

A. FAYOL.
ARTICULATED JOURNAL BOX.

No. 558,642.

Patented Apr. 21, 1896.

FIG. 1.

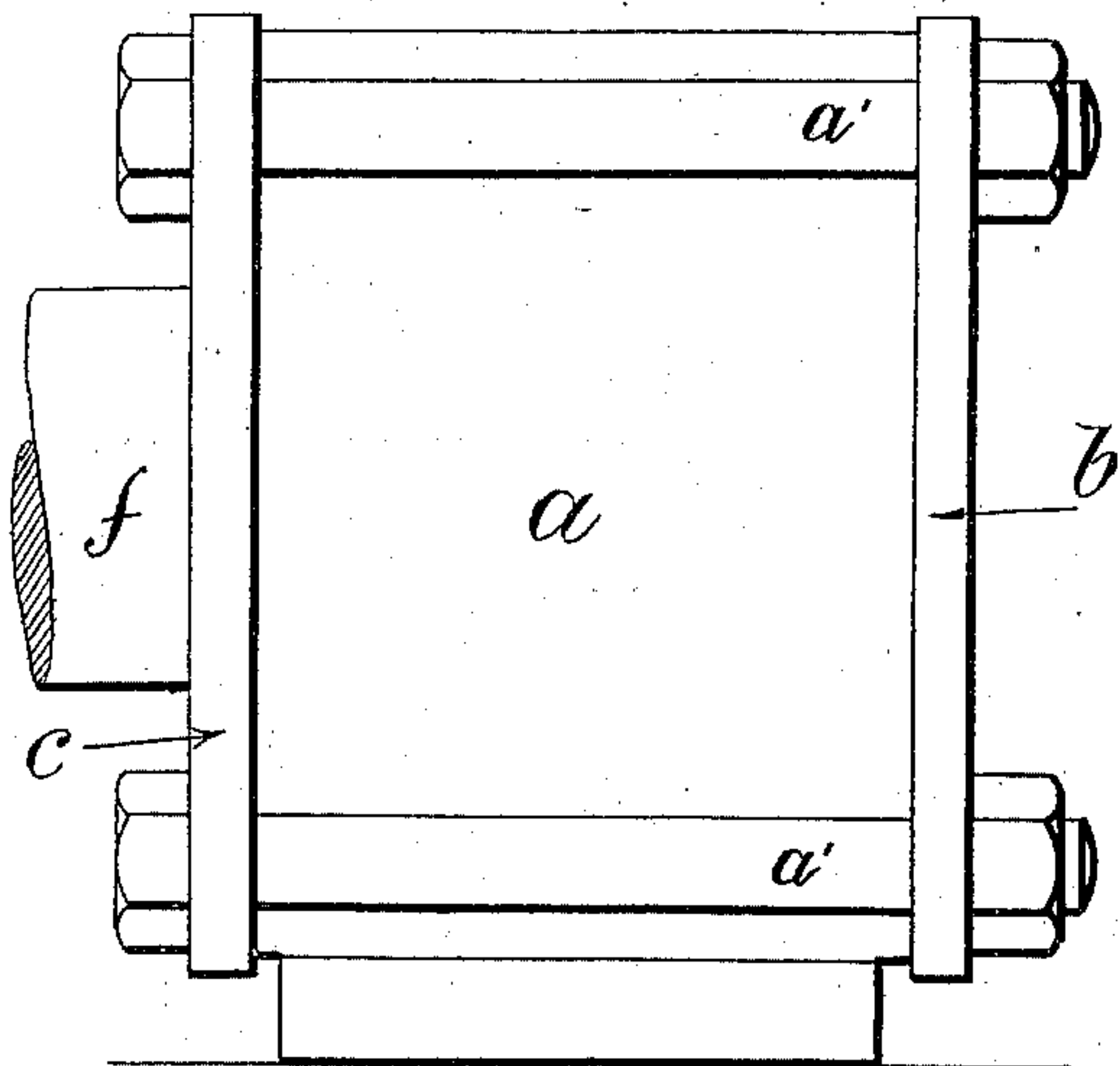


FIG. 2.

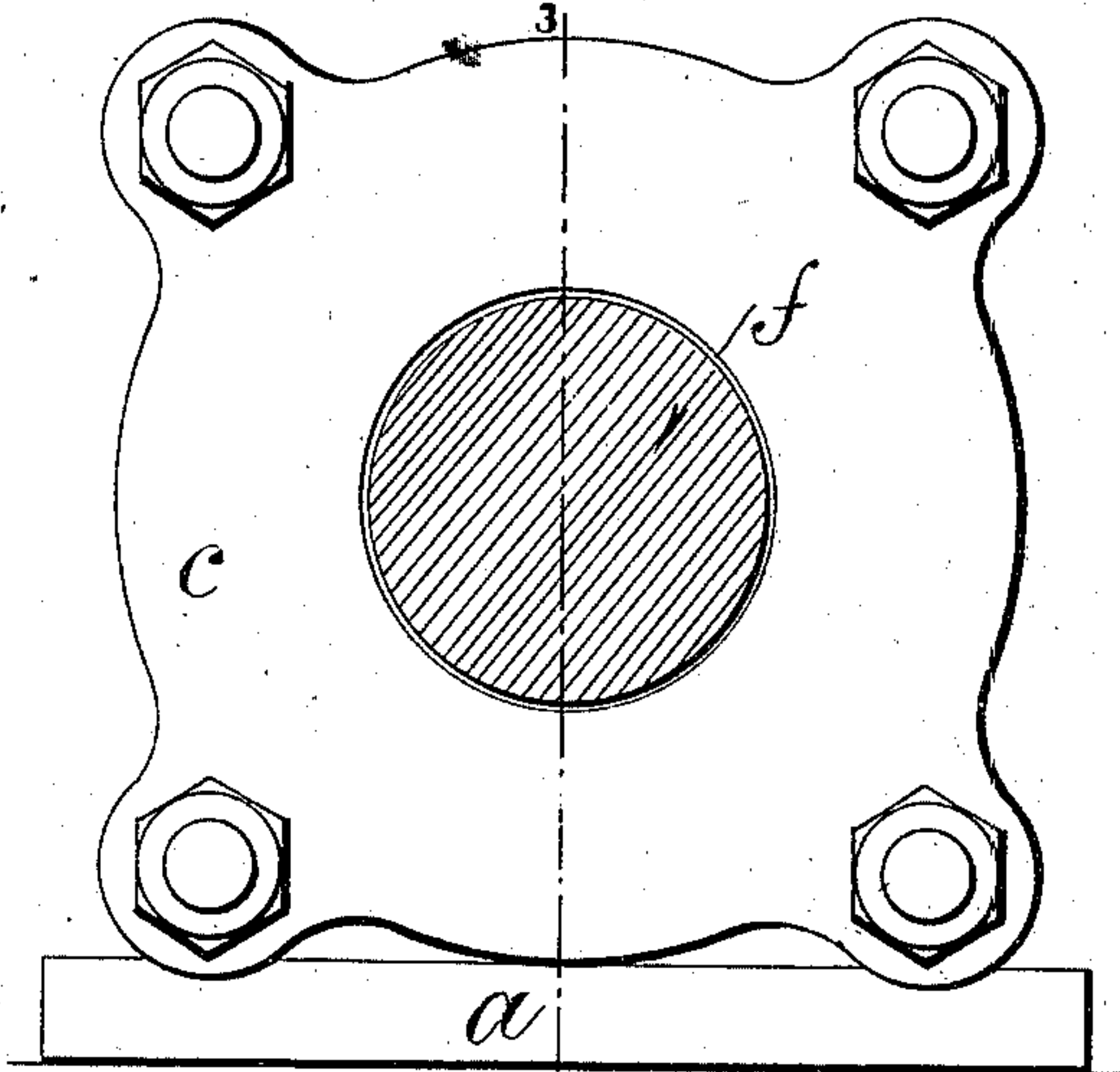


FIG. 3.

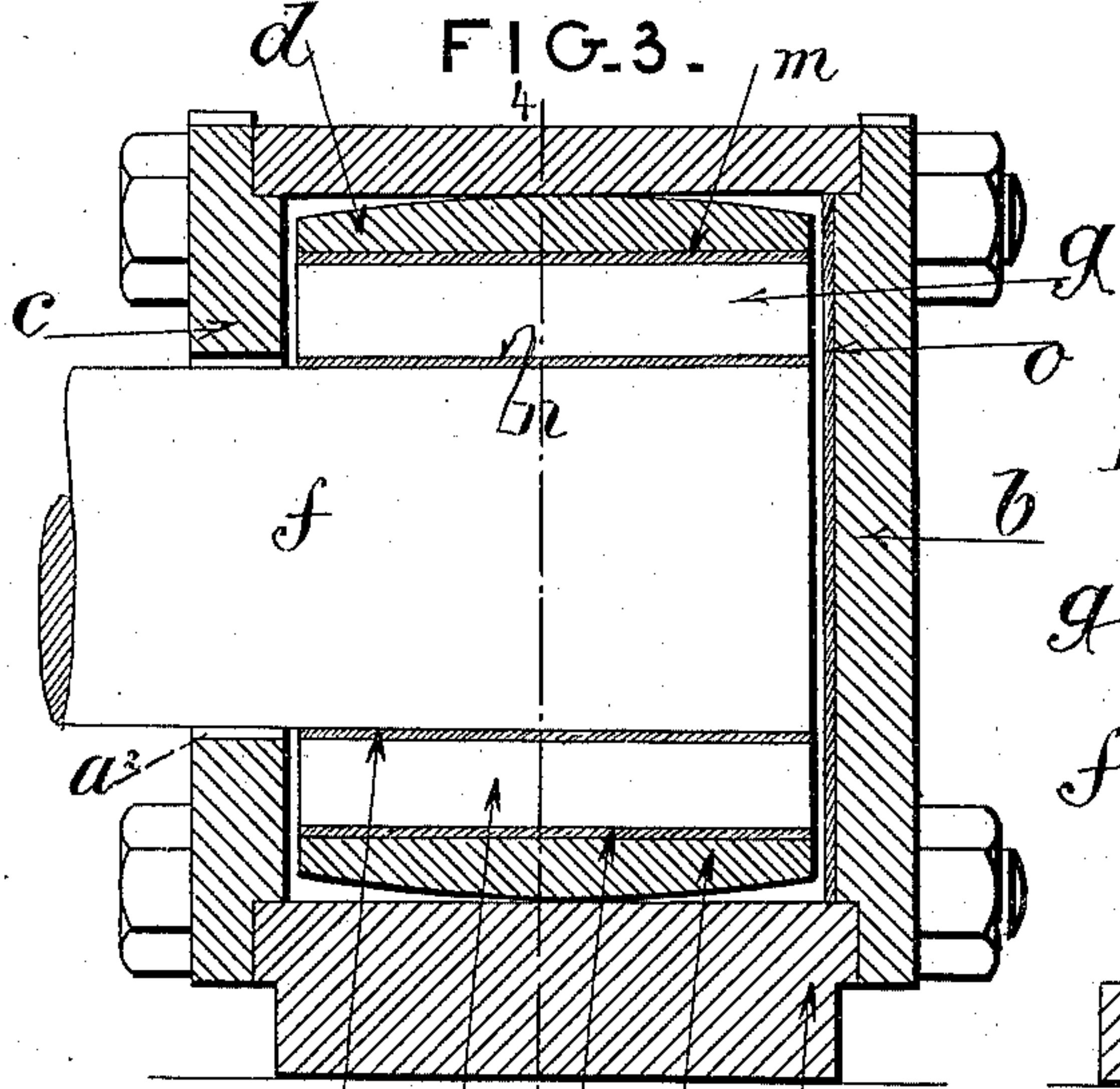


FIG. 4.

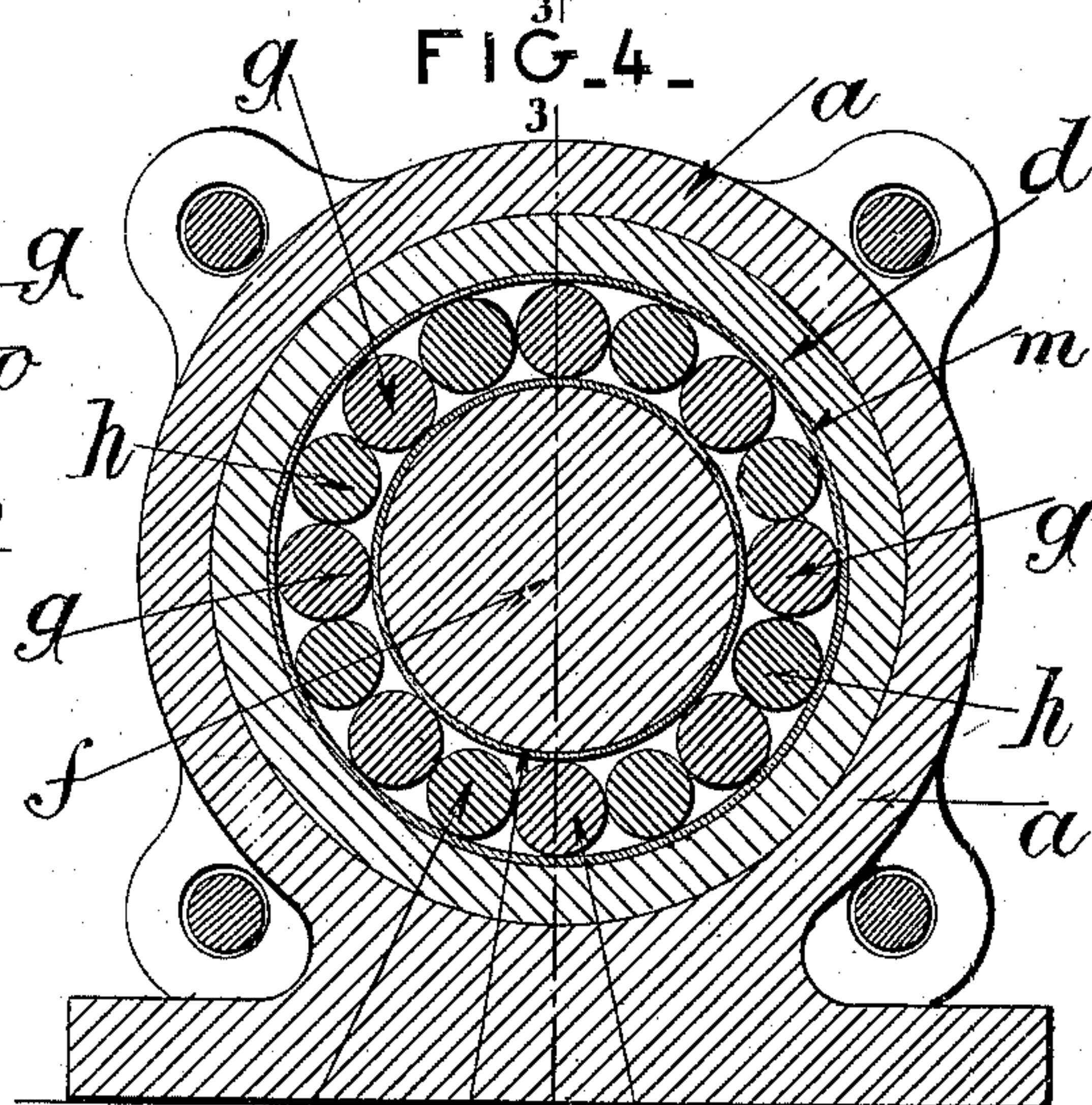
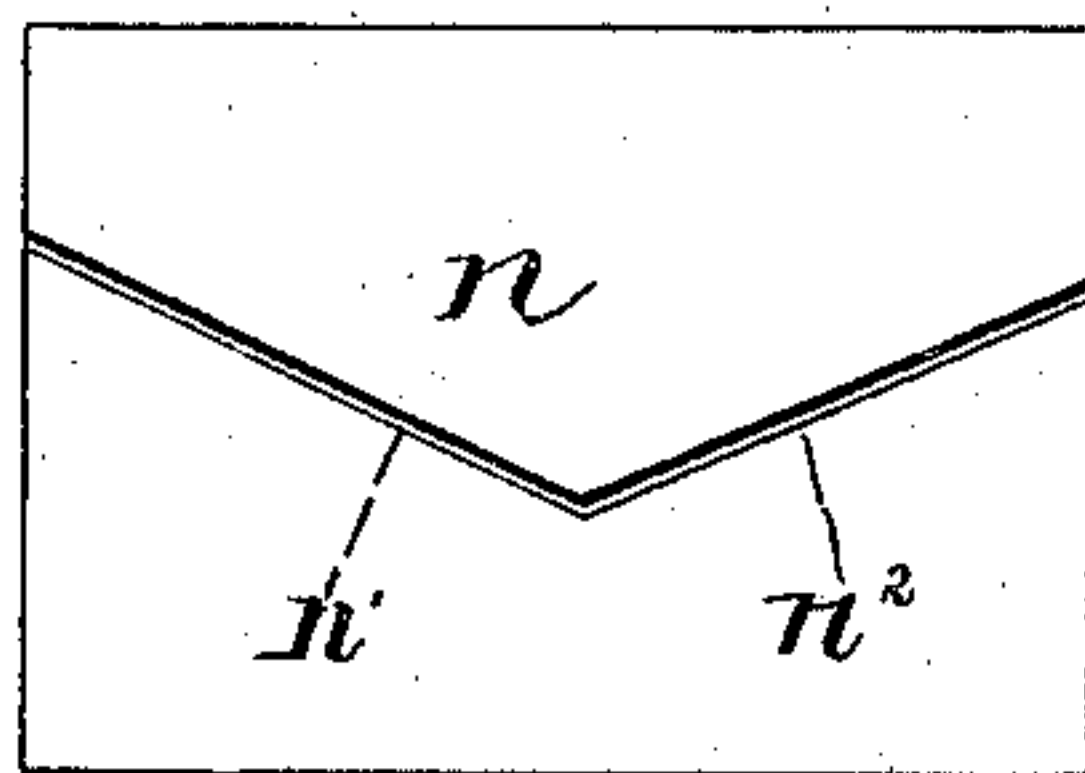


FIG. 5.



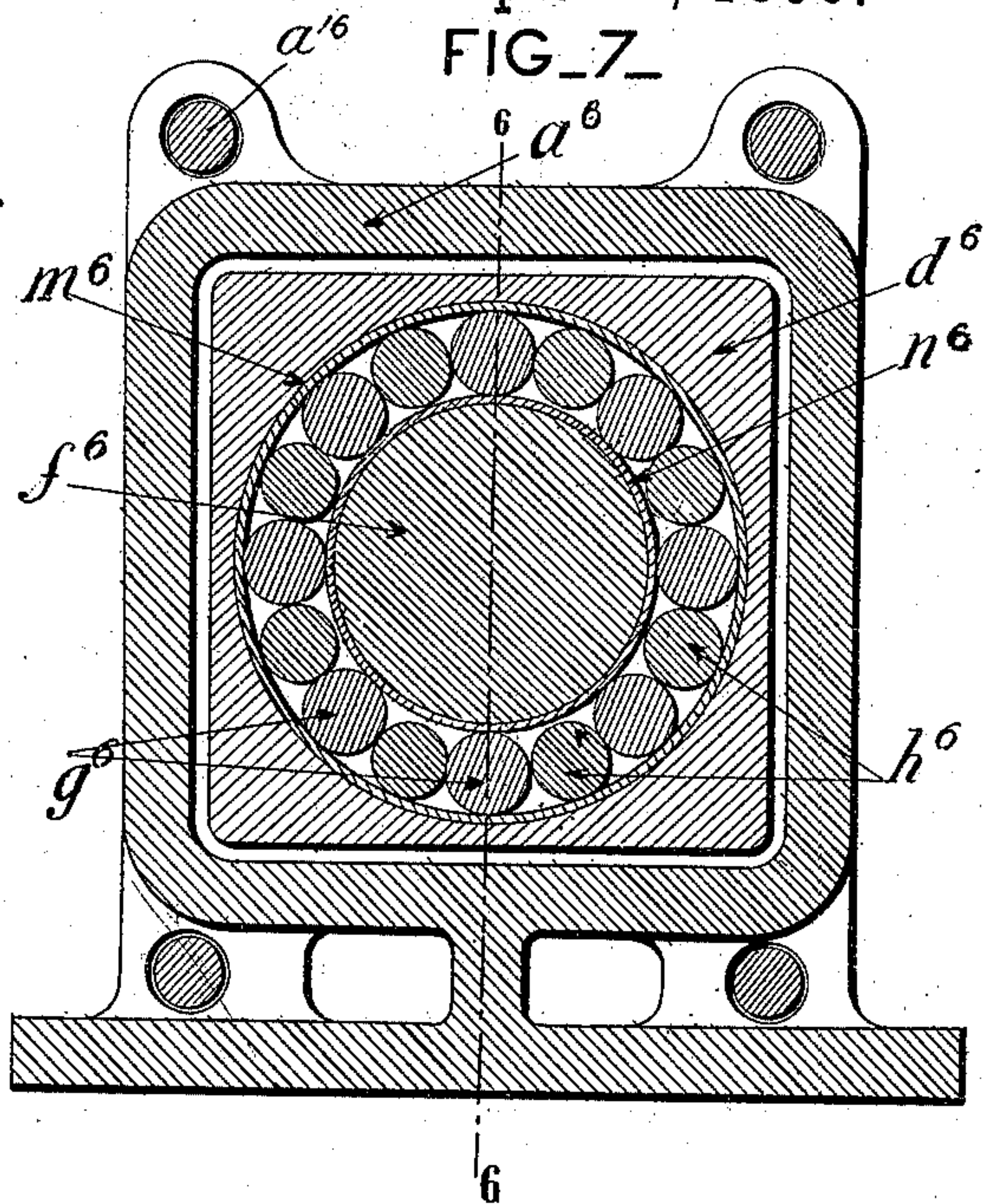
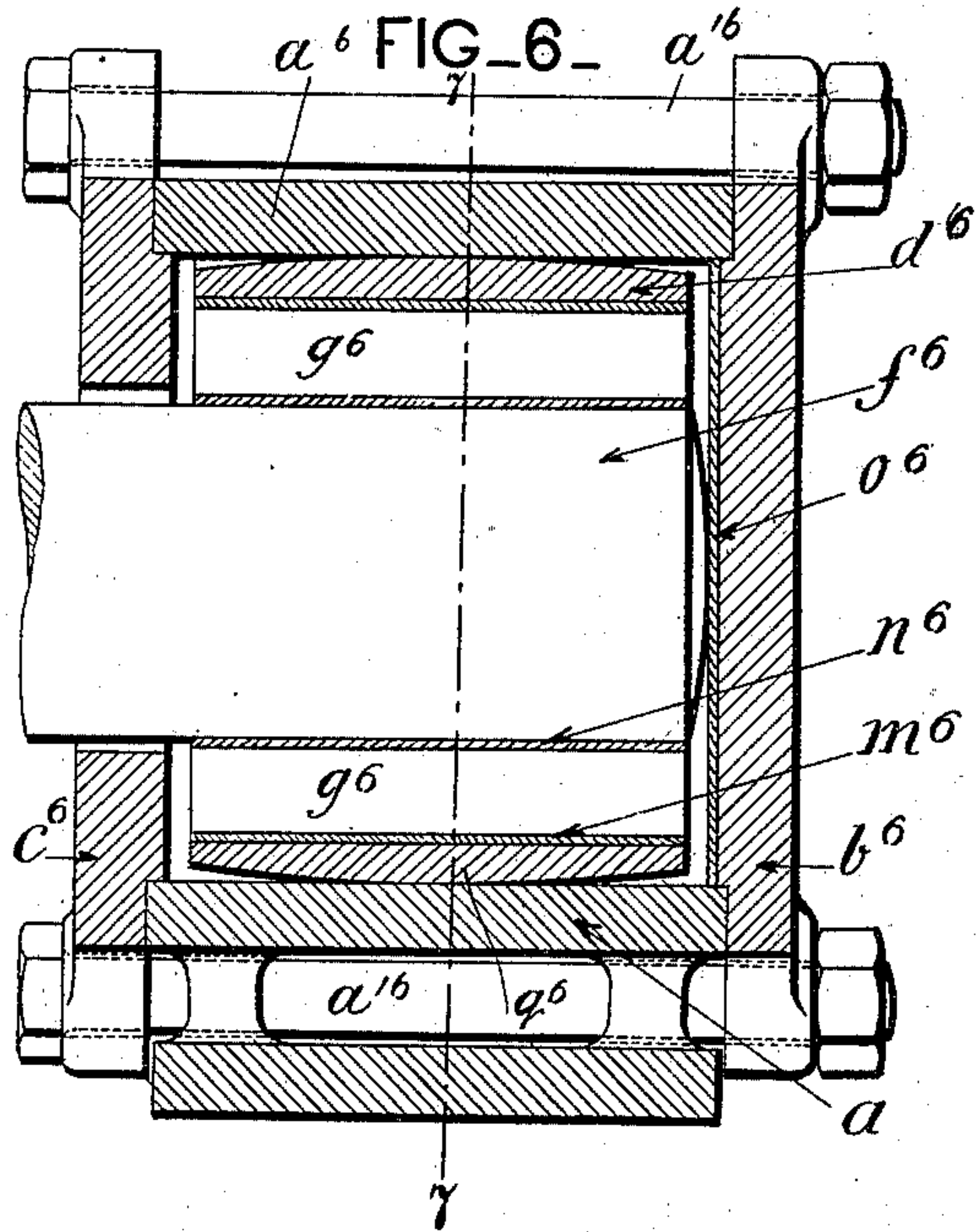
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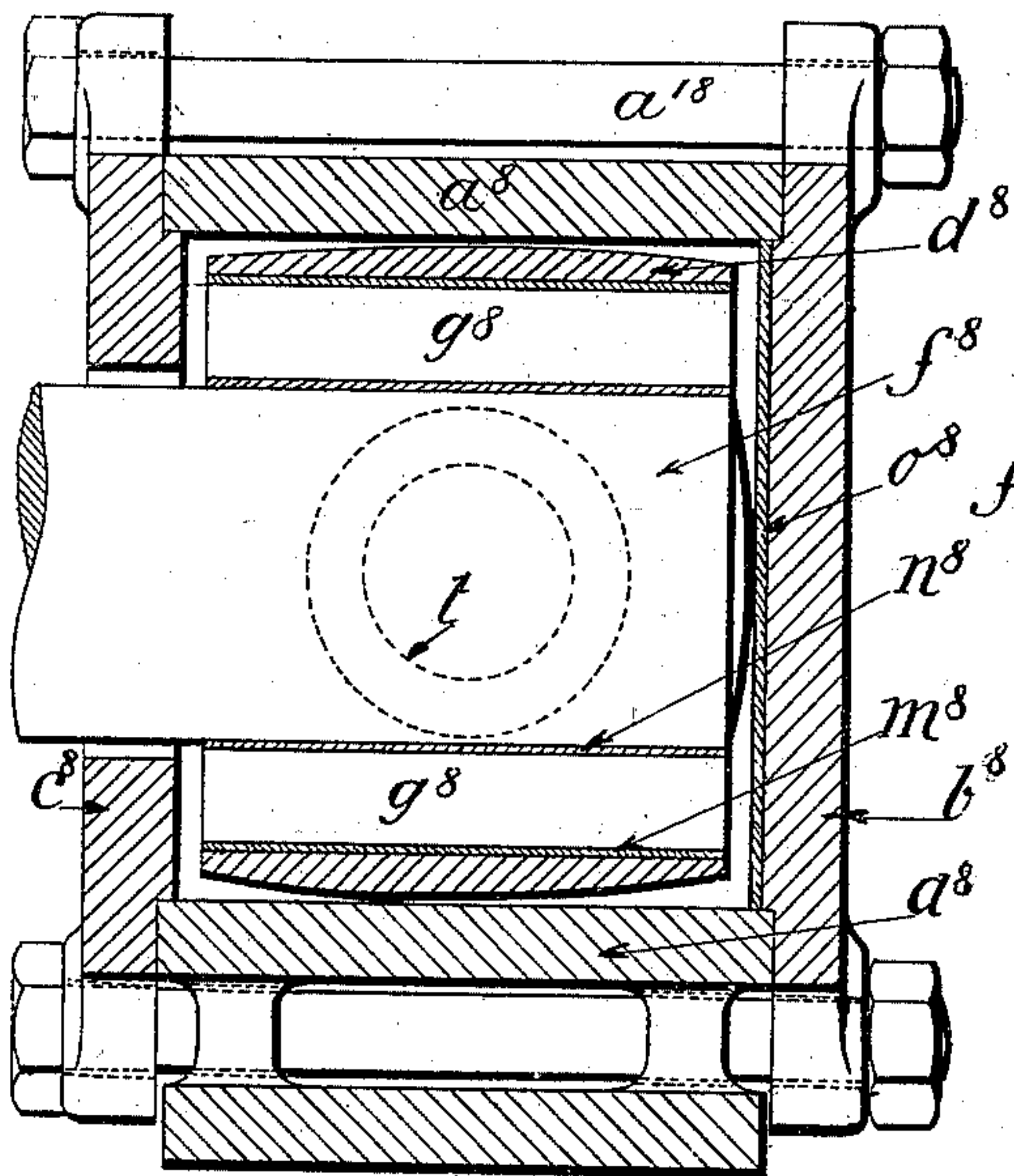
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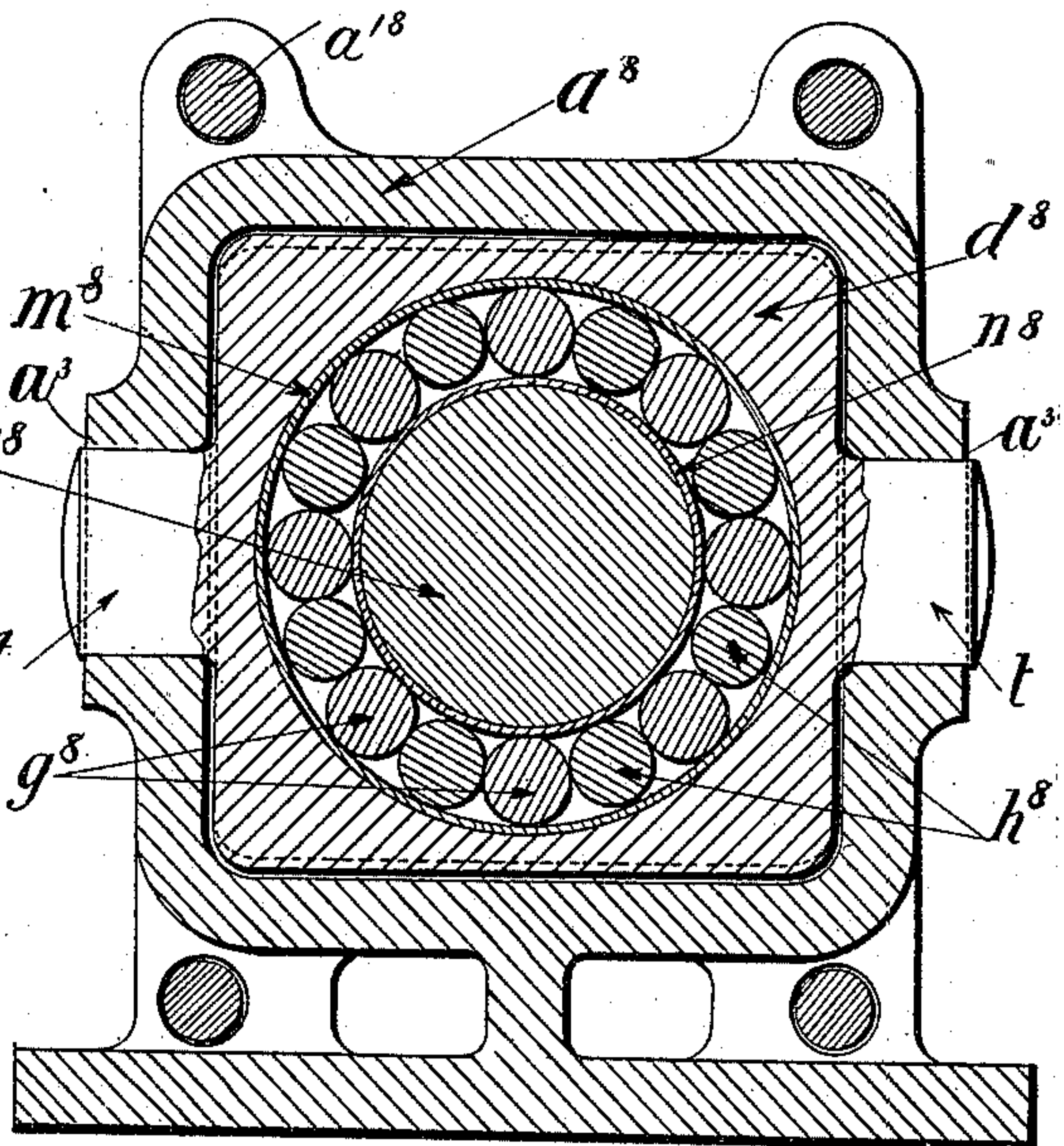
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FIG_8_



FIG_9_



Witnesses:
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UNITED STATES PATENT OFFICE.

AMÉDÉE FAYOL, OF BORDEAUX, FRANCE.

ARTICULATED JOURNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 558,642, dated April 21, 1896.

Application filed January 17, 1896. Serial No. 575,835. (No model.) Patented in France October 23, 1893, No. 233,584.

To all whom it may concern:

Be it known that I, AMÉDÉE FAYOL, a citizen of the Republic of France, residing at 10 Rue Belleville, Bordeaux, France, have invented certain new and useful Improvements in Articulated Journal-Boxes, (patented in France October 23, 1893, No. 233,584,) of which the following is a specification.

My invention relates to journal-boxes, and has for its object to produce an efficient and reliable articulated journal-box.

My invention consists in the construction hereinafter set forth and claimed.

My invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a side view of a journal-box embodying my invention. Fig. 2 is an end view thereof. Fig. 3 is a longitudinal section thereof, taken on the line 3 3 of Fig. 2. Fig. 4 is a transverse section taken on line 4 4 of Fig. 3. Fig. 5 is a detail view of a tempered-steel ring or envelop hereinafter described. Fig. 6 is a longitudinal sectional view of another form of journal-box embodying my invention. Fig. 7 is a section thereof on the line 7 7 of Fig. 6, and exhibits also the section, line 6 6, on which the section of Fig. 6 is taken. Fig. 8 is a longitudinal sectional view of another form of journal-box embodying my invention. Fig. 9 is a central transverse section thereof.

In the drawings, f is the axle or journal arm or other shafting.

a is the axle-box or journal-box which is capped by cheeks $c b$, the cheek b being faced by a tempered-steel facing-plate o , the whole being held together by bolts a' . This journal-box a has a central opening therethrough in which the sleeve or box d is seated, which is faced on the inside by a tempered-steel facing-ring m , thus dispensing with the necessity of tempering the sleeve or box d . Surrounding the axle-arm f is an envelop-ring or wear-plate n , of tempered steel, which is shown in detail in Fig. 5, the said ring being cut on the lines $n' n^2$ and clamped around the axle-arm f , thus dispensing with the necessity of tempering or case-hardening the axle-arm.

Interposed between the rings $m n$ and taking up the friction and bearing of the parts, one on the other, is a series of rollers $g h$, which

entirely occupy the annular space intervening between the rings m and n . These cylinders or rollers are trued perfectly, so that they will maintain absolute parallelism at all times with one another and the axis of the axle-arm, so that there will be no binding, thus obviating unnecessary friction, and will also preserve the absolute concentricity of the axle-arm and box. These rollers are of different sizes, the rollers g , being bearing-rollers, are of a diameter equal to the normal width of the annular space between the rings. These bearing-rollers g alternate with smaller free guiding-rollers h , parallel to the axes thereof, which do not carry the weight which the rollers g carry, but which, touching the rollers g along the lines of their axis, serve to guide the rollers g and preserve their parallelism. The interactions of the rollers, axle-arm, and box will be understood without explanation.

The sleeve or box d contacts with the walls of the box a and is convexly curved on its outer surface after the manner of a finger-ring or the figure generated by the revolution of a convex curve (see Fig. 3)—that is to say, the greatest diameter of the sleeve or box is about the middle thereof on a plane at right angle to its axis, the least diameter being at the edges of the sleeve. Other convex forms may, however, be adopted. This convexity of the sleeve permits the axes of the box a and the axle-arm f to change their relations of parallelism, the aperture a^2 through which the axle-arm f passes being of sufficient size to permit such action.

In the modification shown in Figs. 6 and 7 the axle-box a^6 is square instead of round, as in the former modification, but is capped as before with the apertured cheek c^6 at one end, the cheek b^6 at the other end, which cheek b^6 is provided on its inner face with a tempered facing-plate o^6 , against which the axle or journal arm f^6 bears. The cheeks and box are held in position by the bolts a^{16} . A squared sleeve d^6 is carried in the box a^6 and has its inner face, which is circular, faced with the tempered-steel facing-ring m^6 , the axle-arm f^6 being also enveloped by the tempered-steel ring n^6 . In the annular space between the rings m^6 and n^6 I place rollers g^6 , whose diameter equals the space between the rings m^6 and n^6 , so as to keep the parts concentric.

These bearing-rollers g^6 alternate with smaller guiding-rollers h^6 , which do not carry the weight which the rollers g^6 carry, but which serve to guide the rollers g^6 and preserve their parallelism. The upper and lower surfaces l^6 and q^6 of the sleeve d^6 are curved in the same manner as the exterior surface of the sleeve d in Fig. 3, thus permitting the axes of the box a^6 and the axle or journal arm f^6 to change their relation of parallelism, the aperture in the cheek c^6 through which the axle-arm f^6 passes being of sufficient size to permit such action.

The modification shown in Figs. 8 and 9 is of the same general character as the modification shown in Figs. 6 and 7, the box a^8 being square inside and provided with the apertured cheek c^8 and the cheek b^8 , whose inner face is faced with the tempered-steel plate o^8 , against which the axle-arm f^8 bears, bolts a^{18} serving to hold the parts together, as before. d^8 is the sleeve whose circular orifice is faced with a tempered-steel plate m^8 , as before, and which is provided with trunnions t , which rest in bearings a^3 in the box a^8 . The axle-arm f^8 is also faced with the tempered-steel sleeve or facing-ring n^8 , and intervening between the sleeves m^8 and n^8 are the bearing-rollers g^8 and guiding-rollers h^8 as in the former cases.

It will be obvious that these last two modifications are variations of the articulate feature of the journal-box and have no reference to the antifriction feature as exemplified in the rollers.

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

1. The combination with an axle-arm, of a sleeve or box surrounding the said arm, and bearing-rollers in the space between the arm and the sleeve or box, which rollers bear the strain, are absolutely free to move and are smooth and cylindrical from end to end, guiding-rollers also absolutely free to move, smooth and cylindrical from end to end, interposed between and axially parallel to adjacent bearing-rollers and touching them along the lines of their axes, the exterior sur-

face of the said box or sleeve which confines the rollers and surrounds the axle-arm being convexly curved axially, the said box being combined with and resting in a second box or frame on the line of an arc of a circle in such a manner that it may incline in various directions with relation to the box or frame in which it rests, substantially as described and for the purpose specified.

2. An interior rectangular movable box curved axially, and having trunnions rigidly connected thereto and projecting straight from its sides, which trunnions provide articulation, combined with and carried within an exterior box of rectangular opening and provided with bearings receiving the trunnions, substantially as described and for the purpose specified.

3. The combination of the smooth differential rollers, the journal, the movable articulated box or sleeve, the exterior fixed box, and facing-rings of tempered steel on the contact-surfaces, whereby tempering or case-hardening the contact-surfaces is rendered unnecessary, substantially as described and for the purpose specified.

4. The herein-described articulated anti-friction-bearing consisting of the combination of an axle-arm, a square sleeve or box surrounding the said axle-arm and provided with trunnions, a series of bearing-rollers interposed between the axle-arm and the sleeve or box, a series of smaller guiding-rollers interposed between the rollers and running in the annular space between the axle-arm and the sleeve or box, a square box surrounding the said sleeve and provided with bearings for the trunnions of the box, cheeks forming the ends of the box, and bolts for holding the cheeks up to the edges of the box, substantially as described.

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

AMÉDÉE FAYOL.

Witnesses:

EUGÉNIE WATTIN,
CLYDE SHROPSHIRE.