

G. F. JOHNSON.
PENDENT SETTING WATCH.
APPLICATION FILED MAR. 27, 1911.

1,007,292.

Patented Oct. 31, 1911.

2 SHEETS—SHEET 1.

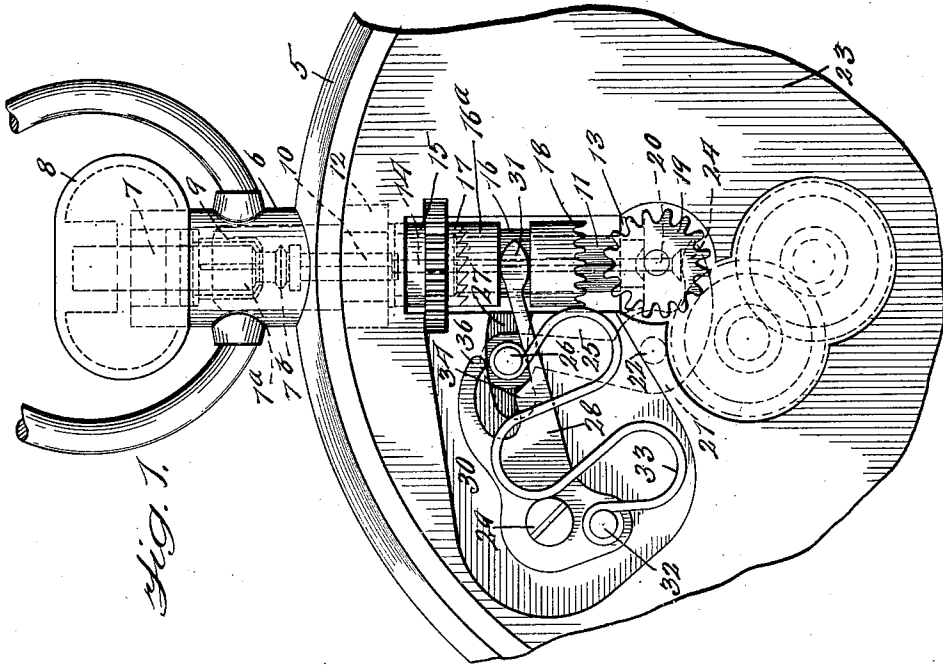


Fig. 1.

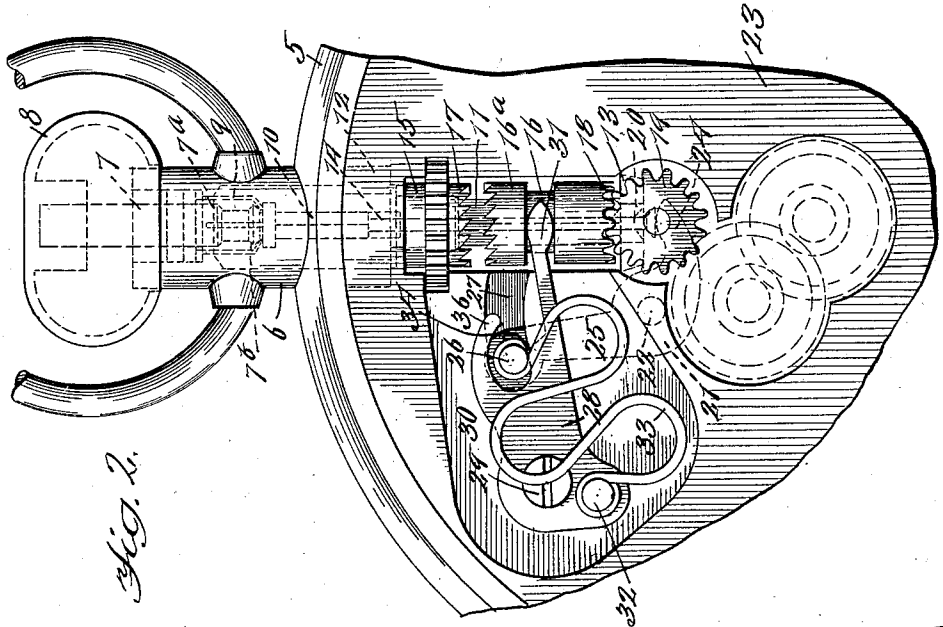


Fig. 2.

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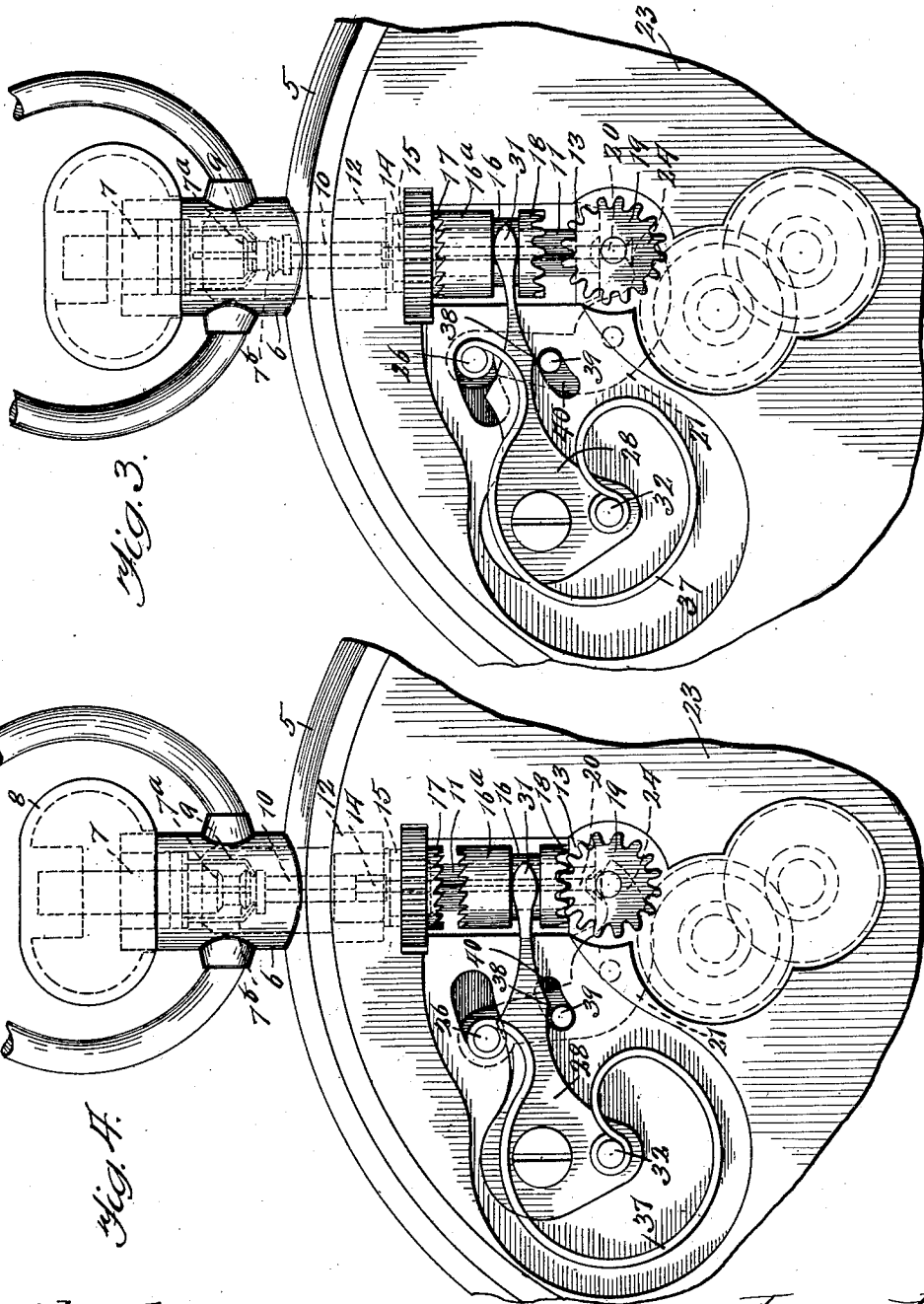
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

GEORGE F. JOHNSON, OF SPRINGFIELD, ILLINOIS, ASSIGNOR TO ILLINOIS WATCH COMPANY, OF SPRINGFIELD, ILLINOIS, A CORPORATION OF ILLINOIS.

PENDENT-SETTING WATCH.

1,007,292.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE F. JOHNSON, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Pendent-Setting Watches, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in the winding and setting mechanism for pendent-setting watches; that is to say, watches which are both wound and set by the rotation of the pendent- or stem- arbor, and in which the mechanism is shifted from winding to setting and from setting to winding position by the longitudinal movement of the stem-arbor.

The object of my invention is to provide a new and improved pendent-setting mechanism in which the shifting from setting to winding engagement is effected by the action of a single spring, acting upon the operating parts in a novel and peculiar manner hereinafter specially pointed out.

To that end, generally speaking, my device consists of a clutch mounted on the winding arbor and movable longitudinally thereon so as to engage with either the winding or setting train, a clutch-shifter adapted by its movement to shift the clutch in one direction or the other according to the position of the stem-arbor, a lever adapted to be rocked in one direction by the inward movement of the stem-arbor and in the other direction by a spring connecting it with the clutch-shifter and normally tending to so act upon the parts as to hold the clutch in setting engagement when the lock-lever is free from constraint of the stem-arbor.

Another object of my invention is to so construct the clutch-shifting lever and the above-named parts that the rocking of the lock-lever in either direction will positively engage and by its movement positively move the clutch-shifter in shifting the clutch-shifter.

My invention relates also to further improvements in pendent-setting mechanism for watches in respects hereinafter pointed out in the claims.

In the accompanying drawings,—Figure 1 is a view of a portion of a watch movement showing my improvement with the devices

in winding position; Fig. 2 is a view of the same parts showing my improved mechanism in setting position; Fig. 3 is a modification showing the parts in winding position; and Fig. 4 is a modification showing the same parts as in Fig. 3 in setting position.

Referring to the drawings,—5 indicates a portion of a watch casing of any ordinary form provided with a stem or pendent in which is rotatably mounted a stem-arbor provided at its head with a crown. The stem-arbor is secured in the stem in any well-known way and is so mounted as to have limited longitudinal movement therein and to be locked at either end of the movement. This is effected in any well-known way, as by shoulders 7^a—7^b and springs 9. As the manner of mounting and securing of the stem-arbor form of themselves no part of my present invention it is not believed it is necessary to describe it more fully herein. The lower end of the stem-arbor is squared, as at 10.

11 indicates a winding-arbor, which is journaled at its upper end in a suitable bearing, as 12, and at its lower end in suitable bearing, as 13, both secured in the watch movement in any well-known manner. The upper end of the stem-arbor is provided with a squared socket 14 into which the lower squared end 10 of the stem-arbor fits.

15 indicates a winding pinion which is journaled on the winding-arbor 11 near the upper end thereof and is adapted to be connected with the winding-train of the watch (not shown). Between the journal bearing at the lower end of the winding-stem 11 and the winding pinion 15 the stem-arbor is squared, or of other suitable shape, and on it is mounted a clutch 16 so as to slide freely longitudinally thereof but to turn therewith. The upper end of the clutch 16 is provided with a toothed clutch-member 16^a adapted to engage with a corresponding ratchet 17 preferably formed integral with the winding-wheel 15. The lower end is provided with a crown-gear 18 which is adapted to mesh with a wheel 19 of the setting-train. It is obvious that when the clutch 16 is in the position shown in Fig. 1 it is in engagement with the winding-wheel 17 and rotation of the crown 8 rotating the stem-arbor will rotate the winding-arbor 11, the

clutch 16 and with it the winding-wheel 15 so as to wind the watch. A movement in the reverse direction, of course, will allow the ratchet-teeth to slip on one another. When the parts are in the position shown in Fig. 2, the rotation of the stem-arbor will rotate the clutch and with it the wheel 19 of the setting-train in one direction or the other, according to the direction of rotation of the stem-arbor.

20 indicates a push-pin, which is slidably mounted in the winding-arbor 11 and is of sufficient length to come in contact at its upper end with the lower end of the stem-arbor 10 and at its lower end with one arm of the lock-lever hereinafter described.

21 indicates a "lock-lever", which, in the form in which I have embodied my invention, is in the form of a bell-crank lever pivoted at 22 on the under side of one of the plates 23 of the watch movement in register with the push-pin 20 and is provided with two arms 24 and 25. The arm 24 projects underneath the push-pin 20 and is in contact with the lower end thereof. The other arm 25 projects upward toward the stem of the watch and is provided at its upper end with a pin 26 which projects outward through a slot 27 in the plate 23.

28 indicates a clutch-shifter, which is pivoted, as at 29, in a recess 30 on the outer surface of the plate 23 and is provided with an arm 31 which engages the clutch 16 so that by the rocking of the clutch-shifter 28 the clutch 16 is moved longitudinally on the winding-arbor 11.

32 indicates a pin, which is mounted upon the clutch-shifter 28 to one side of the pivotal point thereof.

33 indicates a spring, which is secured in any suitable manner, as by loops, at its ends to the pins 26 and 32, respectively. The spring 33 is under a retractile tension so as to tend, when free to operate, to draw together the pins 26 and 32.

34 indicates a cam on the arm 31 of the clutch-shifter 28, with which the pin 26 on lock-lever 21 is adapted to be brought into contact when the lock-lever 21 is moved by the action of the springs hereinafter described so as to swing the arm 25 from the position shown in Fig. 1 to the position shown in Fig. 2, so that by the contact of said pin riding the cam 34 the shifting arm 31 of the clutch-shifter 28 will be moved downward—that is, toward the center of the watch—and thus throw the clutch 16 into setting engagement—that is, into the position shown in Fig. 2. The clutch-shifter 28 is also provided with a cam 36, which, in the form shown in Fig. 2, consists of a curved arm so constructed that when the lock-lever 21 moves in the opposite direction, swinging the arm 25 from left to right—that is to say, from the position

shown in Fig. 2 to the position shown in Fig. 1—the pin 26 will be brought in contact with the cam projection 36 and, bearing against it, will positively rock the shifting arm 31 of the clutch-shifter 28 upward, assisting the action of the spring in the same direction, as hereinafter described.

In the modification shown in Figs. 3 and 4, the parts are like the parts above described with the following exceptions. In this form a spring 37 is used, preferably in the form shown in Figs. 3 and 4. The spring, however, is fastened to the pins 32 and 26 and is under retractile tension so as to tend to draw them together when free to act. Instead of having a projecting cam-arm 36, the clutch-shifter 28 is provided on its lower surface with a cam 38 and the lock-lever 21 is provided with a second pin 39 which projects through a suitable slot, as 40, and as the lock-lever rocks from left to right—that is, from setting to winding position—is brought into contact with the cam 38 so as to assist the action of the spring and positively begin the lifting of the clutch away from the setting wheel.

The operation of the devices first described is as follows: Of course when the watch is being carried the crown 8 with its attached stem-arbor is always pushed in and the watch is in winding position, in order to prevent any accidental shifting of the hands, which would occur if the watch were carried in the other position. However, the parts normally—that is to say, when not under the constraint caused by the inward position of the stem-arbor—are in setting position shown in Figs. 2 and 4. Starting, therefore, with the parts in this position, if the stem-arbor is pushed inward into the position shown in Fig. 1, the push-pin 20 is pushed inward and the lock-lever 21 is swung against the action of the spring 33 or 37 into the position shown in Fig. 1. As the arm 25 starts to swing it is brought in contact with the cam-arm 36 in the form shown in Figs. 1 and 2, or the pin 39 is brought into contact with the cam 38 in the form shown in Figs. 3 or 4, thus positively starting the movement of the clutch-shifter arm 31 upward to free the crown-gear 18 from the setting-wheel 19. The retractile action of the spring tending to draw pins 32 and 26 together will rock the clutch-shifter so as to move the clutch-shifter upward and throw the clutch into winding position, as shown in Fig. 1, the lock-lever being limited in its movement in the other direction by its bearing against the push-pin 20. When, on the other hand, the crown is pulled out so as to partially withdraw the stem-arbor into the position shown in Fig. 2 the spring 33 or the spring 37 is free to act to move the lock-lever 21 and by its retractile force it rocks it so as to draw the arm 25 from right to

left—that is to say, from the position shown in Fig. 1 to the position shown in Fig. 2. As it moves inward the pin 26 comes in contact with the cam 34, rocking the clutch-shifter 28 upon its pivot so as to rock the clutch-shifter arm 31 downward, shifting the clutch again into setting position.

It will be observed that by reason of the construction above set forth a single spring is used and that spring may be made relatively weak so as to act both as a clutch-shifter spring and as a lock-lever spring, and may also be made relatively weak because the action of the spring in shifting from setting to winding position is assisted by the bearing of the pin in the winding movement of the lock-lever upon the cam of the clutch-shifter when freeing the parts from engagement. Moreover, with the spring operating in the manner described, the tension of the spring is less when in setting than when in winding position, and this is desirable because in such case the backward rotation of the stem-arbor will not have so harsh an action in the "ratch-back" in winding. This arrangement also makes certain the disengagement of the clutch from the setting wheel without the necessity of too strong a spring or of two springs, one acting against the other. It will also be seen that in setting position the bearing of the pin 26 upon the clutch-shifter is such as to hold the parts in setting position.

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

1. A winding and setting device, consisting of a winding-arbor, a clutch slidably mounted on said arbor and rotatable therewith and adapted to be moved into either winding or setting position, a clutch-shifter, a lock-lever, a spring connecting said clutch-shifter and said lock-lever and adapted when said lock-lever is not under exterior constraint to throw the clutch into setting position and when said lever is put under constraint to throw said clutch into winding position, and means operated by said lock-lever when put under exterior constraint to positively assist said spring in disengaging said clutch from setting position.

2. A winding and setting device, consisting of a winding-arbor, a clutch slidably mounted on said arbor and rotatable therewith and adapted to be moved into either winding or setting position, a clutch-shifter, a lock-lever, a spring connecting said clutch-shifter and said lock-lever and adapted when said lock-lever is not under exterior constraint to throw the clutch into setting position and when said lever is put under constraint to throw said clutch into winding position, a cam on said clutch-shifter adapted to be engaged by said lock-lever when the same is put under exterior con-

straint and by the movement of said lever to positively assist the spring in disengaging the clutch from setting position.

3. A winding and setting device, consisting of a winding-arbor, a clutch slidably mounted on said arbor, rotatable therewith and adapted to be moved into either winding or setting position, a clutch-shifter, a lock-lever, a stem-arbor, means acted upon by said stem-arbor for swinging said lock-lever by the inward movement of the stem-arbor, a spring connecting said clutch-shifter and said lock-lever and adapted when said lever is freed from the exterior constraint of said stem-arbor to throw the clutch into setting position and when said lock-lever is put under constraint by the inward movement of said stem-arbor to throw the clutch into winding position, and a cam-arm on said clutch-shifter adapted to be engaged by the movement of said lock-lever when put under the exterior constraint of said stem-arbor and to positively assist said spring in freeing said clutch from setting engagement.

4. A winding and setting device, consisting of a winding-arbor, a clutch slidably mounted on said winding-arbor, rotatable therewith and adapted to be moved into either winding or setting position, a lock-lever, a clutch-shifter adapted to be engaged by said lever and when said lever is moved in one direction to rock said shifter and move said clutch into setting engagement, a cam-arm on said clutch-shifter adapted to be engaged by said lock-lever when moved in the other direction to positively move said clutch out of setting engagement, a stem-arbor adapted by its inward movement to positively rock said lock-lever in one direction and by its outward movement to leave said lock-lever free to move in the other direction, and a spring connecting said clutch-shifter and said lock-lever and adapted by its tension, when said lever is not under the constraint of said stem-arbor, to rock the same against said clutch-shifter and thereby move said clutch into setting engagement and also adapted by its tension, when said lever is put under constraint by inward movement of said stem-arbor, to rock said clutch-shifter and cause the same to throw said clutch into winding engagement and also to rock said lock-lever against said cam-arm and positively assist said spring in freeing said clutch from setting engagement.

5. A winding and setting device for a pendent-set watch, comprising a winding-arbor, a clutch slidably mounted on said arbor, revoluble therewith and adapted to be brought into either winding or setting position, a clutch-shifter having a cam, a lock-lever adapted by its movement in one direction to bear upon said cam and rock said clutch-shifter and to move said clutch into

setting position, a push-pin bearing on said lock-lever and adapted when moved in one direction to positively rock said clutch-shifter in one direction and when moved in
5 the other direction to leave said lock-lever free to move, a spring connecting said lock-lever and said shifting-lever and adapted by its tension, when said lock-lever is free to move, to swing said lock-lever against said
10 cam and thereby rock said clutch-shifting lever to move said clutch into setting position, and also adapted by its tension, when said clutch-shifter is positively rocked by
the movement of said pin, to rock said clutch-shifting lever in the other direction and
15 thereby throw said clutch into winding position, said clutch-shifter having a second cam adapted to be engaged by said lock-lever when moved in the direction last described
20 to assist the spring in releasing said clutch from setting engagement.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
