

No. 702,330.

Patented June 10, 1902.

A. M. RITCHIE.

MAGNET HOLDING AND ADJUSTING APPARATUS FOR COMPENSATING BINNACLES.

(Application filed Jan. 31, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 2.

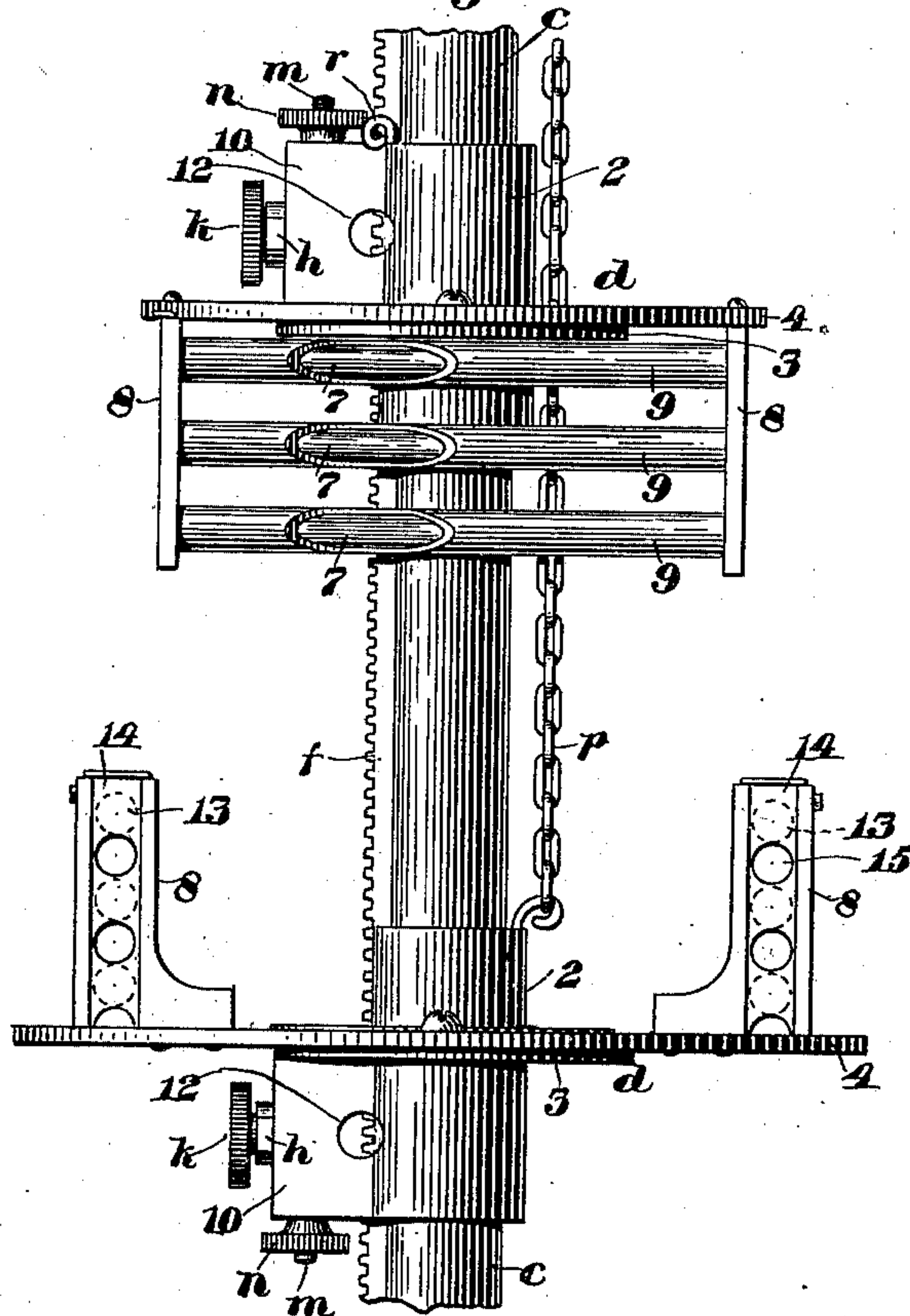
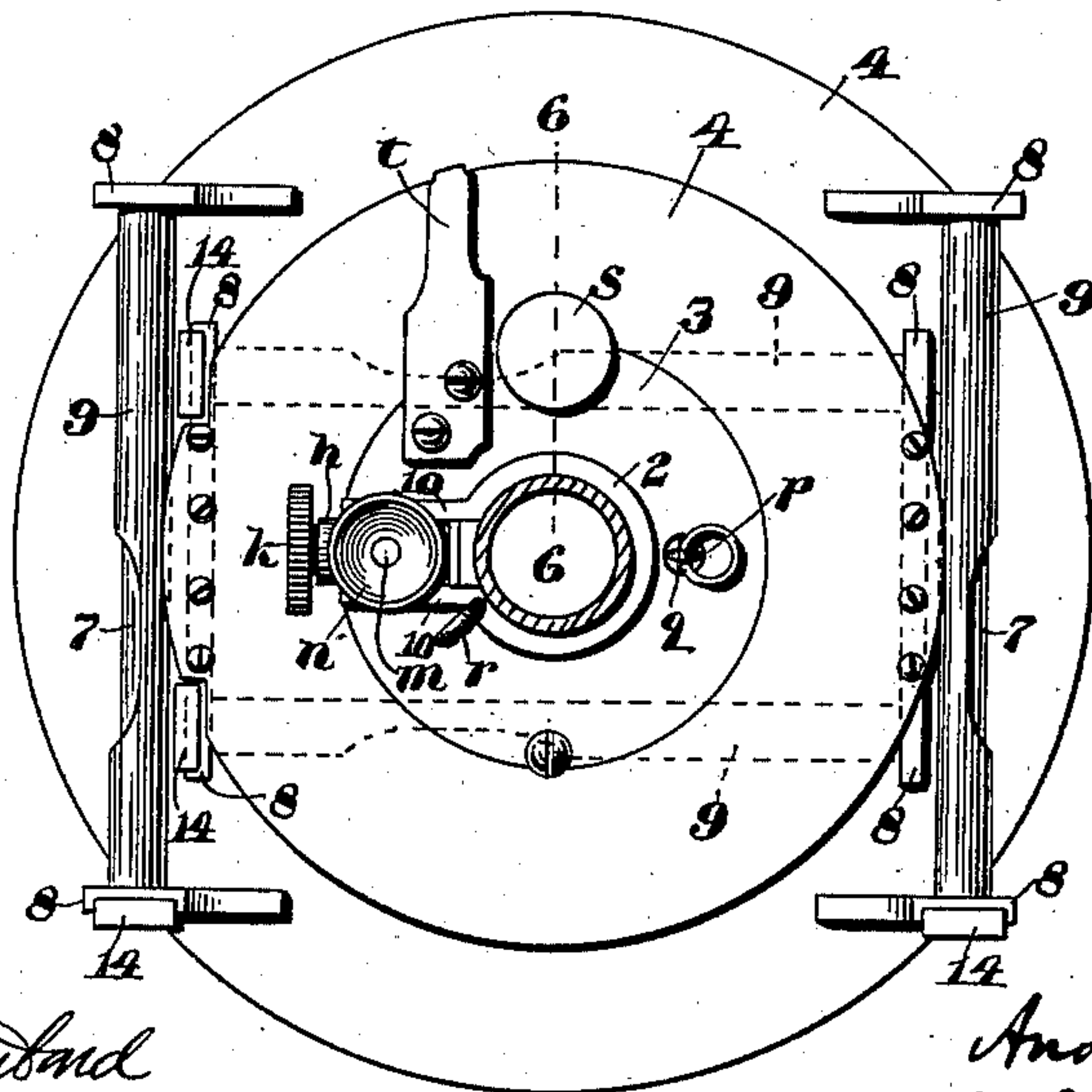


Fig. 1.



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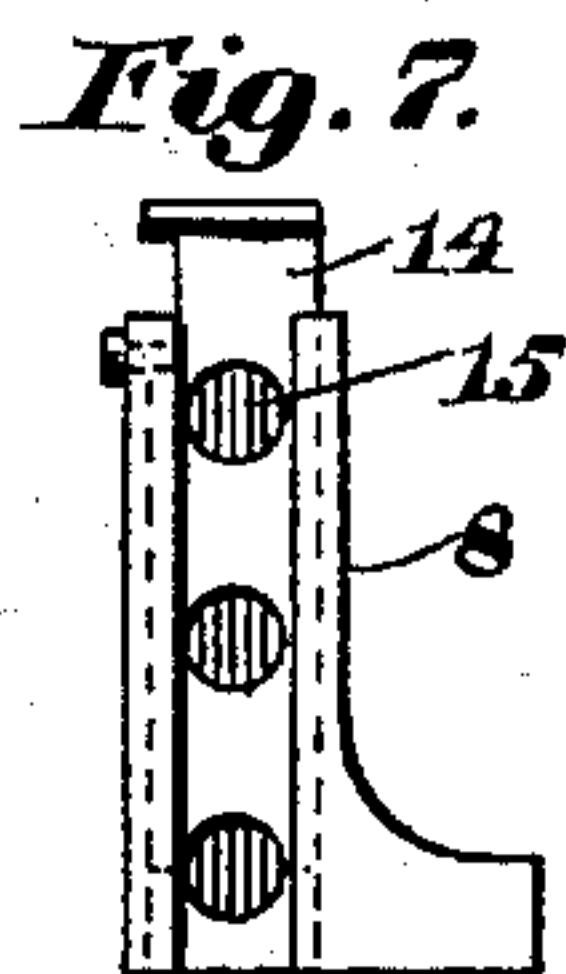
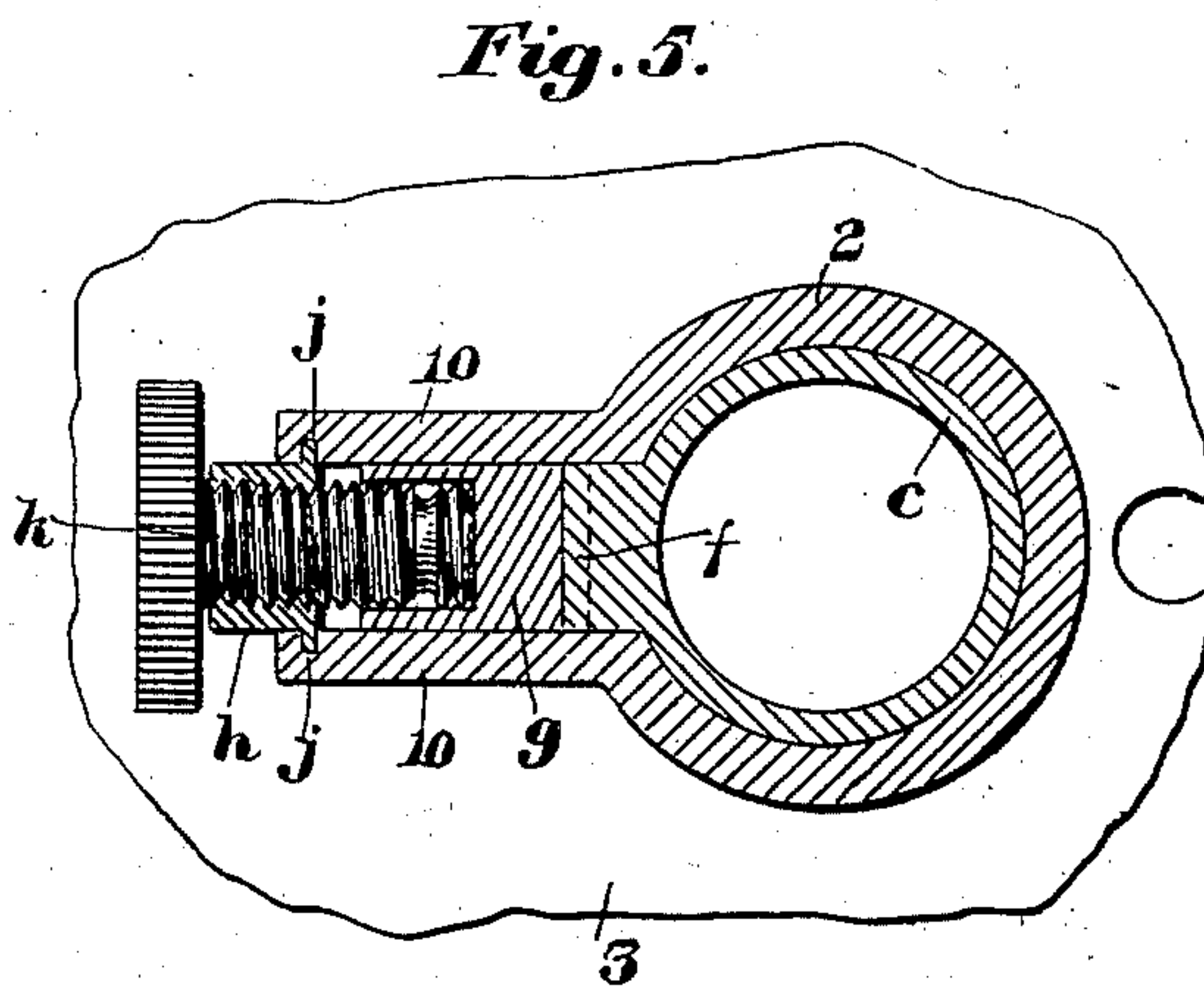
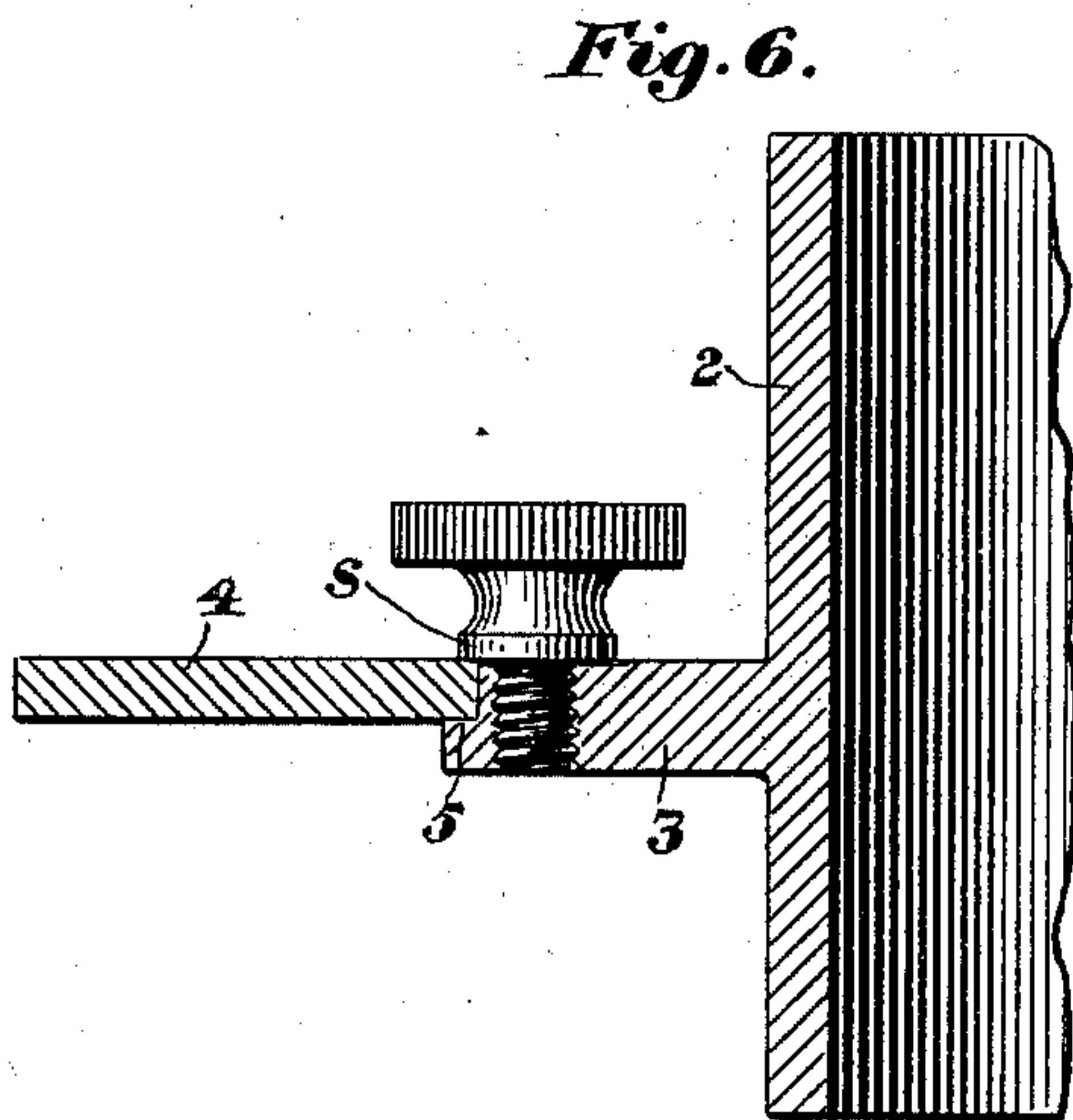
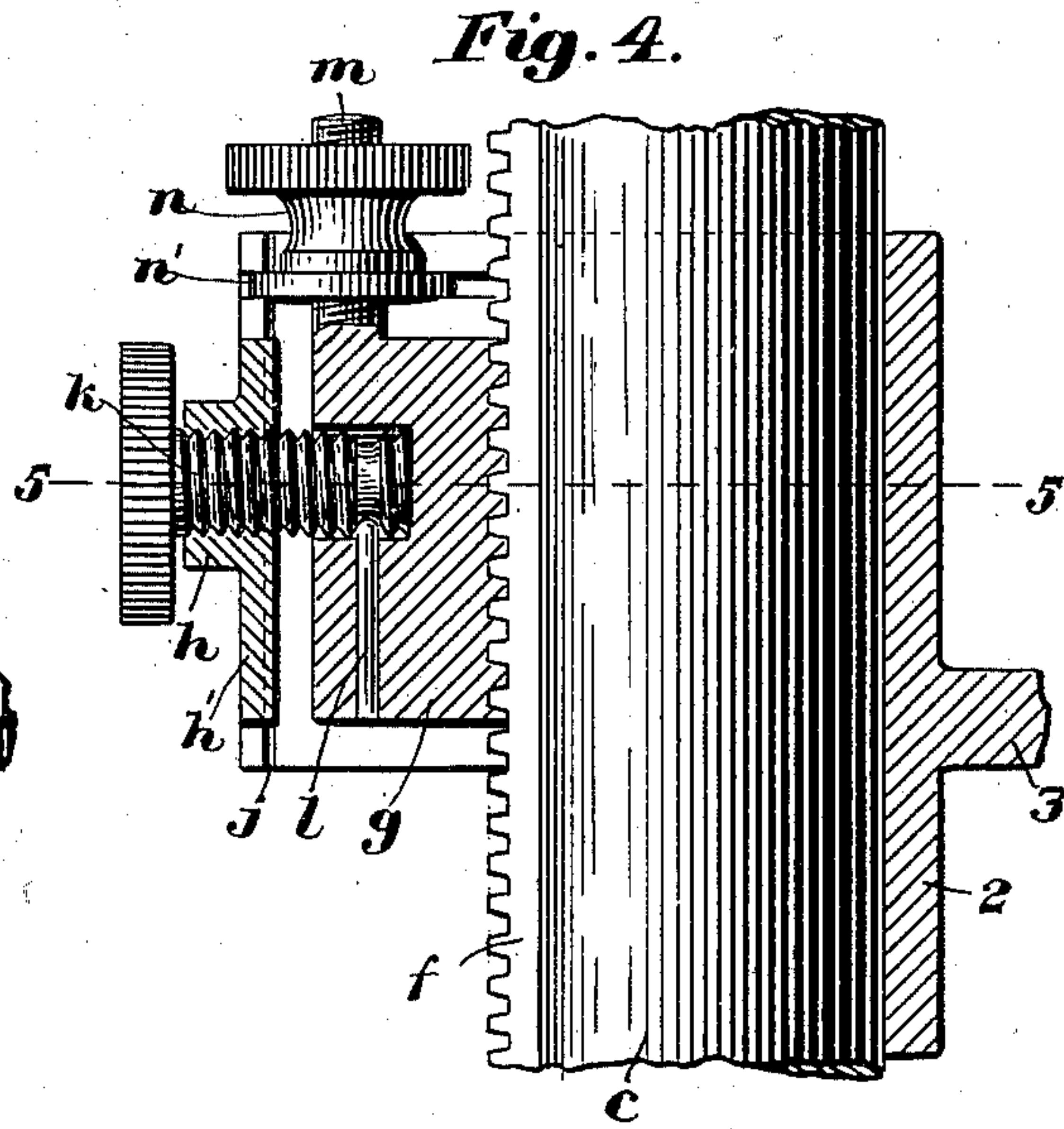
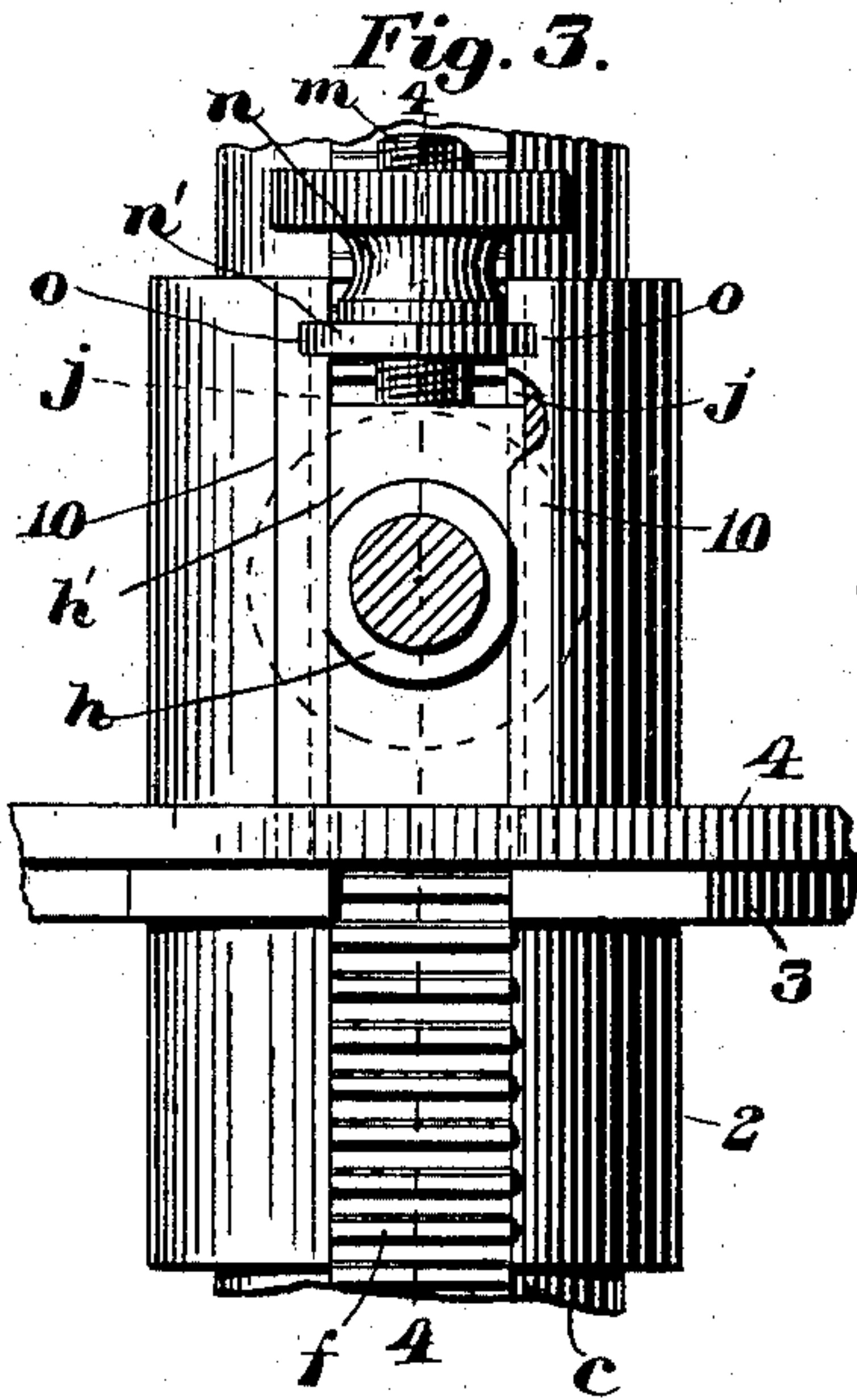
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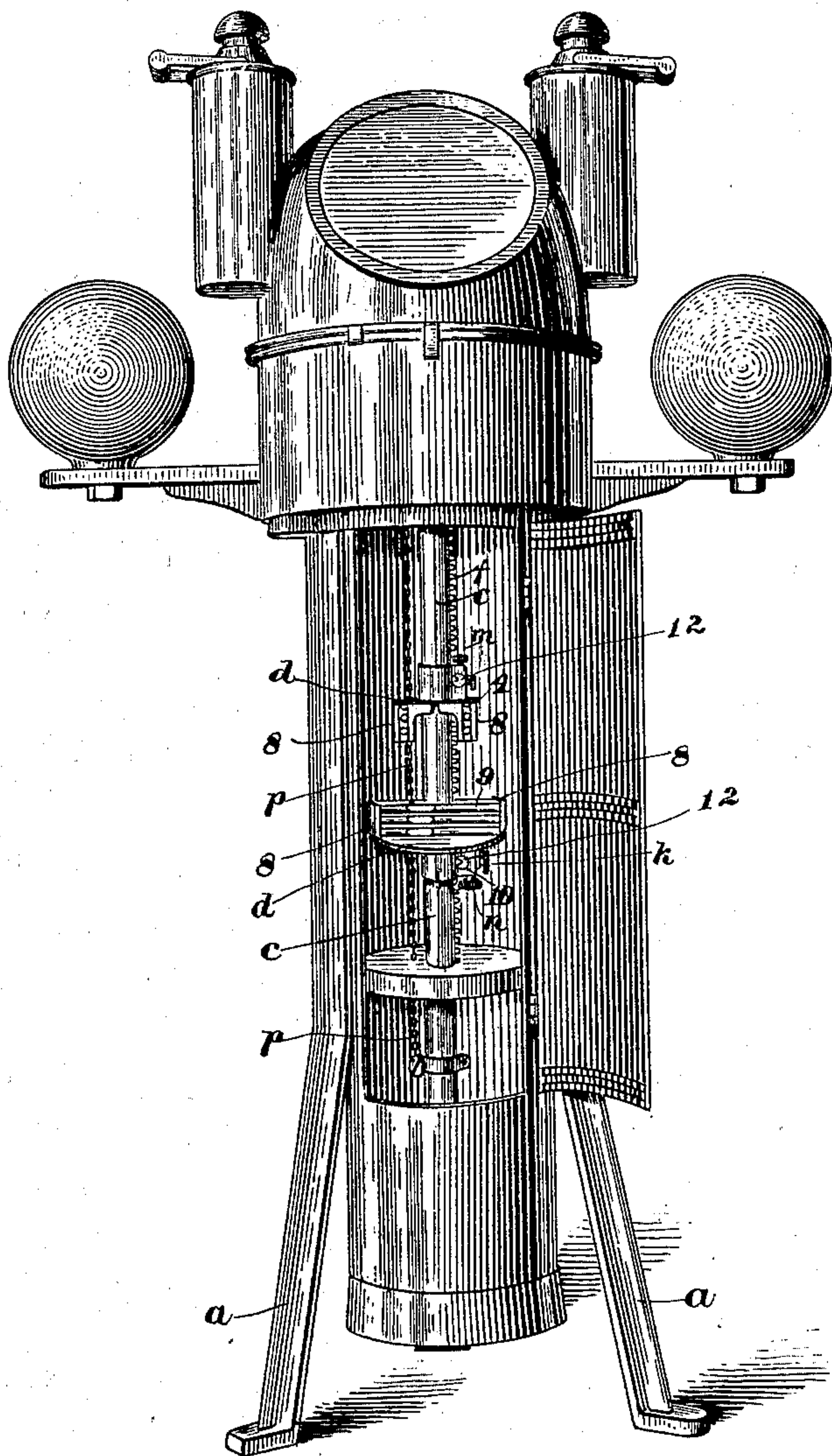
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(Application filed Jan. 31, 1901.)

(No Model.)

3 Sheets—Sheet 3.

*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

ANDREW M. RITCHIE, OF BROOKLINE, MASSACHUSETTS.

MAGNET HOLDING AND ADJUSTING APPARATUS FOR COMPENSATING BINNACLES.

SPECIFICATION forming part of Letters Patent No. 702,330, dated June 10, 1902.

Application filed January 31, 1901. Serial No. 45,461. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW M. RITCHIE, of Brookline, in the county of Norfolk and State of Massachusetts, have invented certain  
5 new and useful Improvements in Magnet Holding and Adjusting Apparatus for Compensating Binnacles, of which the following is a specification.

This invention has for its object to provide  
10 simple and effective means for accurately locating the magnets of a compensating compass-binnacle to overcome the effects of local attraction on the compass. There are usually two sets of these magnets, the magnets  
15 of one set being arranged substantially at right angles to those of the other, the two sets being located below the compass and vertically adjustable to vary the distances between them and the compass.

20 My invention is embodied in a structure which permits a quick vertical adjustment of each set of magnets and a minute or micrometrical adjustment of each set. The said structure may also have provisions for  
25 giving each set of magnets a rotative adjustment, so that the magnets of either set may be placed either fore and aft or athwartship.

The invention consists in the several improvements, which I shall now proceed to describe and claim.

30 Of the drawings, Figure 1 represents a plan view of an apparatus embodying my invention, the central supporting-standard being shown in transverse section. Fig. 2 represents a side elevation of the apparatus shown  
35 in Fig. 1, the upper and lower portions of the supporting-standard being broken off. Fig. 3 represents a side elevation of a portion of the apparatus, showing the means for adjusting one of the magnet-holders. Fig. 4 represents a partial section on line 4 4 of Fig. 3. Fig. 5 represents a section on line 5 5 of Fig. 4. Fig. 6 represents a section on line 6 6 of Fig. 1. Fig. 7 represents a view similar to a  
45 portion of Fig. 2, showing the magnet-retaining slide adjusted to permit the insertion and removal of the magnets confined by it. Fig. 8 represents a perspective view, on a reduced scale, of a compass-binnacle equipped  
50 with my improved magnet holding and adjusting apparatus.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a a*, Fig. 8, represent the supporting-standards of the compass-binnacle, the compass being mounted on the binnacle in the usual or any suitable manner.

*c* represents a vertically-fixed standard, preferably tubular, which is affixed to the supporting-frame below the compass, the said  
60 standard being preferably in the line of the axial center of the compass-needle.

*d d* represent two magnet-holders, each of which is adapted to slide vertically on the standard *c* independently of the other. Each  
65 holder, as here shown, comprises, first, a central member or hub 2, fitted to slide on the standard *c* and having an integral flange 3, as shown in Fig. 6, and, secondly, an outer member 4, preferably of annular form, bearing at its inner edge on a seat 5, formed on  
70 the flange 3 and provided with means, hereinafter described, supported by the extension 4 for supporting the magnets 7. The said magnet-supporting means comprise standards 8 8, affixed to the annular extensions  
75 4 and usually arranged in pairs, there being usually two pairs of said standards on each extension 4, and a series of sockets 9, affixed to and extending between each pair  
80 of standards 8 8. One pair of standards 8 and the accompanying series of sockets and magnets held thereby are located at one side of the standard *c*, while the other pair of  
85 standards 8 and the parts supported thereby are located at the opposite side. Hence the magnets held by each holder are distributed equally at opposite sides of the central standard *c*, the two holders being adjusted relatively to each other so that the magnets on  
90 one holder extend fore and aft, while the magnets on the other holder extend athwartships or at any desired angle.

The standard *c* is provided with a vertically-elongated locking member *f*, which is  
95 here shown as a bar provided with teeth like those of a rack, the length of said bar being such that it is adapted to cooperate with the locking members, hereinafter described, on the magnet-holders in any position to which  
100 the magnet-holders are liable to move up or down on the standard *c*. Each magnet-holder



is provided with a complementary locking member *g*, adapted to be moved into and out of engagement with the fixed locking member *f*. Said locking member *g* is here shown as a block having teeth formed to interlock with the teeth of the bar *f*, the said sliding member or block *g* being supported and adjusted by the means next described.

*h* represents a nut which is formed on or affixed to a slide *h'*, the edges of which are fitted to slide vertically in guide-grooves *j j* in ears or flanges 10 10, formed on the hub 2 of the magnet-holder.

*k* represents an adjusting-screw which is engaged with the internal thread of the nut *h* and projects into an unthreaded socket in the sliding member *g* and engaged with the latter by a pin *l*, affixed to the sliding member *g*, entering a groove in the adjusting-screw, as shown in Fig. 4.

*m* represents a vertical screw-threaded stud formed on or affixed to the sliding member *g* and projecting therefrom. The said stud is internally engaged by an adjusting-nut *n*, having a flange *n'*, the opposite sides of which are fitted to slide in horizontal guide-grooves *o o* in the inner sides of the ears 10 10, the stud *m* and nut *n* constituting an adjusting device supported by the sliding member *g* for giving the magnet-holder a minute adjustment, as hereinafter described.

When the sliding member *g* is in engagement with the elongated fixed member *f*, as shown in Fig. 4, the magnet-holder is fixed immovably to the standard *c*. In case it is desired to effect a minute or micrometrical vertical adjustment of the magnet-holder this may be accomplished by rotating the adjusting-nut *n* on the now fixed and immovable screw-stud *m*. This movement causes the nut and the magnet-holder with which it is engaged by means of the groove *o* to move vertically relatively to the standard *c* and locking members *f* and *g*. The adjusting-screw *k* and its nut *h* remain stationary during this adjustment, the grooved ears 10 10 on the magnet-holder sliding on the edges of the plate *h'*, on which the nut *h* is formed.

When it is desired to give the magnet-holder a quick vertical movement of considerable length, the locking member *g* is withdrawn from engagement with the fixed member *f* by a suitable rotation of the adjusting-screw *k*, the adjusting-nut *n* moving horizontally with the locking member *g* in the grooves *o o* of the ears 10. When the members *g* and *f* are disengaged from each other, the magnet-holder may be moved by hand to the desired point and then again secured by rotation of the adjusting-screw *k* in the direction required to move the teeth of the member *g* into engagement with the teeth of the member *f*. In case the teeth of the member *g* do not properly coincide with the space between the teeth of the member *f* at the end of the quick adjustment the teeth may be brought into the de-

sired position by rotating the adjusting-nut *n*. The ears 10 10 are preferably provided with side apertures 12, Fig. 2, which permit the operator to inspect the teeth of the members *f* and *g* between said ears in adjusting the teeth to each other, as above described.

*p* represents a chain secured to the hub 2 of the lower magnet-holder and extending upwardly beside the stud *c* and through an orifice *q* in the upper magnet-holder, the chain passing over a suitable guide *w* in the supporting-frame and extending downwardly, so that it can be grasped by one end by the operator, who is thus enabled to raise or lower the magnet-holder when the locking members thereof are disengaged, the other hand of the operator being used to manipulate either the adjusting-screw *k* or the adjusting-nut *n*. A similarly-arranged chain may be connected with an eye *r*, Fig. 2, attached to the upper magnet-holder. These chains may, however, be omitted, if desired.

I have already stated that each magnet-holder comprises an annular section or extension 4, to which the socket-holding standards 8 are attached. This extension 4 is adapted to be rotated on the side 4, Fig. 6, to enable the magnets supported by it to stand either fore or aft or athwartships or at any desired angle. The extension 4 and the magnets are secured after being rotated to the desired position by suitable means, such as a clamping-screw *s*, engaged with the flange 3 and having its head arranged to bear upon the inner portion of the upper surface of the extension 4, as shown in Fig. 6. A finger or index *t*, Fig. 1, affixed to the flange 3 and having its upper end about flush with the margin of the extension 4, indicates the proper positions to be occupied by the extension 4 in holding the magnets either fore and aft or athwartships. One of the standards 8 of each pair has openings 13 coinciding with the sockets 9, through which openings the magnets may be inserted and removed, and a sliding gate 14, having openings 15. When said gate is raised, as shown in Fig. 7, its openings coincide with the openings in the standards 8, thus permitting the magnets to be inserted or removed; but when the gate is depressed, as shown in Fig. 2, it covers the openings 13 and prevents the removal of the magnets.

The invention is not intended to be limited to the mechanical construction and details here shown, as the same may be modified in various particulars without departing from the spirit of the invention.

The described adjusting mechanism may be used in other forms of apparatus where both a minute and a quick adjustment is desirable, so that it is not intended to limit the invention to the application of said adjusting mechanism to compass-binnacles.

Having thus explained the nature of the invention and described a way of constructing and using the same, although without at-



tempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. An apparatus of the character specified, comprising a vertical standard, a plurality of magnet-holders each composed of an inner member fitted to slide without rotating on the standard, and an outer member rotatable horizontally on the inner member, means for giving each holder a vertical adjustment independently of the other, means for securing the holders in any positions to which they may be vertically adjusted, and means for securing the outer members of the holders in any positions to which they may be rotatively adjusted.

2. An apparatus of the character specified, comprising a fixed standard having a fixed elongated locking member, a magnet-holder adapted to slide vertically on said standard, a sliding locking member mounted on said holder, an adjusting device supported by the sliding locking member for vertically adjusting the magnet-holder when the sliding locking member is locked, and means for moving said sliding member and adjusting device toward and from the fixed member, the magnet-holder being free to receive a quick adjustment when said members are out of engagement with each other.

3. An apparatus of the character specified, comprising a fixed standard having a fixed

elongated locking member, a magnet-holder adapted to slide vertically on said standard, a sliding locking member mounted on said holder, a vertical screw-stud affixed to the sliding member, an adjusting-nut engaged with said stud and with horizontal guides on the magnet-holder, a horizontal adjusting-screw connected with the sliding locking member, and a nut engaged with the adjusting-screw and with vertical guides on the magnet-holder.

4. The combination of an elongated standard having an elongated locking member, a holder or carrier movable relatively to the standard, a movable locking member mounted on said holder, an adjusting device supported by the movable member, whereby the holder may be moved relatively to the movable locking member when the latter is locked, to give the holder a minute adjustment, and an adjusting-screw and a nut engaged therewith for moving the movable locking member into and out of engagement with the elongated locking member, the holder being quickly adjustable when the locking members are separated.

In testimony whereof I have affixed my signature in presence of two witnesses.

ANDREW M. RITCHIE.

Witnesses:

E. BATCHELDER,  
A. D. HARRISON.