

No. 668,552.

Patented Feb. 19, 1901.

W. O. BAILEY.
GRINDING AND POLISHING MILL AND MEANS FOR FEEDING ABRADING OR POLISHING
MEDIUMS THERETO.

(No Model.)

(Application filed Mar. 13, 1900.)

3 Sheets—Sheet 1.

FIG. 1.

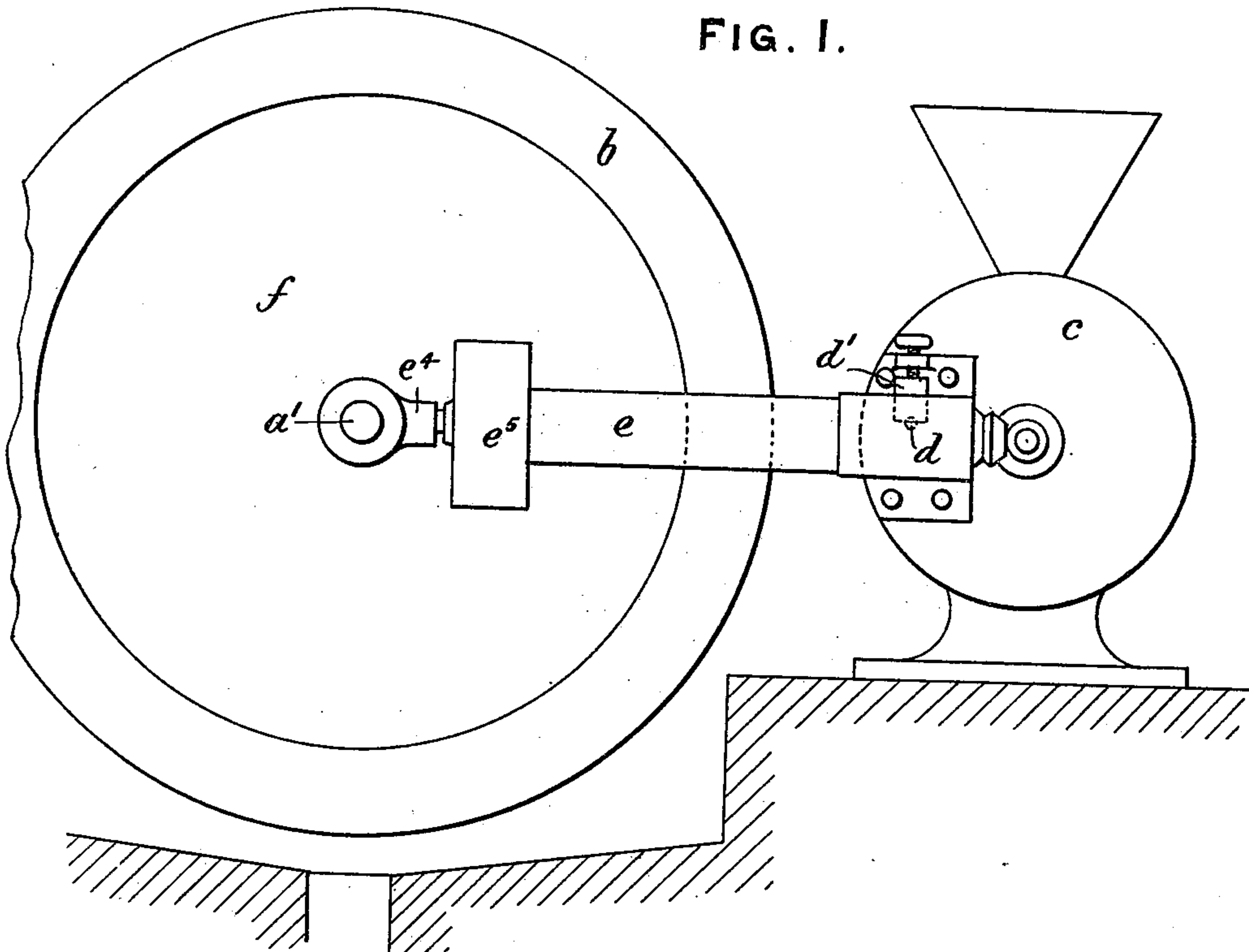
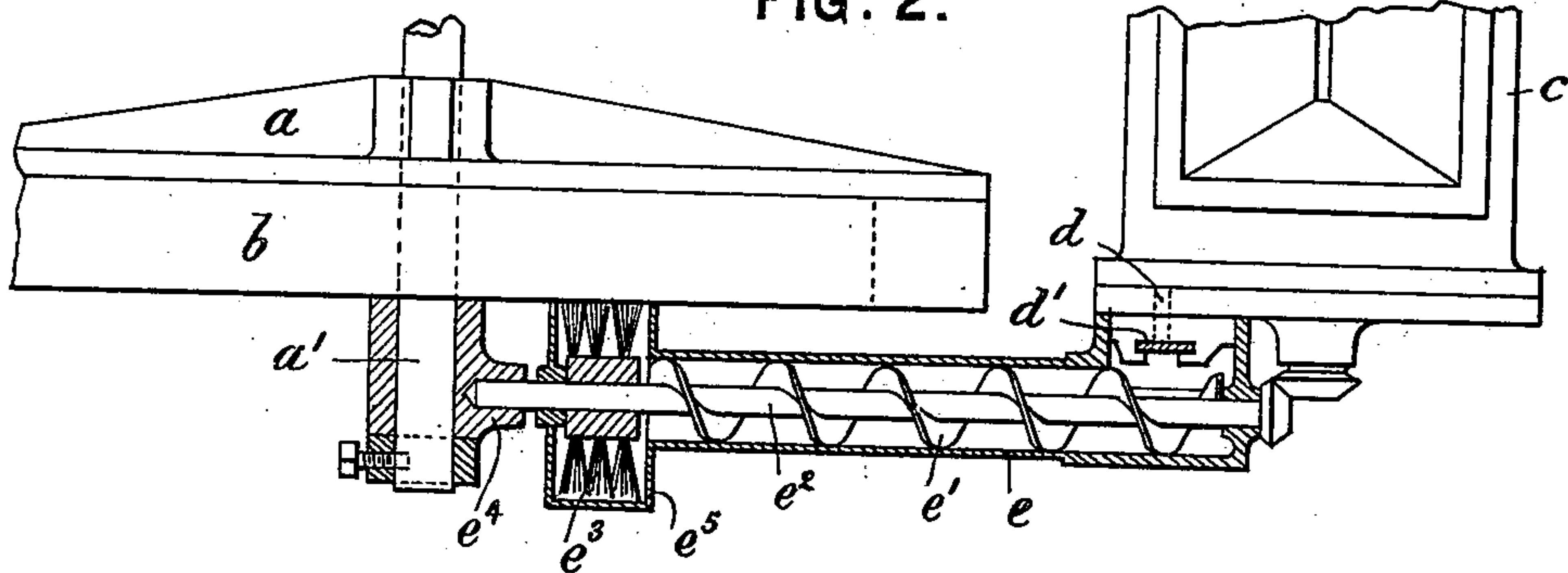


FIG. 2.



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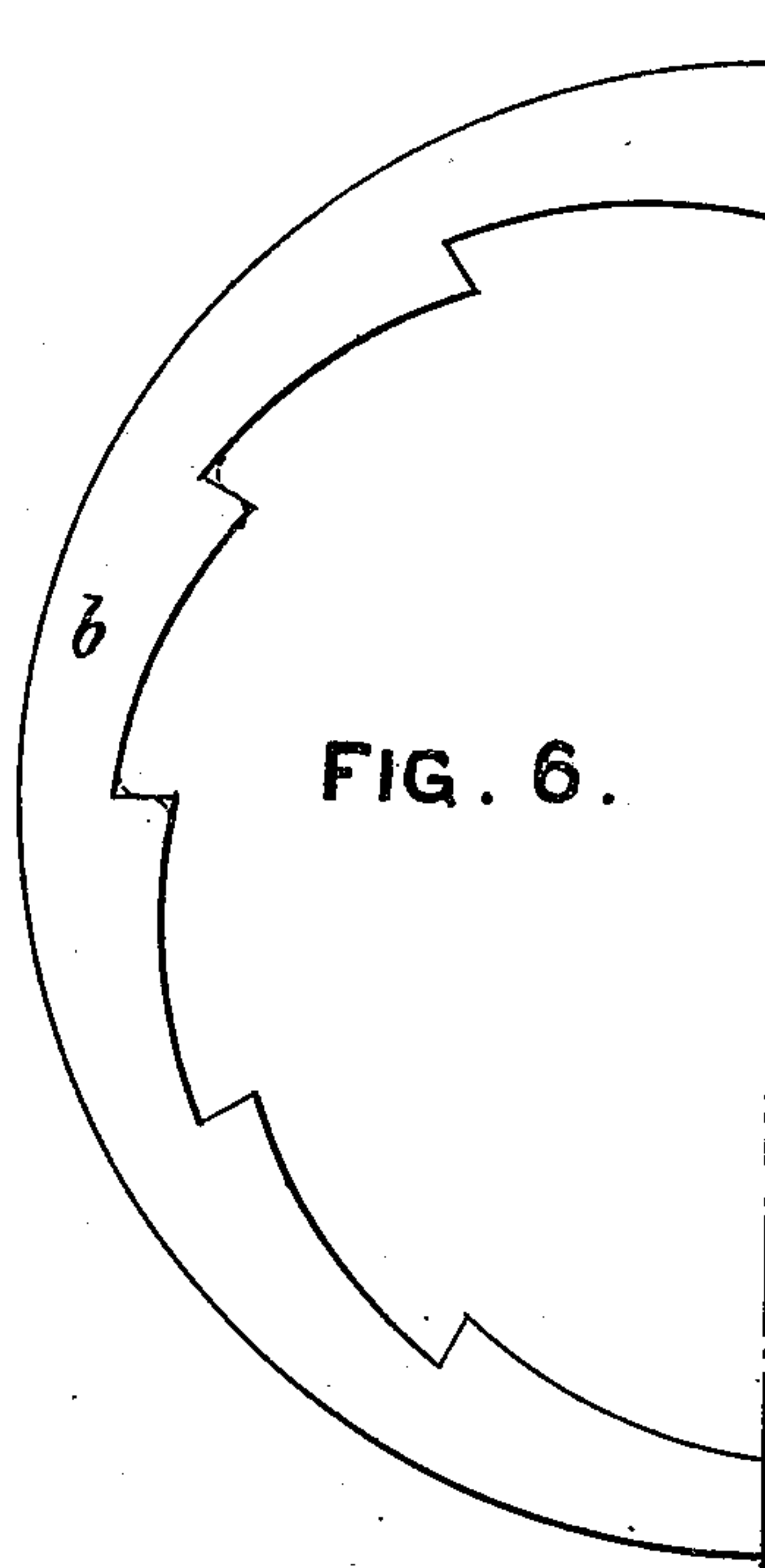
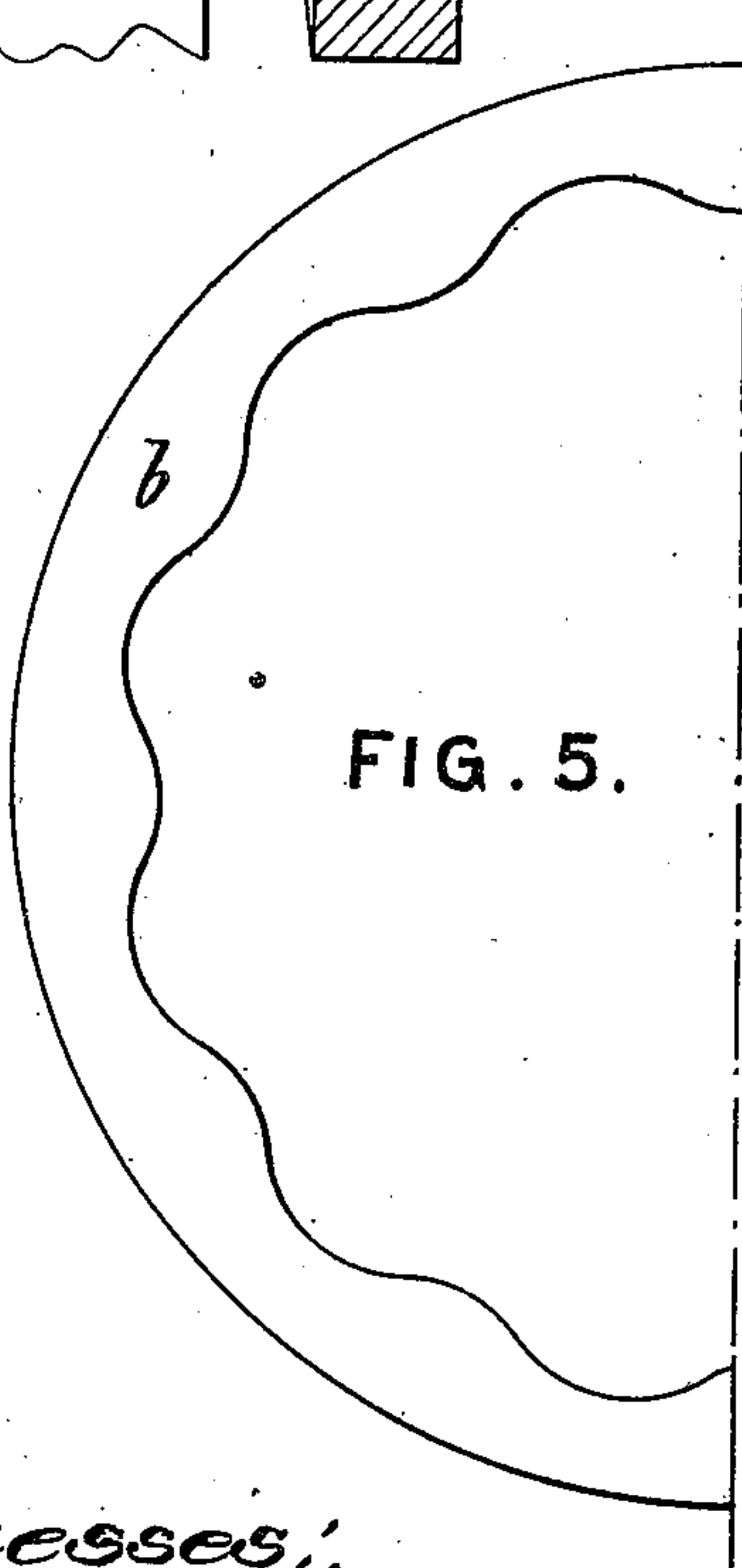
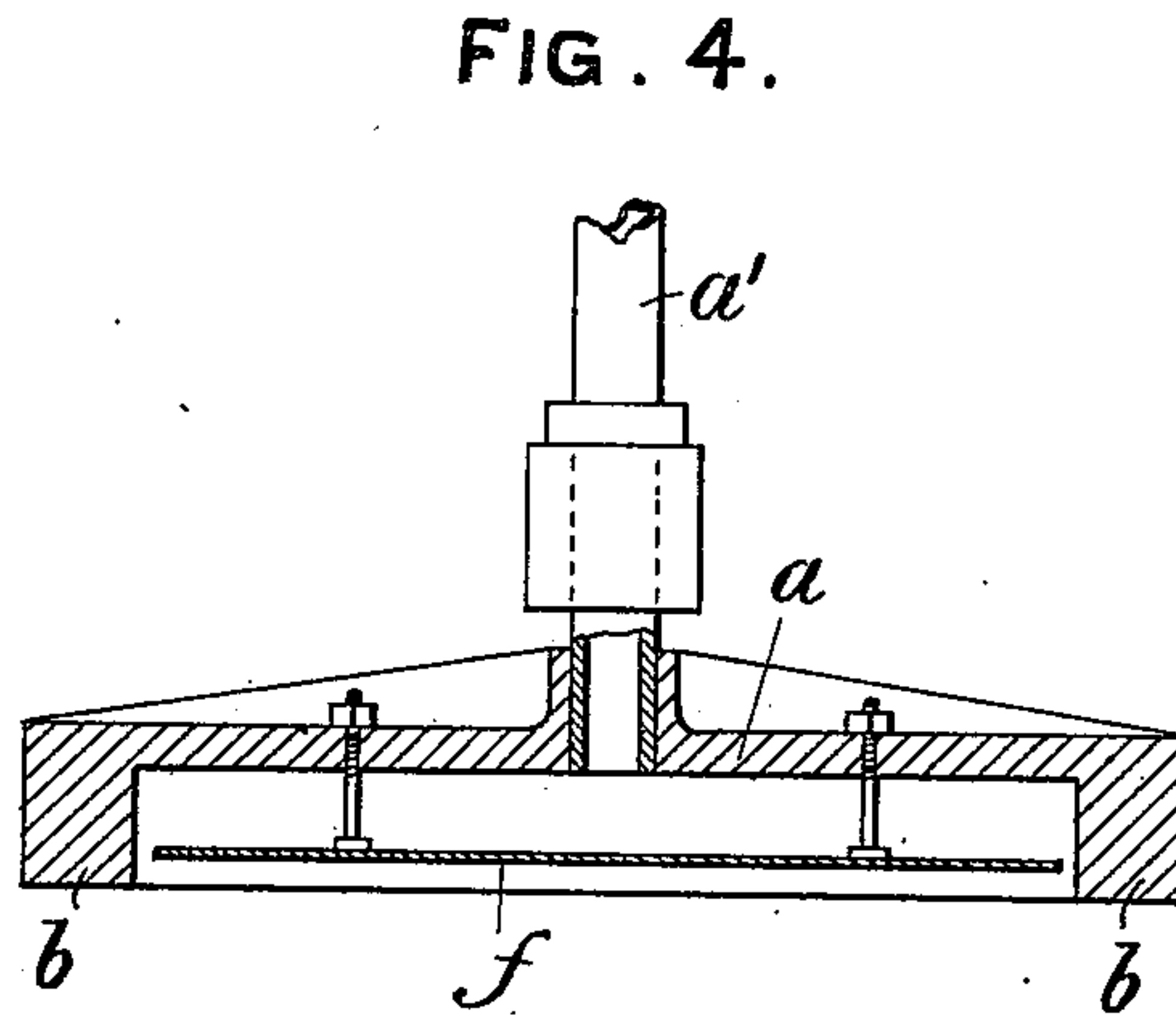
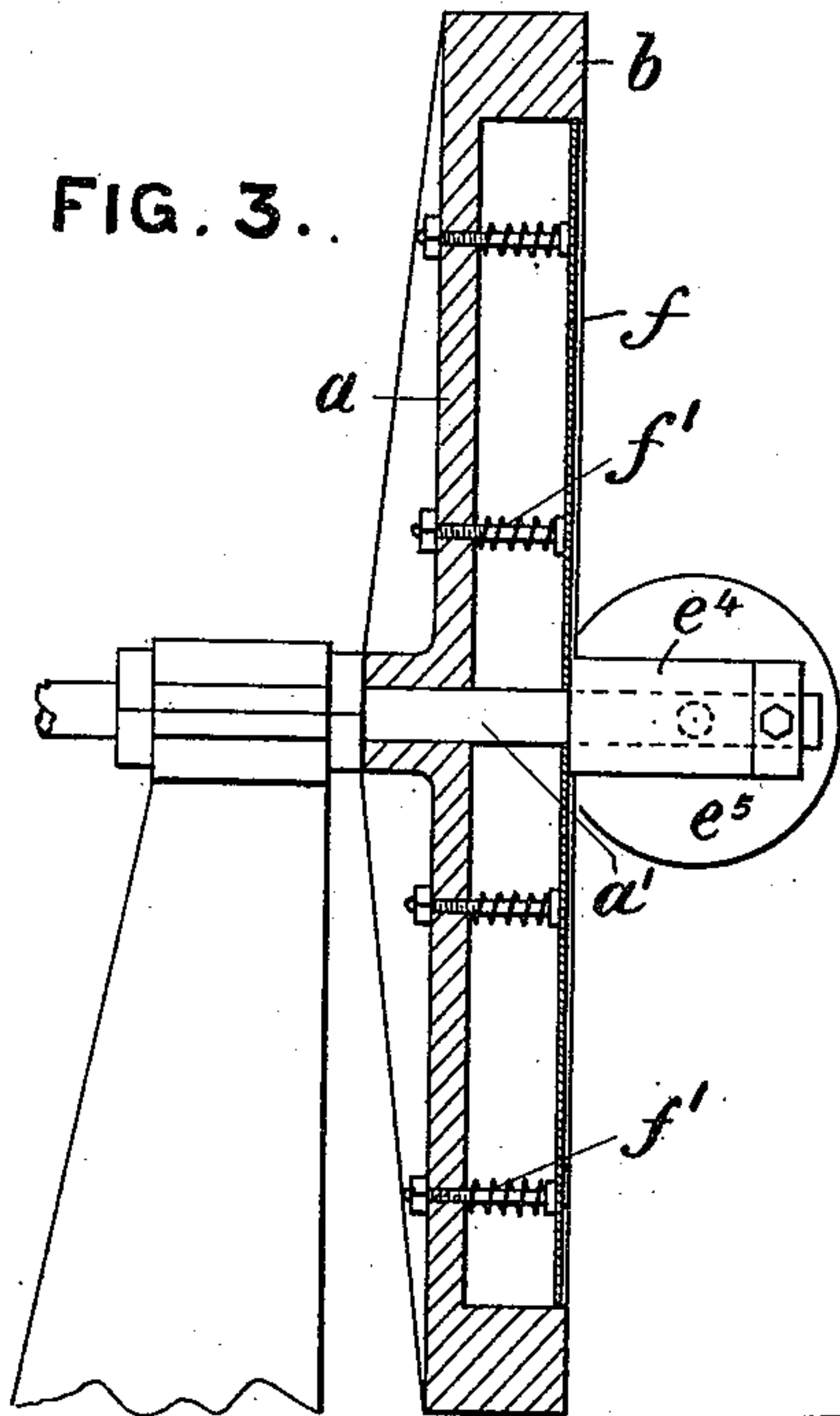
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

FIG. 7

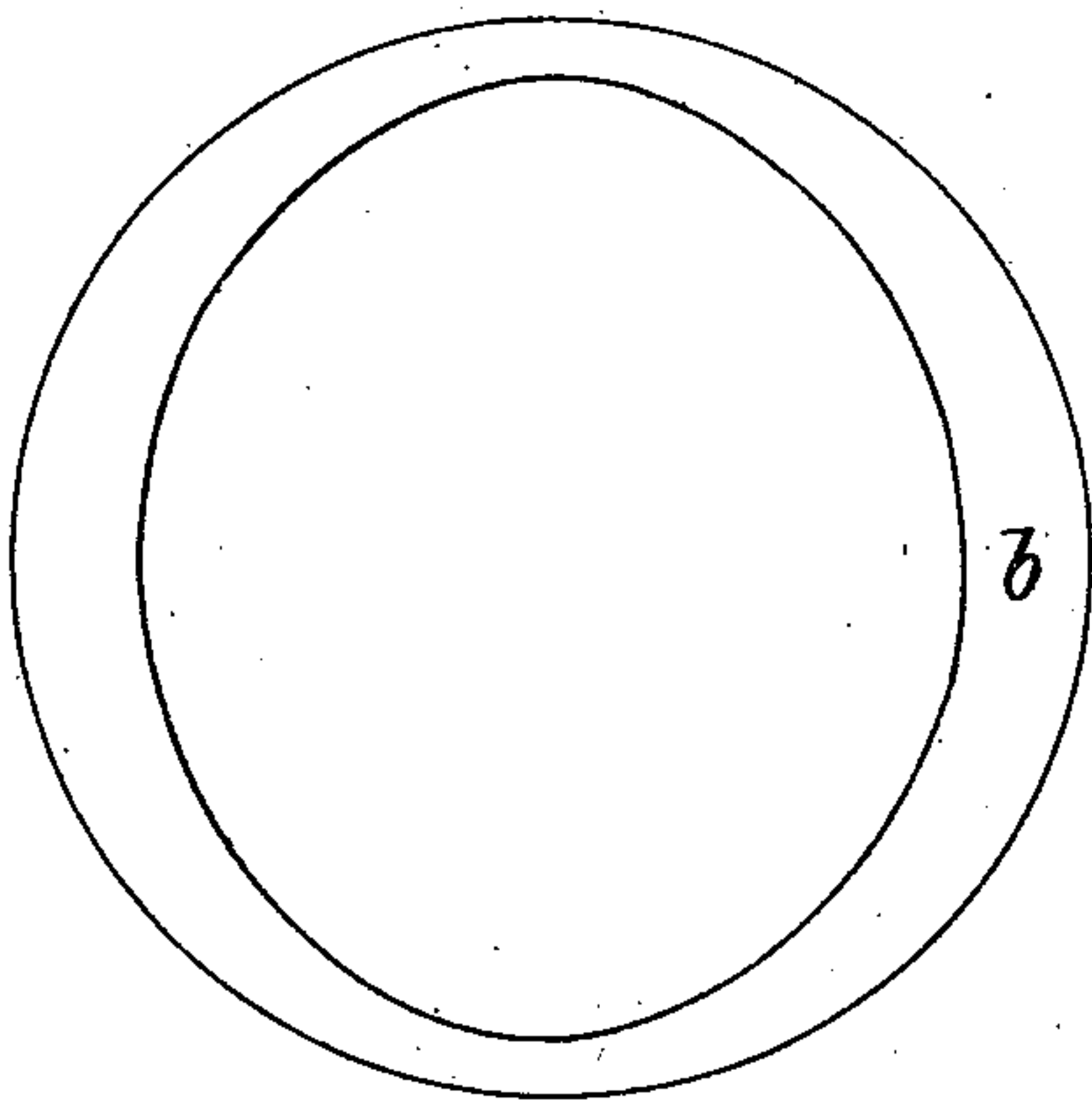


FIG. 8

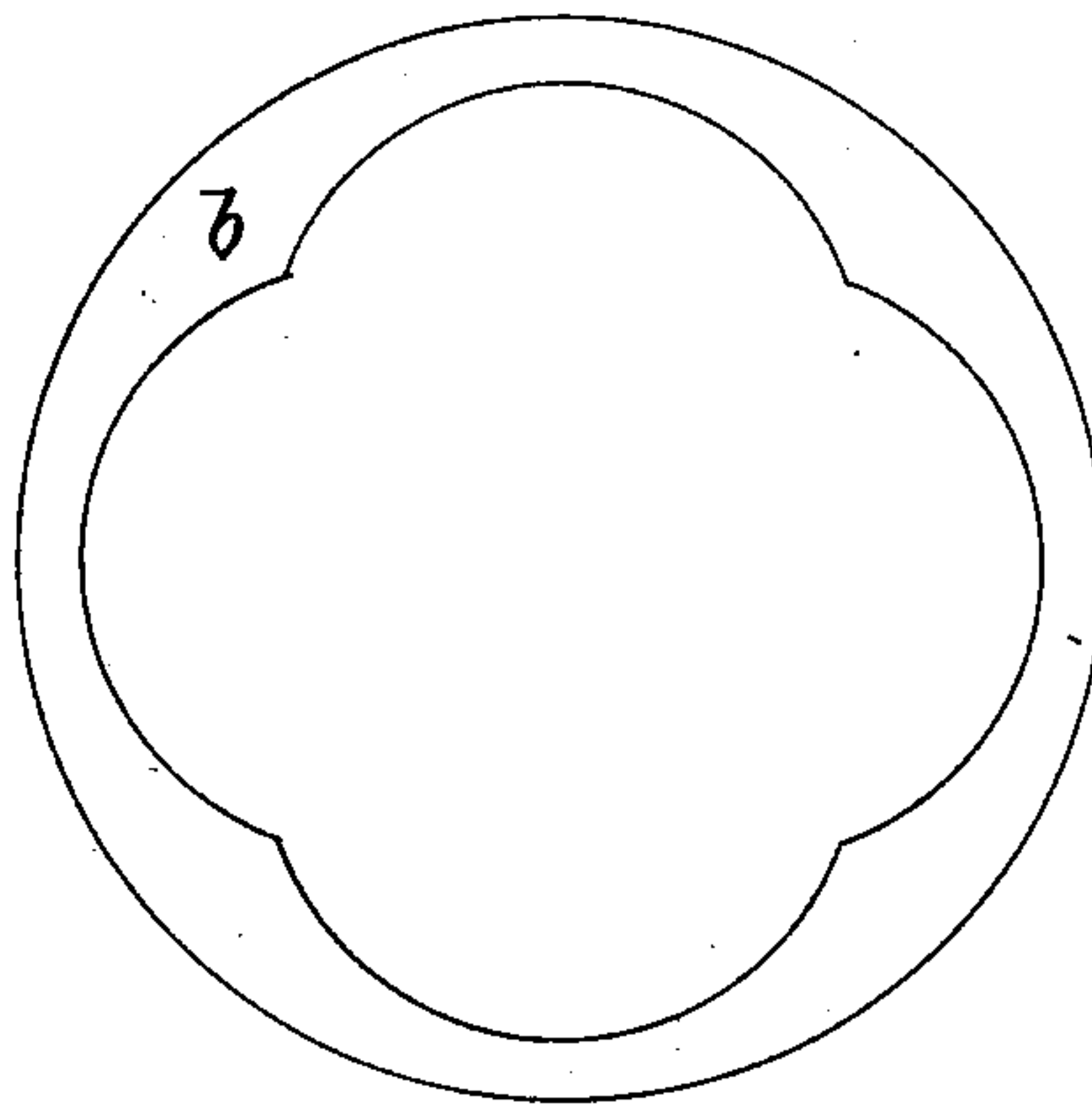


FIG. 9

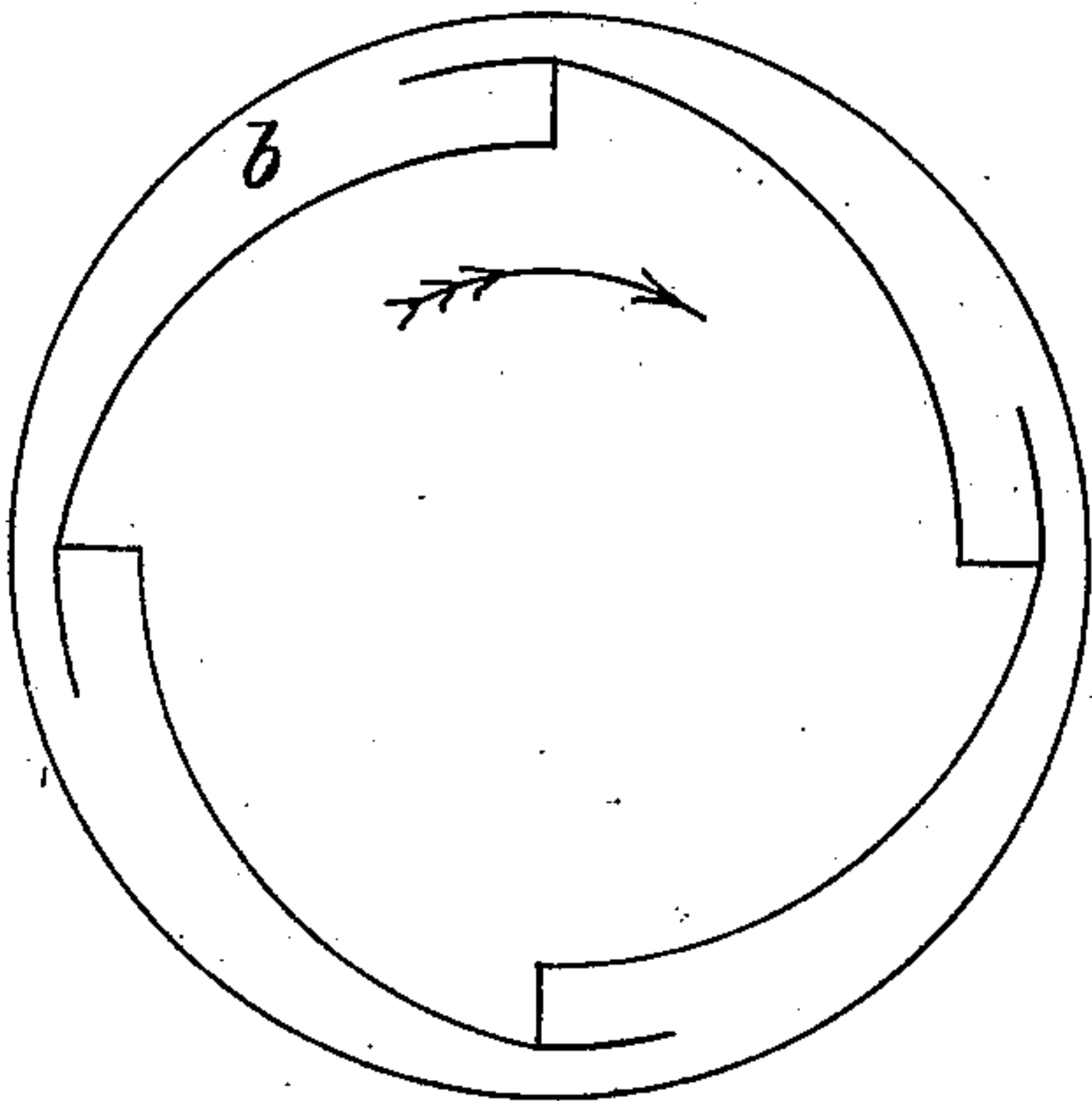
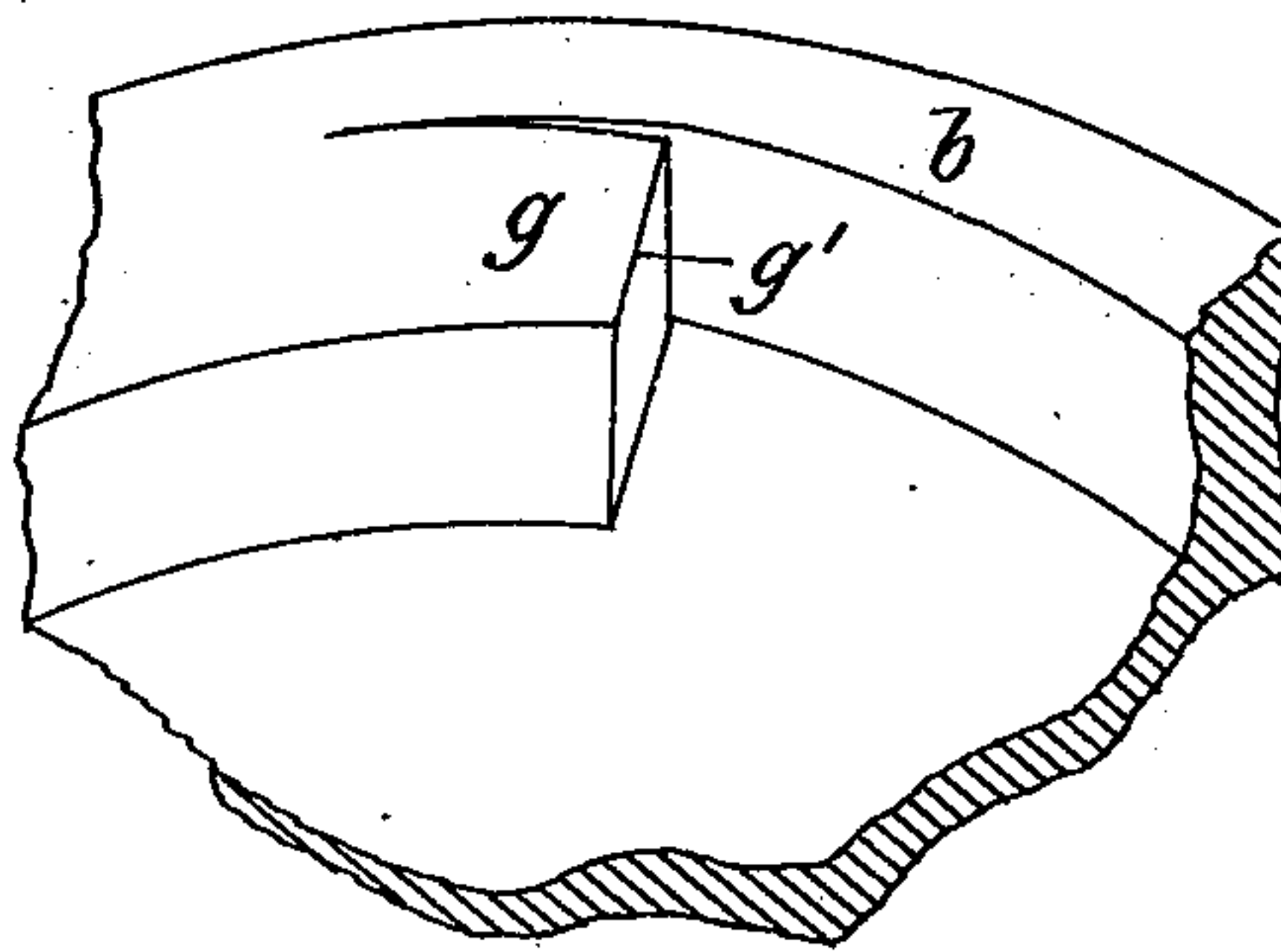


FIG. 10



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UNITED STATES PATENT OFFICE.

WILLIAM OLIVER BAILEY, OF LONDON, ENGLAND.

GRINDING AND POLISHING MILL AND MEANS FOR FEEDING ABRADING OR POLISHING MEDIUMS THERETO.

SPECIFICATION forming part of Letters Patent No. 668,552, dated February 19, 1901.

Application filed March 13, 1900. Serial No. 8,501. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM OLIVER BAILEY, glass-merchant, silverer, and beveler, a subject of the Queen of Great Britain, residing at Excelsior Works, Wenlock road, City road, London, England, have invented certain new and useful Improvements in Grinding and Polishing Mills and in Means for Feeding the Abrading or Polishing Medium Thereto or to Analogous Mills, of which the following is a specification.

My invention relates to that class of mills or grinding-machines for which I have obtained a Patent No. 617,668, in which the grinding or polishing medium—such as sand, emery, rouge, or the like in solution—is fed to the grinding-face of the mill from a hopper or mixer by means of a rotary disk brush. Practice has proved that although an even feed is obtainable by such means, yet a large amount of waste of the medium occurs, a portion of the medium becoming thrown off the mill by centrifugal action before it reaches the work to be ground or polished.

The object of my present invention is to provide means whereby the medium may be fed to the mill with less waste, while still retaining the even flow across the grinding-face; also, to improve the grinding action of mills by the means to be hereinafter described.

In order that my said invention may be particularly described and ascertained, reference is hereby made to the accompanying drawings, in which similar letters of reference indicate corresponding parts.

Figure 1 is a front elevation of my improved feeding arrangements. Fig. 2 is a sectional plan. Fig. 3 is a sectional end view of the mill. Fig. 4 is a section of a horizontal mill. Fig. 5 is a plan of a modified form of ring with a corrugated inner face. Fig. 6 is a like view of a modified form of ring with its inner face ratchet-shaped. Fig. 7 is a similar view of a modified form of ring with its inner face elliptical. Fig. 8 is a like view of a modified form of ring with its face formed in a series of segments or with two ellipses arranged at right angles to each other. Fig. 9 is a like view with the segments arranged eccentrically to form a ratchet. Fig. 10 is an enlarged perspective view of a portion of Fig. 9.

Referring to Figs. 1 to 4, *a* is the mill, *b* is

the grinding-ring, and *c* is the hopper or mixer in which the medium in solution is agitated. The end of the hopper or mixer *c* is formed with a hole or slot *d*, which is fitted with a suitable valve *d'* to control the exit of the medium solution. In front of the mixer *c* and the hole *d* therein, a trough or tubular conveyer *e* is fitted. In the drawings this is shown as bolted to the mixer and supported on the mill-axle; but any other convenient means of support may be adopted. The conveyer *e* is provided with a worm *e'*, (or a spiral brush may be used,) attached to a worm-shaft *e*², driven from any convenient source of power. In the drawings it is shown as geared with the mixer-shaft by bevel-gearing. The shaft *e*² carries on its end a circular brush *e*³, which is fixed thereto, the end of the shaft being supported in the socket-bearing *e*⁴, in which the mill-shaft *a'* revolves. The tubular conveyer or trough is formed with a case *e*⁵, inclosing the annular brush *e*³, except for a suitable distance opposite the mill, where the brush projects through an opening in the case onto a metal or other disk *f*. This disk, Fig. 3, is arranged to fit the recess formed by the grinding-ring and is adjustably supported therein by bolts and springs *f'* or by any other suitable means whereby the level of the disk may be adjusted to a position preferably slightly below the level of the ring *b*, as shown in Fig. 3.

Where the mill or grinder is used horizontally and inverted, as shown in Fig. 4, I suspend the disk *f* therein. The disk is of a smaller diameter than the internal diameter of the ring and is adjustably arranged above the level of the grinding-surface, as shown. In such cases the medium in solution is preferably fed through the hollow shaft *a'*, the medium falling onto the disk, upon which it travels or creeps by centrifugal action to the edge, where it falls or is thrown off close to the revolving grinder or mill.

Referring again to Figs. 1, 2, and 3, it will be seen that as the medium is ejected through the hole or slot *d* of the mixer it is conveyed to the brush *e*³, which transfers the medium onto the disk *f* in a regular manner. The mill and disk revolving causes the medium to creep or travel spirally (by centrifugal action) toward and over the surface of the grind-

ing-ring. In traveling or creeping the medium becomes more and more spread and evenly distributed and the layer, which (where it is first applied to the disk from the brush) began comparatively thick and uneven, flows over the grinding-face of the ring as a thin fine even film.

Figs. 5 to 10 illustrate means for improving the grinding action of the rings. This is effected by forming the ring with an irregularly-shaped inner edge or side, so as to catch up and induce the flow of the medium across its face and produce a cutting or grinding analogous to a shearing action. In Fig. 5 the inner edge or side of the ring is corrugated. In Fig. 6 it is ratchet-shaped, the sharp corners being in some cases rounded off, as indicated by the dotted lines. In Fig. 7 it is elliptical. In Fig. 8 it is formed by four segments of circles or by two ellipses at right angles to each other. In Fig. 9 it is formed by segments arranged eccentrically to form a long ratchet. In the latter case it may be desirable to incline the surface at g , so that the edge g' is slightly below the level of the ring, as shown in Fig. 10, which is an enlarged perspective view of a portion of Fig. 9. Any other irregular but balanced shape may be used with slightly varying success.

I claim—

1. In a grinding and polishing mill, a grind-

ing-ring, a disk suitably supported therein, and a feeding mechanism for an abrading or polishing medium arranged in suitable relation to the said disk.

2. In a grinding and polishing mill, a grinding-ring having its inner face formed eccentrically, a disk mounted therein, and means for suitably feeding an abrading and polishing medium thereto.

3. In a grinding and polishing mill, the combination with the grinding-ring provided with a recess, of a disk mounted in said recess and suitably connected to said ring, a rotary brush arranged in suitable relation to said disk, and a conveyer for the abrading and polishing medium connected to the said brush.

4. In a grinding and polishing mill, the combination with the grinding-ring provided with a recess, of a disk mounted in said recess, means for adjustably connecting the disk to said ring, a rotary brush mounted in suitable relation to said disk, and a conveyer for the abrading and polishing material connected to said brush.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM OLIVER BAILEY.

Witnesses:

GEORGE C. DOWNING,
WALTER J. SKERTEN.