

(No Model.)

W. HUMANS.

ARMATURE FOR MAGNETO ELECTRIC MACHINES.

No. 375,750.

Patented Jan. 3, 1888.

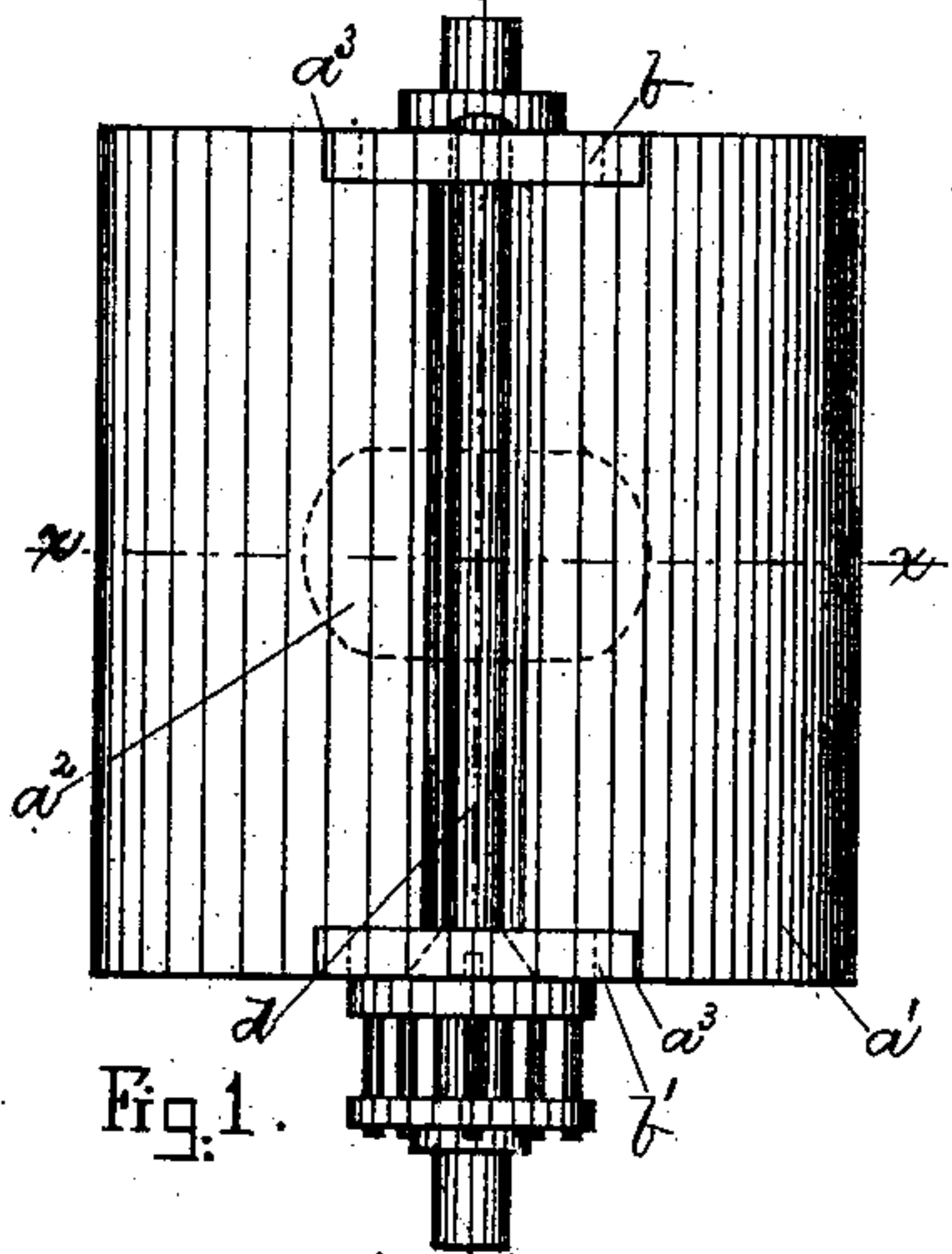


Fig. 1.

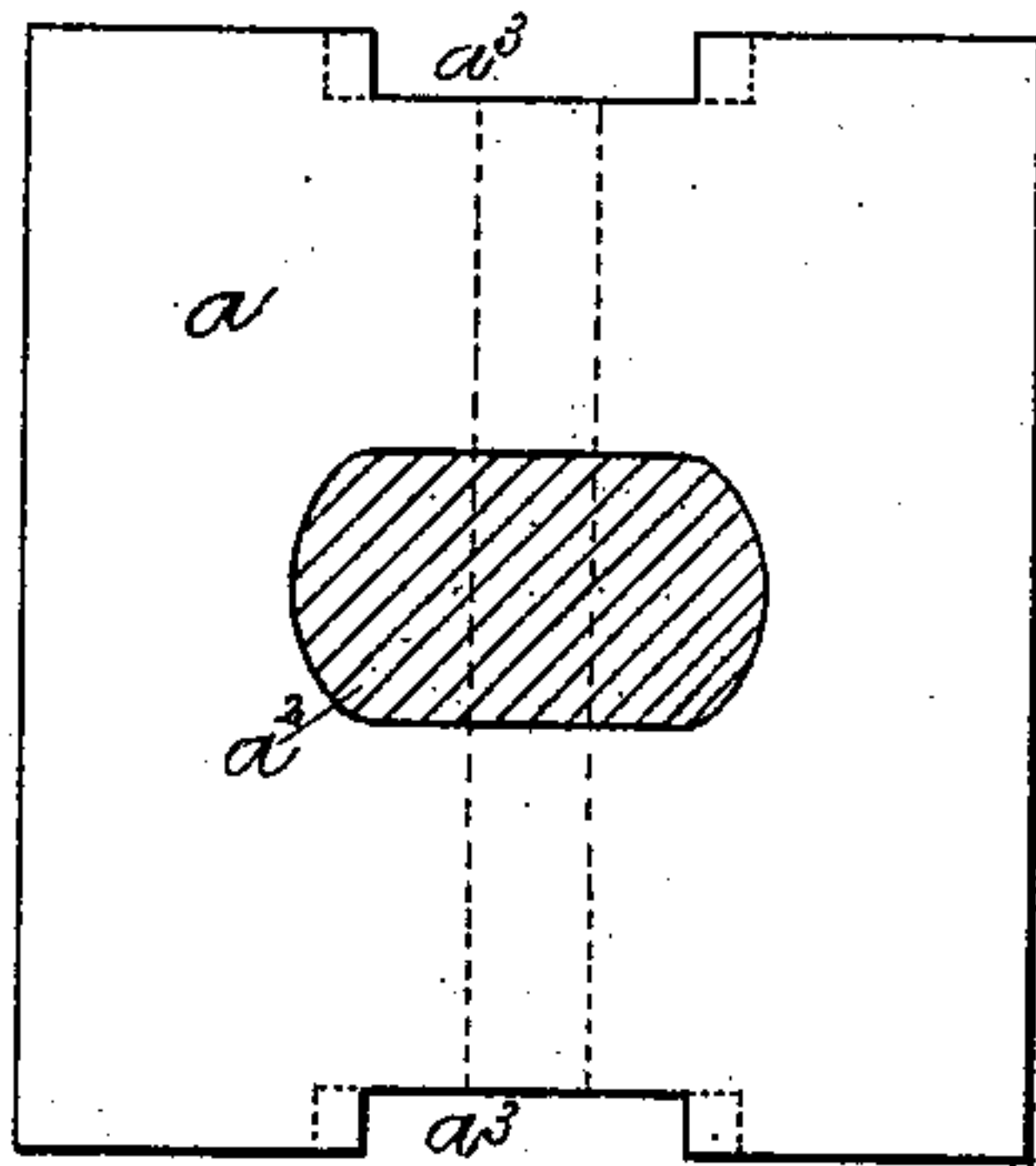


Fig. 4.

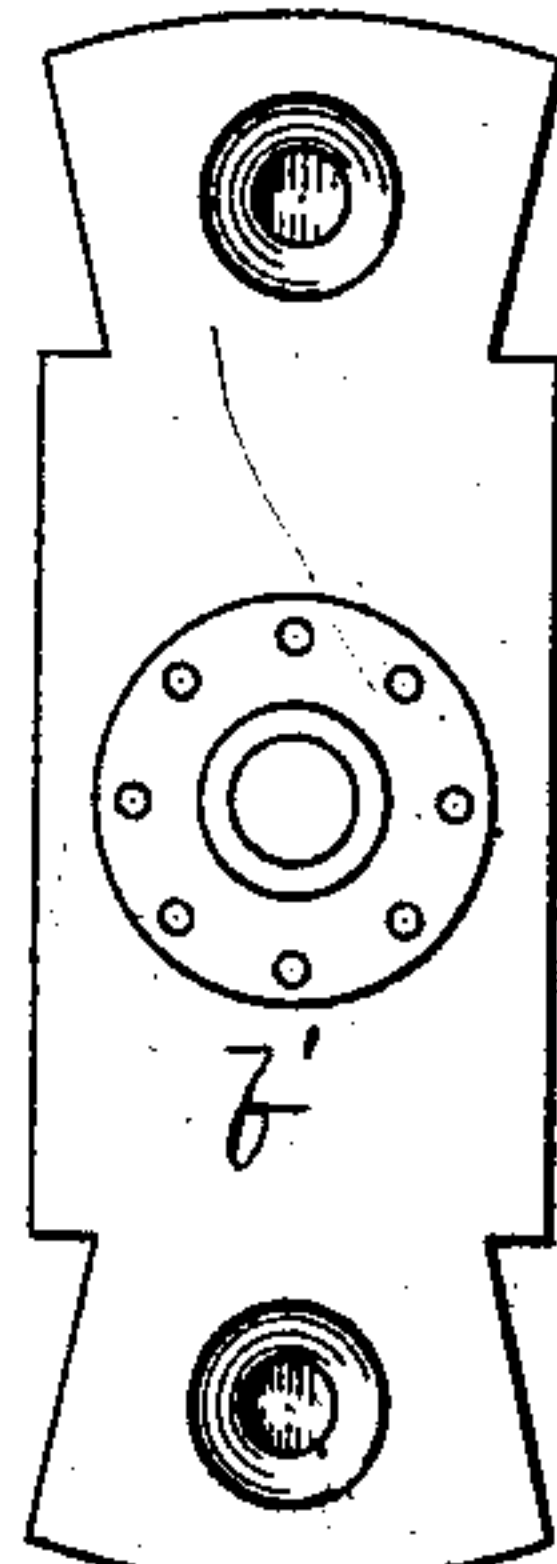


Fig. 5.

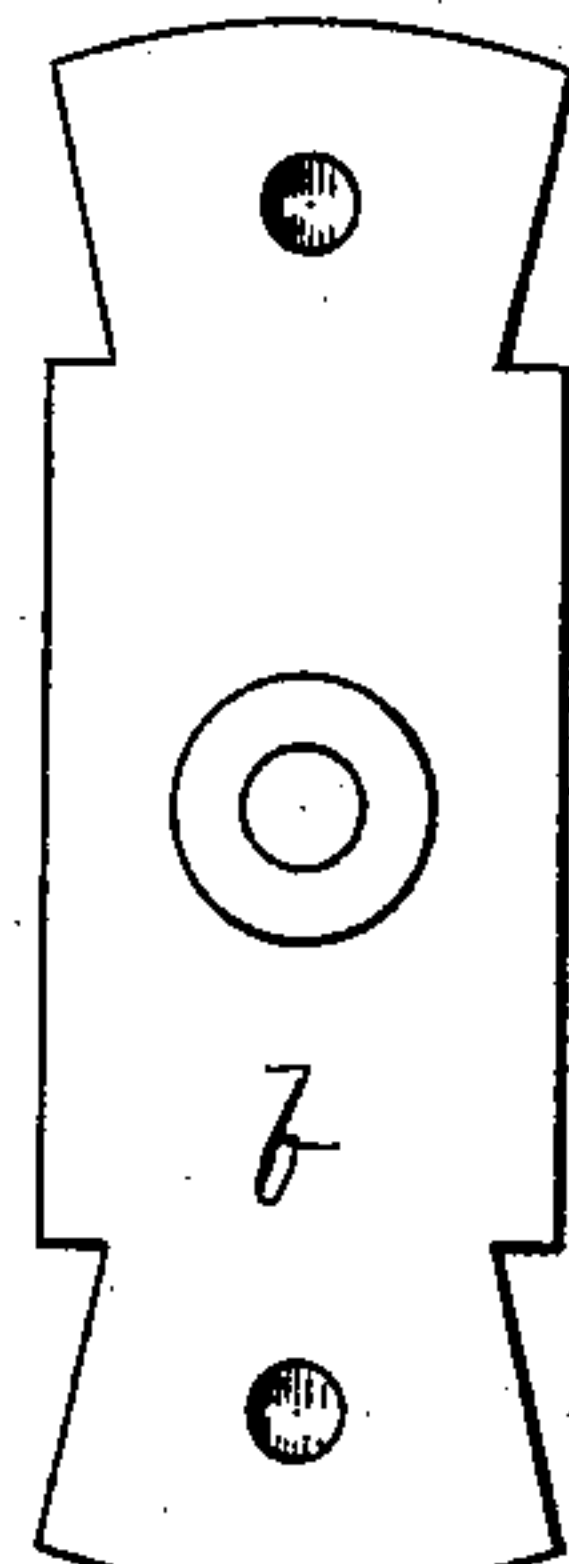


Fig. 6.

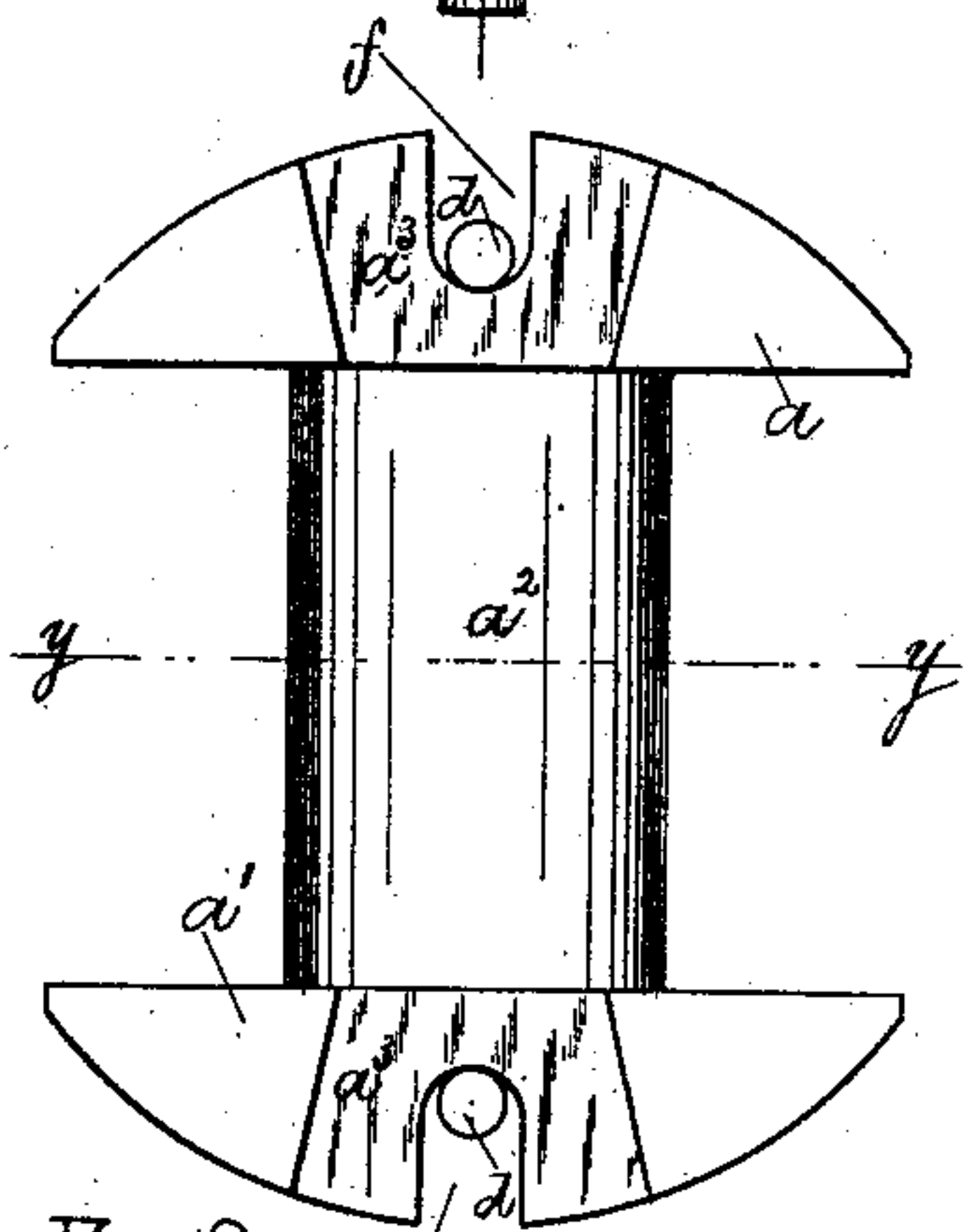


Fig. 2.

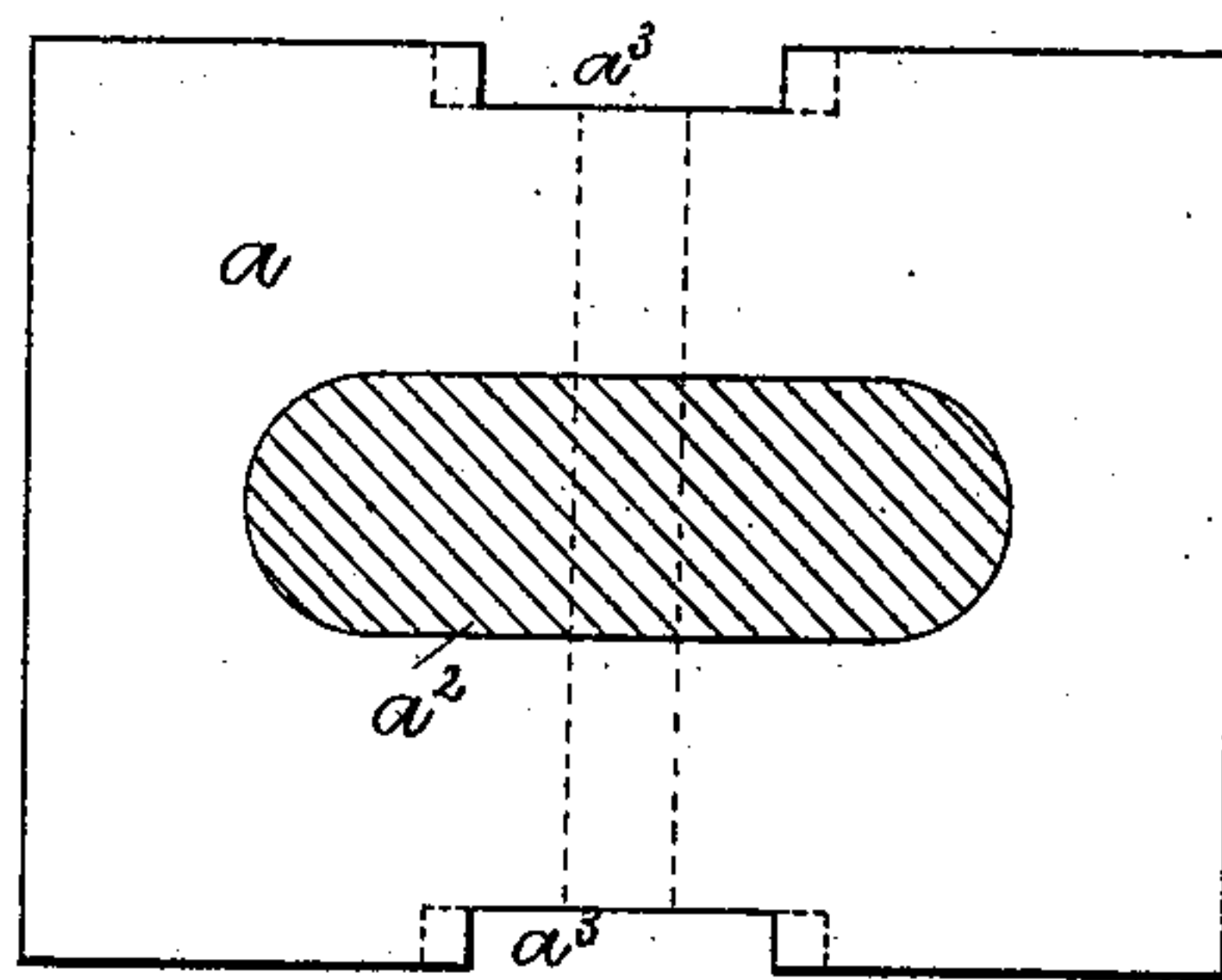


Fig. 9.

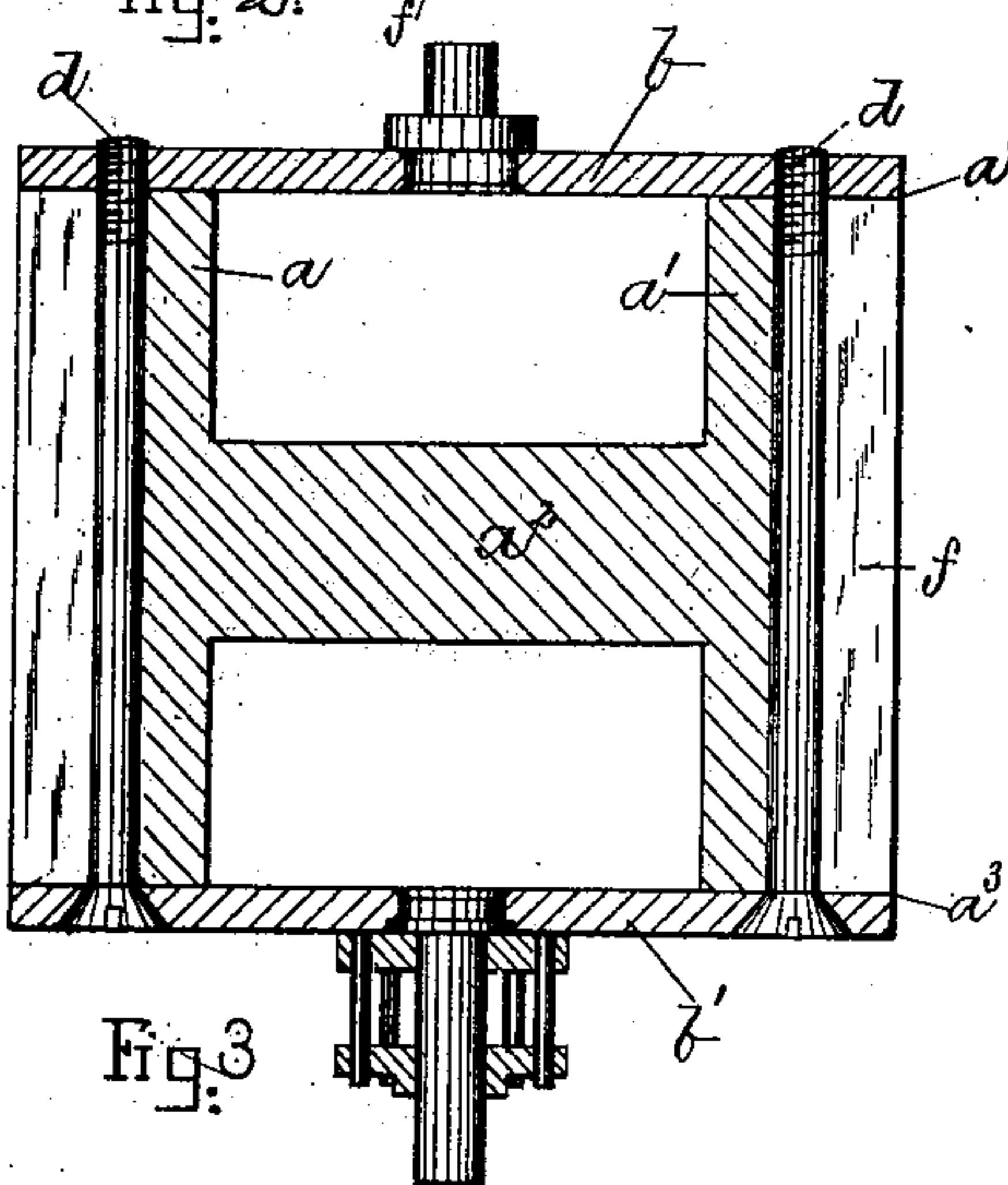


Fig. 3.

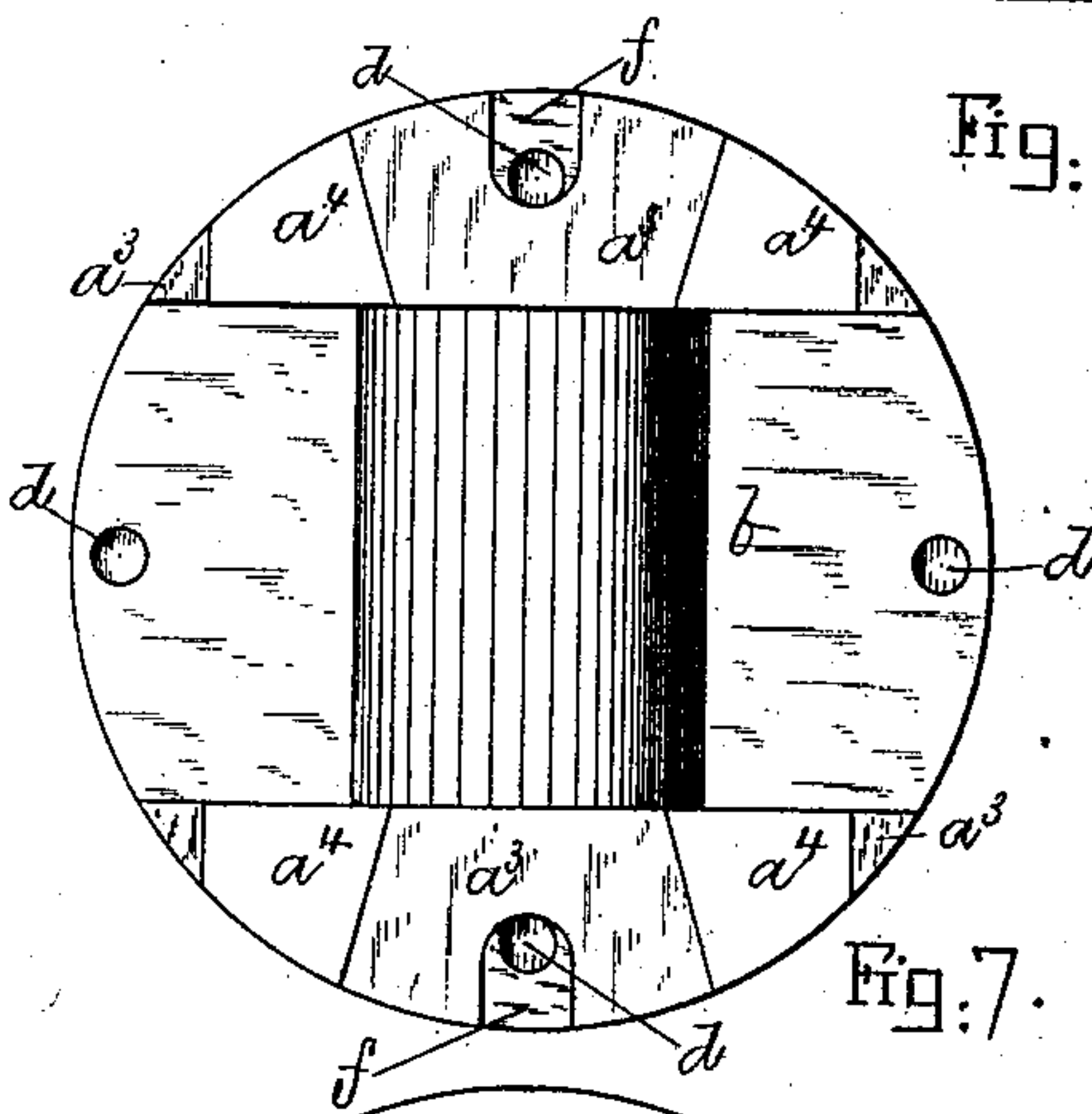


Fig. 7.

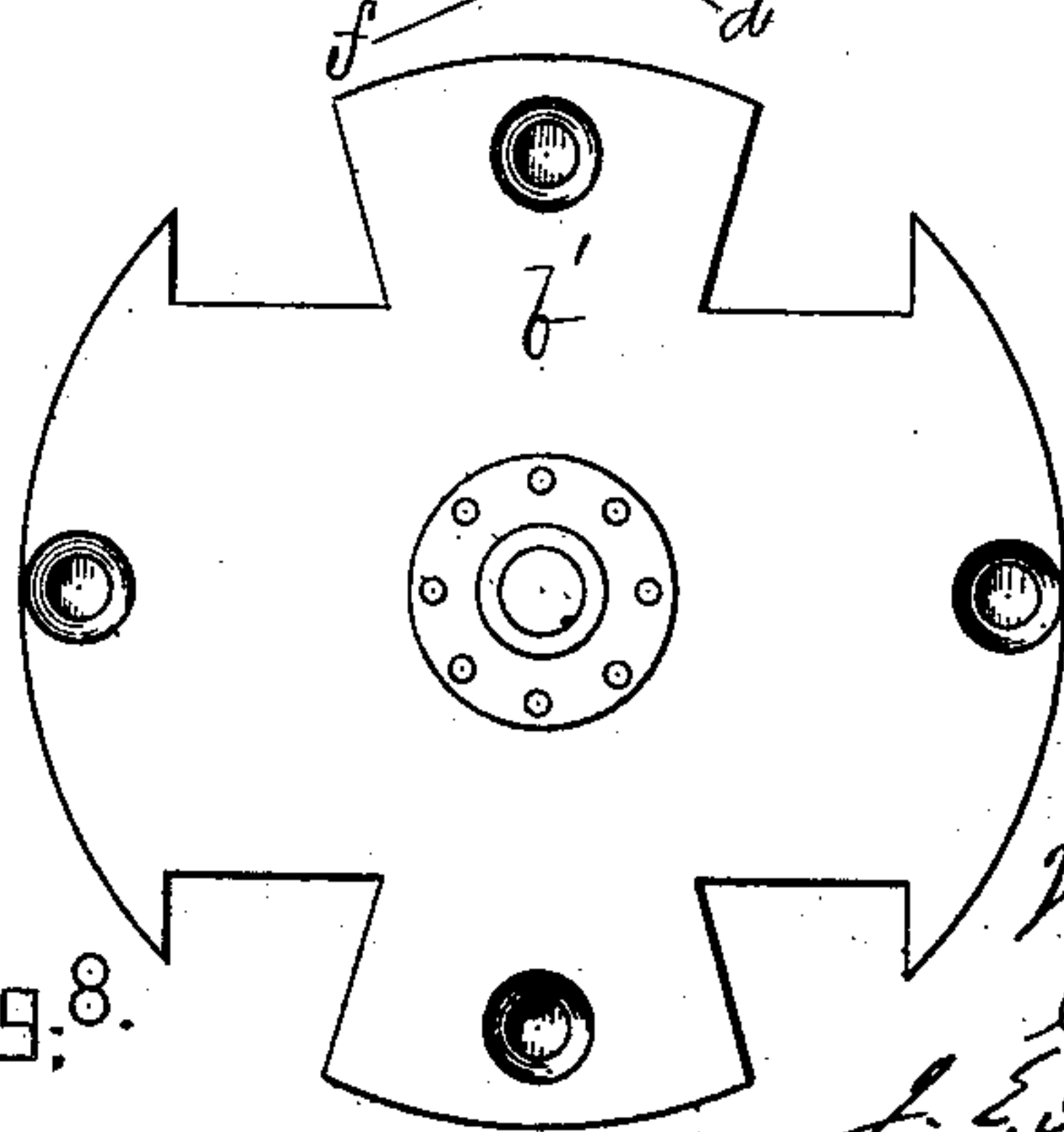


Fig. 8.

Witnesses.

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Inventor:

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*by his attorney,*  
*J. E. Maynard.*



# UNITED STATES PATENT OFFICE.

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## ARMATURE FOR MAGNETO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 375,750, dated January 3, 1888.

Application filed July 23, 1885. Serial No. 172,433. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HUMANS, a citizen of the Dominion of Canada, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Armature for Magneto-Electric Apparatus, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, an end elevation. Fig. 3 is a section on line  $xx$  of Fig. 1; Fig. 4, a section on line  $yy$  of Fig. 2. Figs. 5 and 6 are elevations of the end pieces. Figs. 7 and 8 illustrate a modification. Fig. 9 is a view similar to Fig. 4.

My armature consists of two pole pieces,  $a$  and  $a'$ , and a cross piece or core,  $a^2$ , and the coil (not shown) is wound upon the core  $a^2$ , thus making an armature of the Siemens type; but in my armature the end pieces,  $b$  and  $b'$ , which support the shaft on which the armature is revolved or oscillated, are supported in recesses  $a^3$  in the pole-pieces  $a$  and  $a'$ , as clearly shown in the drawings, and it is this which constitutes the main feature of my invention. These end pieces are held in place by the rods  $d$  and  $d'$ , and it is this which constitutes the second feature of my invention—that is to say, the first feature of my invention consists in attaching the end piece,  $b$  or  $b'$ , by means of a recess,  $a^3$ , in the end of the armature; and the second feature of my invention consists in holding the end pieces together by means of rods  $d$  and  $d'$ . It will be obvious that while both these features are preferably used together, yet either may be used separately, for the advantages of either may be obtained to some extent without using the other, although when used together certain additional advantages are obtained. For example, the end pieces, by being recessed into the armature, are more readily fitted and are more firmly held than in any other way known to me; but they may obviously be secured in their recesses in a variety of ways other than by the rods  $d$  and  $d'$ , and in like manner the rods  $d$  and  $d'$  will hold end pieces in place which are not recessed into the armature; but when the end

pieces,  $b$  and  $b'$ , are not only recessed, as shown, but are also clamped together and each clamped in its recess by the rods, as shown, the shearing off of the rods by the end pieces is wholly prevented by the recesses, each aiding the other, and the durability of the armature thereby greatly increased, while the cost of construction is much reduced.

It will be obvious that the recess may be formed in the end pieces and a corresponding projection on the end of the armature; but this is manifestly an equivalent construction.

I prefer to place the rods  $d$  and  $d'$  each in a groove,  $f$ , in the face of the poles  $a$  and  $a'$ , as shown in the drawings, as I can thereby lighten the armature without affecting its magnetic qualities.

In Fig. 7 I have shown an end view of an armature adapted to receive the end piece  $b'$ , (shown in Fig. 8,) the four projections  $a^4$  forming in substance the recess  $a^3$ , which is filled by the end piece  $b'$ , Fig. 8. In this modification four rods,  $d$ , are used, two of which are in grooves  $f$ ; but the other two lie midway between the pole-pieces. Of course either pair of these rods may be dispensed with; but in a large-sized armature all four are desirable.

Another feature of my invention consists in a flattened core or cross piece,  $a^2$ , the plane of which is at right angles with the axis of the armature, instead of parallel with that axis, as heretofore. The main advantage of this construction is that I can make the armature shorter without diminishing the number of coils or the cross-section of the core, which is impossible in the old construction; and although I must of course in my new construction increase the diameter, yet for certain practical purposes (such as magneto-bells, indicators, and small generators or motors generally) it is of great practical importance to make the armature as short as possible.

What I claim as my invention is—

1. An armature consisting of the pole-pieces  $a$  and  $a'$  and a cross piece or core,  $a^2$ , having its end pieces,  $b$  and  $b'$ , inserted in recesses in

the end of the armature, substantially as described.

2. An armature consisting of the pole-pieces  $a a'$  and a cross piece,  $a^2$ , having its end pieces,  $b b'$ , clamped together and held upon the ends of the armature by the rods  $d d$ , substantially as shown.

3. An armature recessed on its ends at  $a^3$ , and having grooves  $f$  on the face of its pole-pieces  $a a'$ , as set forth.

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Witnesses:

J. E. MAYNADIER,  
JOHN R. SNOW.