

R. LANGE.
HAIR SPRING COLLET FOR TIMEPIECES.
APPLICATION FILED MAR. 3, 1910.

975,697.

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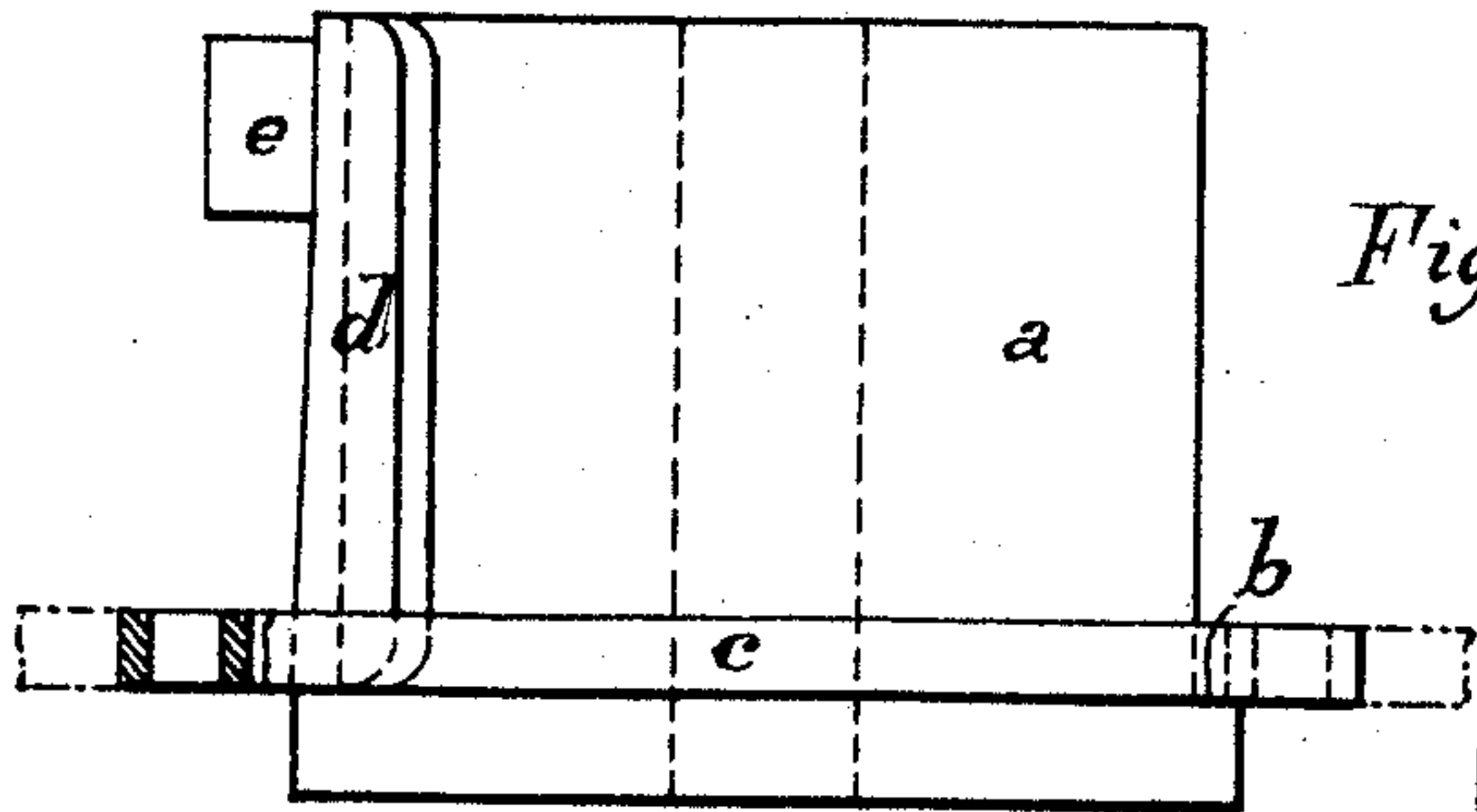


Fig. 1.

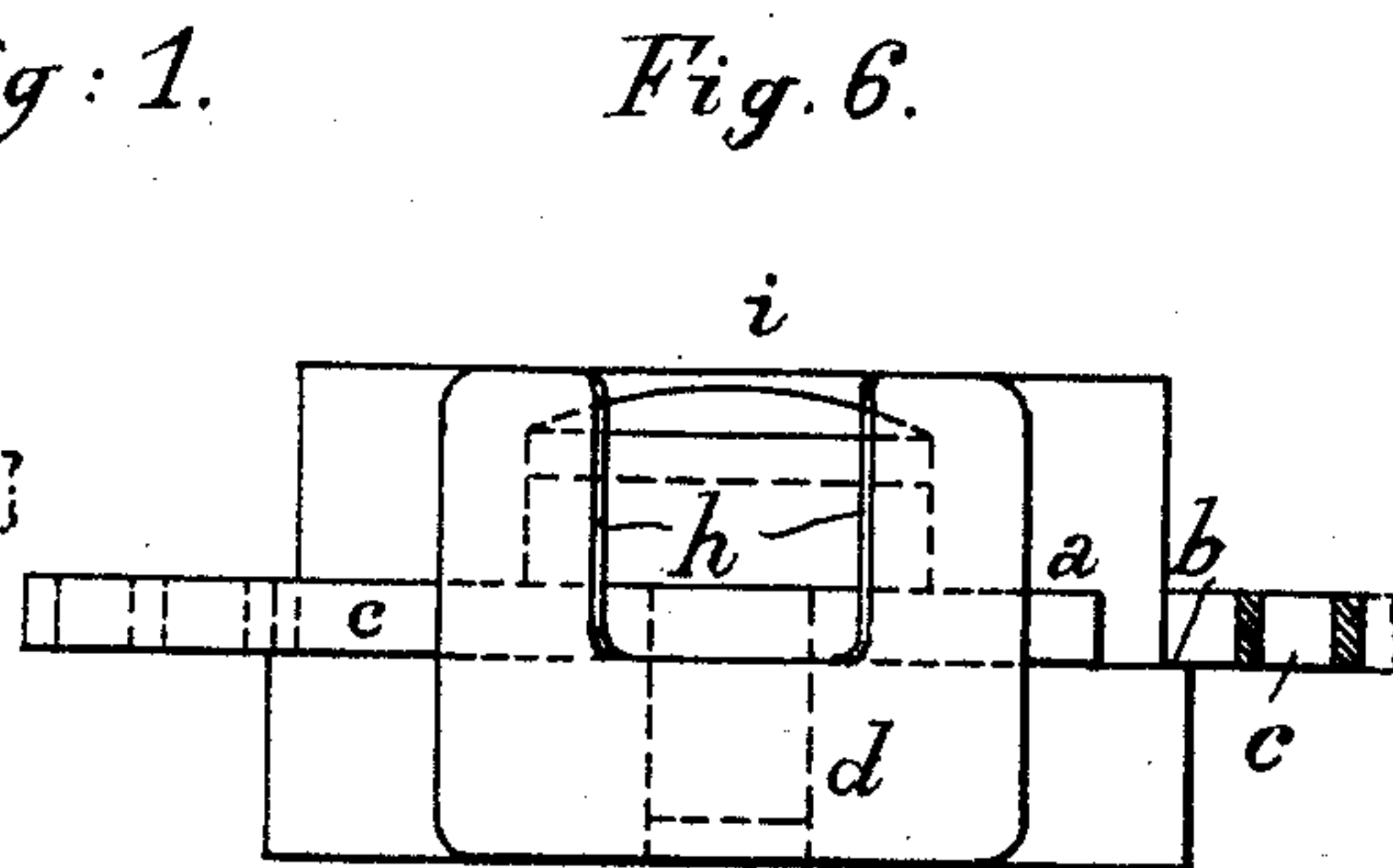


Fig. 6.

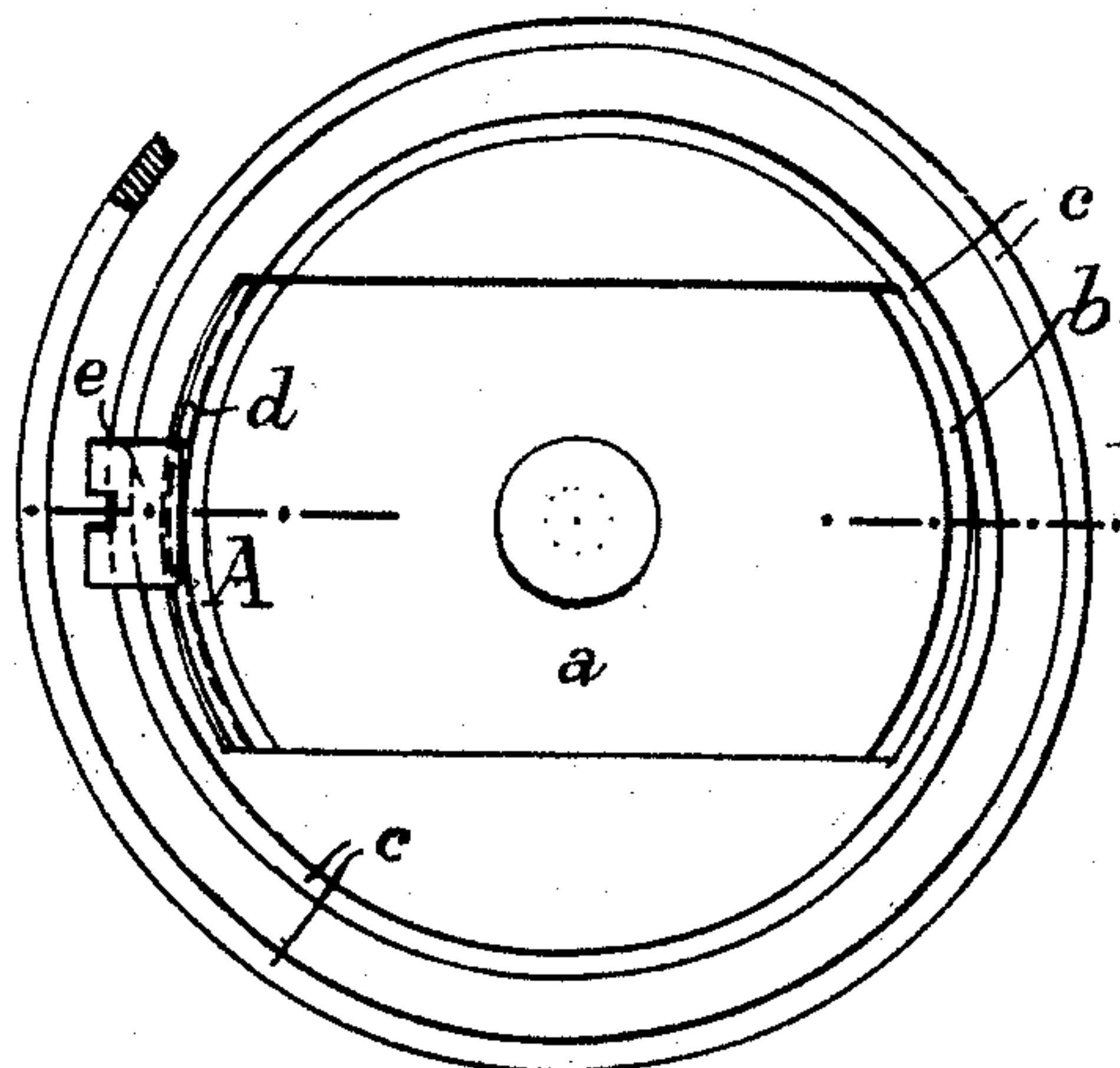


Fig. 2.

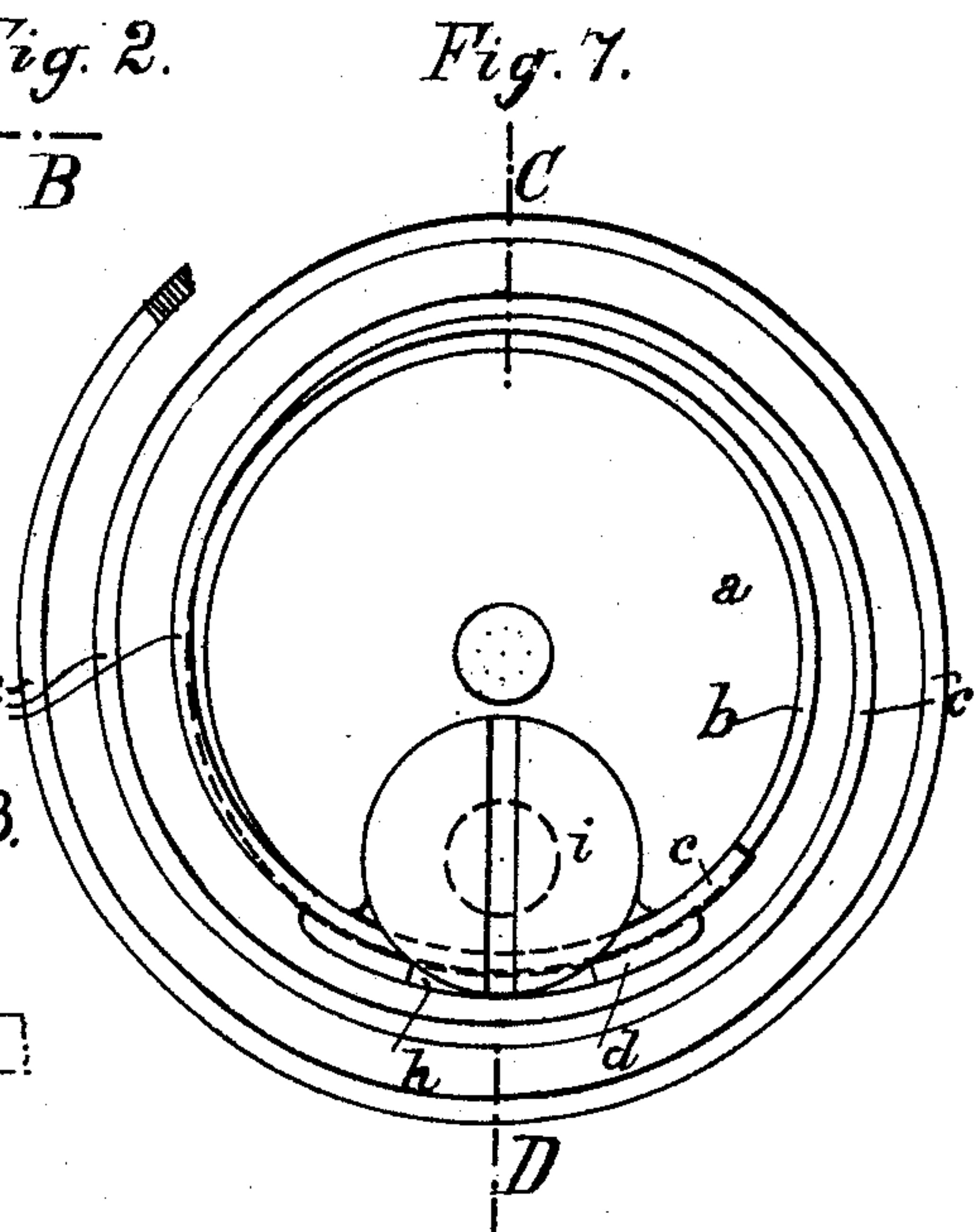


Fig. 7.

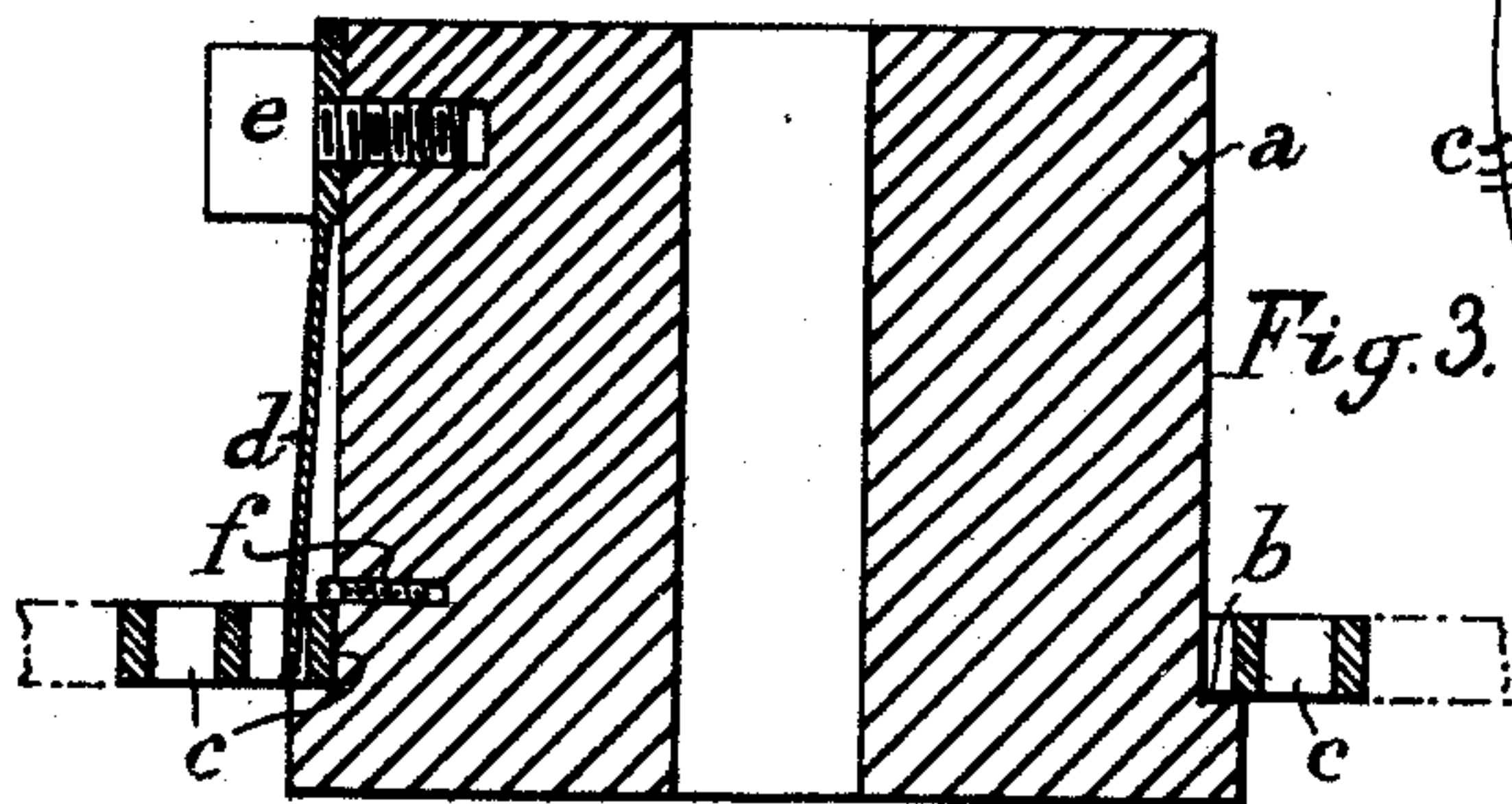


Fig. 3.

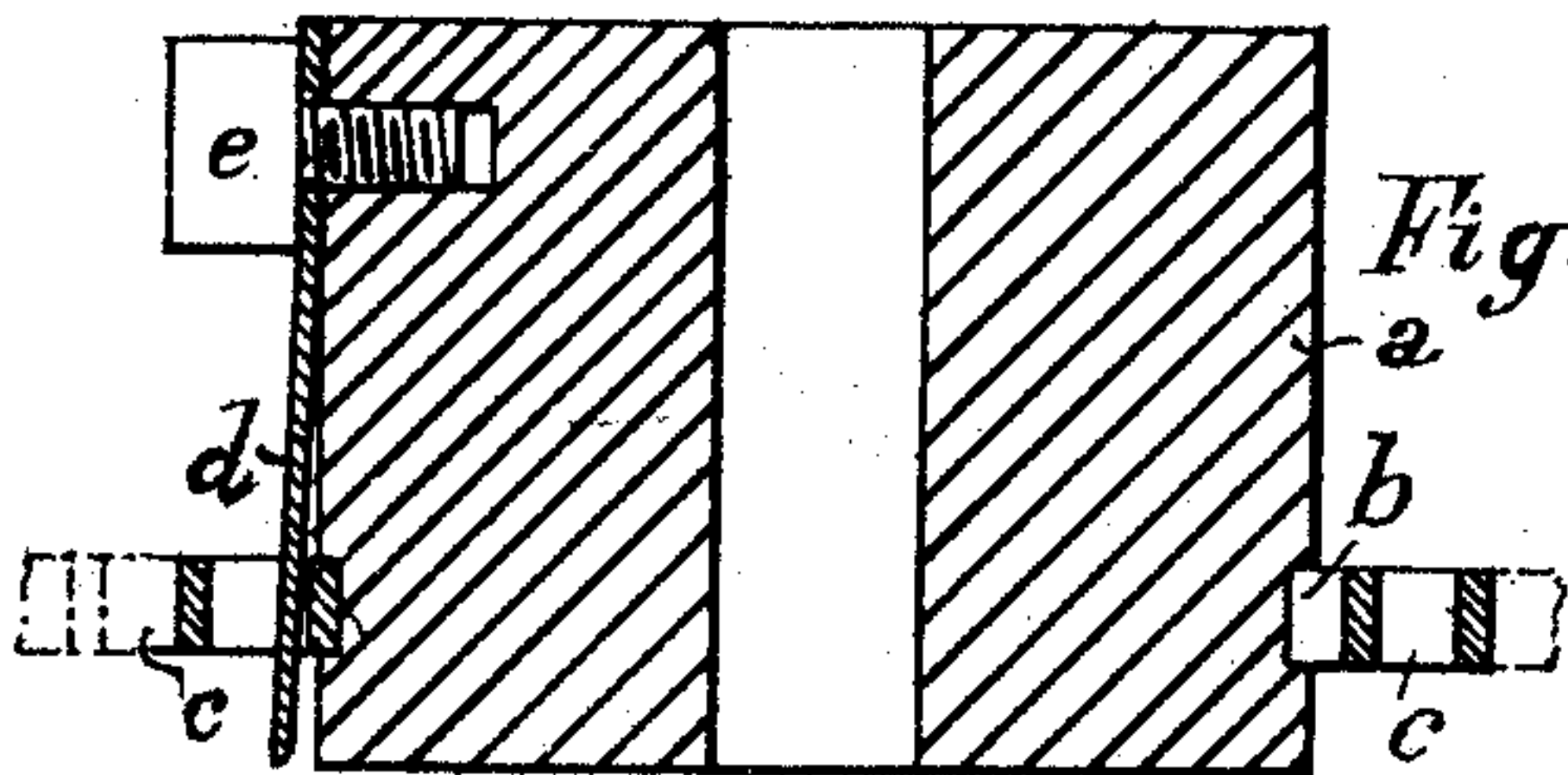


Fig. 4.

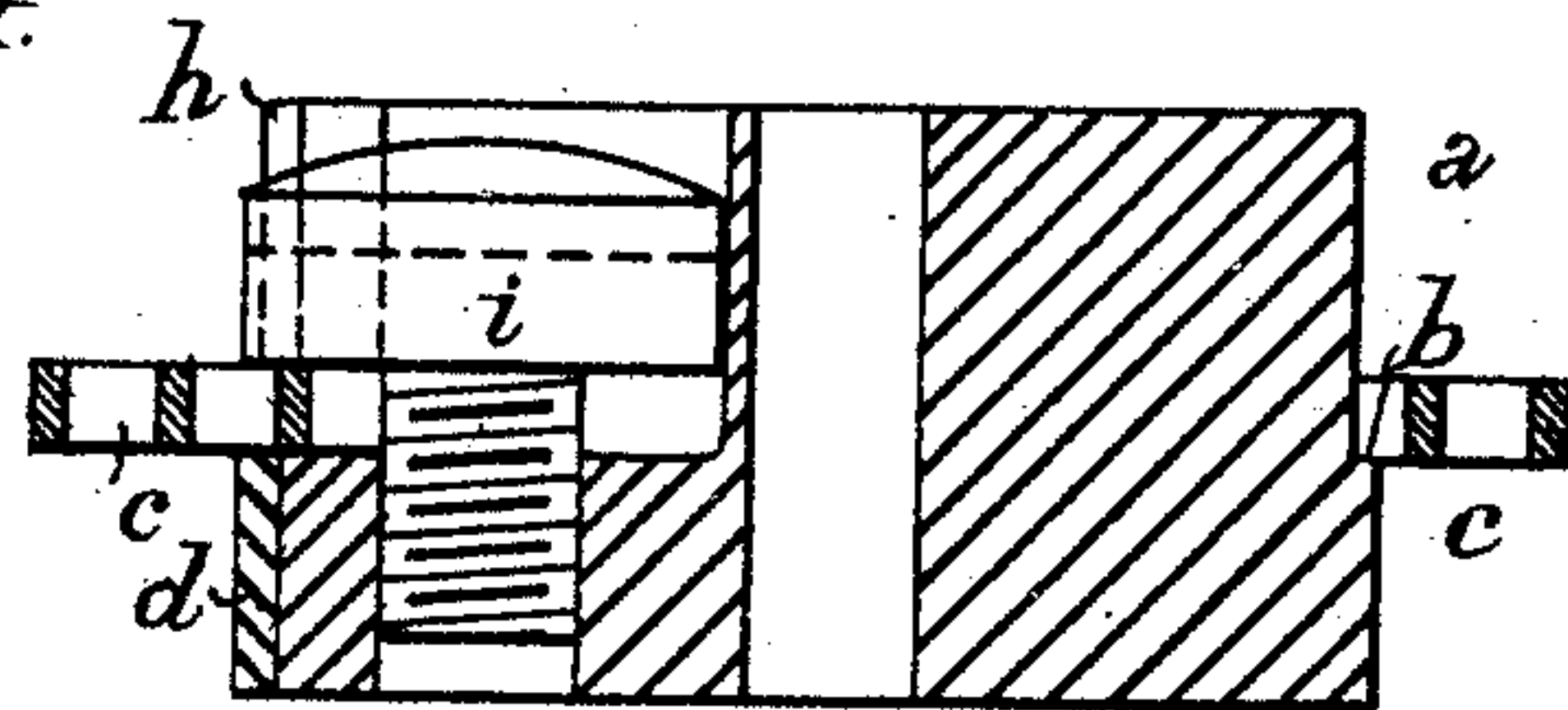


Fig. 8.

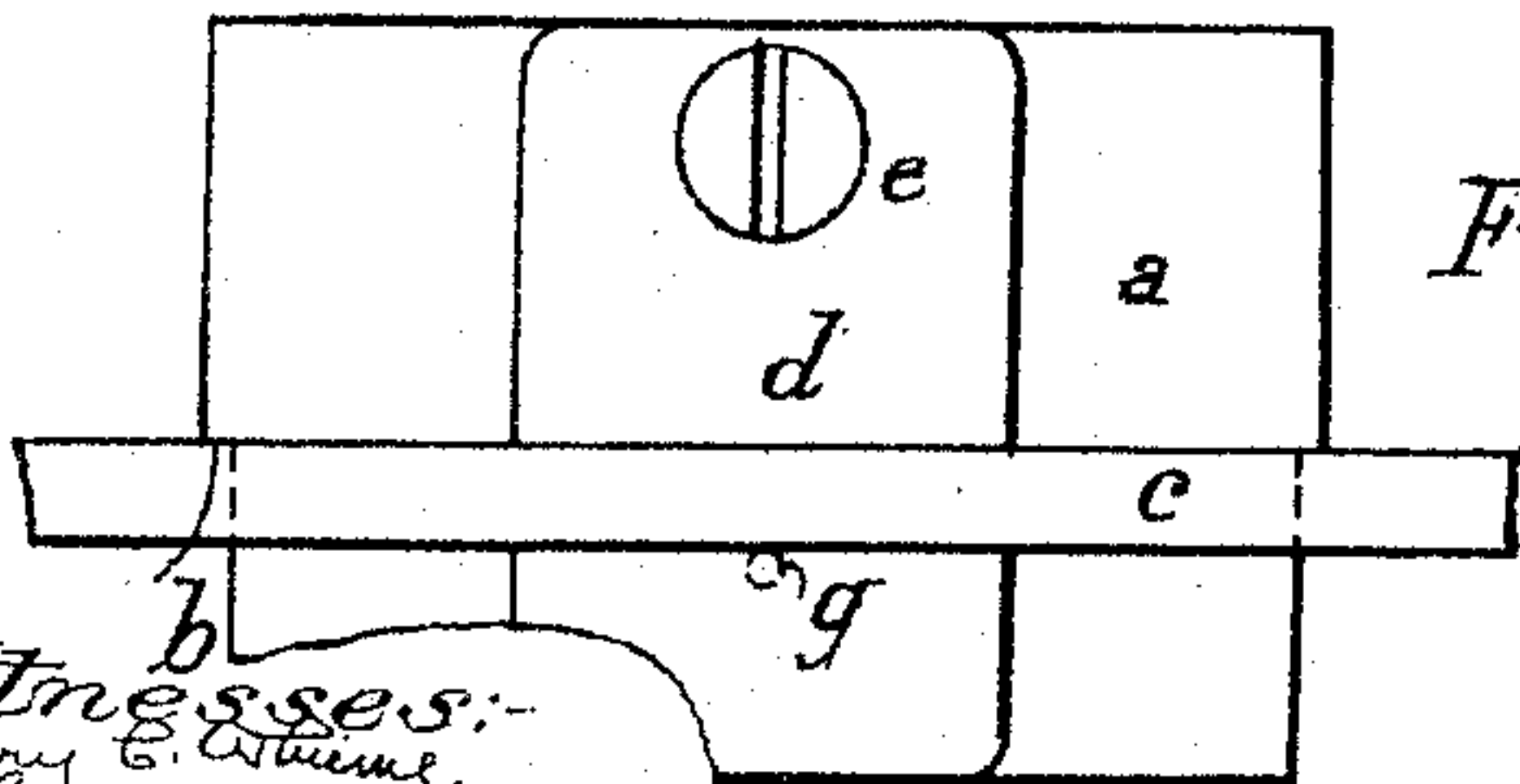


Fig. 5.

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UNITED STATES PATENT OFFICE.

RICHARD LANGE, OF GLASHÜTTE, GERMANY.

HAIR-SPRING COLLET FOR TIMEPIECES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, RICHARD LANGE, merchant, a subject of the King of Saxony, and resident of Glashütte, Kingdom of Saxony, German Empire, have invented a new and useful Improvement in or Relating to Hair-Spring Collets for Timepieces, of which the following is a specification.

The pinning of the hair-spring of a watch to its collet in a position which is not perpendicular to the collet, often causes an improper regulation of the time-piece. The pinning point of the hair-spring is, however, in most cases, not correctly found at first, and to correct the error the length of the hair-spring is slightly varied. To maintain the theoretical curve of the hair-spring, the latter is first pinned at its inner end and the curved part lengthened or shortened somewhat and then the spring is pinned again. It is a known fact that if hair-springs of a good and hard quality are used, the end of the spring will break off at times during the regulating operation, thus requiring the use of a new hair-spring.

It will follow from the above statement that if the hair-spring of a time-piece or watch is not fastened to its collet in such a manner that the hair-spring lies absolutely perpendicular to the axis, a proper regulation of the watch or time-piece can never be obtained. Attempts have heretofore been made to insure an unchanged natural position of the coils or convolutions of the hair-spring without essentially bending the inner coil of the hair-spring, all of which have, however, failed to fulfil the conditions necessary for a good regulation. For example, the hair-spring collet has been formed of two parts, each part being provided with a groove. After inserting the inner coil of the hair-spring into the groove of one collet part and pushing the other collet part with its groove on to the above mentioned inner coil, the two combined parts have been pressed and fastened together by a set screw. It has not, however, been possible to obtain grooves of such small width that the hair-spring would, after being inserted, have a sufficient play, and even if it were possible to adapt the width of the groove to the thickness of the hair-spring, the latter, after loosening the set-screw, could not be moved in either direction, due to friction produced. If, however, the groove were to be made broader than the thickness of the hair-

spring, the material remaining on the collet must be considerably broader than the space between each two adjacent hair-spring coils. In this case the inner end of the hair-spring would not maintain its natural shape.

The present invention has for its object the production of a hair-spring collet to which the end of the hair-spring is detachably connected, the thin edge or rib on the outer surface or periphery of the collet of the character or construction above mentioned, if a groove is provided in the latter, being replaced by a separate thin plate or tongue formed of resistant metal and connected to the collet and so arranged as to embrace the flatly inserted end of the hair-spring on its flat side. The said metal plate or tongue is made thinner than the space existing between two coils of the hair-spring and clamps the inner end of such spring so tightly, without bending the same, that the spiral of Archimedes runs without any alteration of the coils, round and flat and also remains flat when the hair-spring, after loosening the set screw for the small metal tongue, is slightly displaced and after such displacement again fastened.

A practical embodiment of the present invention is shown in the accompanying drawings, in which,

Figure 1 represents in elevation one form of construction, Fig. 2 is a plan view of the same; Fig. 3 is a section in the plane of the line A—B of Fig. 2; Fig. 4 is a section of another form of construction of the hair-spring collet; Fig. 5 represents a third form of construction and Figs. 6 to 8 show a fourth form of construction.

a is the hair-spring collet provided on the periphery of a groove *b*. This groove, the depth of which corresponds approximately to the width of the hair-spring *c*, extends either nearly to the height of the collet *a*, as shown in Fig. 3, or is only of the height of the hair-spring, Fig. 4. Over the groove *b* and the hair-spring *c* inserted in the latter, a small, very thin metal blade-like tongue or cover plate *d* is fastened by means of a small set-screw *e*. As will be seen in Figs. 2 and 3, this metal tongue is made a good deal thinner than the space between the inner and the adjacent outer coil of the hair-spring so that it will, during the working of the time-piece, never get in contact with said coils and will in no way interfere with the run or movement of the

hair-spring. Against the surface of the inner coil of the hair-spring, a small pin *f*, Fig. 3, will rest, the pin being screwed into the collet *a* or the groove may be of the same width as the hair-spring and no pin be required, as seen in Fig. 4. This small thin and resistant metal tongue or cover-plate *d* clamps the inner spiral end tightly without bending the same in the least and makes it remain flat and round, while the hair-spring is gripped or embraced at its flat side by the small tongue.

According to the modified construction shown in Fig. 5, the hair-spring collect *a* is provided with a shoulder *b* forming an abutment for the inner end of the hair-spring *c*, against which shoulder the inner coil of the hair spring is pressed by means of the very thin metal tongue or cover-plate *d*. The small pin *g* serves in this case as a support for the inner coil of the hair-spring.

It is also possible to modify the described construction for fastening or attaching the hair-spring end, obtained by the small cover-plate or tongue in such a manner that this plate or tongue *d* stationarily fastened to the collet *a*, is cut away in its middle part, in which case there is inserted from above into the collet, a set-screw *i* or a conical bolt not provided with threads which either itself or with its head, seated in a recess of the collet, rests on the surface of the inner end of the hair-spring and the outer surface of which, inserted into the recess *h* of the small metal tongue *d* precisely, lies flush with the outer surface or periphery of said metal plate or tongue, as shown in Figs. 6 to 8. In this case the edges of the said recess are in contact with the outer surface of the

screw or bolt-head protruding into the recess.

On tightening the screw *i*, the head of which slightly projects above the inner coil of the hair-spring, the same somewhat presses down this coil and thus tightens the hair-spring *c* in a downward direction in connection with the metal plate or tongue *d*.

What I claim is:

1. In hair-spring collets for time pieces or watches, the combination with a collet provided with a groove, and a hair-spring inserted with its inner end flatly in said groove, of a thin cover plate or tongue attached to the outer surface of the collet and covering the flat side of the inner coil of the spring and means for pressing the said inner coil of the spring down together with the plate or tongue, substantially as and for the purpose specified.

2. In hair-spring collets for time pieces or watches, the combination with a collet provided with a groove and a hair-spring having its inner end inserted flatly in said collet groove, of a thin cover plate or tongue attached to the outer surface of the collet and covering the flat side of the inner coil of the spring and a set screw for pressing the said inner coil of the spring down together with the cover plate or tongue, substantially as and for the purpose specified.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this seventh day of February 1910.

RICHARD LANGE.

Witnesses:

PAUL ARRAS,
CLÄRE SIMON.