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E. STAEHLI.

STEM WINDING AND SETTING MECHANISM FOR WATCHES.

APPLICATION FILED JUNE 8, 1904.

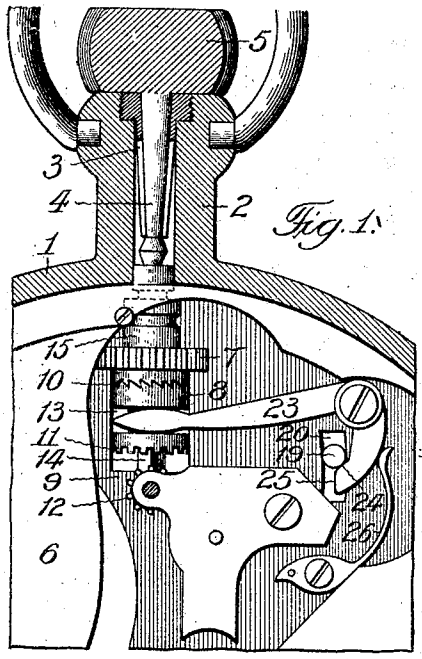

Fig. 1.

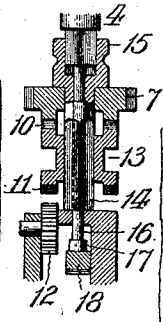

Fig. 5.

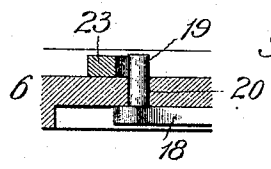

Fig. 6.

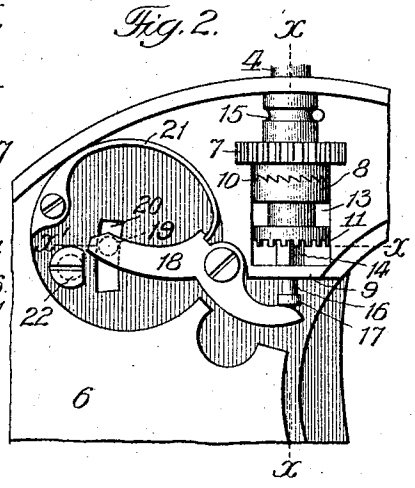

Fig. 2.

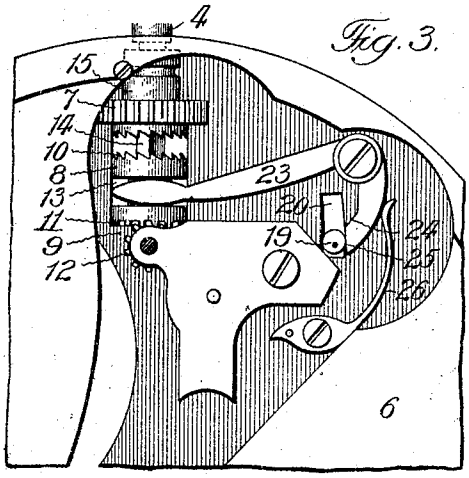

Fig. 3.

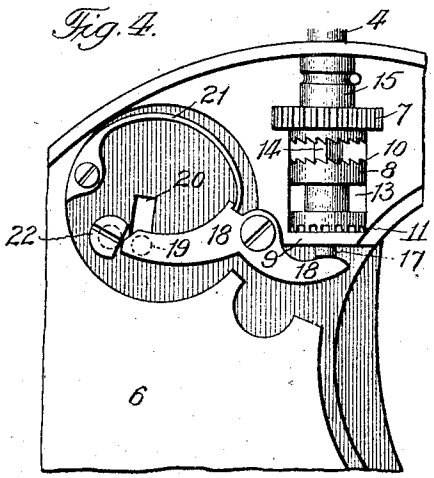

Fig. 4.

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STEM WINDING AND SETTING MECHANISM FOR WATCHES.

No. 833,489. Specification of Letters Patent. Patented Oct. 16, 1906.

Application filed June 8, 1904. Serial No. 211,626.

To all whom it may concern:

Be it known that I, EDWARD STAEHLI, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Stem Winding and Setting Mechanism for Watches, of which the following is a specification.

This invention relates to that class of stem winding and setting mechanism for watches in which an axial outward adjustment of the watch-crown effects an inward shift of a clutch wheel or member into operative engagement with a pinion of the hand-setting mechanism and an axial inward adjustment of said crown to its normal position effects an outward shift of said clutch-wheel into operative engagement with the pinion of the watch-winding mechanism; and the present improvement has for its object to provide a simple and efficient structural formation and combination of parts in the intermediate mechanism between the winding-stem and the clutch-wheel of the mechanism, whereby an easy, certain, and effective operation is insured and which is equally adapted to closed and open face watches, as well as to watches which vary in the relative proportions of their parts, all as will hereinafter more fully appear.

In the accompanying drawings, illustrative of the present invention, Figure 1 is an enlarged front view of my improved stem winding and setting mechanism for watches with the mechanism in position for winding the watch. Fig. 2 is an enlarged rear view thereof with the mechanism in a similar position. Fig. 3 is an enlarged front view of the same with the mechanism in position for setting the hands. Fig. 4 is an enlarged rear view thereof with the mechanism in a similar position. Fig. 5 is a detail longitudinal section at line x x, Fig. 2. Fig. 6 is a detail transverse section at line x' x', Fig. 2.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents the watch-case, having a tubular pendant 2, in which the set-sleeve 3 and the male stem 4 of the winding-crown 5 are arranged, as usual in stem winding and setting watches.

6 is the main plate or frame of the watch-movement. Such plate is formed with depressions in its front and back for the reception of the present shifting mechanism, with a transverse orifice to receive the winding-pinion 7 of the winding mechanism and hold the same in position, with a secondary transverse orifice connecting with the orifice aforesaid and adapted to receive and permit axial adjustment of the clutch member or wheel 8 and with a cross-piece or bridge 9 at the lower end of the secondary orifice aforesaid to form an abutment for the inner end of the winding-stem and a stop for the primary lever of the shifting mechanism, the described formation of parts being common to the present type of stem winding and setting watches. The winding-pinion 7 of the winding mechanism is arranged upon the shank of the winding-stem hereinafter described and in a manner to permit independent rotation of such shank.

The clutch member or wheel is formed at its upper end with a circular set of ratchet-teeth 10, adapted for operative engagement with a like set of ratchet-teeth on the adjacent under side of the winding-pinion 7 of the winding mechanism, and at its lower end such clutch member is formed with a circular set of gear-teeth 11, adapted for operative engagement with the pinion 12 of the hand-setting mechanism. Such clutch member is adapted to have limited independent axial adjustment upon the tubular winding-stem hereinafter described, in order that said clutch member may be moved from one to the other of the above-described engagements.

13 is a peripheral recess in the clutch member 8 and intermediate of its length for operative engagement with an arm of the secondary lever of the shifting mechanism hereinafter described.

14 is a tubular winding-stem having a square or like non-circular lower shank portion in operative engagement with a correspondingly-formed bore of the clutch member 8 aforesaid. Said winding-stem is also provided with an upper enlarged head 15, recessed centrally to form a non-circular orifice for operative engagement with the non-circular lower end of the male stem 4 of the winding-crown 5 in a manner to permit of limited axial adjustment between the parts, as usual in the present type of stem winding and setting watches.

16 is a push-rod extending axially through the tubular bore of the winding-stem 14. The upper end of said rod has bearing against the under side of the male stem 4 aforesaid, and its lower end is preferably provided with a

head or enlargement 17 for operative engagement by the primary lever of the shifting mechanism hereinafter described.

18 is the primary lever of the present shifting mechanism, pivoted to the inner plate 6, as shown. The inner arm of said lever is of an outwardly-curved form and is arranged to engage against the inner end of the push-rod 16 aforesaid, while the outer arm of said lever is also of outwardly-curved form and carries near its free end a lateral pin or stud 19, which extends through an elongated orifice 20 in the main plate 6 for operative engagement with the hereinafter-described secondary lever of the shifting mechanism.

21 is a spring of some stiffness, engaging the outer arm of the primary lever 18, with a tendency to move the push-rod 16 outward.

22 is a set-screw having an irregular head arranged adjacent to the free end of the outer arm of the primary lever 18 and adapted for engagement therewith to lock said lever in the position it normally assumes under the influence of the spring 21, for convenience in the assemblage and removal of the parts.

23 is the secondary lever of the shifting mechanism, having a short inwardly-curved arm and pivoted to the main plate 6, as shown. The main arm of said lever is substantially straight, with its free end in operative engagement with the peripheral recess 13 of the clutch member 8, while the other arm is in angular relation to said main arm and is formed with an inclined inner cam-face 24, ending in a straight transverse end bearing-face 25, providing an extended guide for the lateral pin at an angle thereto concentric with the pivot-axis of the primary lever 18. The arrangement is such that as the pin 19 moves downward against the inner inclined cam-face 24 it will impart a corresponding movement to the secondary lever 23 until the straight transverse end bearing-face 25 is reached, when the pin will move along the same without imparting any movement to the secondary lever 23 and without any liability to disengagement of the parts due to an excessive downward movement of the pin 19. By such construction the present shifting mechanism is adapted to a wide range of watch-movements in that it provides for a wide difference in the adjustment of the winding-stems of the different movements.

26 is a spring engaging the short inwardly-curved arm of the secondary lever 23, with a normal tendency to move said lever in the direction which brings the clutch member 8 in operative engagement with the pinion 7 of the winding mechanism. Such spring has less resiliency than the spring 21 of the primary lever 18, in order that said spring 21 will effect a shifting of the clutch member 8 to a hand-setting position, as more fully set forth in the operation of the mechanism.

The operation is as follows: With the winding-crown 5 in the normal position shown in Fig. 1 its stem 4 is in the inner position shown in Figs. 1 and 5 to longitudinally depress the push-rod 16 and, through the primary and secondary levers 18 and 23, maintain the clutch member 8 in its upper position and in operative engagement with the pinion 7 of the winding mechanism. With an outward movement of the winding-crown 5 and its stem 4 in the usual manner the holding stress of the stem 5 against the push-rod 16 is released, and said rod follows the stem 4 in its outward movement under the stress of the spring 21 and primary lever 18, and with such lever moving under the stress of said spring the lateral pin 19 moves against the inner inclined cam-face 24 of the secondary lever 23 to impart movement to the main arm of said secondary lever in an inward direction, and through the operative connection of said arm with the clutch member 8 the said clutch member is moved inwardly to release the prior operative engagement thereof with the pinion 7 of the winding mechanism and to operatively engage its gear-teeth 11 with the pinion 12 of the hand-setting mechanism. The lateral pin 19 next passes onto the straight transverse end bearing-face 25 to positively hold the secondary lever 23 without imparting movement thereto. With the completion of the hand-setting operation the winding-crown 5 is pushed back to its normal position, thus shifting the lateral pin 19 from the straight transverse end bearing-face 25 and releasing the secondary lever 23, and a reverse operation of the parts to that last described takes place and the clutch member 8 is returned to its normal engagement with the pinion 7 of the winding mechanism.

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

A stem winding and setting mechanism for watches comprising a primary lever carrying a lateral pin and a secondary lever having an arm for engaging the clutch member, and a short inwardly-projecting angular arm formed with an inclined inner cam-face with which the lateral pin carried by the said primary lever engages for moving the said secondary lever, and with a straight transverse end bearing-face located at an angle to the said inclined inner cam-face providing an extended guide for the lateral pin concentric with the pivot of axis of the primary lever to positively hold the secondary lever without imparting movement thereto.

EDWARD STAEHLI.

In presence of—
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