

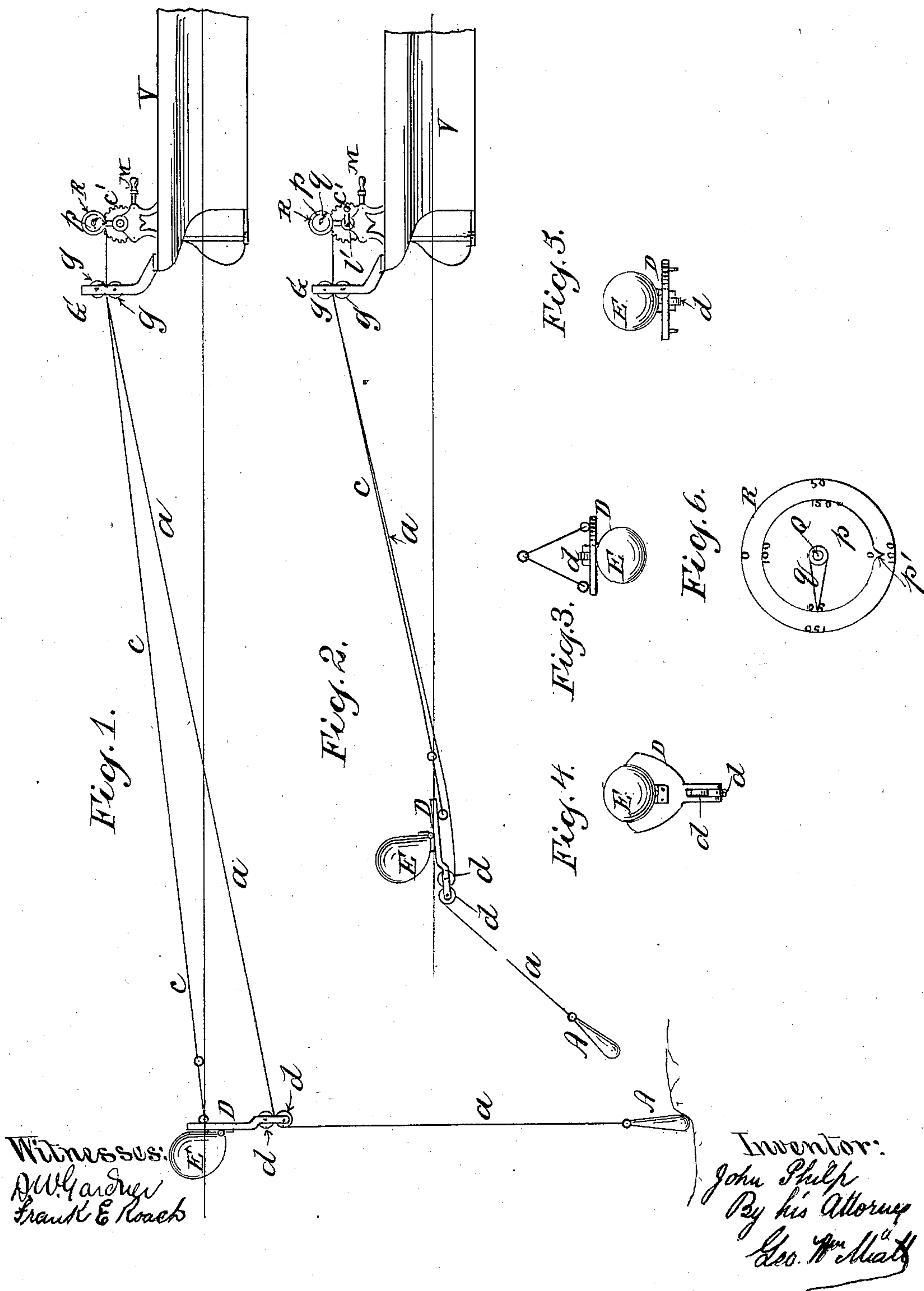
No. 756,887.

PATENTED APR. 12, 1904.

J. PHILP.
SOUNDING APPARATUS.
APPLICATION FILED JULY 10, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

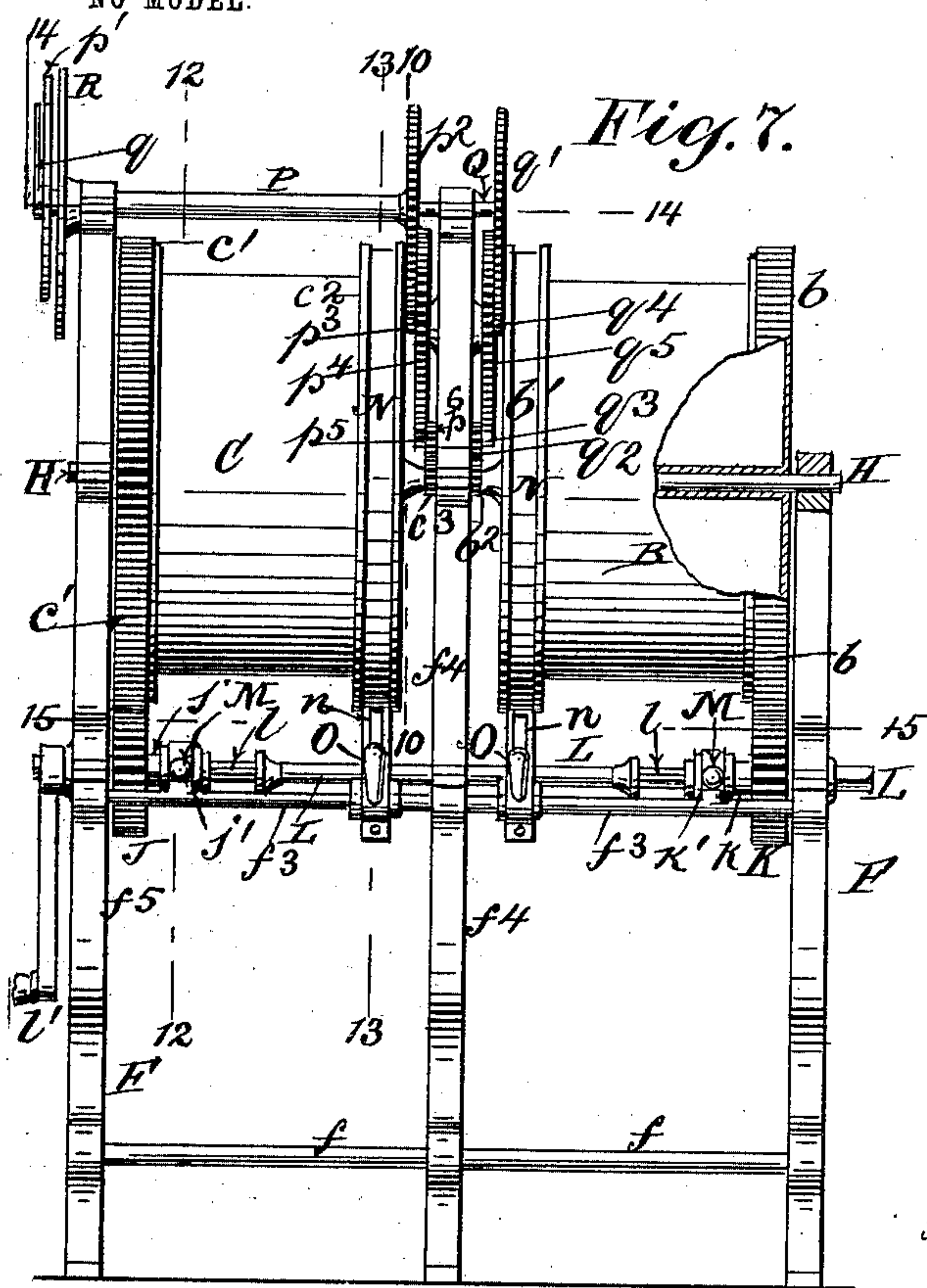


Fig. 7.

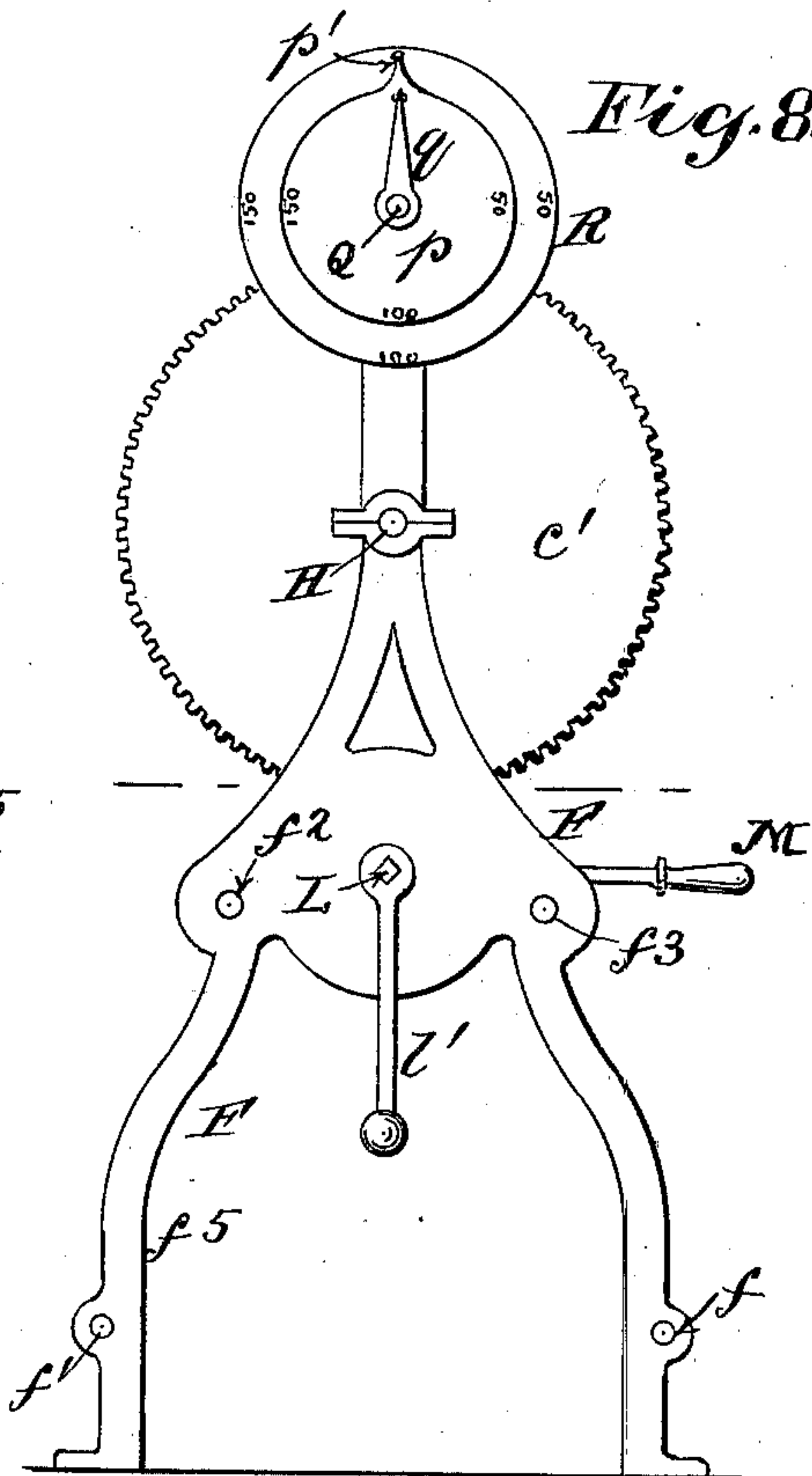


Fig. 8.

Fig. 9.

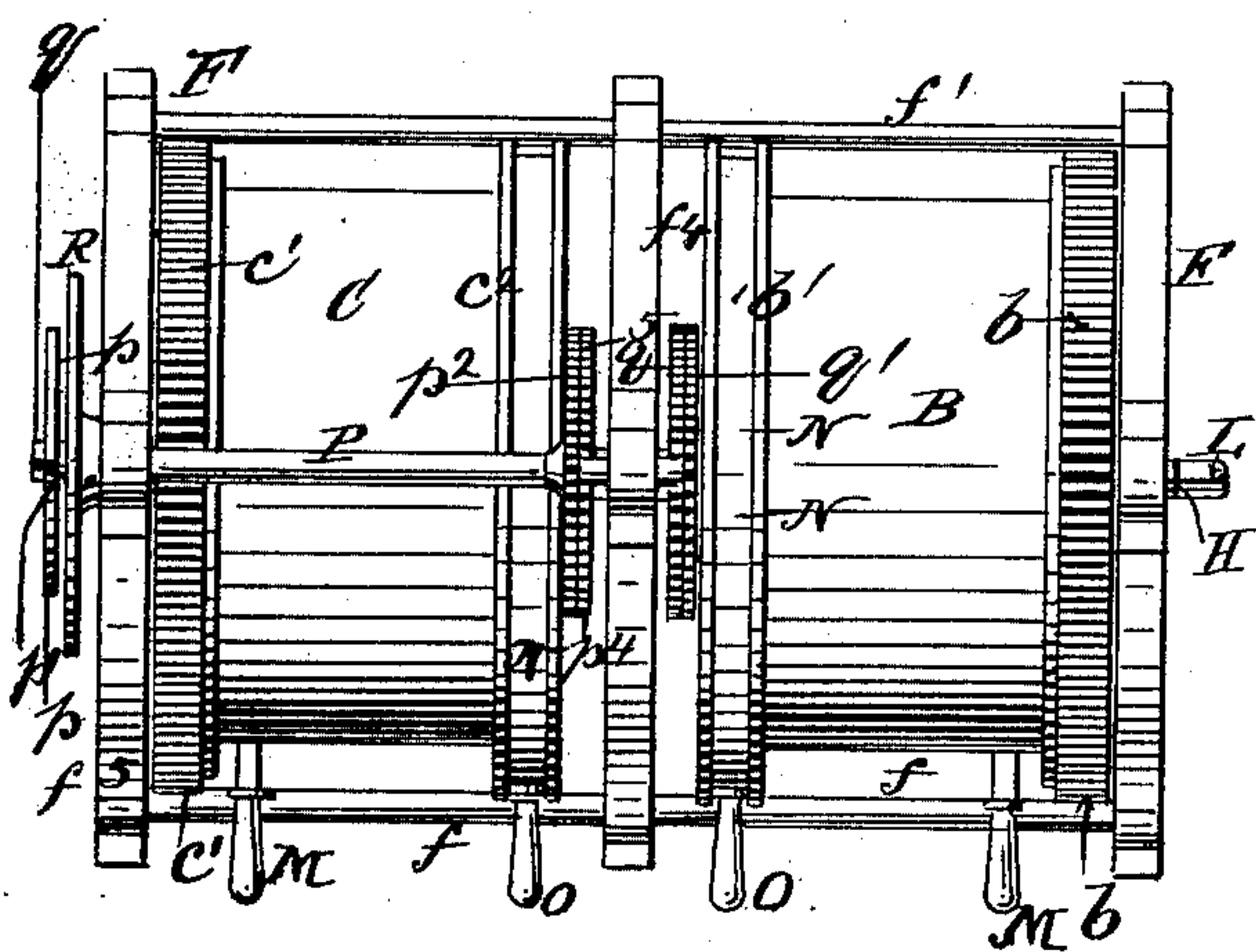


Fig. 10.

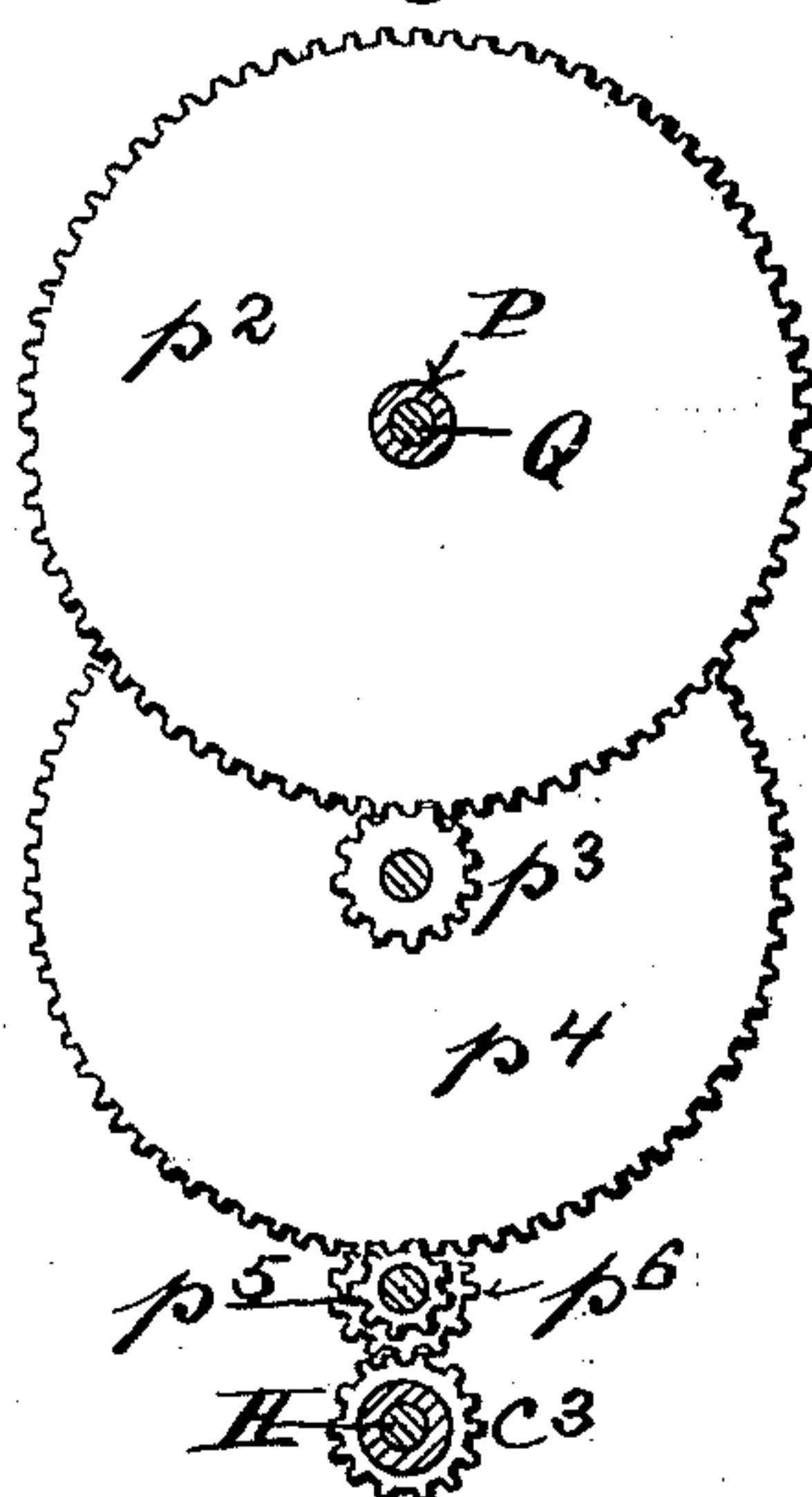
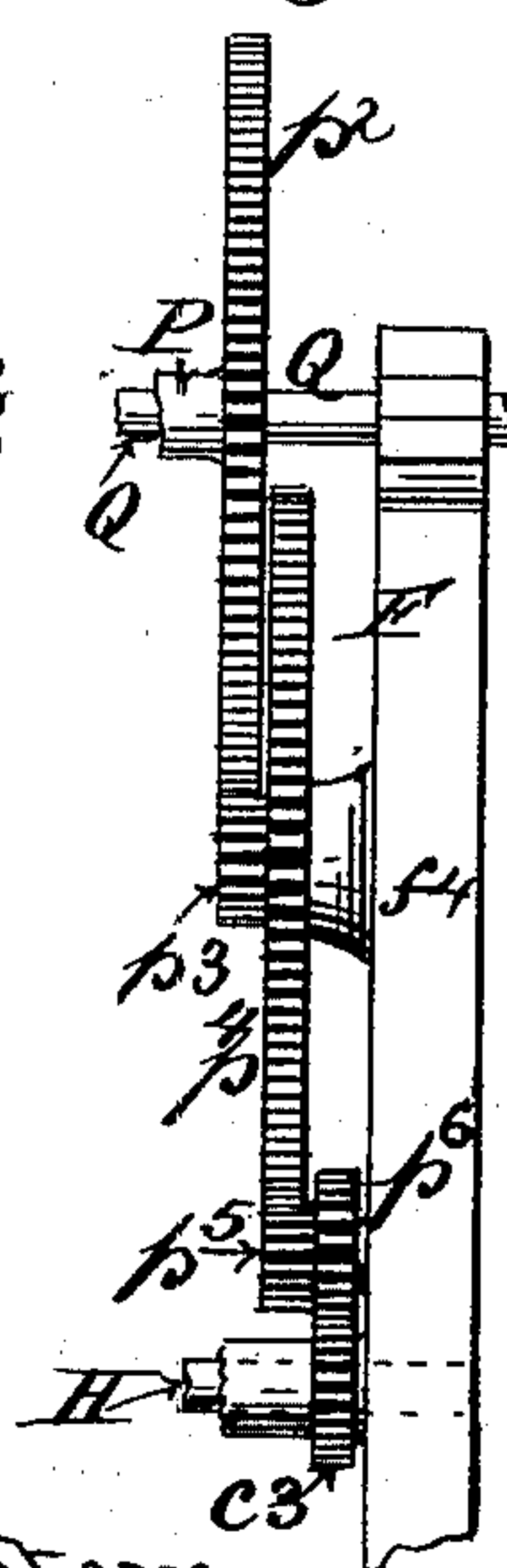


Fig. 11.



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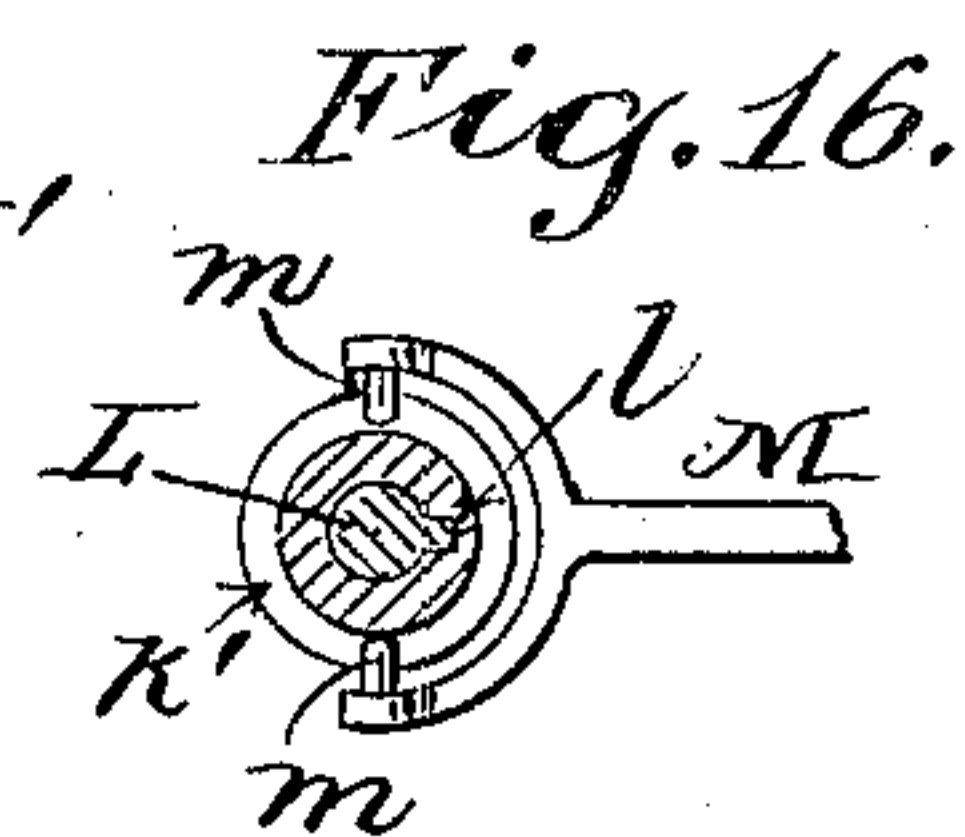
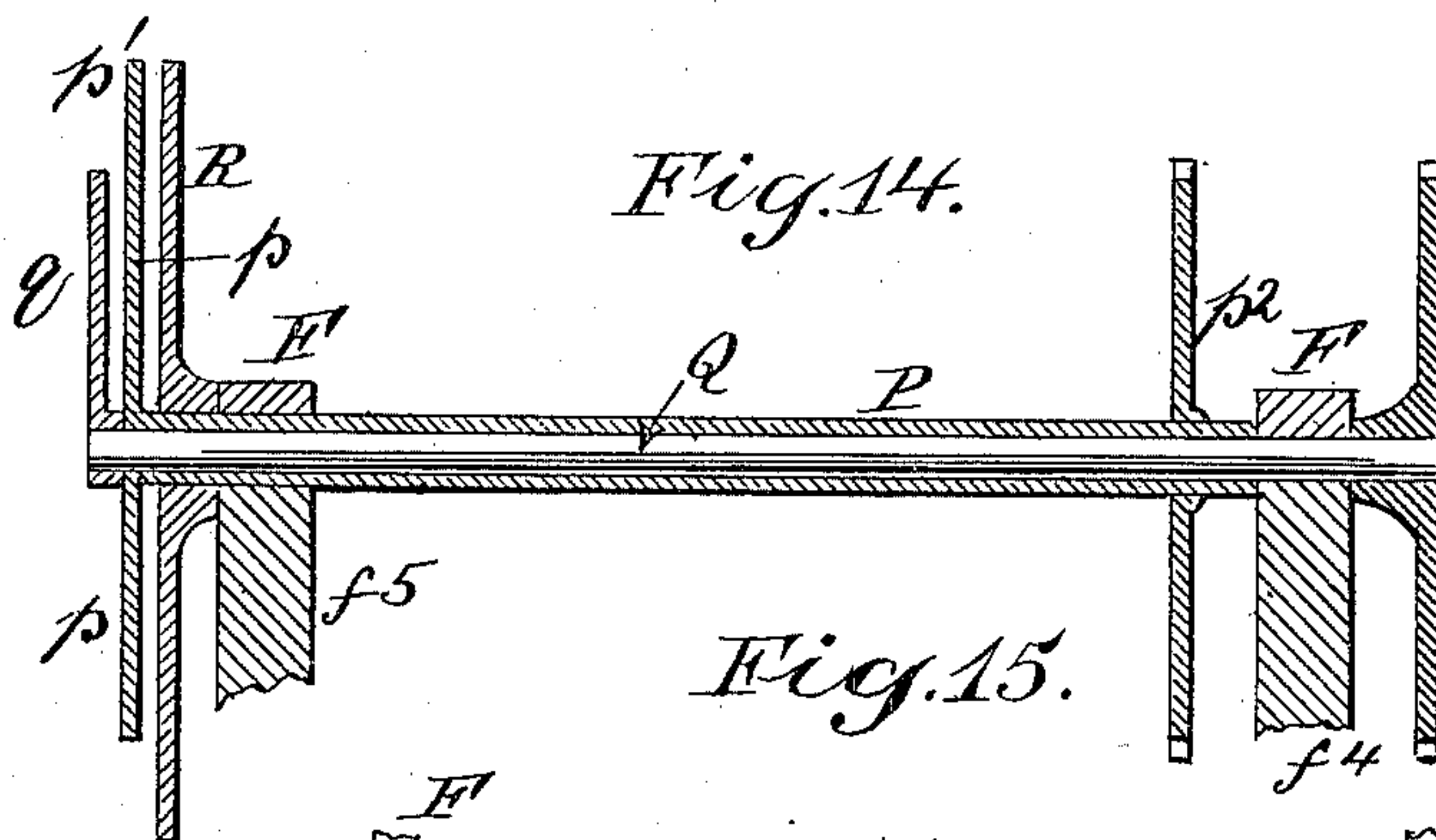
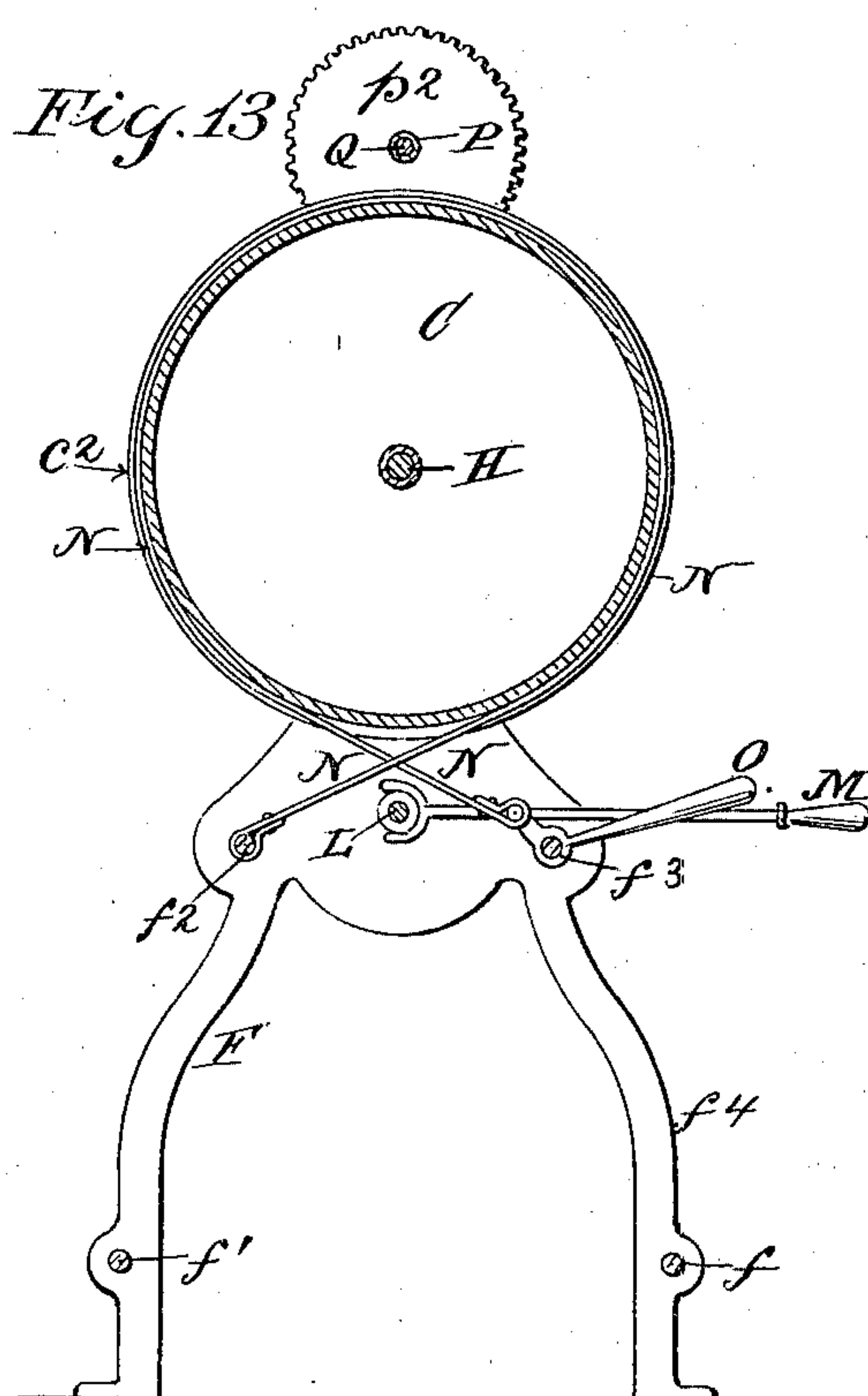
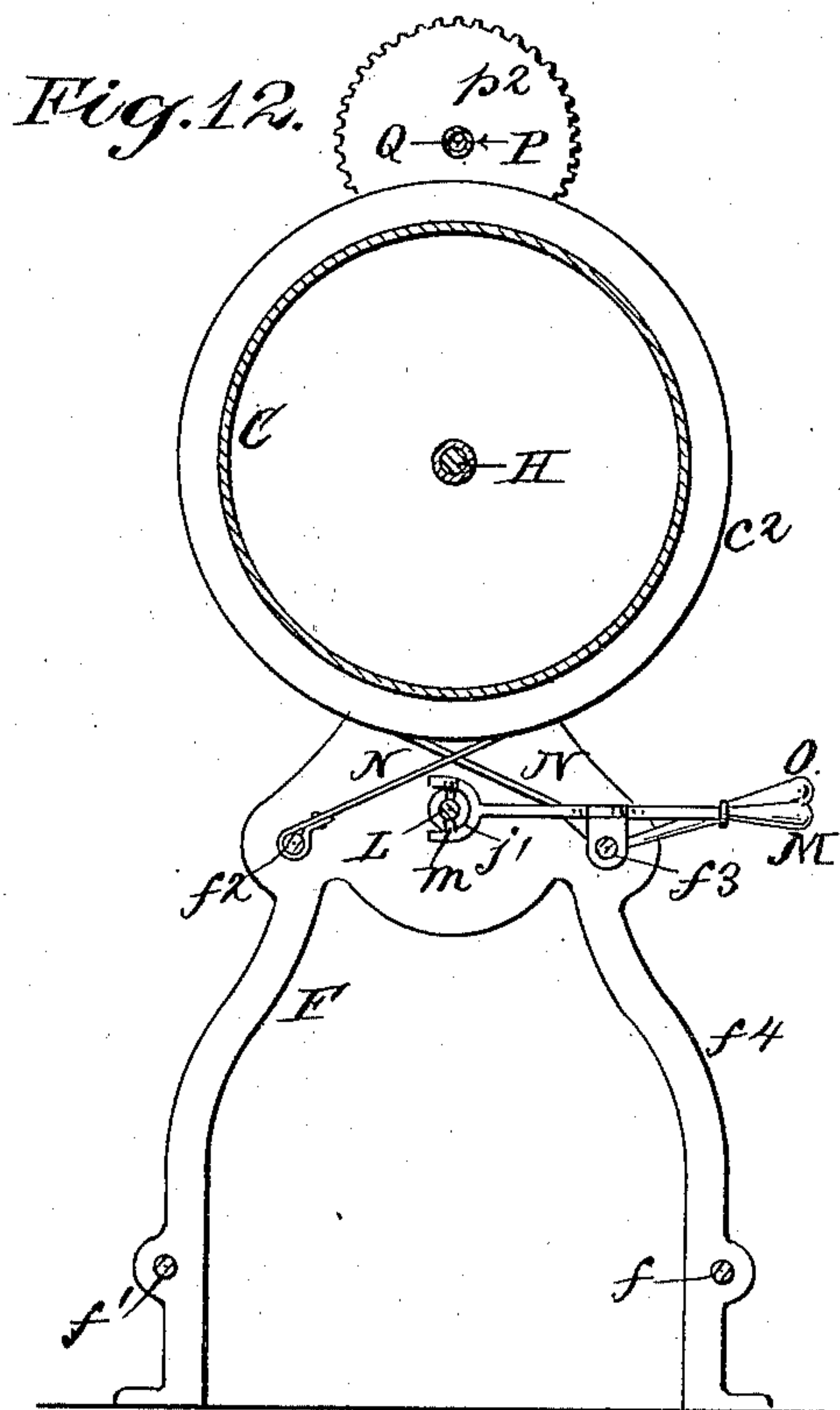
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN PHILP, OF NEW YORK, N. Y.

SOUNDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 756,887, dated April 12, 1904.

Application filed July 10, 1903. Serial No. 164,963. (No model.)

To all whom it may concern:

Be it known that I, JOHN PHILP, a citizen of the United States, residing in the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Sounding Apparatus, of which the following is a specification sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

The purpose of this invention is to afford means by which soundings may be made with accuracy in a vertical line at right angles to the course of a vessel while the latter is traveling at full speed and whereby the distance traveled from the point of sounding and the depth of the latter will be indicated automatically, so as to be easily read at a glance.

The invention consists in the combination and arrangement of parts whereby certain results hereinafter set forth are attained.

In the accompanying drawings I illustrate apparatus suitable for use in the practical application of my invention, although I do not wish to confine myself to the identical form and construction of parts shown, since various modifications and substitutions of the several devices employed may be resorted to with like result and without departing from the spirit and intent of my invention.

Figure 1 is a diagrammatic view illustrating my improved sounding device in the act of effecting a sounding. Fig. 2 is a similar view illustrating the position of parts after the sounding is made and while the anchor-board, sounding-weight, &c., are being returned to the vessel. Fig. 3 is a top view of the float-anchor board when in a vertical position; Fig. 4, a rear view of the same when in a vertical position; Fig. 5, a rear or top view of the float-anchor board when the same is nearly a substantially horizontal position, as in Fig. 2. Fig. 6 is a diagram illustrating the relative positions of the dials in indicating a sounding. Fig. 7 is a front view of my duplex reeling device; Fig. 8, an end elevation of the same; Fig. 9, a top view thereof. Fig. 10 is a sectional view, upon an enlarged scale, taken upon plane of line 10 10, Fig. 7, showing the indicator-gearing. Fig. 11 is an elevation of the

parts shown in Fig. 10; Fig. 12, a section upon plane of line 12 12, Fig. 7; Fig. 13, a section upon plane of line 13 13, Fig. 7; Fig. 14, a horizontal section upon plane of line 14 14, Fig. 7. Fig. 15 is a horizontal section upon plane of line 15 15, Fig. 7. Fig. 16 is a section upon plane of line 16 16, Fig. 15.

In the drawings, A represents a sounding weight or "lead" of any ordinary or desired construction attached to the sounding-line a , attached to the reel B, mounted in the reel-frame F. The sounding-line a passes between rollers g , mounted in a stationary support G on the marine vessel V and also between rollers d d , mounted upon the float-anchor board D.

The float-anchor board D is connected by the line c with the reel C and carries a float E, hinged to what may be designated as its "upper" or "rear" surface, according to the position which said float-anchor board assumes in use, as hereinafter described.

The float E is preferably hinged to the float-anchor board D above the center of the latter or above its center of gravity, so as to cause the said anchor-board to assume a substantially vertical position, as indicated in Fig. 1, during the descent of the sounding-weight A.

By the term "float-anchor board" I do not necessarily intend to limit myself to a structure of wood, since the "board" so called may be made of any suitable material and of any desired form that will afford the necessary superficial resistance to the water, as hereinafter set forth.

The reels B and C are preferably, though not necessarily, of the same size and mounted in a common frame F for convenience of manipulation, although they are entirely independent of each other in action in that each is free to rotate on its own axis. As shown in the drawings, they are supported upon a stationary horizontal axle H, mounted in the frame F.

The reel B is provided with the gear-wheel b and brake-wheel b' , either formed therewith or rigidly attached thereto. In like manner the reel C is provided with the gear-wheel c' and brake-wheel c'' . f f' are rods uniting the upright members of the duplex frame F, which is also reinforced by the rigid axle H. L is a

power-shaft suitably mounted in the frame F and carrying pinions J and K, adapted to mesh with the wheels b and c' , respectively. These pinions J and K are respectively formed with
 5 or attached to sleeves j and k , sliding on splines l , on the power-shaft L, which latter is actuated by a crank l' or by any other mechanical expedient. The pinions J and K are slid into
 10 or out of engagement with the cog-wheels b and c' , respectively, by means of hand-levers M, provided with bifurcated ends having pins m , which rest in the annular grooves j' and k' , respectively.

Brake-straps N are secured at one end to the
 15 cross-bar f^2 , pass around the brake-wheels c^2 and b' , respectively, and are then secured to hand-levers O, pivotally supported on the cross-bar f^3 , as will be seen more particularly by reference to Fig. 13.

20 In order to admit of the end portions of each brake-strap crossing below the reel without disturbing the alinement of the strap, one end portion of each brake-strap is formed with a slot n , through which the other end portion, reduced in width, passes, as indicated in Fig. 15.

25 P (see Fig. 14) is a hollow shaft or sleeve rotatable upon an inner shaft Q, which is also rotatable. The two are supported in bearings on the frame F, the inner shaft Q upon the central upright f^4 of the frame and both
 30 upon the left-hand upright f^5 of said frame. The inner shaft has rigidly attached to its outer extremity a pointer or index-finger q . The sleeve-shaft P has rigidly attached to its
 35 outer end a dial p , also formed with a peripheral index-finger or pointer p' . Concentric with the shafts P and Q and rigidly attached to the standard f^5 or other stationary part of the apparatus is what may be designated as the
 40 "anchor-line" dial R. The dial p upon the hollow shaft P may be designated as the "sounding-line" dial.

The inner end of the hollow shaft P carries a gear-wheel p^2 , which is connected, through
 45 the medium of suitably-proportioned intermediate gearing, with the pinion c^3 upon the hub of the anchor-line reel C. Thus, as illustrated clearly in Figs. 10 and 11, the gear-wheel p^2 may mesh with a pinion p^3 , attached
 50 to and rotating with an idler p^4 , mounted upon a stud projecting from the central standard f^4 , said idler p^4 in turn meshing with a pinion p^5 , secured to a second idler p^6 , mounted upon another stud projecting from the central stand-
 55 ard f^4 , the last-named idler p^6 meshing with the pinion c^3 on the hub of the anchor-line reel C. A corresponding or duplicate set of gearing consisting of the pinion and idlers q^2 and q^3 and the pinion and idlers q^4 and q^5 may
 60 be interposed between the gear-wheel q' , attached to the inner shaft Q, and the pinion b^2 upon the hub of the sounding-line reel B, although I do not limit myself to this particular arrangement of gearing, since it is obvious
 65 that like results may be accomplished by the

substitution of other chains of gearing relatively proportioned to indicate the length of line played out from the sounding-reel B and the anchor-line reel C, respectively.

My improved sounding apparatus is used as
 70 follows: The float-anchor board D and sounding-weight A are dropped over the stern of the moving vessel after the pinions J and K have been thrown out of engagement with the
 75 wheels b and c' by means of the hand-levers M M, thus allowing the reels B C to rotate freely upon the rigid axle H, while the sounding-line a and float-anchor board D play out. Upon striking the water the float-anchor board
 80 D assumes a vertical or practically vertical position, the hinged float E sustaining it at the surface against the pull of the sounding-weight A, since it is to be remembered that the said float E is hinged to the anchor-board D above
 85 the center of gravity of the latter and that consequently the said sounding-weight A when unsupported tends constantly to maintain the sounding-board in a vertical position against the resistance of the float E, as illustrated in
 90 Fig. 1, in which position the anchor-board D affords the greatest resistance to the water. Under these conditions, as I have found by
 95 actual experience, with the vessels traveling at any or full speed the anchor-board is practically held stationary in one place, since both the sounding-line a and the anchor-float line
 100 c run freely from their respective reels B and C. Hence the sounding-line a by reason of the sounding-weight A will play out faster than the anchor-board line and will drop ver-
 105 tically through the water until it touches bottom, as indicated in Fig. 1. As the two lines play out they rotate their respective reels upon the axle H, and thereby set in operation the
 110 trains of gearing hereinbefore described, the pointer p' upon the dial p , attached to the hollow shaft P, pointing out upon the stationary dial R the distance of the vessel from the
 115 anchor-board D, while the pointer q upon the inner shaft Q indicates upon the dial p the vertical drop of the sounding-line. Thus the actual depth of the sounding may be quickly
 120 seen and noted, when the brake-straps N may be applied by means of the hand-levers O and the rotation of the reels B C stopped. For
 125 instance, suppose the vessel to have traversed one hundred fathoms from the anchor-board when the sounding-weight touches bottom and that the vertical drop of the sounding-line has been fifty fathoms. Under these conditions
 130 the anchor-line reel C has played off one hundred fathoms of line, while the sounding-line reel has played off one hundred and fifty. The dial p in carrying its pointer p' to the one-
 135 hundred-fathom mark on the stationary anchor-line dial R has traveled one-half a revolution, as shown in Fig. 6. In the meantime the pointer q has traveled three-quarters of a
 140 circle, bringing it opposite the fifty-fathom mark on the dial p , thus indicating the exact

number of fathoms the sounding-line has played out in excess of the length of anchor-line played out, and consequently indicating the depth of sounding visually and without need of comparison or calculation. When the brakes are thus applied to the reels, the anchor-board D and sounding-weight will obviously drag, owing to the uninterrupted movement of the vessel, and will assume approximately the positions indicated in Fig. 2, the anchor-board sliding over the surface of the water in a nearly horizontal position and presenting the minimum of resistance while both lines are being rewound upon their reels. This latter operation is accomplished by throwing the pinions J and K again into gear with the wheels *b c'* by means of the hand-levers M M, releasing the brake-bands N N, and rotating the power-shaft L in the opposite direction by means of the crank *L'* or other mechanical expedient, thereby returning the parts to their original positions, when the apparatus is again ready for immediate use, if desired, and may be so used continuously or intermittently, as may be found expedient, without the need of any preparatory manipulation, substitution, or renewal of parts.

The main advantage attained by my invention is that by the use of my apparatus true vertical soundings can be taken without reducing the speed of the vessel, a result never heretofore attained in so far as I am aware. Another important feature is the immediate indication of the sounding as soon as made by the use of duplex dial and pointing mechanism, substantially as set forth.

It is to be noted that by my method and apparatus the sounding is made and indicated automatically and the record thereof held and maintained until lengths of both lines have been rewound upon their respective reels equal to the distance attained between the anchor-board and the ship, since the moment the sounding-weight A reaches the bottom and is supported thereby both the dial *p* and the pointer *p'* will travel together, and their relative positions will be maintained until the anchor-board is drawn back to the vessel, so that the depth of sounding may be read until the anchor-board is brought to rest, when the difference or excess of line representing the actual sounding will be taken up, it being understood that when the anchor-board line *c* is fully wound upon the reel C that the pinion J is thrown out of engagement with the wheel *c'*, so that the excess or additional length of sounding-line *a* may be wound upon the reel B. The arrival of the pointer-dial *p'* at zero on the movable dial *p* is a sure indication that the anchor-board and weight are out of water and all the parts in their normal positions ready for reuse in effecting another sounding.

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

1. In sounding apparatus, the combination of a float-anchor secured to a line attached to a reel, said reel, a sounding-weight attached to a line passing over a roller or other bearing upon the said anchor-float and secured to a reel, said reel, and means for operating said reels for the purpose and substantially in the manner described.

2. In sounding apparatus, the combination of a float-anchor secured to a line attached to a reel, said reel, a sounding-weight attached to a line passing over a roller or other bearing upon the said anchor-float and secured to a reel, said reel, means for operating said reels, and means for independently and automatically indicating the lengths of the float-anchor line and of the sounding-line played out, substantially as set forth.

3. In sounding apparatus, the combination with a reel and mechanism for operating the same, of a line attached to said reel at one extremity and to a float-anchor at the other extremity, said float consisting of an anchor-board to which is hinged a float and which is formed with a roller or bearing over which the sounding-line passes, said sounding-line attached to a sounding-weight at one extremity and to a reel at the other extremity, said reel and mechanism for operating the same, for the purpose set forth.

4. In sounding apparatus the combination of a reel and mechanism for operating the same, a line attached to said reel at one extremity and to a float-anchor at the other extremity, said float-anchor consisting of an anchor-board having a float hinged to its upper side above the center of gravity of said anchor-board and provided with a bearing over which the sounding-line passes, said sounding-line attached to a sounding-weight at one extremity and to a reel at the other, said reel and mechanism for operating the same, for the purpose and substantially in the manner set forth.

5. In sounding apparatus, the combination with an anchor-reel and mechanism for operating the same, of a line attached to said anchor-reel at one extremity and to a float-anchor at the other extremity, said float-anchor consisting of an anchor-board having a float hinged thereto and being provided with a roller or bearing over which the sounding-line passes, said sounding-line attached to a sounding-weight at one extremity and to a sounding-reel at the other extremity, said sounding-reel and mechanism for operating the same, and means for independently and automatically indicating the lengths of float-anchor line and of sounding-line played out, substantially as set forth.

6. In sounding apparatus, the combination of the sounding-line *a*, and weight A, anchor-board D, having the hinged float E, and sounding-line bearing *d*, independent reels for the

said sounding-line a , and anchor-board line c , together with means for operating said reels for the purpose and substantially in the manner set forth.

5 7. In sounding apparatus, the combination of the sounding-line a , and weight A, anchor-board D, having the hinged float E, and sounding-line bearing d , independent reels for the said sounding-line a , and anchor-board line c ,
10 means for operating said reels, and means actuated through the medium of said reels for automatically indicating the length of line played out, from each of said reels, for the purpose set forth.

15 8. In sounding apparatus, the combination with the sounding line and weight and with the float-anchor and its line, of an independent reel for each of said lines, each of said reels being provided with winding-gear, and with
20 a pinion which may be drawn in or out of engagement therewith, together with means for applying power to each reel through the medium of said gear and pinion, for the purpose set forth.

25 9. In sounding apparatus, the combination with the sounding weight and line, and with the float-anchor and its line, of an independent reel for each of said lines, each of said reels being provided with a winding-gear and with
30 a pinion which may be thrown in or out of engagement with said winding-gear, means for applying power to each reel through the medium of its said independent gear and pinion, and means for automatically indicating the
35 length of line played off from each reel, for the purpose set forth.

10. In sounding apparatus, the combination with the sounding weight and line, and with the float-anchor and its line, of an independent
40 reel for each of said lines, gearing for operating each of said reels independently, and means for braking each of said reels independently for the purpose set forth.

11. In sounding apparatus, the combination
45 of the sounding weight and line, and the float-anchor and its line, independent reels for each of said lines, said reels being supported so as to be independently rotatable on a common axis, means for operating and controlling said
50 reels, and means for indicating automatically and simultaneously the length of line played off from each reel, for the purpose set forth.

12. In sounding apparatus, the combination of the sounding weight and line, the float-anchor and its line, independent reels for each
55 of said lines, said reels being supported so as to be independently rotatable on a common axis, means for operating and controlling said reels, and means for indicating automatically
60 and simultaneously upon adjoining concentric

dials the length of line played off from each of said reels for the purpose set forth.

13. In sounding apparatus, the combination of the sounding weight and line, the float-anchor and its line, the reel C to which the float-anchor line is attached; formed with the pinion c^3 , intermediate gearing connecting said pinion c^3 indirectly with the gear p^2 , upon the hollow shaft P, said hollow shaft P, formed with the dial p , and pointer p' , the stationary
65 dial R, the reel B, to which the sounding-line is attached, formed with the pinion b^2 , intermediate gearing connecting said pinion b^2 , indirectly with the gear q' , upon the inner shaft Q, said inner shaft Q, formed with the pointer
70 q , and means for operating and controlling the said reels C and B, for the purpose set forth.

14. In sounding apparatus, the combination of the sounding-weight A, and line a , attached
80 to the reel B, said reel B, rotatable upon the stationary axis H, and formed with the gear-wheel b , and pinion b^2 , the float-anchor board D, provided with the hinged float E, and line-bearing d , over which the sounding-line a ,
85 passes, the float-anchor line c , attached to the reel C, said reel C, rotatable upon the stationary axis H, and formed with the gear-wheel c' , and pinion c^3 , the power-shaft L, the movable pinions J and K, supported thereon,
90 means for throwing said pinions into or out of engagement, respectively, with the gears b and c' , means for independently braking the reels B, C, the stationary dial R, the hollow shaft P, the dial p , pointer p' , and gear-wheel
95 p^2 , attached to said hollow shaft P, intermediate gears connecting said gear-wheel p^2 , indirectly with the pinion c^3 , on the reel C, the inner shaft Q, the pointer q , and gear-wheel q' , attached to said inner shaft Q, and intermediate
100 gears connecting the said gear-wheel q' , indirectly with the pinion b^2 , upon the reel B, for the purpose and substantially in the manner described.

15. In sounding apparatus, the combination
105 with independently-rotatable reels carrying respectively a sounding-line and a float-anchor line substantially as set forth, of concentric dials arranged to indicate relatively the difference in the length of line played out
110 from each reel through the medium of suitable gearing interposed between said reels and the pointers, whereby the depth of the sounding may be observed by comparison as herein described.

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