No. 720,258. PATENTED FEB. 10, 1903.

C. KUENZEL.

STEM WINDING AND SETTING WATCH.

APPLICATION FILED APR. 19, 1902.

NO MODEL.

Fig. 1.

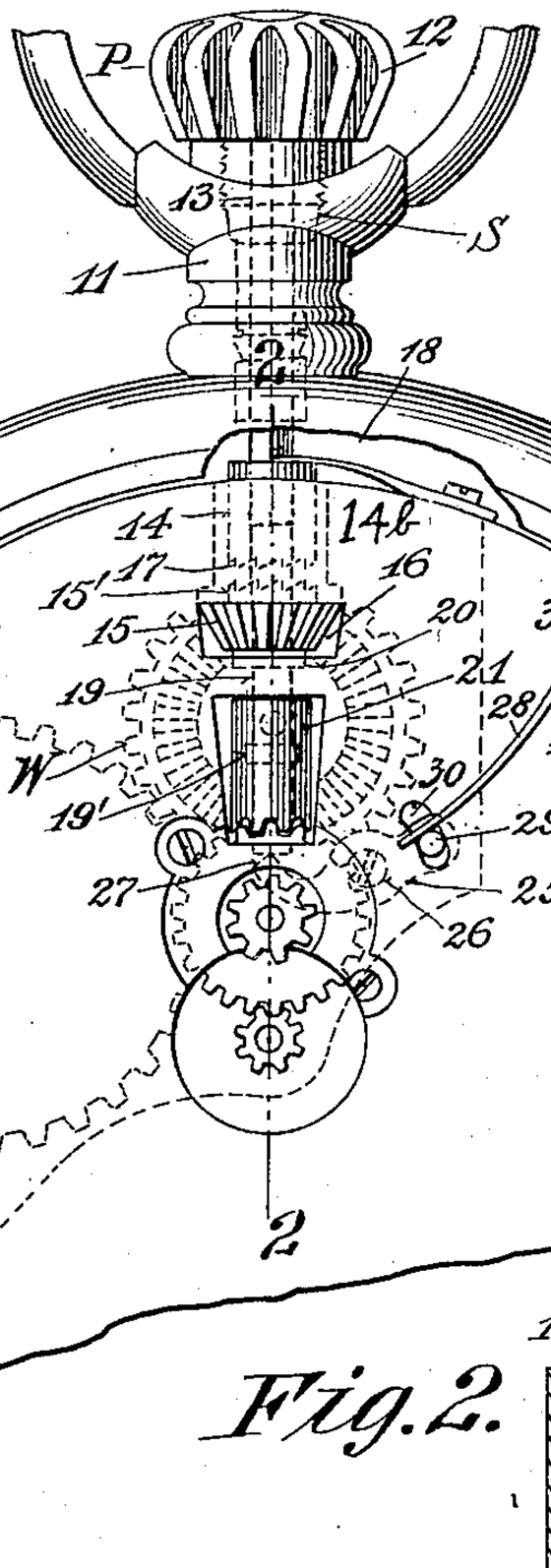


Fig. 5.

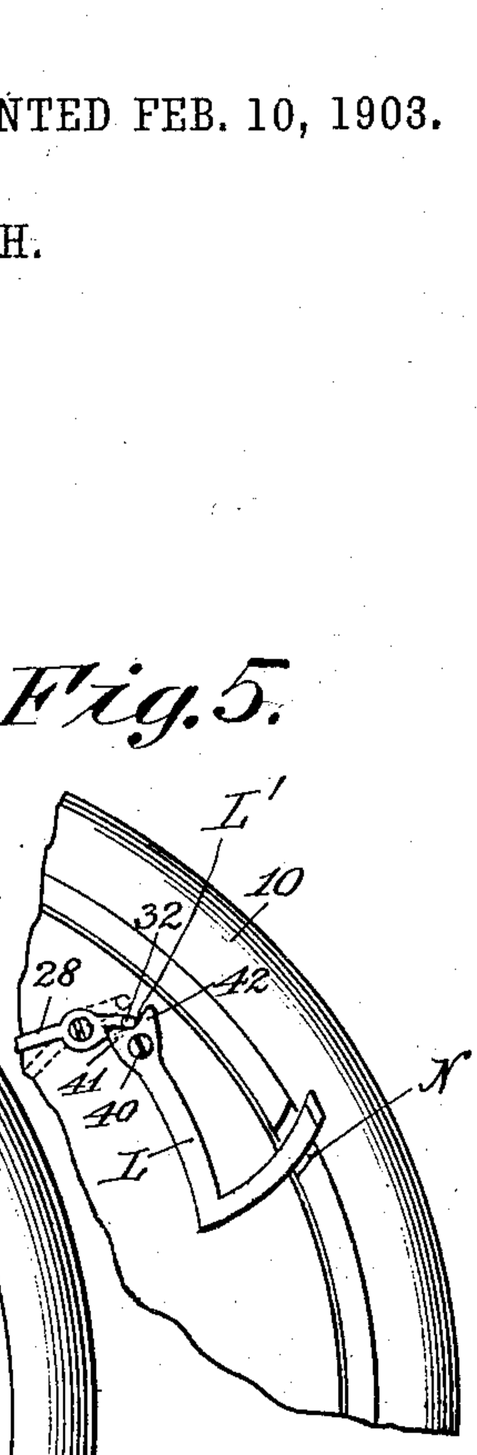


Fig. 2.

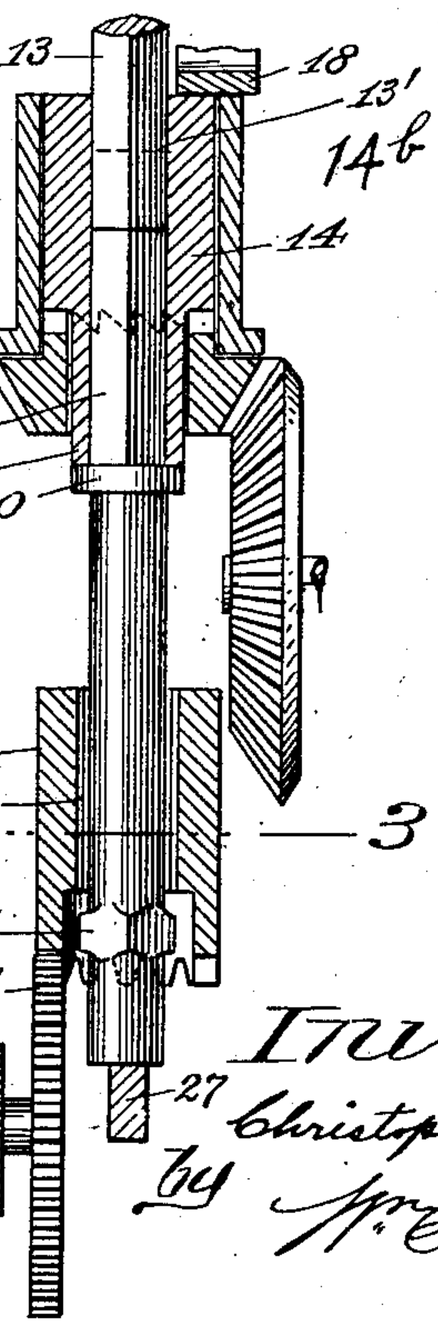


Fig. 4.

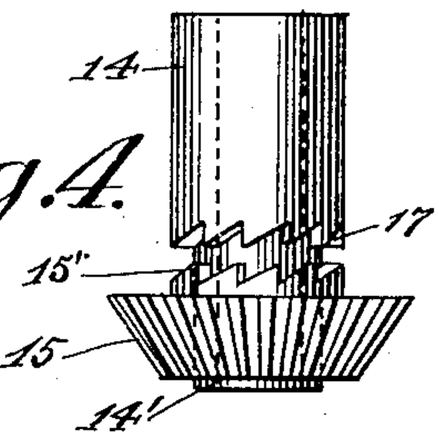
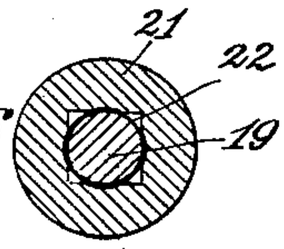


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHRISTOPHER KUENZEL, OF SPRINGFIELD, MASSACHUSETTS.

STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 720,258, dated February 10, 1903.

Application filed April 19, 1902. Serial No. 103,813. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER KUENZEL, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Winding and Setting Mechanism for Watches, of which the following is a full, clear, and exact description.

This invention relates to improvements in winding and setting mechanism for watches, and has for its object to provide a winding and setting mechanism which is of unusually simple construction, compact, very direct in its action, convenient in the assemblage and in the removal of certain of the portions thereof without requiring the disconnection or displacement of other portions, and which is applicable on descriptions of watches most commonly and extensively made in this country as is not permissible in respect of the Swiss system of winding and setting mechanism; and the invention consists in constructions and combinations of parts, all substantially as hereinafter fully described and explained, and set forth in the claims.

My invention has been fully illustrated in the accompanying drawings, in which—

Figure 1 shows a face view of the watch, the dial of which has been removed and the several operating parts being in position for setting the hands. Fig. 2 represents, on an enlarged scale, the section on line 2 2 of Fig. 1, but showing the several parts in position for winding. Fig. 3 is a section on line 3 3 of Fig. 2. Fig. 4 is a detail view showing the winding ratchet and pinion in a position corresponding to Fig. 1. Fig. 5 is a sectional view illustrating the position of the shipper-lever when the mechanism is in normal position and ready for winding the watch.

In the drawings, in which similar characters denote similar parts, 10 denotes the case, having a stem 11 for supporting the pendant (indicated in a general way by P) and comprising the crown 12 and stem 13, the latter being preferably polygonal in cross-section and in constant engagement with the winding-sleeve 14, which is fitted in a socket 14^b, formed in the plate or frame F of the watch-movement, and which socket opens to the edge of such plate and is in axial alinement with the pendant. The said sleeve has the axial opening therethrough of polygonal form for the engagement aforesaid therein of the stem 13, the latter being capable, however, of an endwise movement. Disposed below the sleeve 14 is the winding-pinion 15 in continual engagement with the winding mechanism, of which it forms a part, and retained in proper position in an aperture 16, provided therefor in the front plate F of the works. The hub of the winding-pinion (which hub is outwardly extended and protrudes into the aforesaid socket 14^b) is provided with teeth 15′, of ratchet form, to be engaged by similar teeth 17, formed on the inner end of sleeve 14, which may be held normally in engagement with the pinion 15—as, for instance, by a spring 18, secured to the plate F—and while in some cases it may be preferable to have a shipper-lever, whereby the position of the sleeve may be controlled, yet in its preferred form I wish to employ a pendant P, mounted for outward movement in order to permit the sleeve 14 to be disengaged from the pinion 15.

For the sake of convenience in assembling the several parts of the mechanism the pendant P comprises a two-part stem, the upper part 13 of which is secured to the crown 12, while the lower portion 19 may be mounted for shifting movement relatively to the other, although both stem parts 13 and 19 will be caused to rotate together by any suitable device—as, for instance, the winding-sleeve 14, the axial aperture of which is polygonal in shape to correspond to the cross-section of the stem parts 13 and 19.

From the foregoing it will be understood that the winding-pinion 15 will always be in the same position, while the sleeve 14 will be shifted relatively thereto, this shifting movement being accomplished by the longitudinal movement of the stem-section 19, having a collar 20 bearing against the under side of the hub 14′ of the winding-sleeve, and inasmuch as the spring 18 above referred to is in direct contact with the upper face of said sleeve it follows that when the stem-section 19 is moved

downwardly, exerting a downward pressure on the pendant P and its stem 13 and against the resistance of a spring 28, to be referred to later on, the polygonal portion 19′ thereof will be disengaged from the setting-pinion 21, the central aperture of which is formed to correspond with the section 19′, above referred to.

The normal position of the parts is clearly shown in Fig. 2, in which the winding-sleeve 14 is in engagement with the winding-pinion 15, while the stem-section 19′ is out of engagement with the setting-pinion 21. It will therefore be seen that as the stem-section 13 is rotated movement will be imparted to the winding mechanism, one member of which has been herein indicated by W, and that at the same time no action will take place on the part of the setting-pinion 21. On the other hand, by referring to Fig. 1 it will be seen that a rotation of the pendant P will have a direct effect upon the setting-gearing, inasmuch as the squared portion 19′ is in that position shown in engagement with the setting-pinion 22, while the winding-sleeve is out of engagement with the pinion 15.

As above stated, the stem-section 13 may be moved longitudinally by the pendant-crown 12; but inasmuch as certain regulations are in existence on railroads which specifically state that the watches carried by their employees must have devices of a character similar to that of the shipping-lever, I employ in connection with the stem 19 a device whereby the force of the spring 18 will not only be counteracted, but, furthermore, overpowered, this device consisting, substantially, of a lever 25, pivoted at 26 on the plate F and having one of its ends 27 in direct engagement with the lower end of the stem 19.

The lever 25 is preferably actuated by a spring 28, engaging a pin 29, projecting from said lever 25 and through an aperture or slot 30, provided therefor in the plate F. This spring 28 when in normal position is stronger than the spring 18, over which it predominates, and therefore tends to force the stem 19 upward and into the position shown in Fig. 1, so that when it is desired to reverse or force said stem 19 downward and bring the mechanism into position for winding the watch it will become necessary to relieve the tension of the spring 28 to yield to the spring 18. Hence the spring 28 is in this instance pivotally supported, as at 31, on the plate F, and the rearward extension 32 thereof is in engagement with a lever L, whereby said extension may be swung around the fulcrum 31, so as to vary the tension of the spring 28, and therefore its efficiency, relatively to that of the spring 18.

The normal position of the lever L is shown in Fig. 5, in which the extension 32 is illustrated as resting in the crotch portion L′ of the lever L, so that the tension of the spring 28 is relieved, but may be reinstated by swinging said lever L around its pivot 40 in either direction, so as to occupy the position shown in full lines of Fig. 1 or that indicated by dotted lines in the same figure.

In order to have the lever L perform the same function—viz., that of increasing the tension of the spring 28 when it is moved into either of the positions named—said lever is provided with a pair of cam projections 41 and 42, respectively, coöperative with the projection 32 of the spring 28.

When the organization of the several parts just described is substantially as shown in Fig. 1, the tension of the spring 28 predominates over that of the spring 18, and hence it will be understood that when the stem 19 is forced downward to disengage the squared portion 19′ from the setting-pinion 21 and at the same time permit the spring 18 to exert its power in coöperatively uniting the sleeve 14 with the ratchet-pinion 15, means must be provided whereby the upwardly-tending force of said spring 28 will be counteracted, this result being accomplished by a pendant of ordinary construction and comprising the usual slip-and-catch connection employed with pendant-set watches and indicated herein by S.

When it is desired to use only the pendant for setting the hands of the watch, the lever L is placed into the position shown in Fig. 1 and the cam projection 41 is brought into engagement with the pin 32 of the spring 28, so that whenever the pendant P is pulled upward the spring 28 will rock the lever 25, thus bringing the squared portion 19′ into engagement with the setting-pinion 21 and at the same time disconnecting the winding-sleeve 14 from the pinion 15. On the other hand, it will be seen that when the pendant P is forced downward the organization of these parts will be reversed and be retained in such reversed position by the connection S, above mentioned.

It is of course understood that when the pendant P is used for shifting the stem the lever L is not to be manipulated, and hence it will not be necessary to provide a notch N in the casing of the watch, as is usually the case when the shipper-lever is employed for disconnecting the winding mechanism and connecting the setting mechanism.

In Fig. 5 the lever L has been shown in its normal position when the spring 28 has been relieved of its tension, so that practically the spring 18 predominates in forcing the stem 19 downward, and it will be clearly seen that when the lever L is shifted from the position shown in Fig. 5 to that indicated by dotted lines in Fig. 1 the cam projection 42 thereof will be brought into contact with the pin 32, thus tensioning the spring 28 to force the stem 19 upward, and in this instance the upper stem-section 13 is cut off or shortened, as indicated by 13′, (see Fig. 2,) so as to permit the stem-section 19 to move upward, and thus disengage the winding-sleeve 14 from the winding-pinion 15. In this instance the notch N will of course permit the lever L to

pass therethrough, so as to be operated from the outside of the watchcase, as usual in lever-set watches.

It is desired to be pointed out in the mechanism here shown that a reversal of the more common arrangement of certain of the essential parts is made for purposes of complicity, convenience, and efficiency—that is to say, the provision in the plate of the winding-pinion having its clutch-hub outwardly instead of inwardly extending and the same protruding into the outwardly edgewise-opening socket 14^b permits the employment of a sleeve (having the clutch-teeth at its inner end) which merely requires to be dropped or slipped into place from the outer edge of the plate, so that the assemblage of the sleeve in its proper relation to the other parts is most easy, and, as is important and very desirable, when the watch requires to be taken down to be cleaned or repaired or a clutch-sleeve replaced the latter may be taken out on the mere displacement of the spring 18, without removing the winding-pinion. Moreover, in the mechanism described it is to be appreciated that the winding-sleeve 21 is a stationary element and one which is in the present organization of comparatively small diameter, and because of such small diameter and the absence next thereto and at the exterior thereof of any necessary means for causing endwise motions thereof, as has been necessary in watch-movements heretofore of the most common construction, the winding-wheel and its hub on the one side and the usual center-wheel of the watch on the other side of this winding-sleeve 21 may have their positions very close to this sleeve, thereby enabling the watch-movement to be made somewhat thinner than heretofore or leaving increased space for occupancy of a thicker mainspring-barrel, in which there may be employed a correspondingly-wider mainspring, which in many cases is highly advantageous.

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

1. In a watch winding and setting mechanism in combination, the movement-plate having a socket 14^b opening to the edge thereof and having the winding-sleeve therein with clutch-teeth at its inner end, the stationary winding-pinion set in an aperture in the plate and having a clutch-toothed hub protruding outwardly into said socket, the setting-sleeve 21 rotatably mounted in an aperture in the plate radially inside of, and in alinement with, the winding-pinion, the same being endwise immovable, and in driving connection with the setting-gearing, a stem endwise movable in and through both sleeves 14 and 21, having a constant non-rotatable engagement relatively to the sleeve 14 and having a portion constructed for temporary engagement inside of the sleeve 21, means for forcing and temporarily retaining the stem in its inwardly-thrust position, and a spring bearing in an endwise outward direction against the stem, substantially as and for the purposes set forth.

2. In a winding and setting mechanism for a watch the combination with the pendant and crown and the frame or plate of the watch-movement having the aperture 16, and a socket 14^b therein extending from such aperture to the outer edge of the plate, of the setting-gearing and a sleeve 21, set for rotation, but constrained against endwise movement in the plate, having an axial opening in alinement with said socket 14^b a portion of the length of which opening is of polygonal shape, and the sleeve 14, set in said socket 14^a, having, at its inner end, the clutch-teeth 17, the winding-pinion mounted in said aperture 16 and having its hub extended into said socket 14^b and at the outer end provided with clutch-teeth, the two-part stem, one section 13 thereof being connected to the crown, and endwise movable and non-rotatably engaging in the sleeve 14, and the other section being provided with the polygonal portion 19′ and having a non-rotatable engagement and an endwise movement in the sleeve 14, and also adapted to have an endwise movement for engagement with, and disengagement from, the sleeve 21, and a spring exerting a force endwise outwardly on the stem-section 19, for the purposes set forth.

3. In a winding and setting mechanism for a watch, in combination, the pendant, the crown, the watch-movement plate having the aperture 16 and the socket 14^b extending outwardly therefrom to the edge of the plate, the winding-pinion in said aperture 16 constructed with a clutch-ended hub extended outwardly into said socket 14^b and leaving a central polygonal passage therethrough, the setting-gearing and the sleeve 21 located radially inside of the winding-pinion and in engagement with the setting-gearing and having a polygonal opening, the stem-section 13 connected to the crown and engaging in the opening in the sleeve 14, the stem-section 19 having the polygonal outer end portion engaging in sleeve 14 and having the inner polygonal end portion 19′ adapted to engage and disengage the sleeve 21, the pivoted lever 25 having a member bearing against the inner end of stem-section 19, a pivoted spring 28 engaging a member of said lever and having a stud 32, the lever L pivoted on the plate having the members 41 and 42, for engagement with said stud 32, and having an opening L′ between them, and a spring 18 bearing endwise inwardly against the said sleeve 14, substantially as and for the purposes set forth.

Signed by me at Springfield, Massachusetts, in the presence of two subscribing witnesses.

CHRISTOPHER KUENZEL.

Witnesses:
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M. A. CAMPBELL.