H. M. ROBOTTOM.

Stem Winding and Setting Watches.

No. 196,252. Patented Oct. 16, 1877.

Fig. 1.

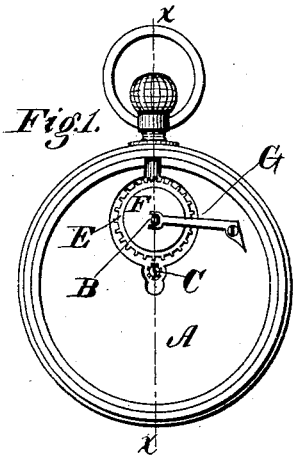


Fig. 2.

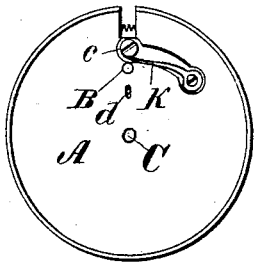


Fig. 3.

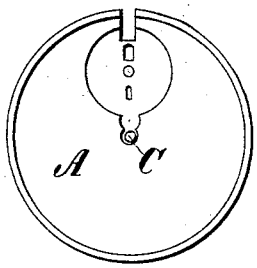


Fig. 4.

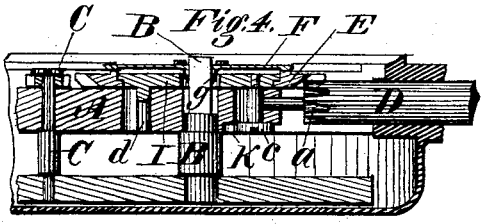


Fig. 5.

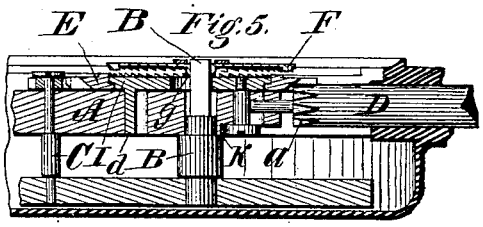


Fig. 7.

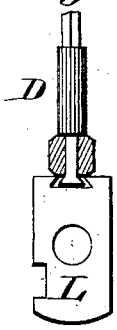


Fig. 6.

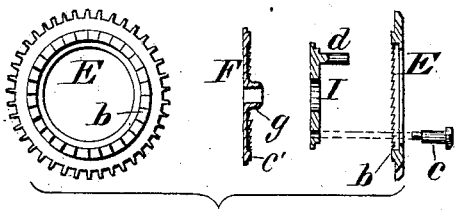


Fig. 8.

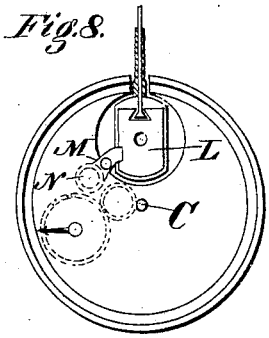
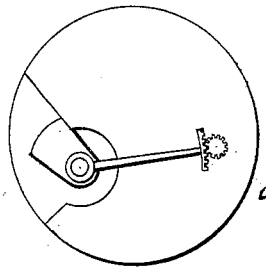


Fig. 9.



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By his attys.

Dodge & Son

UNITED STATES PATENT OFFICE.

HENRY M. ROBOTTOM, OF LIVERPOOL, GREAT BRITAIN, ASSIGNOR OF ONE-THIRD HIS RIGHT TO WILLIAM PHILLIPS THOMPSON, OF SAME PLACE.

IMPROVEMENT IN STEM WINDING AND SETTING WATCHES.

Specification forming part of Letters Patent No. **196,252**, dated October 16, 1877; application filed August 18, 1877.

To all whom it may concern:

Be it known that I, HENRY MATTHEW ROBOTTOM, of Liverpool, in the county of Lancaster and Kingdom of Great Britain, have invented certain new and useful Improvements in Stem Winding and Setting Watches, of which the following is a specification:

My invention relates to a stem winding and setting mechanism of peculiar construction, which may also, if desired, be used in connection with the regulating devices; and consists in the special construction and arrangement of parts hereinafter described.

Figure 1 is a face view of a watch, having the front plate exposed, and showing the parts in position for winding; Fig. 2, view of the inside face of the front plate, showing the spring by which the winding-gear is held out of contact with the center-pinion; Fig. 3, a face view of the front plate, with the winding and setting devices removed therefrom; Fig. 4, a transverse central section on line *x x* of Fig. 1, with the parts in the winding position; Fig. 5, a similar view, with the parts in the position for setting hands; Fig. 6, views showing parts of the winding and setting mechanism in detail; Figs. 7, 8, and 9, views illustrating the manner of connecting the winding and setting mechanism with the regulator — an arrangement which may be adopted, but which I do not seek to cover in the present patent.

A represents the front plate of the watch; B, the winding arbor or pinion; C, the center-pinion, by which the hands of the watch are controlled.

D represents the stem of the watch, provided with the usual head or button on the outer end, and arranged so that it may receive a rotary and also a limited longitudinal movement. At its inner end the stem is formed into or provided with a bevel-pinion, *a*, which gears constantly with a large gear-wheel, E, so that whenever the stem is rotated in either direction it causes a rotation of the wheel E. The wheel E is provided on its upper side face with a concentric circle or ratchet-teeth, *b*, (most clearly shown in Fig. 6,) which gear into a corresponding set of teeth, *c'*, on the under face of a disk, F, which is mounted on the squared end of the winding-pinion B, and pressed down upon the wheel E by a spring-arm, G, as shown in Figs. 1 and 5, so that when the wheel E is turned forward by the stem it transmits motion through the teeth to the disk F, which, in turn, rotates the pinion B, and thereby winds upon the mainspring of the watch. When the wheel E is turned backward the spring-arm permits the disk F to rise, and the ratchet-teeth ride upon each without turning the disk or affecting the winding-pinion.

The above-described arrangement is all that is necessary to effect the winding of the watch; but in order to secure the setting of the hands, also, I so arrange the parts that the wheel E, while remaining in gear with the stem, may be moved edgewise into gear with a wheel or pinion, H, on the center-pinion or hand-shaft C. This is accomplished by connecting the wheel with sliding supports, and arranging the stem to push it inward, and a spring to push it outward again when the stem is released.

The wheel E is made, as shown in Fig. 6, in an annular or ring form, and surrounds or encircles the winding-arbor, and is held down in place by a circular central plate or washer, I, which latter is held in its place, as shown in Figs. 4 and 5, by a fastening-screw, *c*, and a guide-pin, *d*, both of which are mounted in slots in the body-plate A, as shown in Figs. 2, 3, 4, and 5, so that they permit the wheel E and washer I to play edgewise. A spring, K, mounted on the inside of the plate A, bears against the screw *c* of the washer I, and serves to push the latter and the wheel E outward away from the center-pinion C. The end of the stem D is provided with a small neck or spindle, *e*, passing into the edge of the plate A, and bearing against the screw *c*, as shown in Figs. 4 and 5, so that upon pressing the stem inward with sufficient force to overcome the spring K, the wheel E will be forced into gear with the center pinion, while at the same time it remains in gear with the stem, which latter, upon being now turned forward or backward, will transmit motion through the wheel E to the center-pinion and hands.

When the setting operation takes place it is, of course, necessary that the ratchet-teeth

of the wheel E and the winding-disk F shall be disengaged from each other, and this is accomplished by providing said plate F with a central hub, *g*, which has its end beveled or inclined, as shown in Fig. 6, and extended into an opening in the center of the sliding washer or plate I, as shown in Fig. 4, so that when the wheel E and the washer are pushed sidewise by the stem, as described, the washer rides under the inclined end of the hub *g*, and, pushing the same upward, lifts and holds the disk F and its teeth clear of the wheel E, as clearly shown in Fig. 5, the disk F rising and standing still on the winding-arbor as the wheel and washer move sidewise under it.

When the pressure is removed from the end of the stem after setting the watch, the spring K pushes the wheel E back to its place under the disk F, and the latter drops back thereon, so that their teeth again interlock to permit the winding of the watch.

It is obvious that, unless some provision were made against it, there would be danger of the stem being pushed inward and the setting devices being operated accidentally during the operation of winding. To prevent this trouble the disk F has its bevel-ended hub *g* made with a cylindrical body of such length as to extend down into the opening in the plate or washer I, and present a vertical side to hold said plate from moving, as shown in Fig. 4, until the disk F is first raised sufficiently to withdraw the cylindrical portion of the hub and bring its beveled end opposite or on a level with the edge of the opening in the washer, to be acted on thereby. This preliminary raising of the washer is effected by first turning the stem D slightly backward, the effect of which is to turn the wheel E back, and cause its ratchet-teeth to ride under those of the disk F, and thereby push the latter up. In this way all danger is avoided of affecting the hands accidentally when winding; but at the same time the instantaneous operation of the setting mechanism is permitted, after unlocking them, by the backward rotation of the stem.

Instead of beveling the end of the hub, it may be made square, and the same action precisely secured by beveling or flaring the opening in the disk or washer.

It will be observed that the normal position of the parts is such that the rotation of the stem will cause the winding up of the mainspring, and that the mere inward pressure on the stem instantly disconnects the winding devices, and brings those for setting the hands into action.

In case it should be desired to adjust the regulator of the watch by means of the stem, the latter may have an enlarged inner end connected with a sliding plate, L, which serves to operate a lever, M, carrying an idle-pinion, N, as shown in Figs. 7 and 8, so that upon drawing the stem outward beyond its position for winding, it will move the slide and lever, and cause the pinion N to connect the wheel E with gearing which actuates the regulator arm or lever, as in Fig. 9, the wheel E to move and remain in gear with the stem, as in winding.

It is manifest that in constructing the winding and setting mechanism the precise arrangement of details shown need not be adhered to, the only requisite being that the main parts should have the movements and actions described.

Having thus described my invention, what I claim is—

1. The combination of the winding-arbor B, provided with the yielding ratchet plate or disk F, the gear-wheel E, provided with the ratchet-teeth on its side face, and the pinion-stem D.

2. In combination with the winding-pinion B, the center-pinion or hand-shaft C, and stem D, having the rotary and longitudinal movements, the rotating and laterally-moving wheel E, with ratchet-teeth on its side face, and the yielding ratchet plate or disk F, mounted on the winding-pinion.

3. In combination with the rotating and sliding winding and setting wheel E, having ratchet-teeth on its side face, the yielding ratchet-plate F, provided with the hub having the cylindrical body and beveled or conical end, for the purpose described.

4. In combination with the rotating disk F and the rotating and sliding wheel E, having ratchet-teeth on their contiguous faces, a locking-hub, *g*, to prevent the wheel E from moving laterally until it has first turned backward, to cause the raising of the disk by the ratchet-teeth.

5. In a stem-winding mechanism for watches, the combination of a driving and a driven wheel provided with circular rows of ratchet-teeth on their contiguous faces, and held together by a spring-pressure, substantially as shown.

6. The combination of the hand-controlling pinion C, the driving-wheel E, capable of a transverse sliding movement, a spring arranged to urge the wheel away from the pinion, and the stem D, serving both to rotate the wheel and force it into gear with the pinion.

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