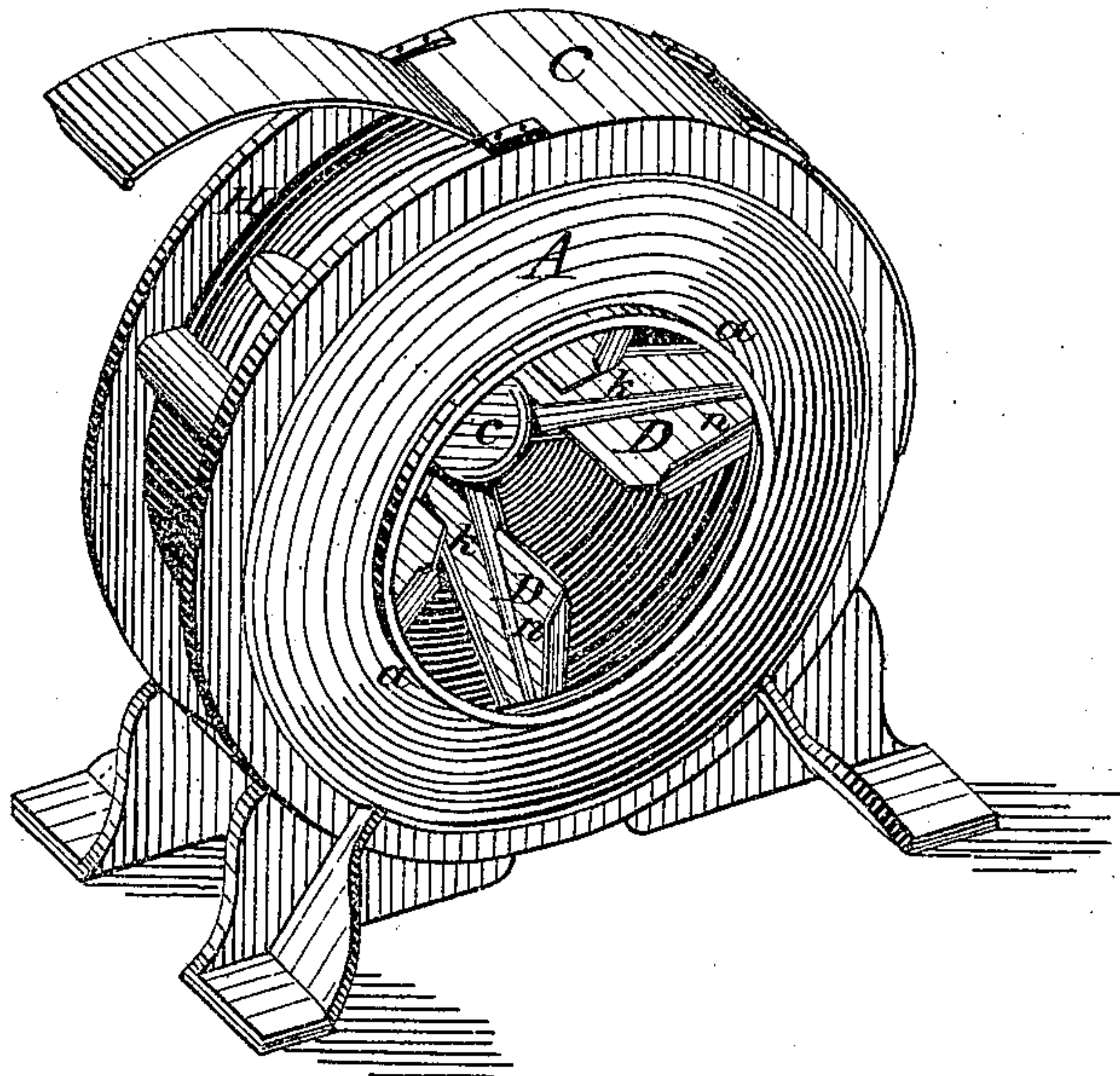
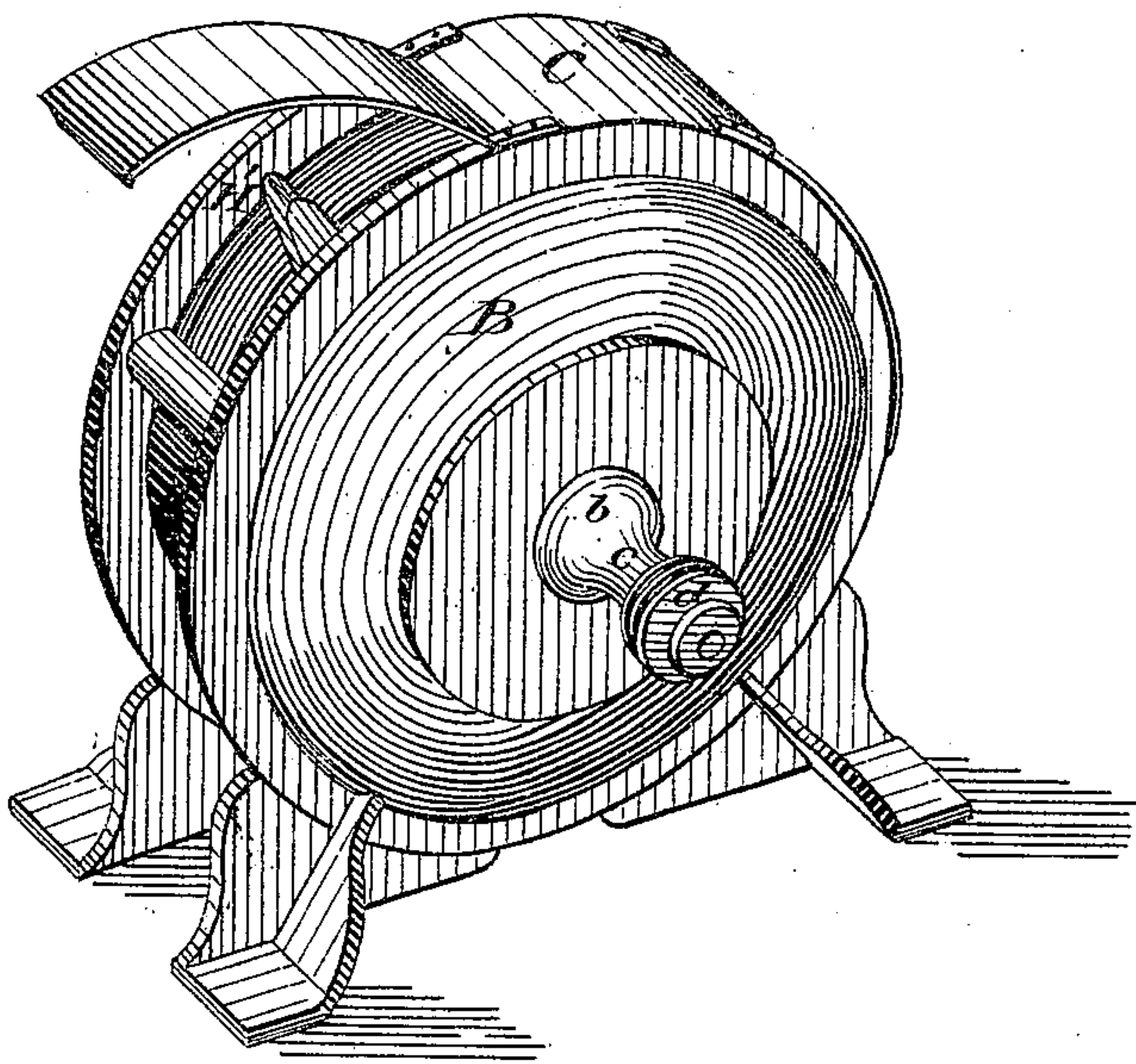


Fig. 2.



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Fig. 3.

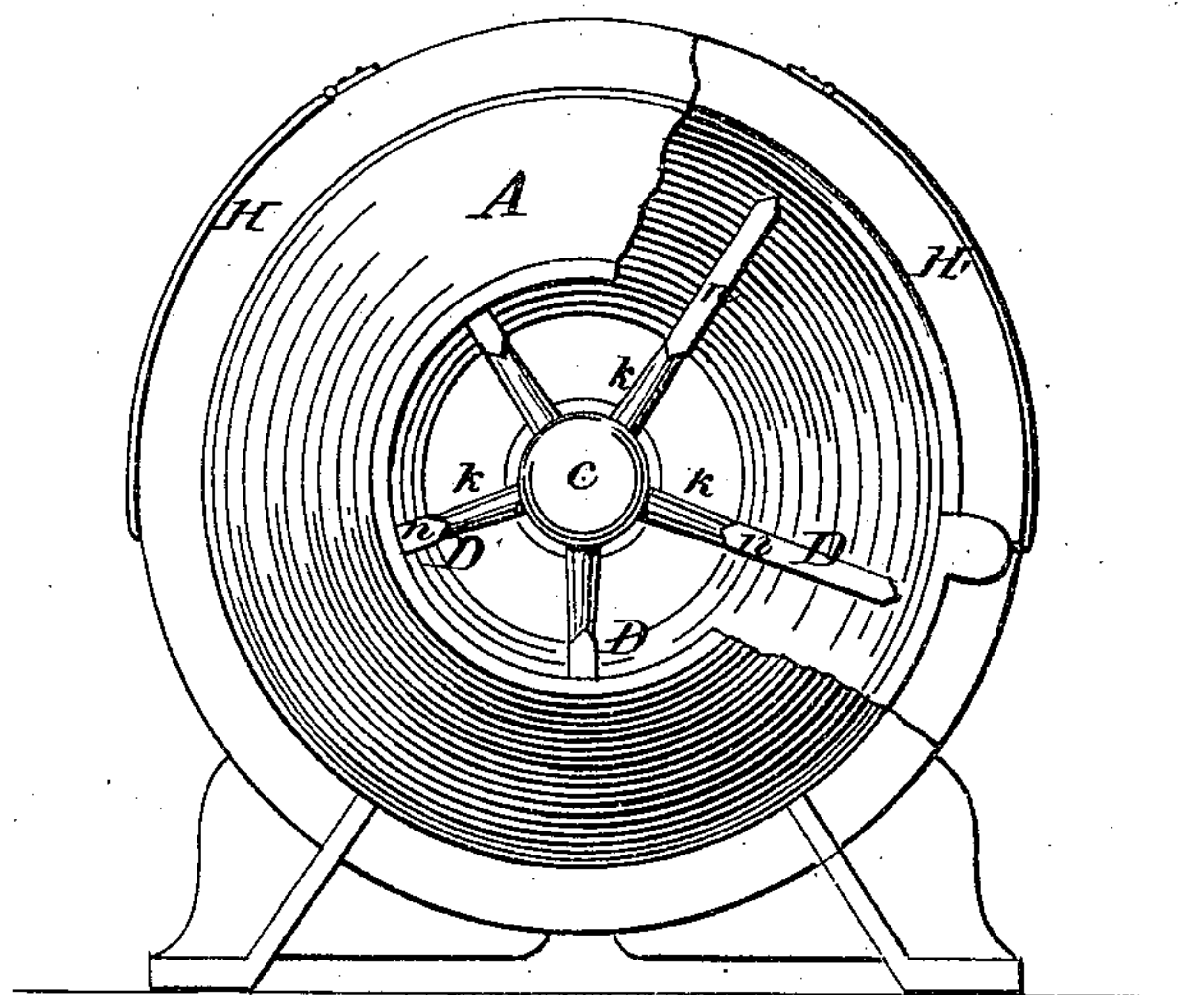
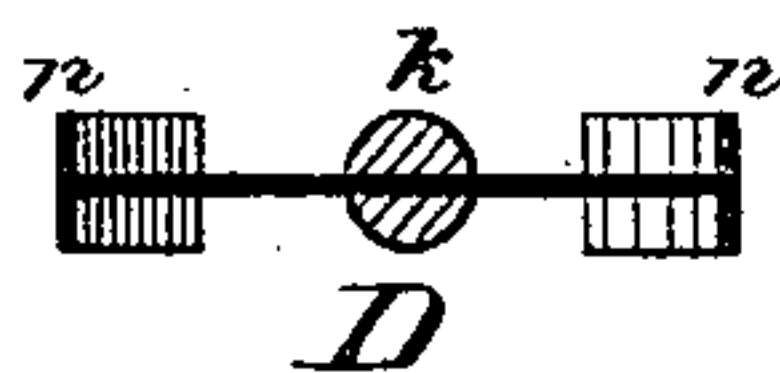


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD E. HARGREAVES, OF SARNIA, CANADA.

IMPROVEMENT IN EXHAUST-FANS.

Specification forming part of Letters Patent No. **174,813**, dated March 14, 1876; application filed January 17, 1876.

To all whom it may concern:

Be it known that I, EDWARD E. HARGREAVES, of Sarnia, in the county of Lambton and Dominion of Canada, have invented a new and useful Improvement in Exhaust-Fans; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention relates to a new and novel construction of an exhaust-fan, adapted to exhaust equally well when driven in either direction.

Figures 1 and 2 are perspective views from opposite sides, the first showing the air-receiving opening in the side, and an exhaust-opening in one side of the rim, and the second showing the opposite side of the fan, with the shaft and pulleys, and an exhaust-opening in the rim opposite the one shown in Fig. 1. Fig. 3 is a like view with Fig. 1, with a portion of the shell removed to show the form and arrangement of the wings. Fig. 4 is a cross-section of one of the wings, showing the flanges on the edges of the wings.

Like letters refer to like parts in each figure.

In the accompanying drawings, A represents one of the vertical faces of the shell of the fan, provided with the usual inlet-opening *a*. B is the opposite face of the shell, provided with a hub, *b*, bored out to receive the shaft *c*, to the outer end of which are secured the pulleys *d*. C is the rim of the shell, secured between the parts A B, and provided at opposite sides with the exhaust-openings H H'.

The buckets or wings D are secured to arms *k*, which, in turn, are secured to the inner end of the shaft. These buckets are flat, in the

shape of the vertical section of a truncated cone, the base of which is presented toward the shaft. Each wing is provided with a flange, *n*, on each side, projecting at right angles to the face of said wing in both directions, as shown in Fig. 4, and so adapted that, no matter in which way the fan moves, a like face is presented. These flanges are designed to gather the air, and prevent its falling off the sides of the wings.

Each of the exhaust-openings may be provided with a flap or other suitable valve, so arranged that either may be opened to allow the escape of the air while the other is closed, such opening and closing being determined by the direction in which the fan is moving.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An exhaust-fan adapted to run at will in opposite directions, and provided with exhaust-openings on opposite sides, substantially as shown and described.

2. In an exhaust-fan, the combination, with the shell, having exhaust-openings on opposite sides of the same, of the revolving wings, adapted to run in opposite directions, and provided with flanges on each edge, projecting from each face, substantially as described and shown.

3. The combination, with the face A, having opening *a*, solid face B, and rim C, having openings H H', of the shaft *c* and wings D, all constructed and arranged substantially as described and shown.

This specification signed and witnessed this 9th day of December, 1875.

EDWD. E. HARGREAVES.

Witnesses:

I. GLEESON,

CHAS. H. BOGAN.