

U. OPPLIGER.
Stem Winding and Setting Watches.

No. 213,833.

Patented April 1, 1879.

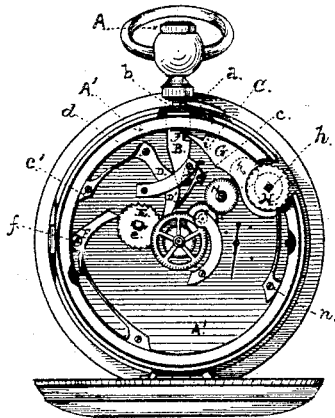


Fig. 1.

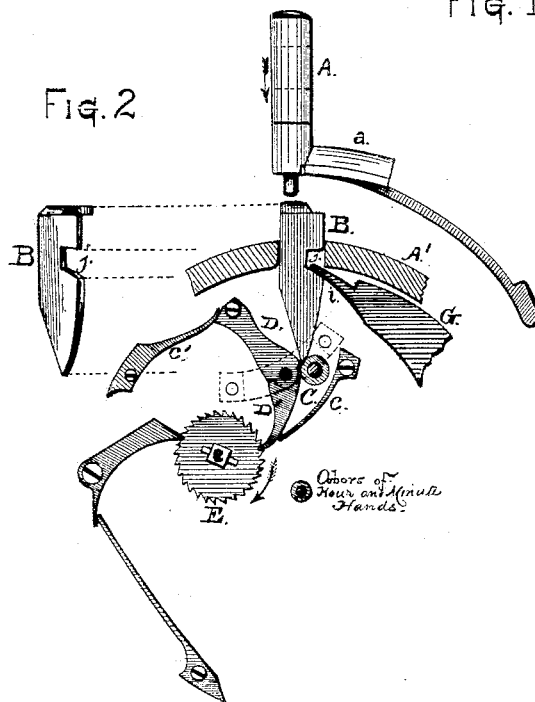


Fig. 2.

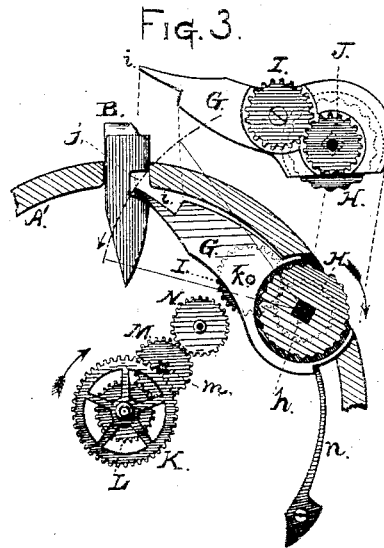


Fig. 3.

WITNESSES:

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ULRICH OPPLIGER, OF CHAUX DE FONDS, SWITZERLAND, ASSIGNOR TO
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IMPROVEMENT IN STEM WINDING AND SETTING WATCHES.

Specification forming part of Letters Patent No. **213,833**, dated April 1, 1879; application filed
December 26, 1878.

To all whom it may concern:

Be it known that I, ULRICH OPPLIGER, of Chaux de Fonds, in the Republic of Switzerland, have invented a certain new and useful Improvement or Invention in Stem Winding and Setting Watches, which invention is fully set forth and described in the following specification, accompanying drawings making part thereof.

My invention relates to an improvement in stem winding and setting watches that are constructed to be wound up and set from the outside of the watch-movements without the use of a key; and it has for its object to provide a winding and a setting mechanism having points of greater simplicity, cheapness of construction, and a quality of working without being broken or put out of order, whereby I am enabled to employ the invention in the construction of the cheapest as well as the most expensive kinds of watches.

It consists, first, in the construction and application of a winding mechanism that is operated by pushing down the stem or pendant, so that whenever the case is opened to learn the time a rotation of a ratchet-wheel fixed on the arbor of the mainspring is effected, and the watch is wound up a little; second, in the construction of a setting mechanism and its combination with the stem or pendant in such manner that the position of the hands can be changed and adjusted at any time from the outside of the case by means of a roughened or serrated wheel and parts which are independent of the winding mechanism, whereby the two arrangements of mechanism operate entirely independent of each other, but are each set in motion by and actuated from the stem or pendant.

In the accompanying drawings, Figure 1 is a view of a watch with the case open and the dial and hands removed from the movements to expose to view the winding and the setting mechanisms. Fig. 2 is an enlarged view in detail of the winding mechanism, and Fig. 3 is a view of the setting mechanism.

The enlarged diagrams, Figs. 2 and 3, illustrate clearly the mode of operating the mainspring ratchet-wheel from or by means of the stem, and the manner of moving and setting the hands from the outside of the case; and

Fig. 1 shows the arrangement of these parts under the dial.

A is the stem, and *a* the spring-catch for holding down the front case or cover. These parts are of the ordinary construction, except that the lower end of the stem is lengthened, or has a pin, *b*, of proper length projecting below the spring *a* and immediately over a wedge-shaped sliding plate, B. This wedge works through a slot in the case and through the edge of the front plate, A', of the movements. It is made with a pointed tapering end, that fits and works in between a fixed roller-stop, C, and a jointed pawl, D. This pawl is pivoted at *d*, and its finger D' bears against a ratchet-wheel, E, secured on the square end of the mainspring-arbor *e*. A spring, *c*, holds the jointed finger D' in engagement with the ratchet-teeth; and a stop-pawl, F, pivoted at *f*, and kept against the teeth on the opposite side, holds this ratchet-wheel in position as fast as it is turned forward by the movement of the jointed pawl.

The pawl D has the form and action of an elbow-lever, and it is held in and returned to a bent position by the springs *c c'*. One end being fixed or pivoted, and the free end being engaged with the ratchet-wheel, any movement of the lever tending to straighten it will cause the pressure of the free finger D' to turn the ratchet-wheel a certain distance. Thus the act of pushing in the stem A will force the wedge B in between the fixed stop C and the bent elbow of the jointed lever D, and a rotation of the mainspring-arbor *e* will take place. When the pressure upon the stem is removed the action of the pawl in returning to its bent position will throw up the wedge again, and hold it in this position ready for the next motion of the stem.

Every downward movement of the stem winds up the mainspring a certain amount, if enough pressure is put upon the head of the stem, and thus the watch is kept wound and running by the opening and closing of the case in using the watch.

The setting mechanism, Fig. 3, is constructed to work independently of the winding mechanism. The parts in each are separate, and none of them performs a double function.

A swinging plate, G, is pivoted to the plate A'

of the movements at *h*, and has a pointed end or finger, *i*, that projects into a slot or recess, *j*, made in the edge of the wedge B. A serrated or roughened wheel, H, pivoted upon this plate is held in a slot in the side of the movement-plate, so that its roughened surface projects beyond the case of the watch sufficiently to allow it to be acted upon and rotated by the finger; and two gear-wheels, I J, (one pivoted to the plate G at *k*, and the other fixed on the axis of the wheel H,) are located on the under side of the pivoted plate.

The arbors carrying the hour and minute hands are provided with gears K L, that engage with the train of gears M *m* N, pivoted to the plate A', and are made of proper proportion, so that the difference in movement of the two hands shall be produced. The last wheel of the train is in line with the gear-wheel I, and the two are brought into engagement by moving the plate G down against it. This motion of the plate G upon its pivot is effected by pressing down the stem, whereby the wedge B is moved down and caused to bear upon the end of the plate, and by this means throw the wheels N and I together. While the parts are held in such position any movement of the roughened wheel H will throw the train of gears into action and turn the hands in the required direction.

The wide end of the plate G has a spring, *n*, bearing against a shoulder on its edge, which performs the office of bringing the plate back again into place, and throwing the gears N I out of working contact whenever the pressure is taken from the head of the wedge B. By this construction the parts are brought into action by pushing down the stem, and are returned again to their first position when the pressure is removed.

When, however, the watch is fully wound, the stem or pendant has a sufficient free movement without bearing down too hard upon the wedge B; for it is necessary that the catch of the case should be acted upon to open it, and also that the wedge should have a downward movement sufficient to act upon the swinging plate G, to throw the setting mechanism into gear at any time. The movement of the stem and the wedge beneath it must be allowed to take place to either set the watch or to open the case, without bearing too hard against the jointed lever of the winding mechanism when

the mainspring is wound up to its fullest extent.

Having thus fully described my invention, what I claim as new therein is—

1. In a stem-winding watch, the sliding stem or pendant constructed and arranged to operate both the spring-catch of the case and the winding mechanism of the movements, substantially as described, whereby the said stem will act to wind up the mainspring of the watch whenever it is pushed in to open the case, as herein set forth.

2. In a stem winding and setting watch, the sliding stem or pendant constructed and arranged to operate both the winding mechanism and the spring-catch of the watch-case, and to throw into action the hand-setting mechanism by acting upon the pivoted plate carrying the actuating-wheels of the setting mechanism, substantially in the manner and for the purpose set forth.

3. In combination with the mainspring ratchet-wheel of a watch-movement, the winding mechanism operated from the stem or pendant of the case, the same consisting of the jointed pawl D, springs *c c'*, stops C, and wedge B, constructed and arranged substantially as described, to be operated by the downward movement of the sliding stem.

4. In a winding mechanism for watches adapted to be operated by pushing in the stem or pendant of the watch-case, the jointed pawl D, in combination with the stop C on the movement-plate, constructed and arranged substantially as described and set forth.

5. The wedge-shaped plate B, with pointed end, and a slot or recess in its side, *j*, substantially as described, and situated beneath the stem or pendant of the case, for the purposes set forth.

6. The pivoted swinging plate G, carrying a roughened or serrated wheel, which is arranged to project through the side of the case or movements of the watch and having gears, substantially as herein described, for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 16th day of October, 1878.

ULRICH OPPLIGER. [L. S.]

Witnesses:

F. POVAT,

T. A. QUARTIER.