

(Model.)

2 Sheets—Sheet 1.

H. ABBOTT.
STEM WINDING AND SETTING WATCH.

No. 335,731.

Patented Feb. 9, 1886.

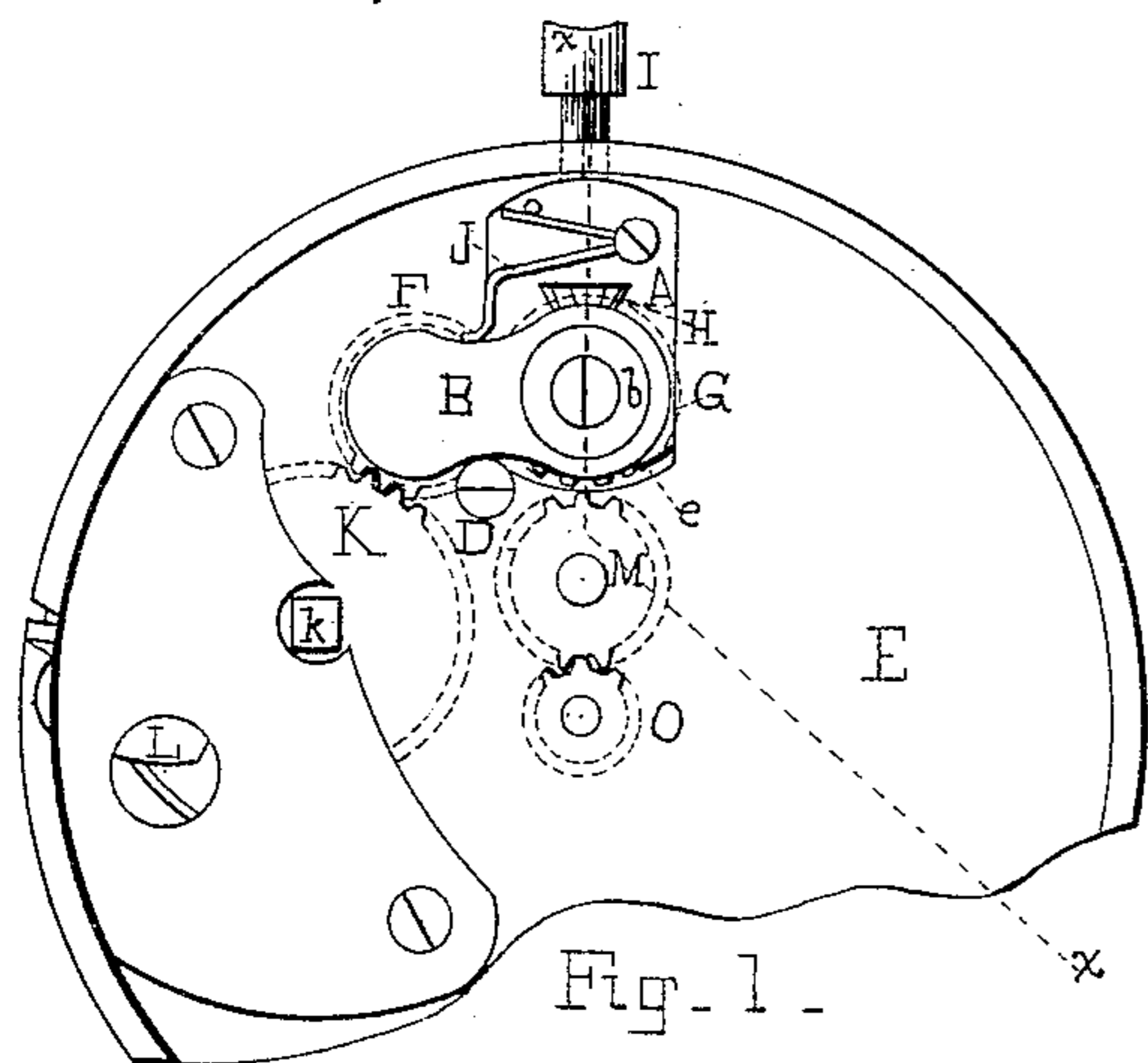


Fig. 1 -

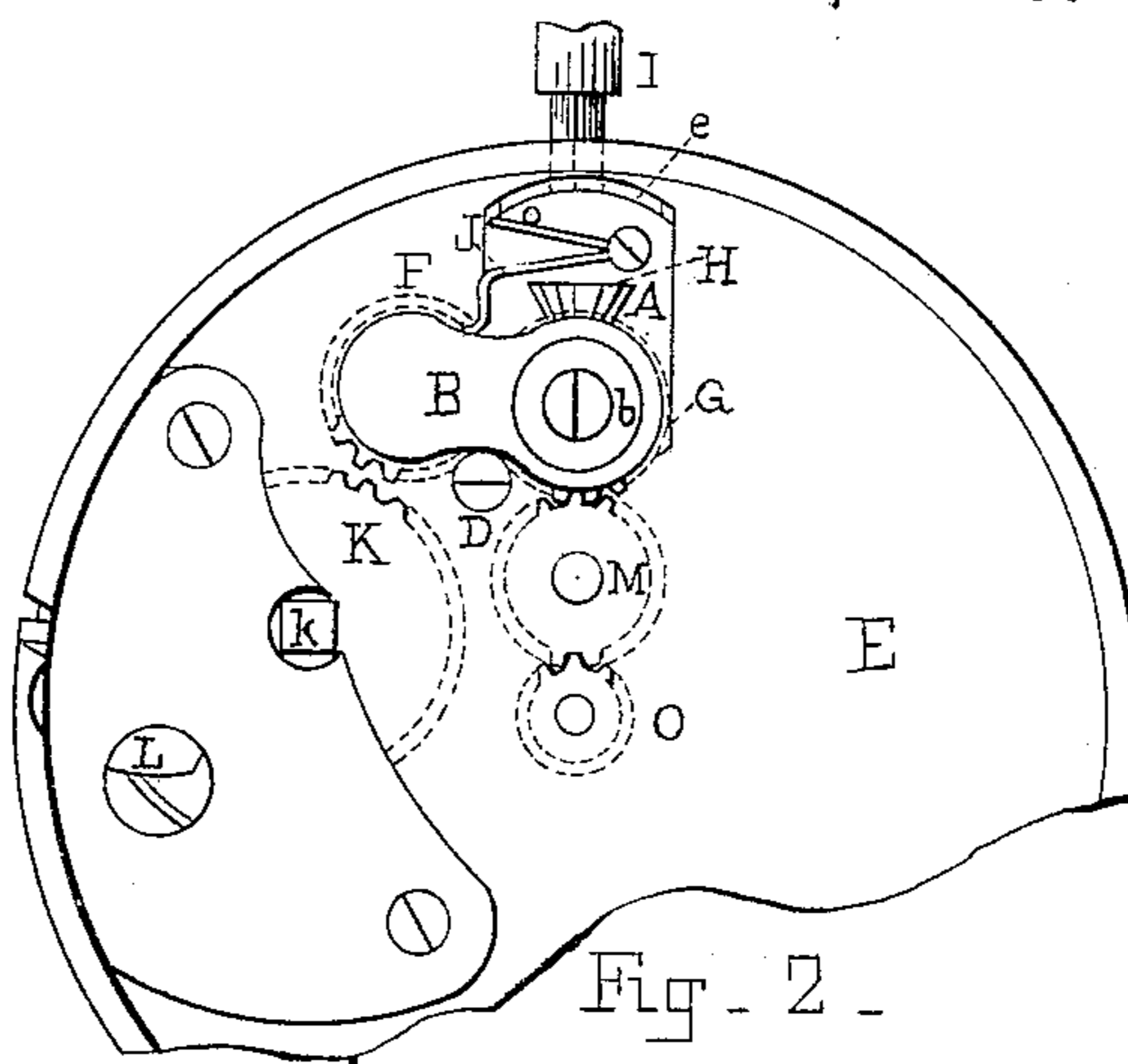


Fig. 2 -

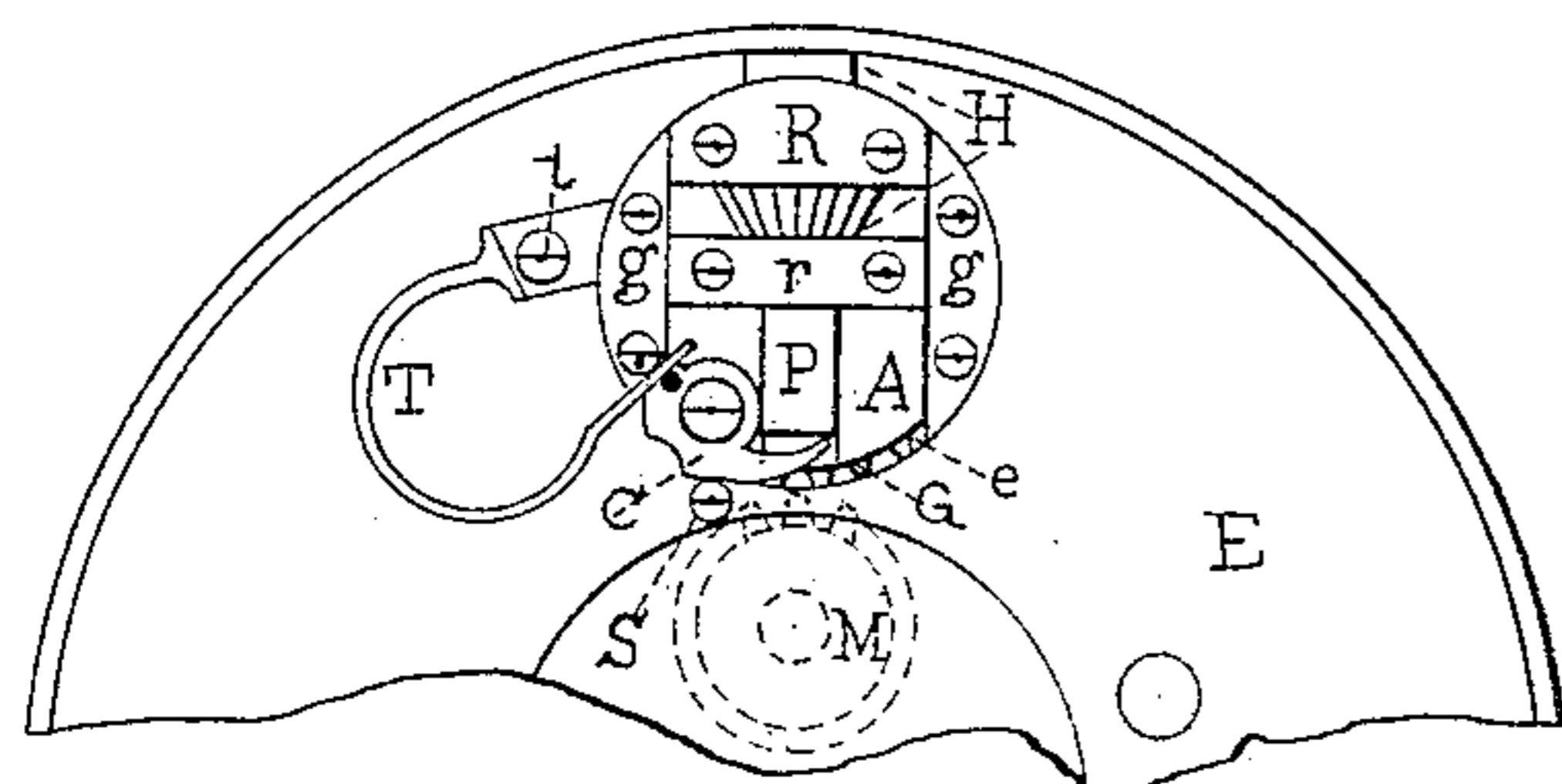


Fig. 3 -

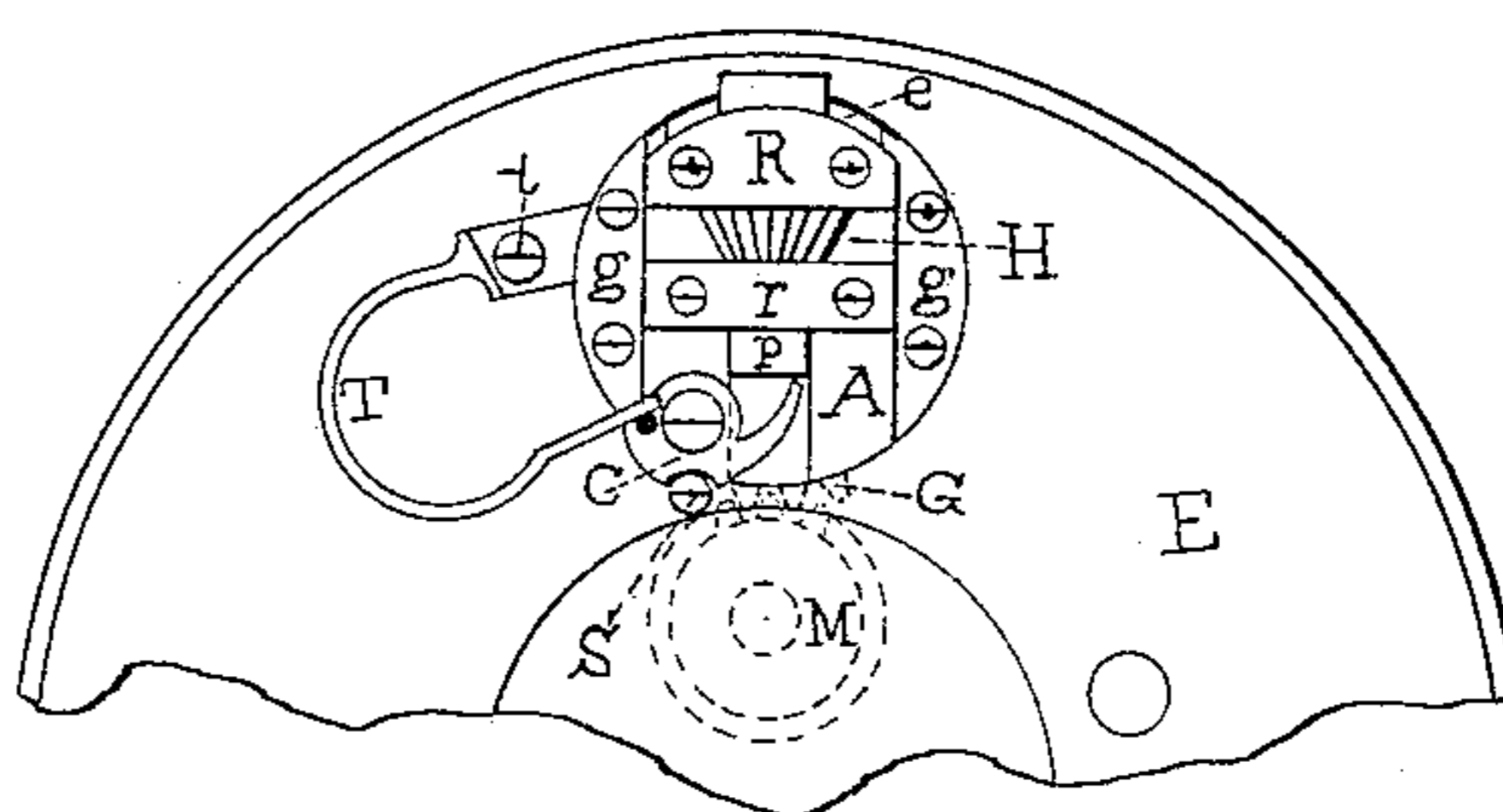


Fig. 4 -

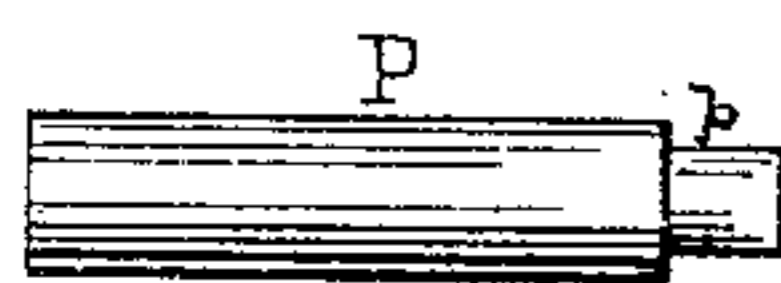


Fig. 10 -

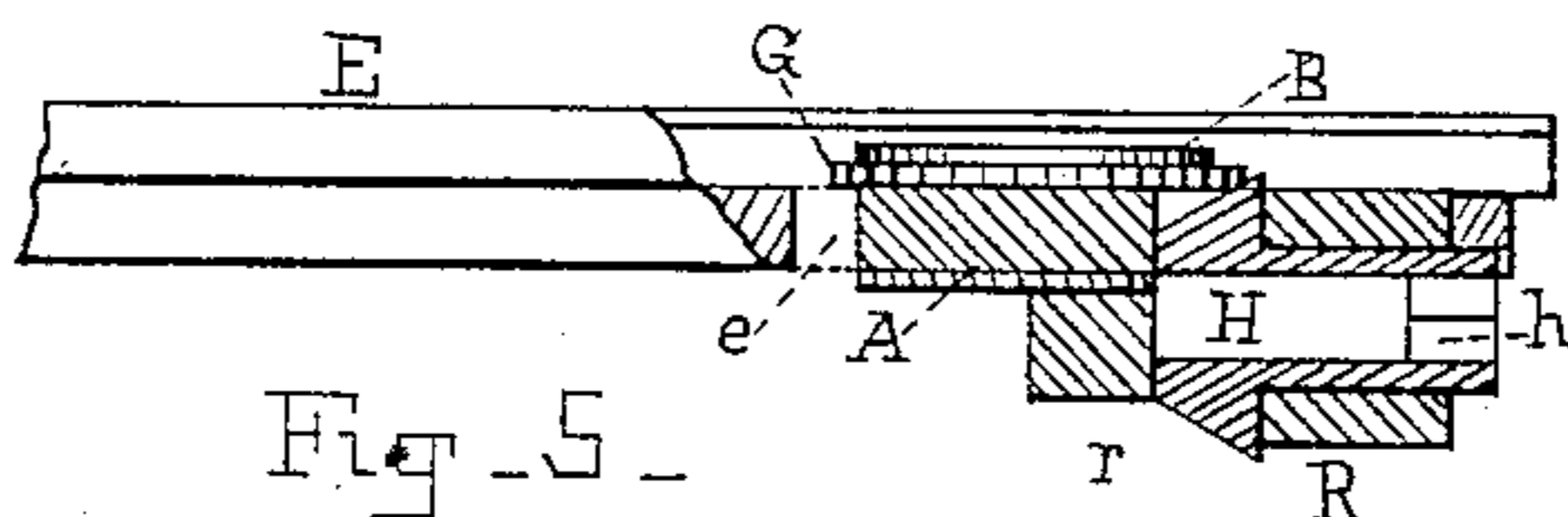


Fig. 5 -

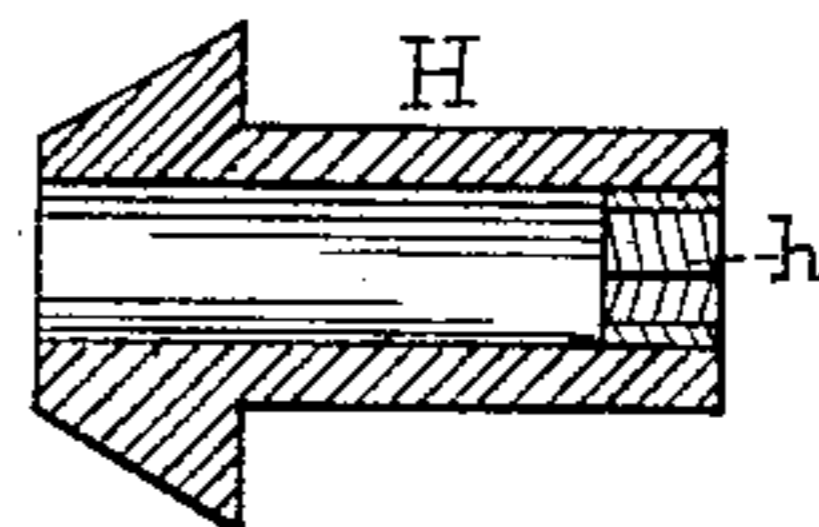


Fig. 11 -

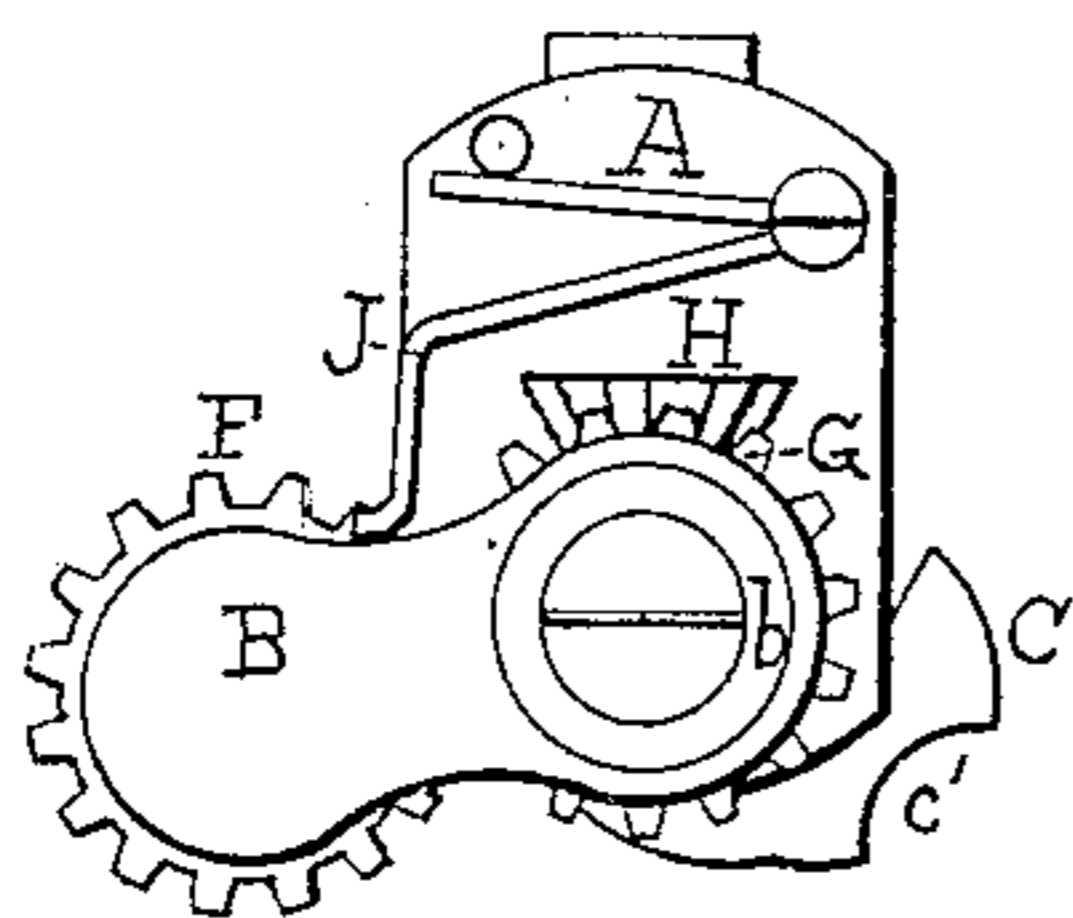


Fig. 6 -

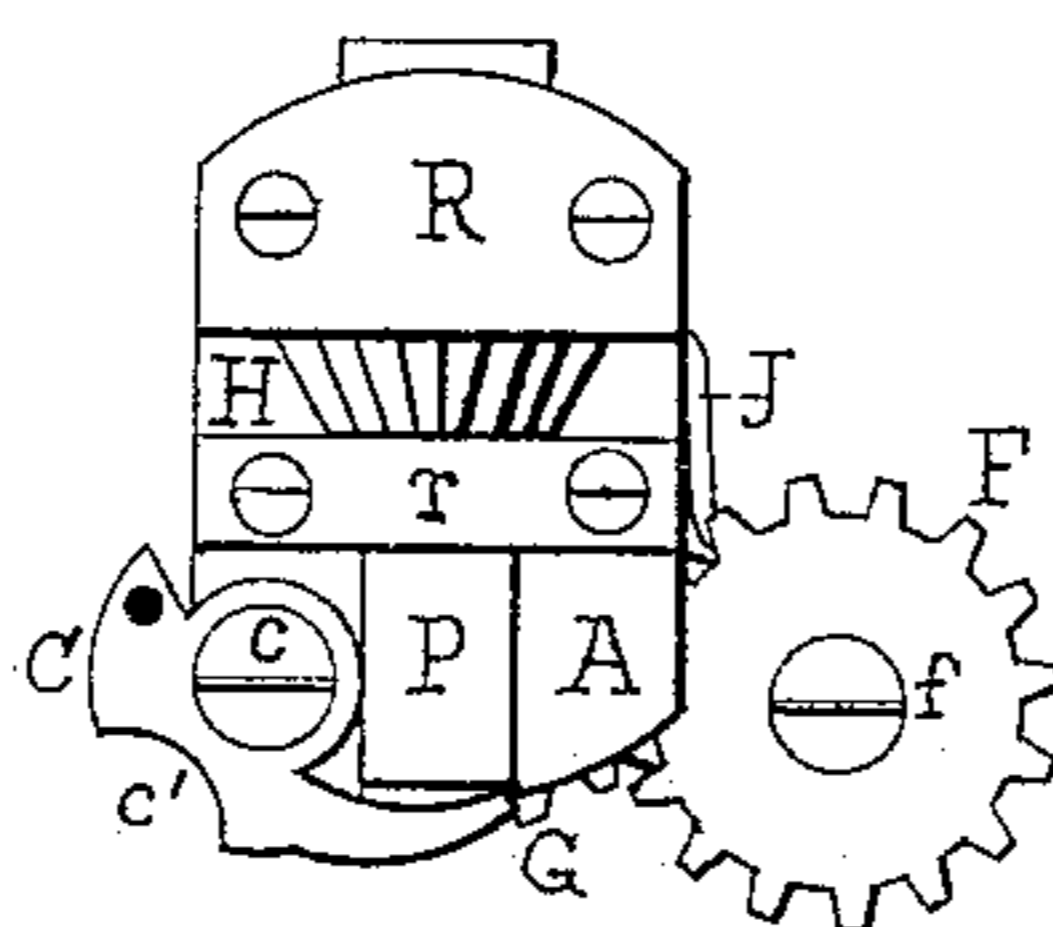


Fig. 7 -

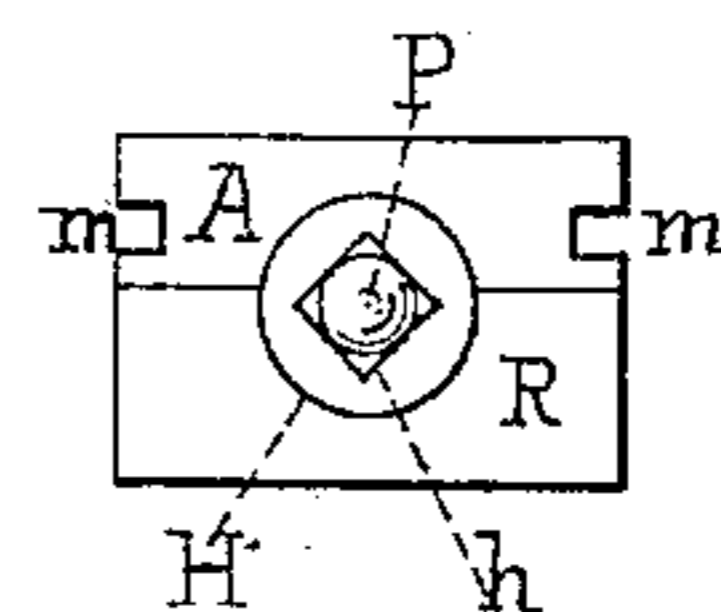


Fig. 8 -

Witnesses -

Charles F. Egler Jr
Albert Kamps

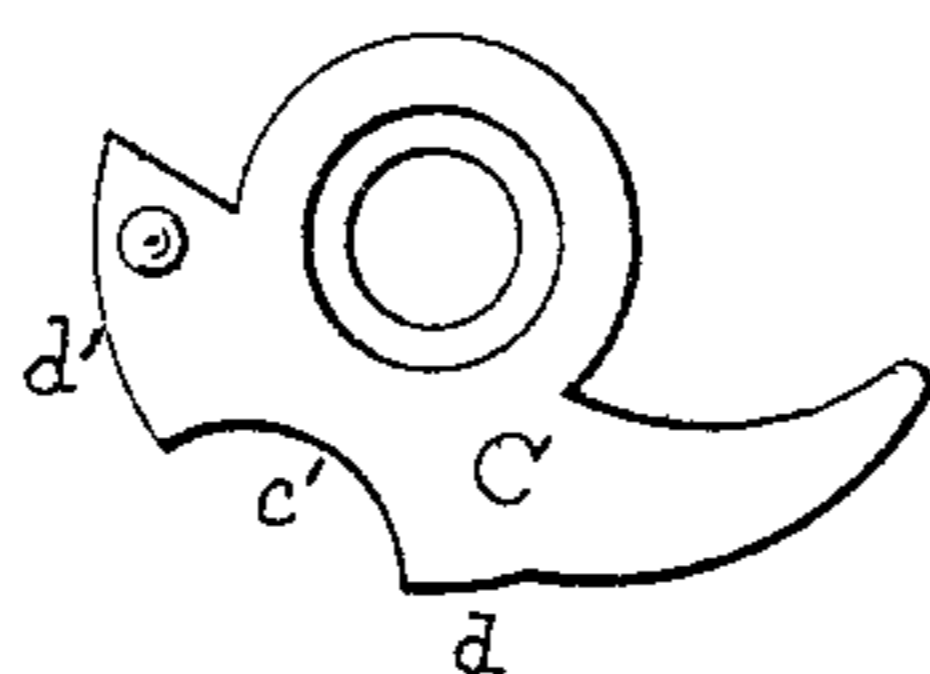


Fig. 9 -

Inventor -

Henry Abbott

(Model.)

2 Sheets—Sheet 2.

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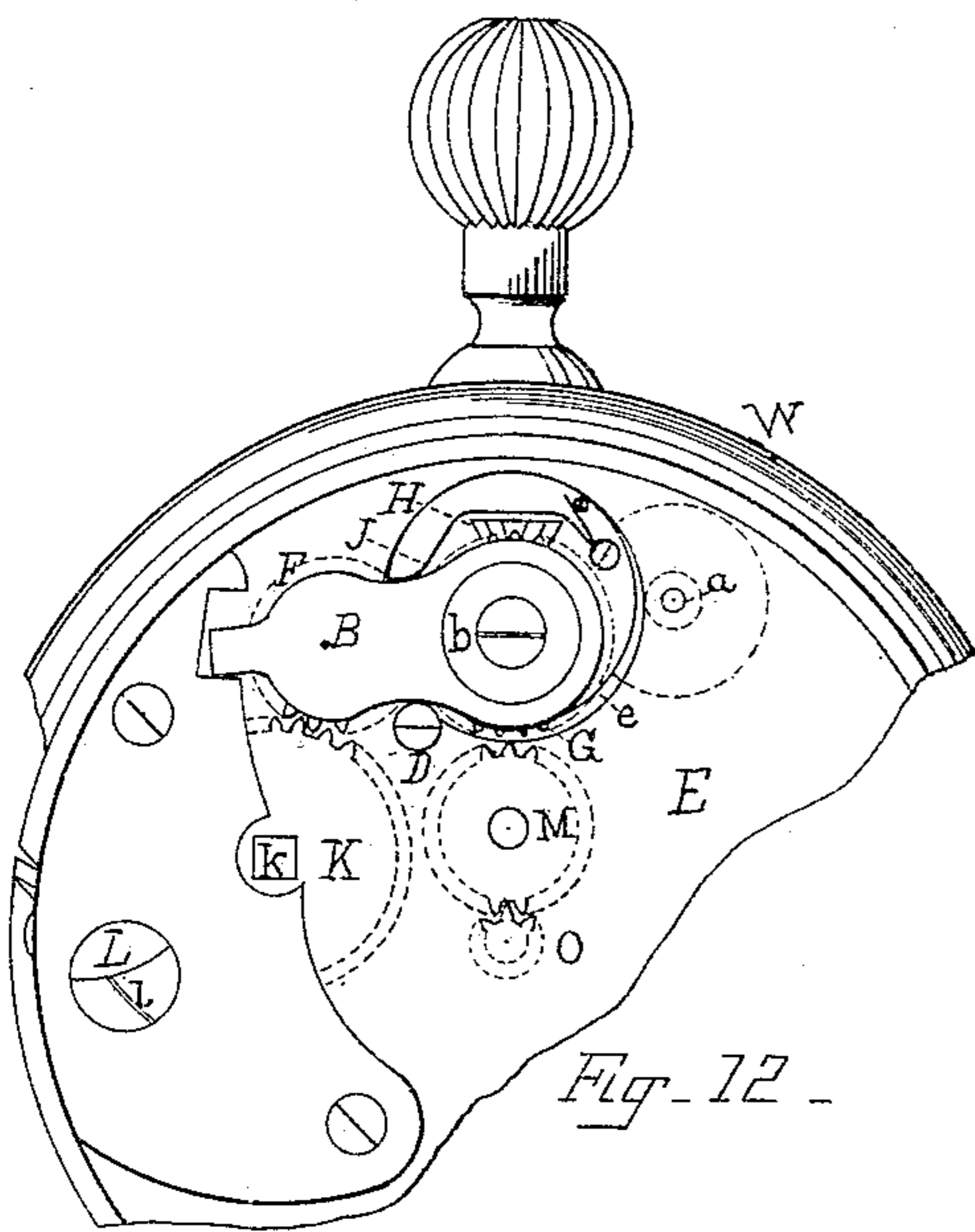


Fig. 12 -

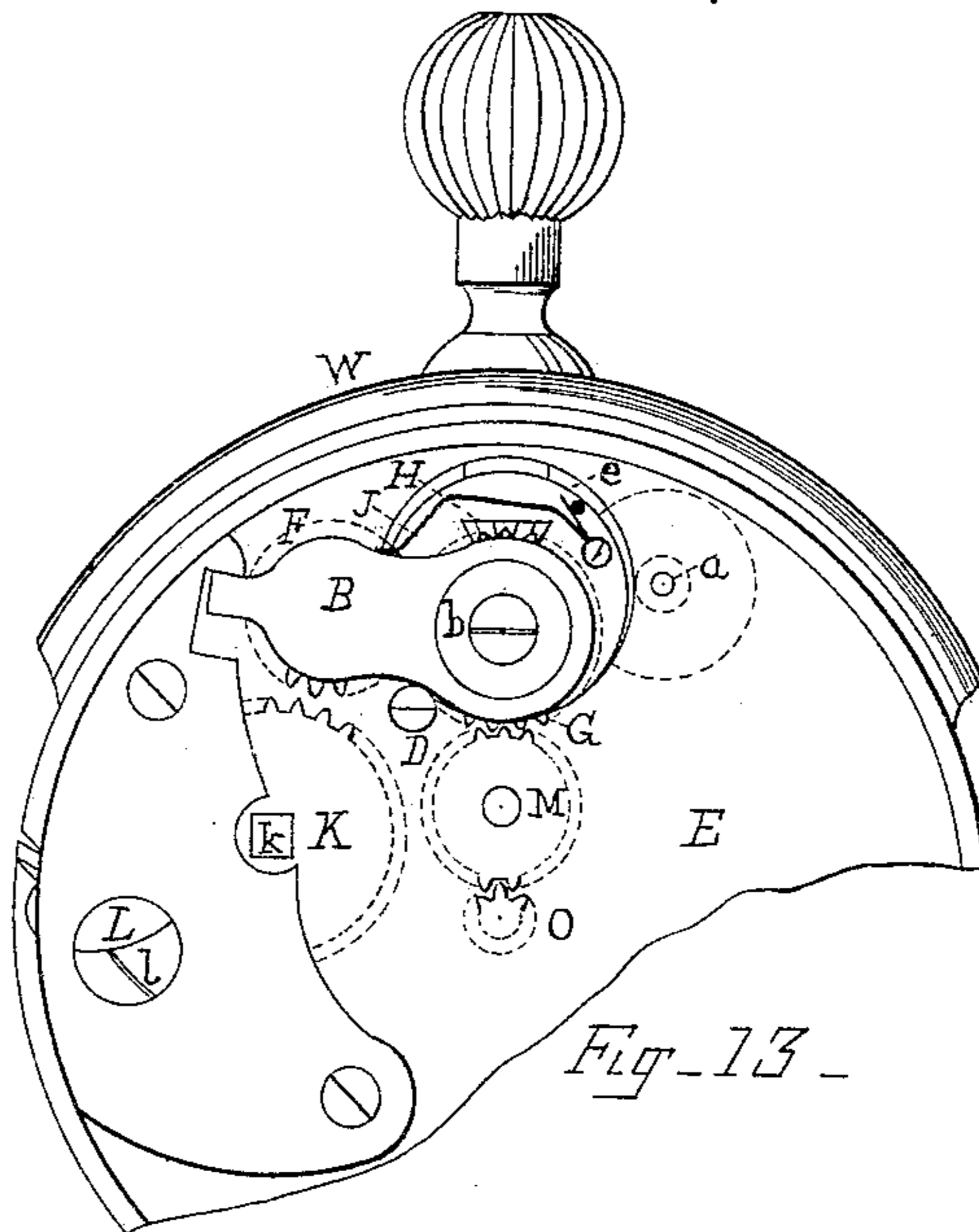


Fig. 13 -

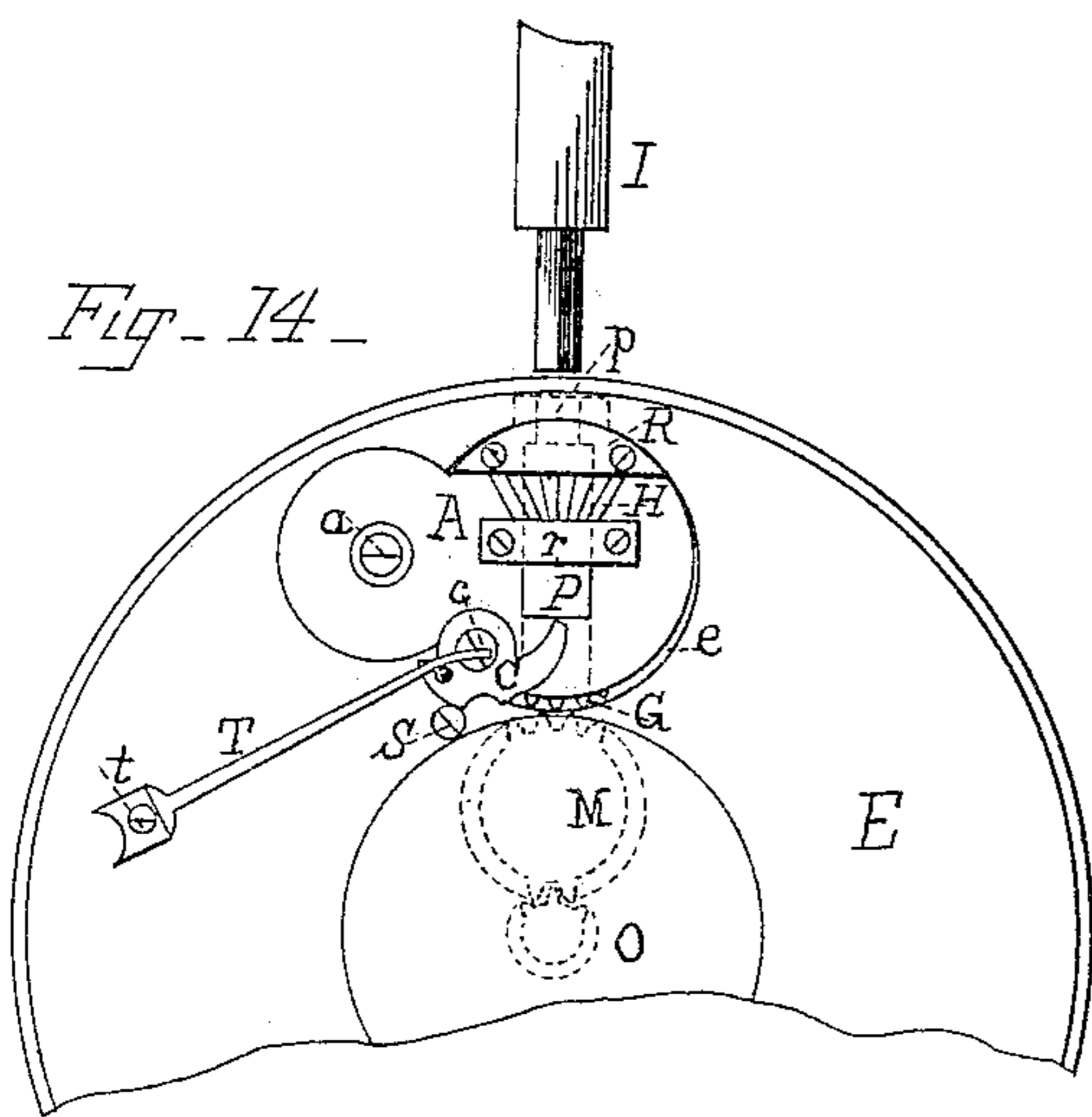


Fig. 14 -

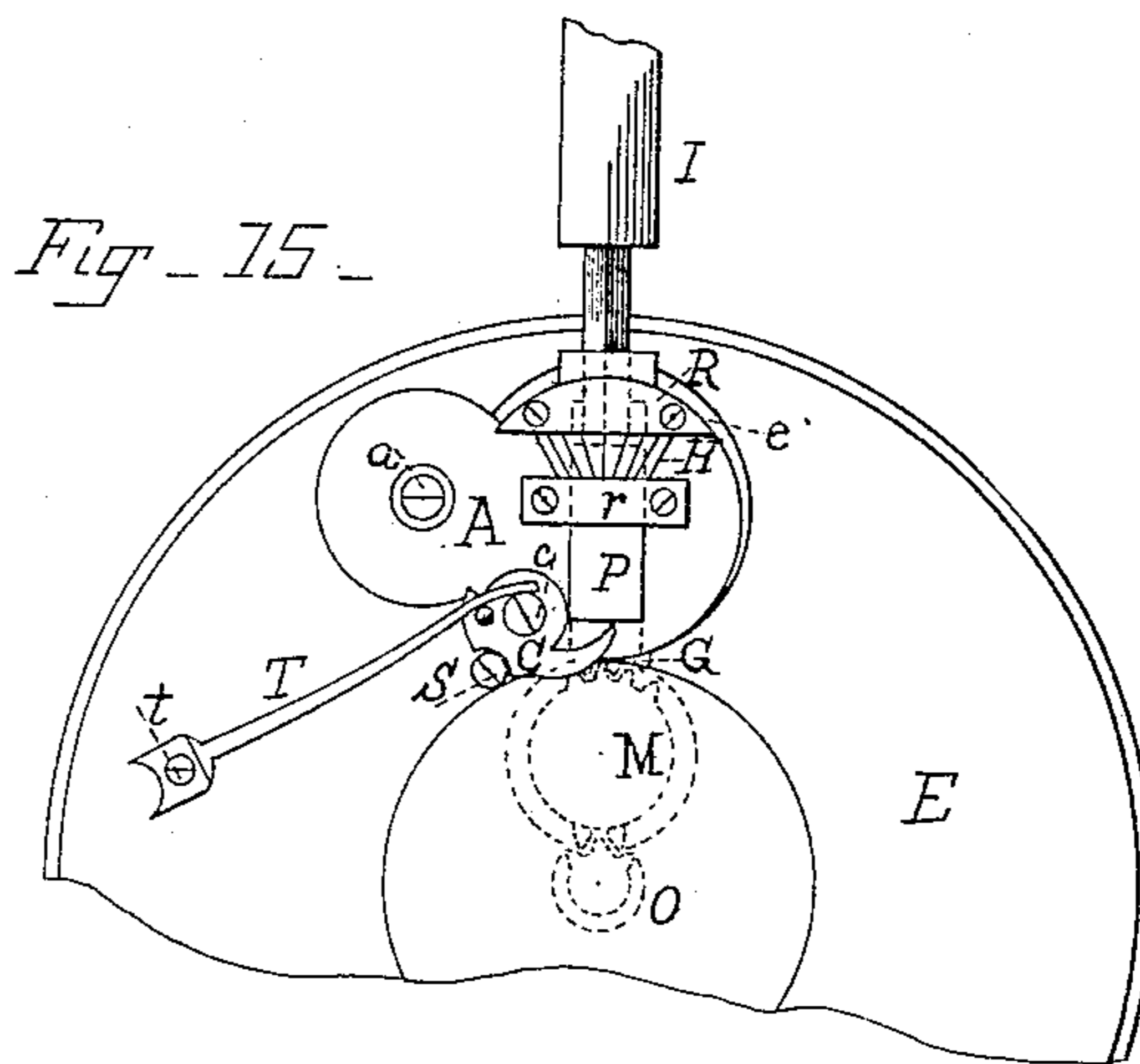


Fig. 15 -

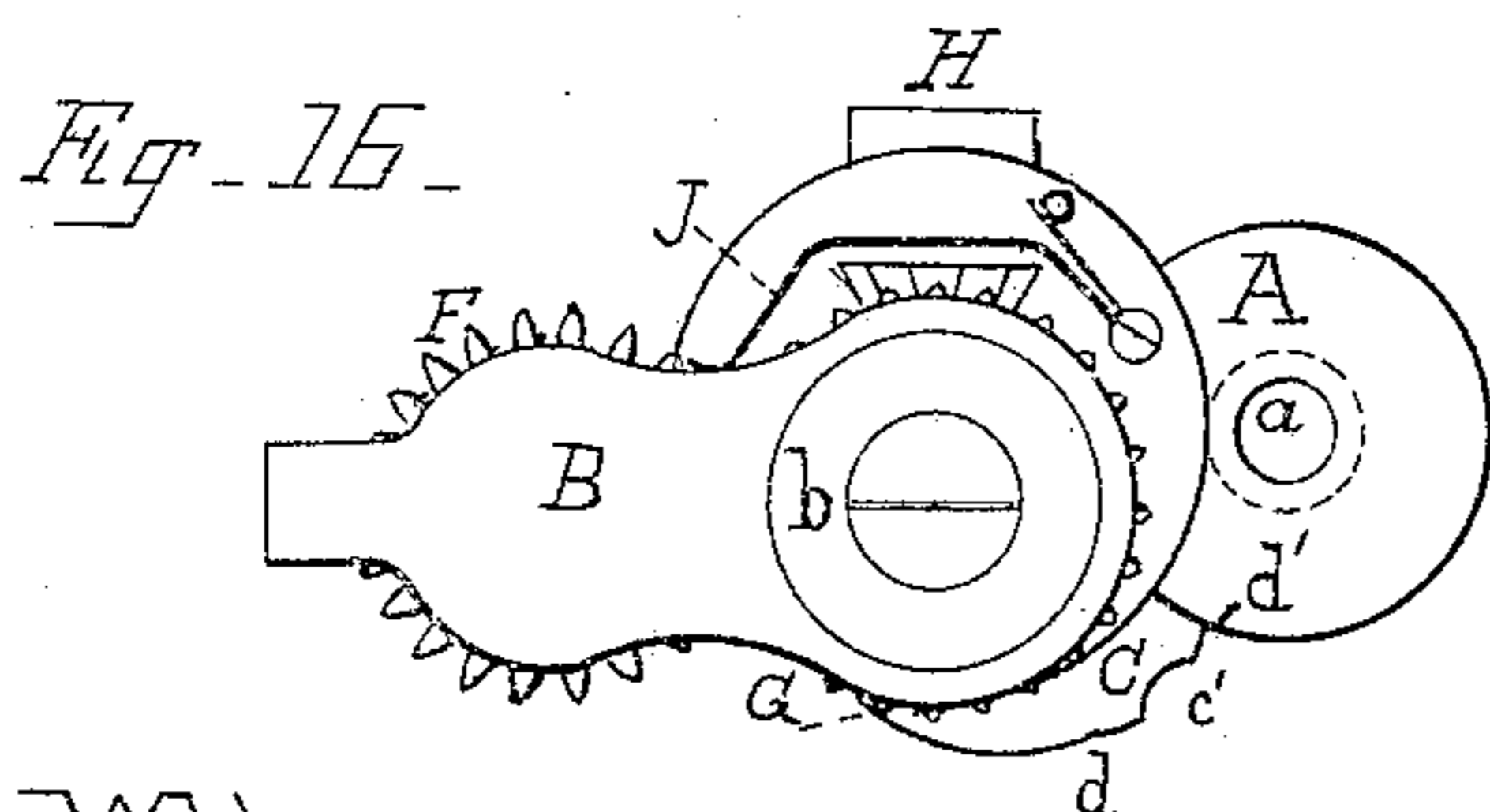


Fig. 16 -

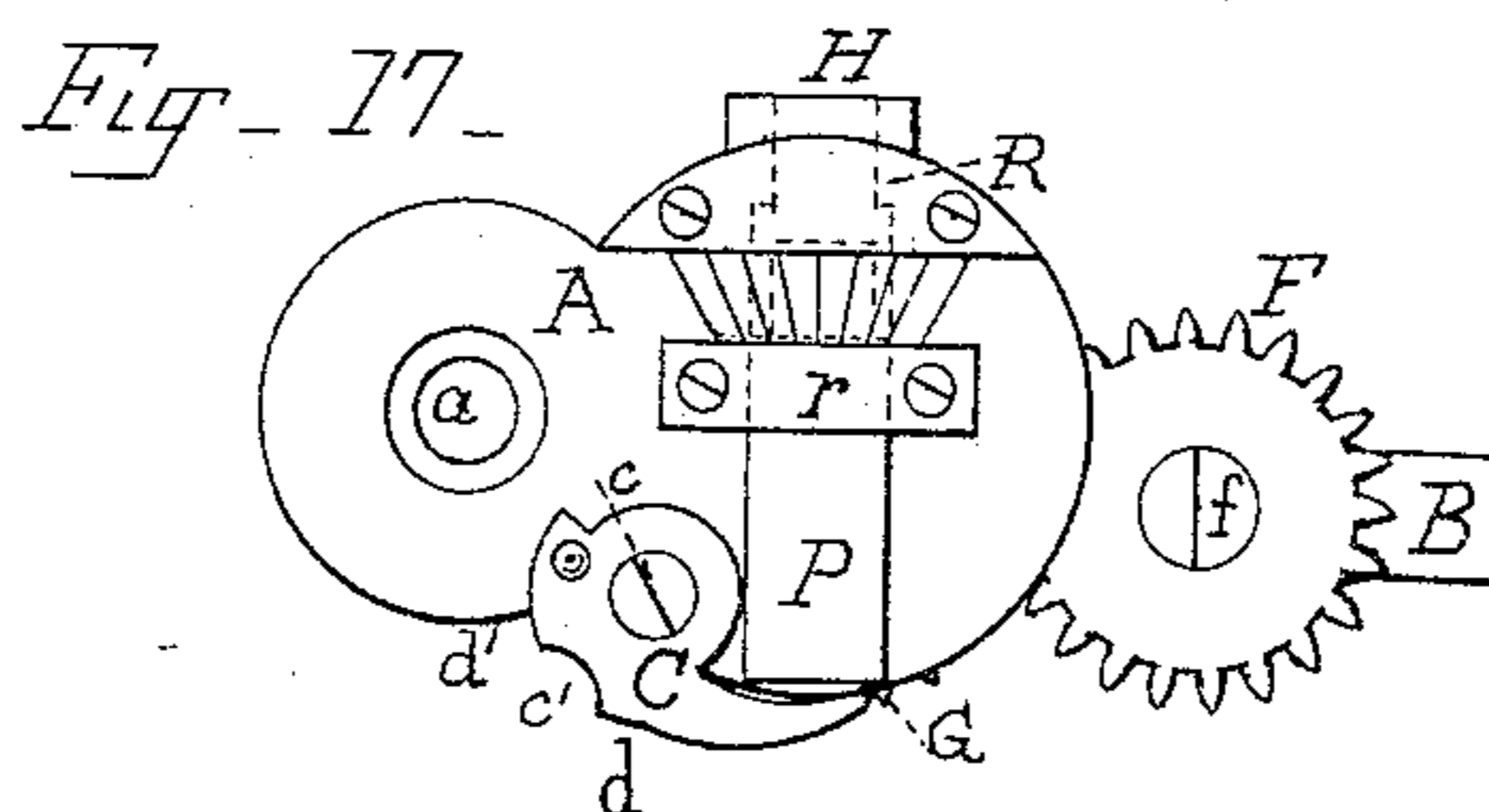


Fig. 17 -

Witnesses -
Albert Kamp.
J. M. P. M. M.

Inventor -
Henry Abbott

UNITED STATES PATENT OFFICE.

HENRY ABBOTT, OF NEWARK, NEW JERSEY.

STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 335,731, dated February 9, 1886.

Application filed July 2, 1885. Serial No. 170,436. (Model.)

To all whom it may concern:

Be it known that I, HENRY ABBOTT, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Stem-Winding and Hand-Setting Attachments for Watches, of which the following is a specification, reference being had to the accompanying drawings, in which—

10 Figure 1 is a plan view of a portion of a watch containing my improvements, the dial being removed and the stem-winding train being shown in position for winding. Fig. 2 is a like view of the same, showing the said

15 train in position for setting the hands. Fig. 3 is a plan view of the reverse side of Fig. 1. Fig. 4 is a view of the reverse side of Fig. 2. Fig. 5 is a sectional view on the line *xx* of Fig. 1. Fig. 6 is a plan view of the upper side

20 of the winding and setting mechanism when detached from the watch; Fig. 7, the reverse side of Fig. 6. Fig. 8 is an end view of the same, showing position of pinion and the grooved edges of the plate A. Fig. 9 is an

25 enlarged view of the cam C. Fig. 10 is an enlarged view of the plunger P, showing its outer end reduced, so as to pass through the square hole in the pinion H. Fig. 11 is an

30 enlarged sectional view of the pinion H. Figs. 12, 13, 14, and 15 show a modified form of my improved winding and setting mechanism, wherein the plate A is adapted to swing upon

35 a pivot, instead of being arranged to slide, as in Figs. 1, 2, 3, and 4. Figs. 16 and 17 are views of the winding mechanism in its modified form detached from the watch.

Similar letters refer to similar parts in each of the figures.

This invention relates to a stem winding and setting watch in which the entire winding and setting mechanism is arranged upon

40 a plate or disk that is separable or detachable from the watch without disarranging or separating the parts of said mechanism from each

45 other, so that it shall be in fact a complete winding and setting device when separated from the watch.

This invention is an improvement upon and an elaboration of a like invention for which

50 Letters Patent No. 236,748 were granted me on the 18th day of January, 1881, the improvement in watches therein described hav-

ing been largely introduced in this market and being now a well-known device among those skilled in the art.

The object of the present invention is to so modify and improve the construction of the said device as to adapt it for use in a style of case, now being introduced, wherein the stem is arranged to move endwise for shifting the mechanism from engagement with the barrel-arbor wheel to the dial-wheels, and vice versa.

To this end my invention consists, principally, in such an arrangement of parts that the entire winding and setting mechanism, together with the separable plate to which said mechanism is attached, is movable bodily while in the watch in such a manner as to engage said mechanism alternately at will with either the barrel-arbor wheel for the purpose of actuating the main-spring or with the dial-wheels for the purpose of setting the hands.

It consists, further, in the novel form and construction of the parts composing said mechanism, and their arrangement with relation to each other and to the watch of which they form a part, which contribute to the accomplishment of the purpose stated, which is hereinafter more fully shown and described.

In the annexed drawings, A represents the movable and separable plate to which the winding and setting mechanism is attached. B is the yoke pivoted to the plate A.

C is a double cam having crescent *c'*, with lifting-periphery *d* and *d'* on either side of the crescent, and being pivoted to the plate A by the shoulder-screw *e*.

D is a screw or stud attached to the main plate E, which acts as a stop against which the yoke B rests, thus holding the yoke B in such position that the proper depth of gearing is maintained between the intermediate wheel, F, and the barrel-arbor wheel K. It also acts as a fulcrum whereby when the plate A is moved forward toward the center of the watch the yoke B will swing on its hub or pivot *b* backward, and thus disengage the intermediate wheel, F, from the barrel-arbor wheel K. The yoke B is made in the usual form, and is held with a yielding pressure against the stud D by the yoke-spring J, which spring may be made in any of the well-known forms. The yoke B also carries on its under side and

pivoted to its outer end the intermediate wheel, F, which communicates a rotary motion between the crown-wheel G (which is arranged to turn upon the hub *b* in the usual manner) and the barrel-arbor wheel K.

E is the main or pillar plate of a watch, and is provided with an opening, *e*, to admit the plate A, said opening being enough larger than the plate A to admit of its movement in the required direction for engaging the wheels carried by said plate alternately with either the minute-wheel M or the wheel K, as stated. The wheels M O are the minute-wheel and cannon, respectively, and are usually termed "dial-wheels," which carry and regulate the movement of the hands of the watch.

It is usual in watches where a pivoted or swinging yoke is used in the winding mechanism to employ an additional intermediate wheel on the opposite end or arm of said yoke, whereby when said yoke swings so as to disengage its intermediate winding-wheel from the barrel-arbor wheel it will at the same time engage its intermediate setting-wheel with one of the dial-wheels. A common fault in watches of this class is the fact that sometimes in the act of engaging or disengaging the intermediate setting-wheel with the dial-wheels the hands will receive an involuntary movement forward or backward either before or after they have been set to the required position. This involuntary movement of the hands is caused by the rotary motion imparted to the intermediate wheel by the act of swinging the yoke on its pivot, while the crown-wheel remains stationary, said rotary motion being imparted to the dial-wheels, and through them to the hands; also, by bringing these two wheels together in an angular direction and not on a line of their centers. To overcome this fault I have discarded the intermediate setting-wheel, and arranged the minute and crown wheels in a direct line with the stem and cannon-pinion, and caused the crown-wheel to move forward on this line to engage directly with the minute-wheel. It is obvious that there can thus be no rotary movement imparted to the minute-wheel by the act of engaging or disengaging it with the crown-wheel. It is obvious, also, that when the crown-wheel is moved forward toward the center of the watch for the purpose of engagement with the minute-wheel the pinion H must move with it in order to maintain a suitable connection between said crown-wheel and the stem I. For this reason the crown-wheel and pinion are both attached to the plate A, and the said plate A is made to move in the direction stated, carrying both crown-wheel and pinion with it, thus keeping the position of the crown-wheel with relation to the pinion always the same.

The plate E, as shown in Figs. 3 and 4, is provided with a recess on either side of the opening *e*, in which are sunk the segments *g g*, said segments being secured to the plate E by two screws each, and having their straight edges adapted to fit in the grooves *m m* of the

plate A, thus forming a bearing on which the plate A slides in its movements backward and forward in the direction of the horizontal diameter of the watch, as specified. The grooves *m m* may also be arranged in the edges of the segments *g g*, and the edges of the plate A adapted to fit in them, thus securing the same result.

P is a plunger adapted to move endwise in the hollow pinion H and under the bridge *r*, and to communicate the end-thrust of the stem I to the cam C. It is, in fact, a continuation of the stem, and is similar to those employed in other watches, and is an old and well-known device except in its form at the outer end, which is reduced in diameter to permit it to enter the squared portion of the hollow pinion H, and to follow the stem, when it is withdrawn, nearly or quite through the said pinion. The importance of this feature of the plunger P will be better understood when it is explained that this extra movement endwise of the plunger, permitted by its reduced end allowing it to pass through the square hole in the pinion H, also permits an additional movement of the cam C, whereby the stud S is forced out of the crescent *c'* and onto the opposite periphery, *d'*, thus forcing the plate A back and disengaging the crown-wheel G and minute-wheel M automatically immediately upon removing the stem from the watch.

It is obvious that the same result could be obtained without thus reducing the end of the plunger P by increasing the length of the square end of the stem I, and permitting it to enter the movement farther, but the object desired is to effect this automatic unlocking without making any alteration in the length of stems already employed in the style of cases above mentioned. The spring T is secured to the plate E by a screw, *t*, and acts upon the short arm of the double cam C, giving said cam a rotary motion. The pressure of the spring T being also in the direction of the center of the watch, it tends to hold the cam C hard against the stud S, and when by the end movement of the stem I, communicated through the plunger P, the cam C is brought in such position that the crescent *c'* is in line, the stud S will fall in the crescent portion of the cam, and the cam C, carrying the plate A with it, will move forward by the pressure of the spring T and bring the crown-wheel G into gear with the minute-wheel M, as specified.

The operation of the mechanism is as follows: The movement being in the case and the stem inserted, as at Figs. 1 and 3, the pressure against the long arm of the cam C holding it in position so that the stud S rests against the periphery *d* of the cam C, the plate A is held back against the outer end of the opening *e* in the plate E, and the yoke B is held by the yoke-spring J against the stop and fulcrum D, thus permitting the engagement of the intermediate wheel, F, and the barrel-arbor wheel K. If the stem I is rotated in a forward direction, the motion will be

communicated through the pinion H, crown-wheel G, intermediate wheel, F, and barrel-arbor wheel K, and the mainspring will be wound. If the stem I be rotated in the reverse direction, the yoke-spring J will permit the lifting and slipping of the intermediate wheel, F, upon the barrel-arbor wheel K, making a back ratchet in the usual manner. If the stem I be withdrawn a short distance until it rests against a stop or shoulder usually provided in the case, the plunger P will follow it, permitting the cam C to turn on its pivot *c* until the crescent *c'* comes in line with the stud S, when the spring T will, by its pressure inward, carry the plate A forward in a radial line toward the center of the watch until the stud S rests in the bottom of the crescent *c'*, this forward movement of the plate A causing the yoke B to swing back on its pivot *b* by means of its contact with the fulcrum D, thus unlocking or disengaging the wheels F and K and bringing into engagement the crown-wheel G and the minute-wheel M. If the stem I be now rotated in either direction, the motion will be communicated through the pinion H and crown-wheel G to the dial-wheels M O, which carry the hands, this position of the mechanism being clearly shown in Figs. 2 and 4. Should the stem now be withdrawn entirely from the watch, the plunger P will follow it by means of the continued pressure against its inner end, its reduced outer end passing through the squared portion of the pinion H, the longer arm of the cam C following it, while the cam turns on its pivot *c* until the periphery *d'* of the cam rests against the stud S, thus forcing the plate A back from the center of the watch and disengaging its train from the dial-wheels, and again bringing them into engagement with the wheel K. This position of the parts is illustrated in Fig. 14. When the crown-wheel comes in contact with the minute-wheel, if the points of their respective teeth should meet they will be held together by the pressure of the spring T until a rotary motion is imparted by turning the stem I, when they will drop into gear at the proper depth, thus preventing any accidental movement of the hands. It is for this reason that I prefer the above-described arrangement of parts, whereby the crown and minute wheels are brought together by means of a spring, and separated by means of a cam or lever, although it is obvious that the reverse could be adopted, if desired. It is obvious, also, that the cam C might be pivoted to the plate E, and the stud S attached to the plate A, and the above-described results obtained, in which case, however, the spring T would press against the stud S, and an additional spring would be required to turn the cam on its pivot. The double cam C may also be adapted, substantially in the manner described, to move by means of the end-thrust of the stem a pivoted yoke of any of the old and well-known forms in such a manner as to engage and dis-

engage its intermediate wheels with the barrel-arbor wheel or the dial-wheels, respectively. The plate A may also be moved into or out of position for the crown-wheel to engage with the dial-wheels by means of any of the well-known forms of "shipping-levers" instead of by means of the end-thrust of the stem, as above described.

In the modified form of my invention indicated in Figs. 12, 13, 14, 15, 16, and 17, the plate A, instead of moving in a straight line with a sliding motion, as above described, turns or swings upon a pivot, *a*, but the movement of the plate A is so slight and comprises so short an arc of a circle that it is substantially a movement in a radial direction in the watch, and is practically the equivalent of the device described and indicated in Figs. 1, 2, 3, 4, 5, 6, and 7.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. As an improvement in stem winding and setting watches, a stem winding and setting train arranged and combined upon a separable plate in such manner that the said plate may be attached to or detached from the main plate or plates of a watch-movement without disarranging or separating the parts of said train from each other, said separable plate being adapted to be moved in the watch in such a manner as to engage at will said train with either the main winding-wheel or the dial-wheels, substantially as described, and for the purpose stated.

2. As an improvement in stem winding and setting watches, a separable plate upon which are combined and arranged a train of wheels and pinion actuated by a stem, said separable plate being adapted to be moved in the plane of the watch-plate, whereby said train may be placed in engagement with the barrel-arbor wheel for the purpose of winding the watch, or with the dial-wheels for the purpose of setting the hands, substantially as specified.

3. As an improvement in stem winding and setting watches, a stem-actuated train attached to a separable plate, said plate being adapted to be moved upon the main plate of a watch in a direction substantially parallel with said stem, in such manner as to engage or disengage said train with either the main winding or the hand-setting wheels, substantially as described, and for the purpose specified.

4. As an improvement in stem-winding and hand-setting watches, a stem-driven train combined and arranged upon a separable plate, said plate being pivotally connected with the main plate of a watch, and adapted to swing in the plane of said watch-plate toward the pendant, whereby said train is connected with the barrel-arbor wheel, and to swing toward the center of the watch, whereby said train is disconnected from the barrel-arbor wheel and is connected with the dial-wheels, substantially as described, and for the purpose specified.

5. As an improvement in stem-winding and hand-setting watches, a winding and setting train combined and arranged upon a separable plate, said separable plate being adapted to be moved upon and in the plane of the main plate of a watch by means of the end-thrust of the stem, whereby said train is connected alternately with wheels for actuating the main-spring or hand, substantially as and for the purpose shown and described.

6. As an improvement in stem-winding and hand-setting watches, a separable plate having attached to it a stem-winding and hand-setting train, said plate being attached to and adapted to be moved upon and in the plane of the main plate of a watch, and arranged to be held by means of a cam or lever in such position that said train shall be in gear with the barrel-arbor wheel, and when released by said cam or lever to be moved by means of a spring out of gear with said barrel-arbor wheel and into gear with the dial-wheels, substantially as described, and for the purpose specified.

7. As an improvement in stem-winding and hand-setting watches, a separable plate carrying a stem winding and setting train, said plate being attached to and adapted to be moved upon and in the plane of the main plate of a watch, and arranged to be held in position to engage the said train with the barrel-arbor wheel by means of a spring, and to be moved out of engagement with said barrel-arbor wheel and into engagement with the dial-wheels by means of a cam or lever, substantially as and for the purpose specified.

8. As an improvement in stem-winding and hand-setting watches, a winding and setting train combined and arranged upon a plate that is separable from the main plate of a watch, and is adapted to be moved thereon by means of the end-thrust of the stem, and is so arranged that when the stem is pushed in to the inner limit of its motion the said train will be held in engagement with the barrel-arbor wheel, when said stem is withdrawn to the outer limit of its motion said train will go out of engagement with the barrel-arbor wheel and into engagement with the dial-wheels, and when said stem is removed entirely from the watch said train will return and remain in engagement with the barrel-arbor wheel, substantially as described and shown, and for the purpose specified.

9. As an improvement in stem-winding and hand-setting watches, a pinion, crown-wheel, yoke, and intermediate wheel, all combined and arranged upon a plate that is separable from the main plate of a watch, and is adapted to be moved thereon in the plane of said main plate, said separable plate being actuated in

its movements by the end-thrust of the stem, whereby when said stem is pushed in toward the center of the watch the said separable plate will move outward, and thus place the said intermediate wheel into engagement with the barrel-arbor wheel, and when said stem is moved outward said separable plate will move inward toward the center of the watch, and thus disengage said intermediate wheel from the barrel-arbor wheel and engage the said crown-wheel with the dial-wheels, substantially as described, and for the purpose specified.

10. The screw or stud D, in combination with the main plate of a watch, and a movable plate or disk carrying a stem-winding train and pivoted yoke, said screw or stud being adapted as a stop to insure the proper depth between the intermediate wheel of said train and the barrel-arbor wheel, and also as a fulcrum, whereby, on the movement of said plate or disk, the said wheels are disengaged from each other, substantially as shown and described.

11. The plate A, carrying a stem-winding train, and having its parallel edges grooved, flanged, rounded, or made V-shaped, and adapted to slide radially upon the main plate of a watch, substantially as described, and for the purpose specified.

12. The plate A, carrying a stem-winding train, said plate being pivoted, as at *a*, upon the main plate of a watch, and adapted to swing substantially in the manner and for the purpose specified.

13. The double cam C, having a lifting periphery on either side of its crescent *c'*, substantially as described, in combination with the stem and winding-train of a stem-winding watch, for the purpose specified.

14. The cam C, in combination with the plate A, main plate E, plunger P, spring T, and stud S, substantially as described, and for the purpose specified.

15. The plunger P, having its outer end reduced in size to permit it to pass freely through the square portion of the pinion H, in combination with the plate A, pinion H, stem I, cam C, stud S, spring T, and main plate E, substantially as shown and described.

16. The spring T, adapted to move both the cam C and the plate A, in combination with said cam C, plate A, and main plate E, substantially in the manner and for the purpose specified.

In testimony whereof I have hereunto set my hand this 30th day of June, 1885.

HENRY ABBOTT.

Witnesses:

SAML. B. MANN,
ALBERT KAMP.