

No. 629,121.

Patented July 18, 1899.

C. H. BICALKY.
BLOWER.

(Application filed Feb. 23, 1899.)

No Model.)

Fig. 1.

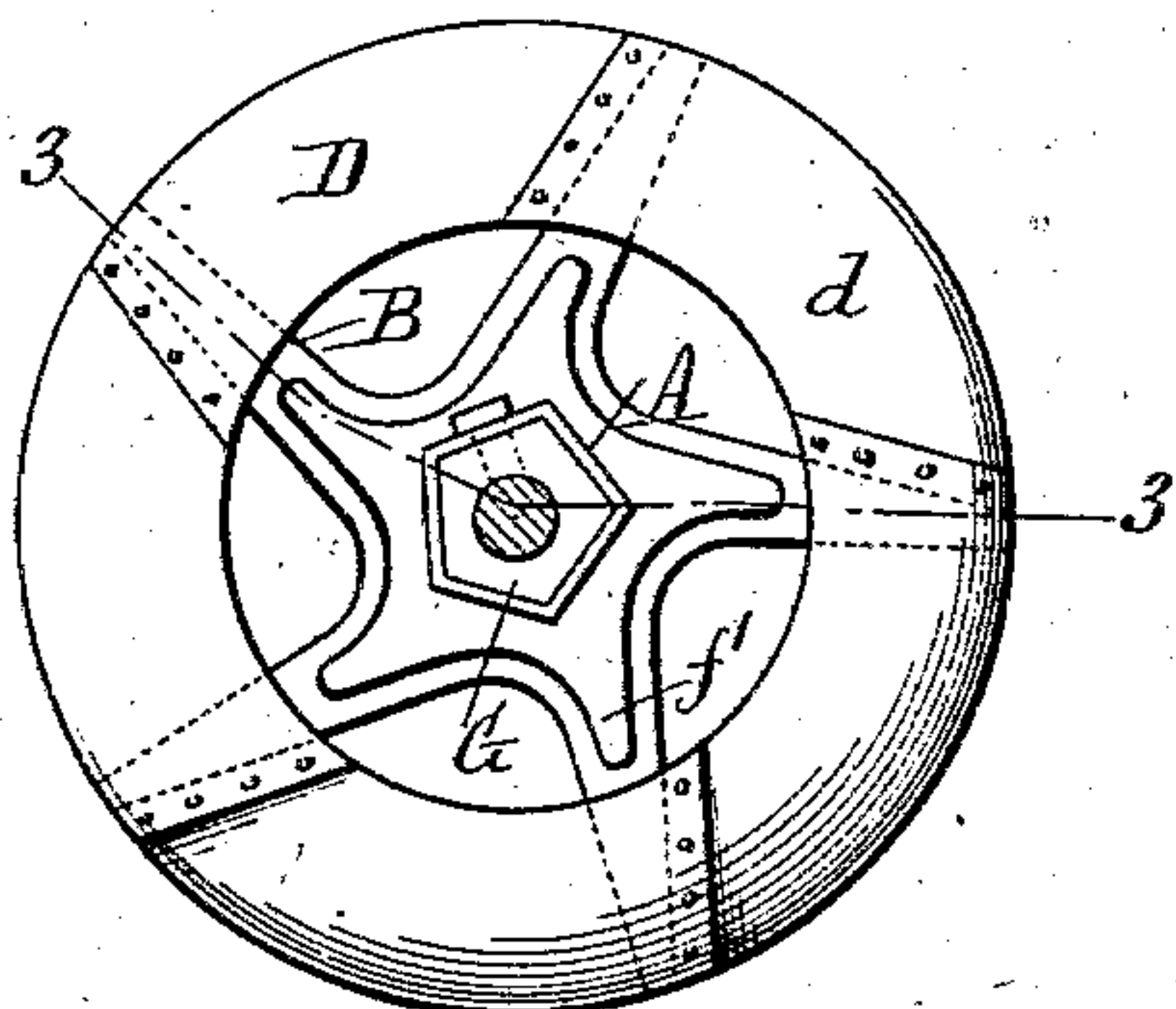


Fig. 4.

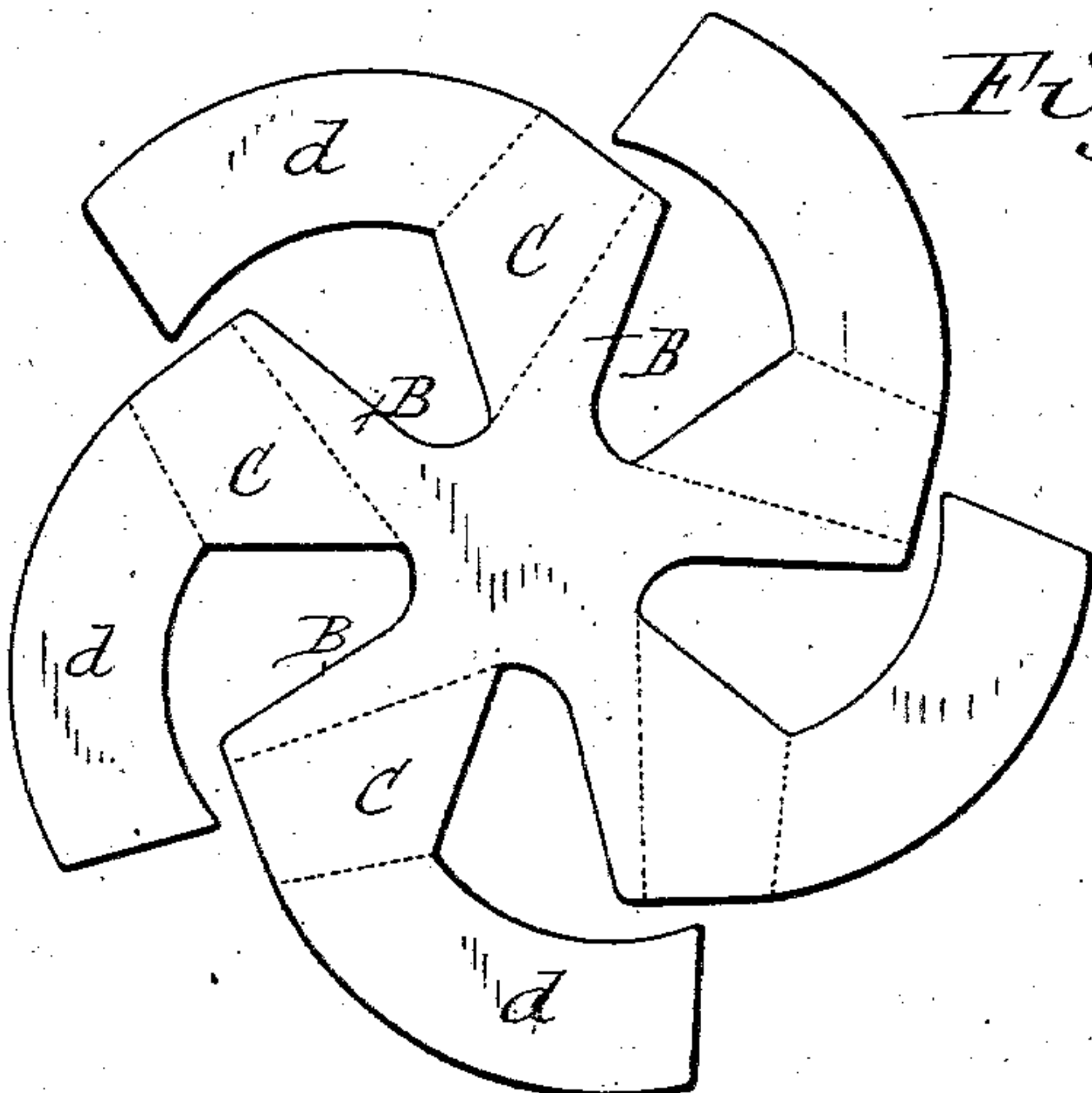


Fig. 2.

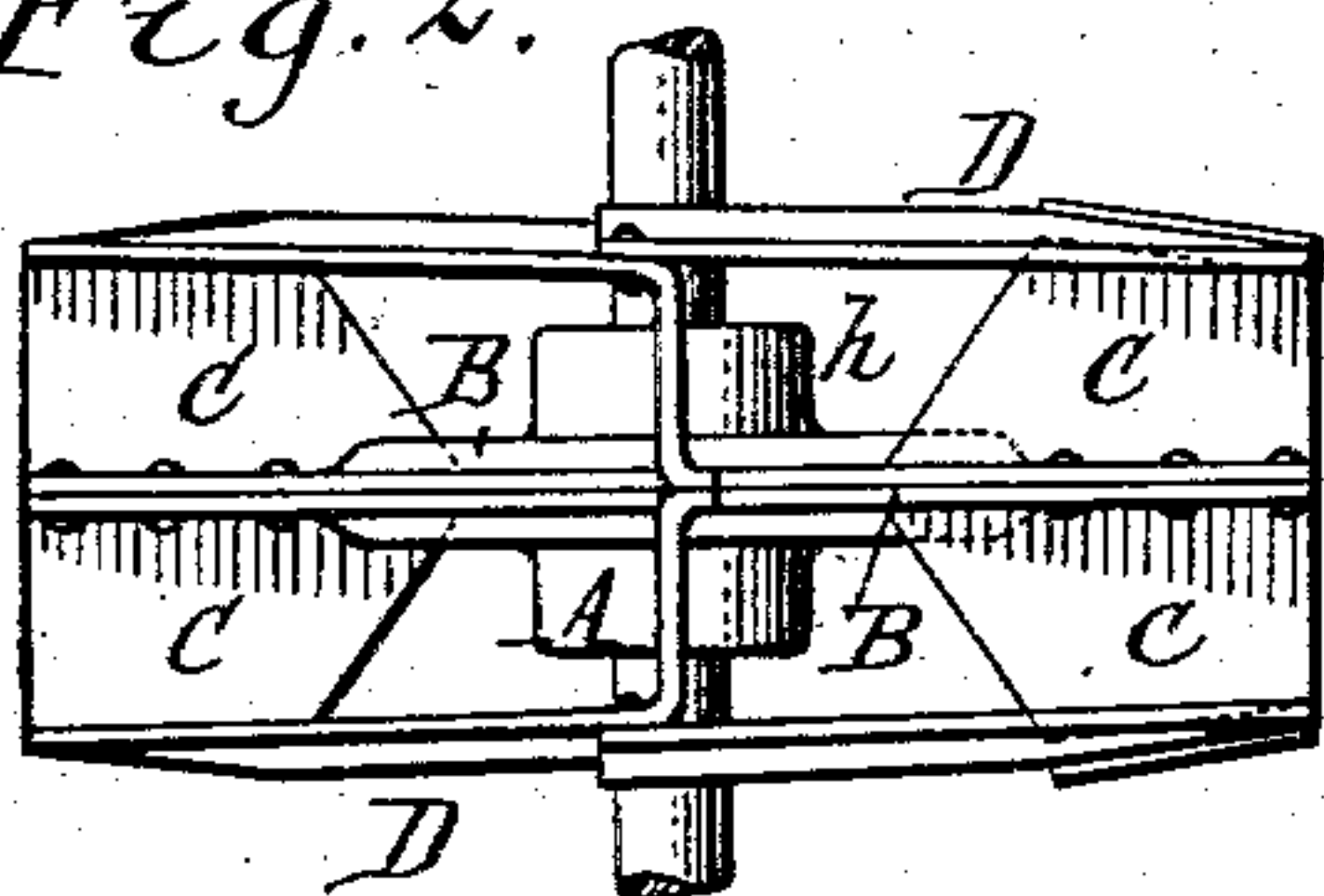


Fig. 5.

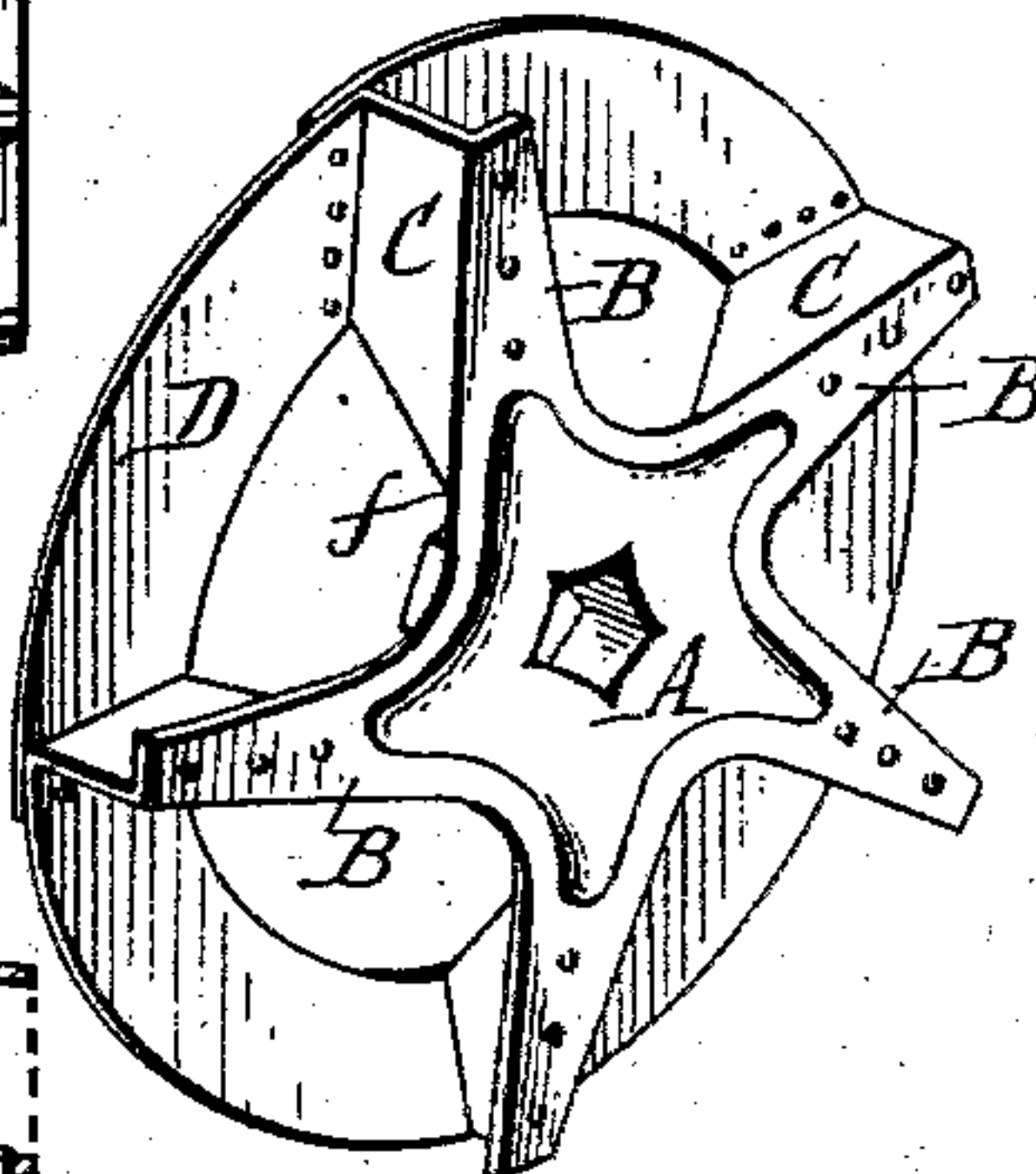


Fig. 6.

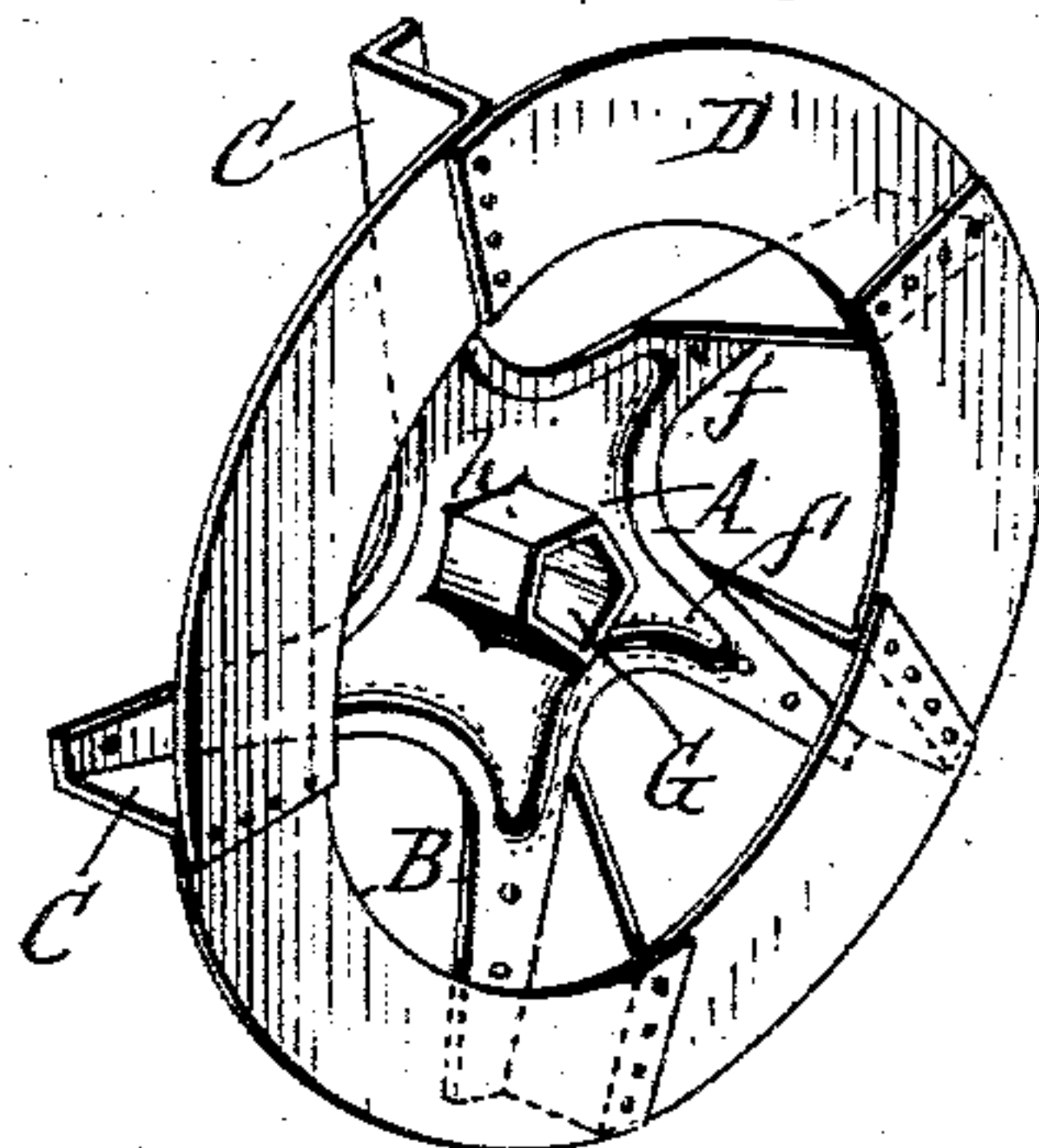


Fig. 3.

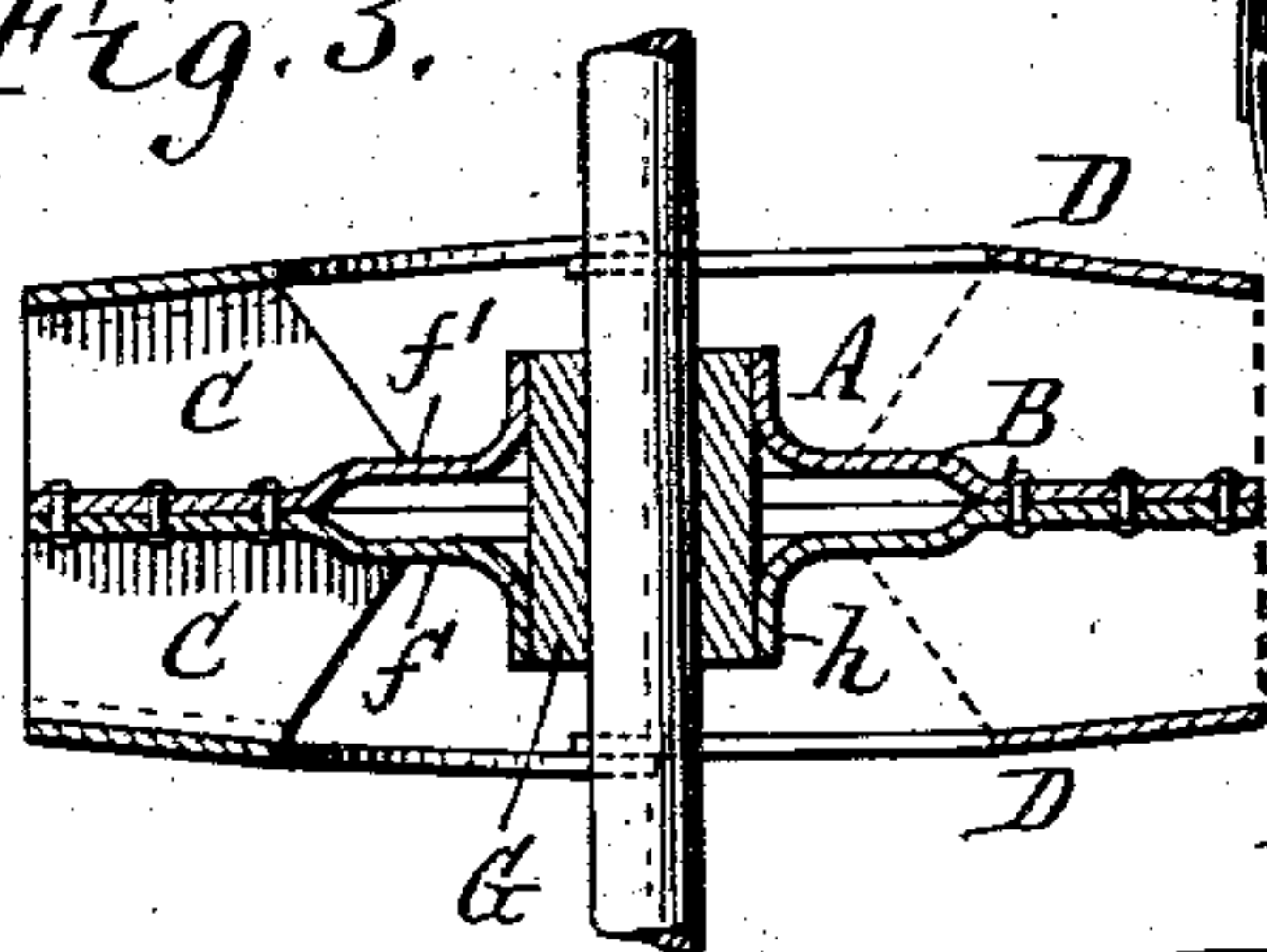


Fig. 7.

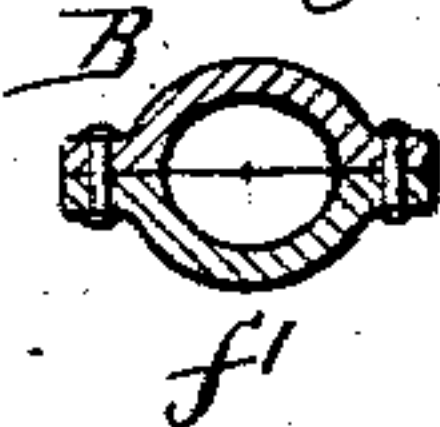


Fig. 8.

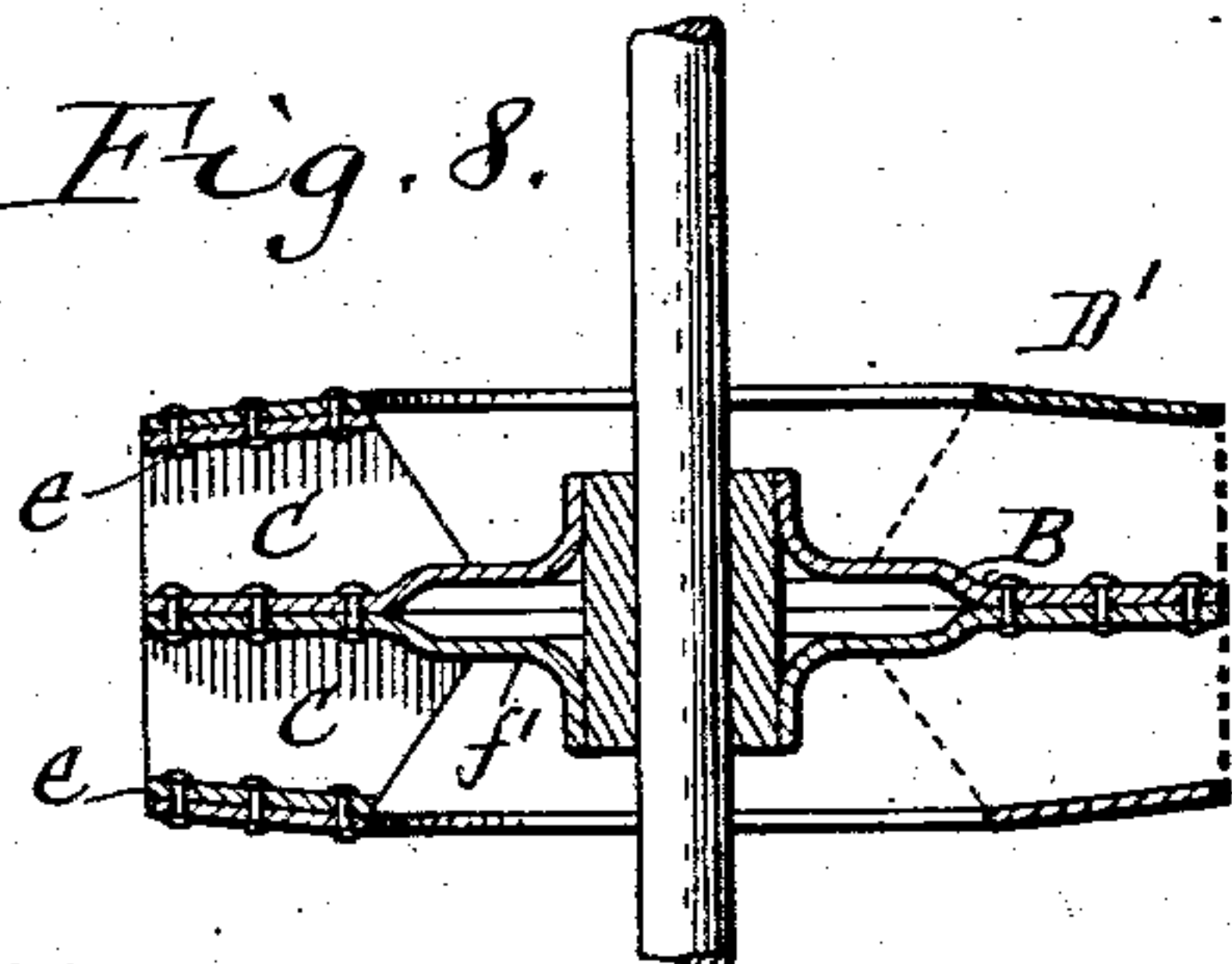
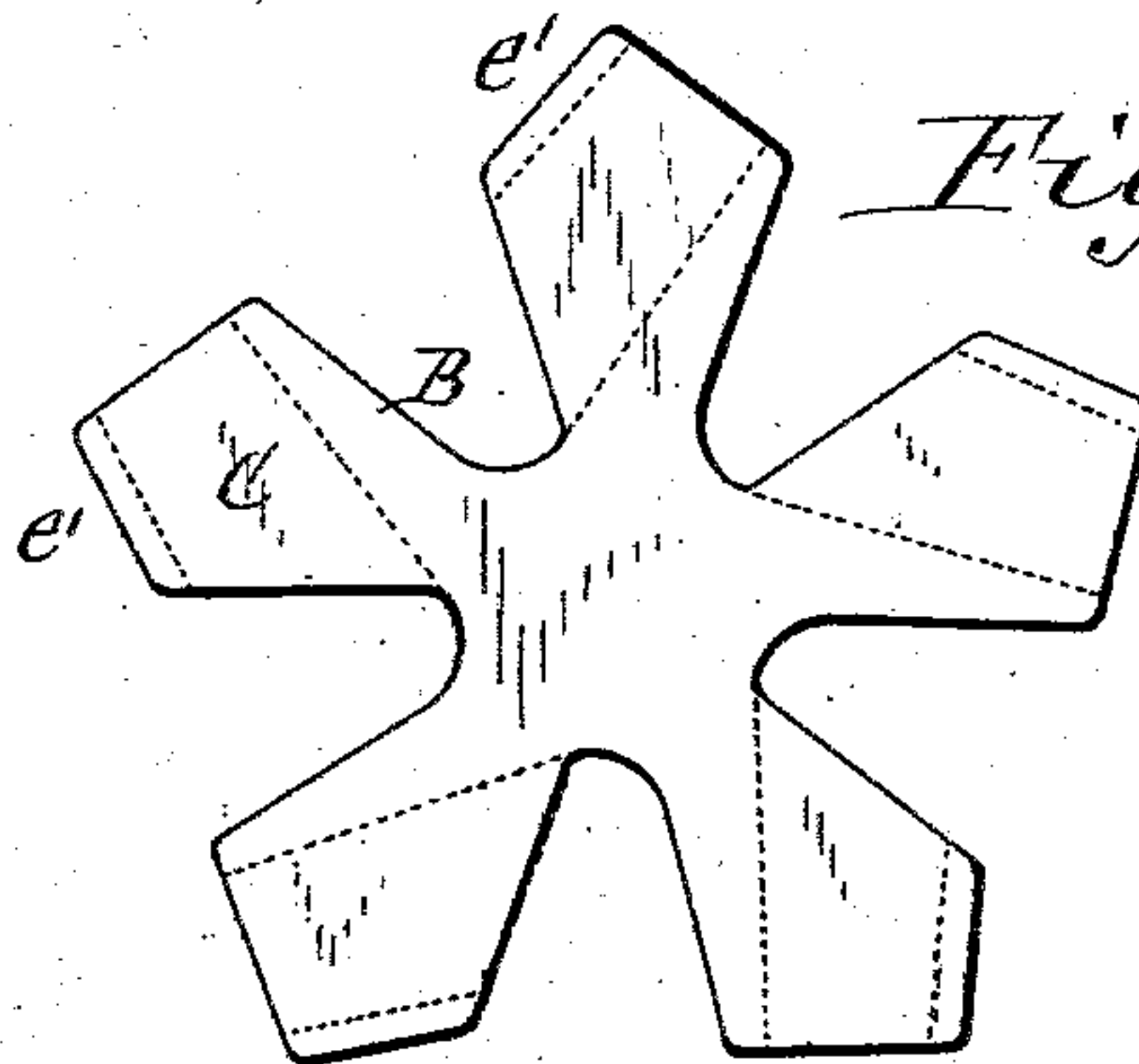


Fig. 9.



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Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES H. BICALKY, OF BUFFALO, NEW YORK.

BLOWER.

SPECIFICATION forming part of Letters Patent No. 629,121, dated July 18, 1899.

Application filed February 23, 1899. Serial No. 706,515. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. BICALKY, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Blowers, of which the following is a specification.

This invention relates more especially to fans or blowers employed for ventilating and other purposes; but the invention is also applicable to other wheels having wings or paddles, such as water-wheels.

The object of my invention is to so construct the blower that the same can be stamped out of sheet metal and made of a minimum number of parts, producing a strong and light blower which can be cheaply manufactured.

In the accompanying drawings, Figure 1 is a side elevation of my improved blower. Fig. 2 is a plan or edge view thereof. Fig. 3 is a longitudinal section of the same in line 3 3, Fig. 1. Fig. 4 is a view of one of the blanks from which the halves or sections of the blower are formed. Figs. 5 and 6 are perspective views of the two parts of the blower, showing the same stamped into proper form preparatory to being secured together to complete the blower. Fig. 7 is an enlarged cross-section of one of the arms of the blower. Fig. 8 is a longitudinal section similar to Fig. 3, showing a modified construction of the blower. Fig. 9 is a view of one of the blanks from which the sections of this modified blower are formed.

Like letters of reference refer to like parts in the several figures.

A is the central or hub portion of the blower; B, the arms radiating therefrom; C, the wings or fan-blades arranged on the arms, and D the dished rings or disks forming the sides of the blower. The blower is composed of two similar sheet-metal sections or halves which meet in a joint arranged at right angles to the axis of the blower. Each of these sections comprises one-half of the central portion A, the arms B, and the wings C, these three portions of each half or section being formed in a single piece, as shown in Figs. 5 and 6. The half-wings of each section of the blower are bent outwardly in opposite directions, and when the two sections are placed against each other with their arms in coincidence the opposing half-wings thereof to-

gether form the complete wings of the blower, as shown in Fig. 2, while the contiguous arms and hub portions of the sections form a complete hub portion and arms containing a double thickness of metal, as shown in Fig. 3. The two sections are secured together by bolts or rivets which pass through the arms and hub portions of the sections, as shown, or by other fastenings. The rings D may be made separate from or formed on the fan-blades, as desired. In blowers of comparatively small size—say not exceeding five feet in diameter—it is desirable to form the rings integral with the wings, and in this case each wing preferably consists of as many segments *d* as there are arms B, and each segment extends from the outer edge of the wing on which it is formed to the next wing. The free end of each segment overlaps the segment formed on the next succeeding wing and is bolted or riveted to the latter, as shown in Figs. 5 and 6, or otherwise fastened thereto. When the blower-sections are provided with such integral segments, each section is stamped from a flat blank cut to the form shown in Fig. 4, the arms of the blank being provided at one edge with lateral wings, which ultimately form the half-blades of the blower, and these wings having contracted segmental extensions which form the rings. The sections are stamped between suitable dies which bend the wing portions C at the proper angle to the arm portions B and bend the ring-segments *d* at right angles to the wing portions to bring the same in a parallel plane with the arm portions.

In the modified construction shown in Figs. 8 and 9 the rings B' are made separate from the blower-wings, and the latter are provided at their outer edges with angular flanges *e*, to the outer sides of which the rings are fastened. In this construction the ring-segments are omitted from the blank, as shown in Fig. 9; and the wings are formed with narrow extensions *e'*, which form the flanges for the attachment of the rings.

The lateral stiffness of the arms B is comparatively small in a line intersecting the same at the base or inner edge of the blower-wings, as indicated at *f*, and in order to stiffen the arms at this point they are provided with raised longitudinal ribs or embossments *f'*,

which are formed by indenting or depressing the metal of the arms on their inner side, as most clearly shown in Figs. 3, 5, 6, and 7. These strengthening-ribs are of sufficient length to bridge or extend across the weak portions *f* of the arms, so as to effectually prevent lateral deflection of the arms.

The two plates forming the blower are perforated centrally to receive a separate hub *G* for securing the blower to a shaft. This hub may be of any suitable form and is rigidly secured in the axial opening of the blower by any suitable means; but I prefer to employ a cast-metal hub of polygonal or flat-sided form, as shown in the drawings, and to provide the blower-sections around their correspondingly-shaped hub-openings with outwardly-extending collars *h* to form a more extensive holding and attaching surface for the separate hub. These collars are drawn out of the central portion of the sections and the hub is secured therein by a set-screw or other fastening.

My improved sheet-metal wheel or blower is stronger than a blower in which the spider is made of cast or malleable iron because there is no liability of flaws being left in the metal, as in cast or malleable iron. The blower is also lighter and more perfectly balanced. Being made up of but two principal parts, it can be quickly assembled, saving time and labor, and as each of its sections is stamped complete in a single piece it can be produced at considerably less cost than blowers of ordinary construction.

I claim as my invention—

1. A blower or similar wheel, composed of two like sheet-metal sections, each comprising a central or hub portion, arm portions radiating therefrom and arranged at right angles to the axis of the wheel, and half-wings extending outwardly from the front edges of said arm portions, the hub and arm portions and half-wings of each section being stamped from a single blank and the arm portions of the two sections being secured together side by side to complete the wheel, whereby each arm of the completed wheel contains two

thicknesses of metal, substantially as set forth.

2. A blower or similar wheel, composed of two like sheet-metal sections, each comprising a central or hub portion, arm portions radiating therefrom and arranged at right angles to the axis of the wheel, and half-wings extending outwardly from the front edges of said arm portions, the arm portions of the two sections being secured together side by side to complete the wheel, and each arm portion being provided on its inner side with a longitudinal groove or depression which extends across the junction of the arm with the hub portion of the same section and which forms a raised hollow stiffening-rib on the outer side of the arm, substantially as set forth.

3. A blower or similar wheel, composed of two similar sections, each comprising a central or hub portion, arms radiating therefrom and arranged at right angles to the axis of the wheel, half-wings extending outwardly from the front edges of said arms, and ring-segments formed at the outer edges of the half-wings and arranged at right angles thereto and each extending from the wing on which it is formed to the rear end of the next succeeding segment, substantially as set forth.

4. A blower or similar wheel, composed of two similar sheet-metal sections, each comprising a central or hub portion, arms radiating therefrom and arranged at right angles to the axis of the wheel, half-wings extending outwardly from the front edges of said arms, and ring-segments formed at the outer edges of the half-wings and arranged at right angles thereto, the free end of each segment overlapping the next succeeding segment and being secured thereto, substantially as set forth.

Witness my hand this 16th day of February, 1899.

CHARLES H. BICALKY.

Witnesses:

CARL F. GEYER,
ELLA R. DEAN.