

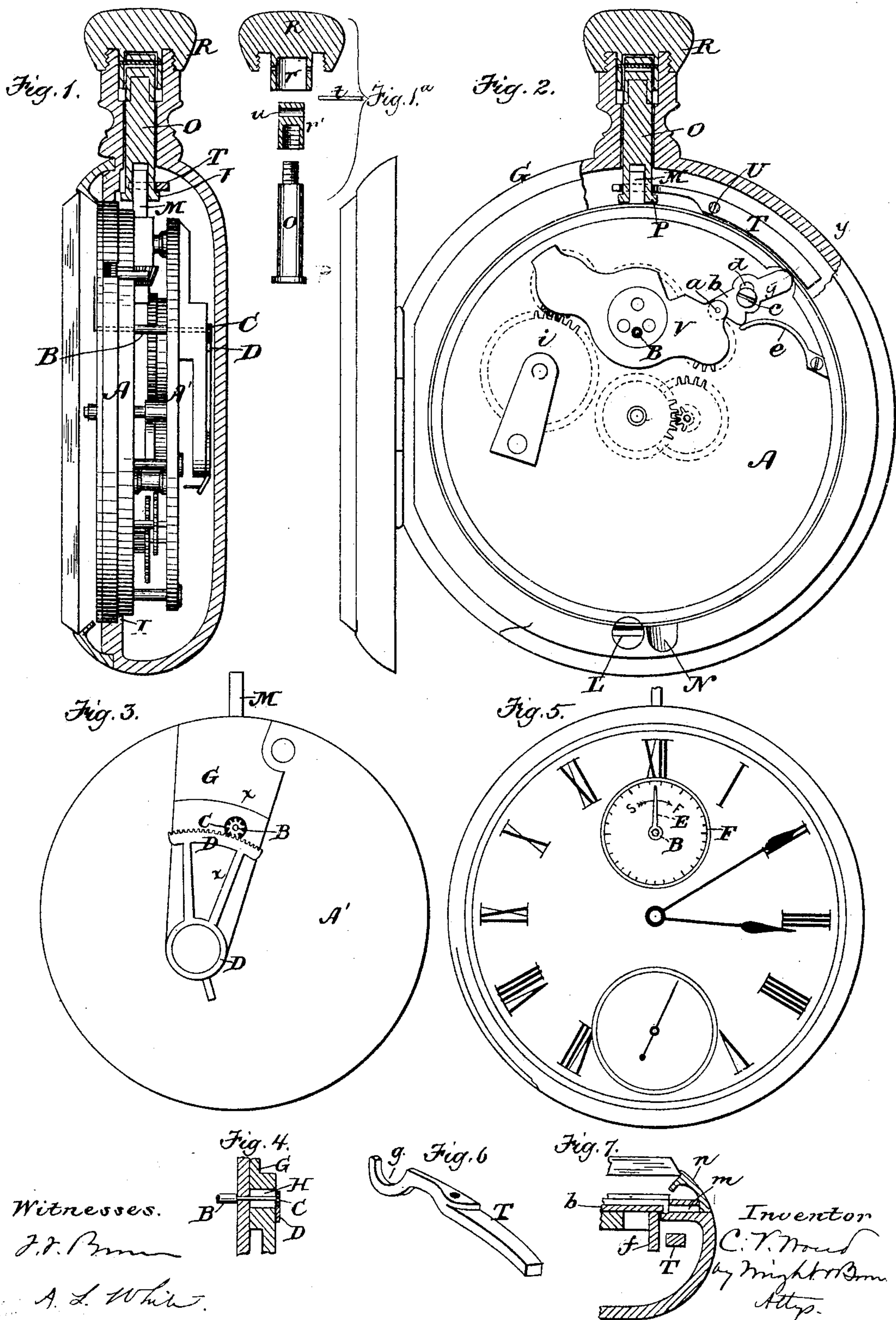
(No Model.)

C. V. WOERD.

WATCH.

No. 271,965.

Patented Feb. 6, 1883.





# UNITED STATES PATENT OFFICE.

CHARLES V. WOERD, OF WALTHAM, MASSACHUSETTS.

## WATCH.

SPECIFICATION forming part of Letters Patent No. 271,965, dated February 6, 1883.

Application filed April 10, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES V. WOERD, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain  
5 Improvements in Watches, of which the following is a specification.

This invention has for its object to provide certain improvements in watches, relating, first, to the regulator when the same is adapted to  
10 be operated from the front or face of the watch; secondly, to the construction of the case, whereby the back of the movement is supported entirely from the front or portion of the case against which the bezel bears, and can be  
15 easily applied and removed from the front when the bezel is open; thirdly, to the device for operating the hand-setting mechanism by the retraction of the pipe of the winding-arbor, whereby, when said device is applied to the  
20 case, it will not interfere with the insertion and removal of the movement; fourthly, to the hand-setting mechanism, whereby it is adapted to be operated by the before-mentioned device; and, lastly, to certain details, all of  
25 which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a transverse section of a watch-case embodying my invention and an edge view of the  
30 movement therein. Fig. 2 represents a front view of the movement, (the dial and bezel being removed,) and the case being partly in section. Fig. 3 represents a rear view of the movement detached from the case. Fig. 4 represents a  
35 section on line *x x*, Fig. 3. Fig. 5 represents a front view of the watch in its entire condition. Fig. 6 represents a perspective view of the lever for operating the yoke of the hand-setting mechanism. Fig. 7 represents a section  
40 on line *y y*, Fig. 2.

The same letters of reference indicate the same parts in all the figures.

In carrying out the first part of my invention, which relates to the regulator-operating  
45 devices, I provide the supporting-plates *A A'* of the movement with an arbor, *B*, which is journaled in said plates and projects at its ends beyond their outer surfaces. The inner end of said arbor is provided with a pinion,  
50 *C*, engaging a rack-segment, *D'*, on the regulator, as shown in Fig. 3. The outer end of

the arbor *B* is provided with a hand or arm, *E*, projecting over the dial of the watch, and serving as a handle to rotate the arbor, and as an indicator, showing the position of the  
55 regulator. The dial is provided with a concentric scale, *F*, around the arbor, and with marks to indicate the direction of the movement of the arbor required to increase or diminish the rate of movement of the balance.  
60 The arbor *B* passes through the balance bridge or cock *G*. Said bridge is provided with an orifice, *H*, larger than the pinion *C*, so that the bridge can be applied and removed without interfering with the pinion. Said orifice  
65 also forms an unobstructed space around the projecting end of the arbor, and therefore enables said projecting end to act to a slight extent as a spring and hold the pinion with a yielding pressure against the rack-segment *D'*,  
70 thus insuring the effective engagement of said pinion and segment.

It will be seen that the provision of the extended arbor on the pinion *C* or equivalent  
75 regulator-operating device, and the operating-hand located outside of the dial, obviates all necessity of exposing the back of the movement for the purpose of operating the regulator. This provision whereby the watch is regulated from the front enables me to employ  
80 in a stem-winding watch a case, *G*, formed with a seamless back or shell, substantially as shown in Letters Patent No. 214,642, granted to E. C. Fitch, April 22, 1879, so that the back of the movement is tightly covered, and the  
85 entrance of dust is made impossible through the back. The case as a whole is composed of two general parts—viz., the seamless concave body or shell *G*, including the back, and the bezel *n*, having the glass, and removably  
90 secured to the body *G* by a hinge, or by screw-threads, as in Fitch's patent above named. The case *G* is provided with an inwardly-projecting seat or flange, *I*, which is adapted to receive the larger or topplate, *A*, of the movement, as shown in Fig. 1, said plate resting  
95 directly on the seat or flange of the case, without the employment of the interposed ring shown in the above-named patent to Fitch. The plate *A* is of the same shape in nearly all  
100 the movements made by the Waltham Watch Company, so that the provision of the flange



or seat I enables the movement to be applied to the case without any adaptation thereto. The movement is secured in place by a screw, L, inserted in the case at a point opposite the winding-arbor M and bearing on the edge of the plate A. The winding-arbor, entering the pipe or key O in the stem, co-operates with the screw L in holding the movement in place.

N represents a recess or notch formed in the case G, to enable a pointed tool to be inserted under the edge of the plate A for the purpose of raising said plate from its seat in removing the movement from the case.

The pipe or key O of the stem has at its end a flange, P, and is capable of a longitudinal sliding movement in the stem, as usual. On the outer end of the key O is a crown, R, which has an internal screw-thread adapted to engage with an external thread on the end of the stem, so that the crown can be screwed upon the stem and caused to tightly close the same, as shown in Letters Patent No. 237,377, granted to E. C. Fitch, dated February 8, 1881, the screw-threads being so formed that the rotary movement of the crown required to screw it upon the stem is the reverse of that required to operate the winding mechanism.

T represents a lever, pivoted at U to the inner side of the inwardly-projecting flange I of the case, and lying, when in its normal position, entirely within the space formed by said flange, outside of the space occupied by the movement, and opposite the space between the plates A A' thereof.

To the swinging yoke V, which carries the pinions that impart motion from the winding-arbor respectively to the winding-wheel *i* and the hand-setting train, is pivoted, at *a*, a slide-plate, *b*, secured to the plate A of the movement by a screw, *c*, passing through a slot, *d*. The plate *b* is thus adapted to slide toward and from the center of the plate A, and is pressed outwardly by a spring, *e*. At the outer end of the plate *b* is an arm, *f*, against which one end of the lever T bears. The opposite end of the lever T has a recess, *g*, which partially incloses the key or pipe O. When said key or pipe is drawn outwardly its flange P bears against the lever T and turns the lever upon its pivot, thereby pressing its opposite end against the arm *f*, pushing the plate *b* inwardly, and swinging the yoke V, so that the hand-setting train is connected with the winding-arbor, and the winding-wheel *i* is disconnected therefrom. The key or pipe O being released, the spring *e* restores the plate *b*, yoke V, and lever T to their normal positions. It is obvious that the pipe O can be withdrawn to operate the lever T only when its crown R is unscrewed from the stem. It will be observed that the location of the lever T entirely outside of the space occupied by the movement enables the movement to be inserted and removed without interference with the lever.

It sometimes happens that the crown R is screwed well upon the stem and at the same time the movement is nearly or wholly wound

up. Under these conditions it is impossible to unscrew the crown and retract the key or pipe O, for the purpose of setting the hands in the manner above described, unless the winding-wheel *i* be disengaged from the winding-arbor. I therefore provide the case with a small orifice, *m*, (seen in Fig. 7,) arranged to permit a wire to be inserted and pressed against the plate *b*, thereby moving the yoke V, so as to disconnect the winding-arbor from the wheel *i*, so that the crown can be unscrewed. The orifice *m* is covered by the bezel *n* when the watch is closed.

To facilitate the entrance of the winding-arbor M into the key or pipe O when the movement is being inserted in the case, I connect the key or pipe with the crown R in such a manner that the key can have a limited oscillating movement in any direction, and therefore can be inclined so as to move its inner end slightly toward the front of the case. To this end the crown is provided with a socket, *r*, and a section, *r'*, is provided, which is adapted to enter said socket and play loosely therein, and is secured by a pin, *t*, secured in the walls of the socket *r*, and passing through an orifice, *u*, of considerably larger diameter than the pin. The pipe O is screwed into the section *r'*. It will be seen that the loose fit of the section *r'* in the socket of the crown and the enlarged orifice *u* receiving the pin *t* enable the pipe and the section *r'* to tilt in any direction. The orifice in the stem, through which the pipe passes, is sufficiently large to give the pipe some lateral play.

It will be observed by reference to Fig. 5 that the arbor B and the center of the index F are diametrically opposite the center of the ordinary minute-index—that is to say, the centers of the index F, the minute-index, and the dial are all in line. This arrangement gives the dial a neat and symmetrical effect, and it is brought about by passing the arbor B through the fixed plate on which the yoke V is journaled, as shown in Fig. 2. It will be observed, however, that the arbor B could not be so arranged if the pipe or barrel of the winding and setting mechanism were extended toward the center of the watch to the usual extent, because said pipe would extend inwardly beyond the point where the arbor is located. By providing the short pipe O and the intermediate devices for operating the winding and setting mechanism I am therefore enabled to produce this advantageous arrangement.

I am aware that it is not new to operate a watch-regulator by an arbor passing through the case and having a hand projecting over the dial. Therefore I do not claim broadly the provision of such an arbor.

I claim—

1. The combination, in a watch, of a regulator having a rack-segment, an arbor journaled in the supporting-plates of the movement, and provided at its respective ends with a pinion engaging the segment and a hand or arm projecting over the dial, and the bal-



ance-wheel having an orifice larger than said pinion, whereby the bridge is adapted to be applied and removed without disturbing the pinion, and an unobstructed space is provided  
5 around the pinion-supporting end of the arbor, as set forth.

2. The combination of the case, having the seamless body and back, the inwardly-projecting seat or flange I, and the longitudinally-  
10 movable flanged winding-arbor pipe or key O, the lever T, pivoted under said flange outside of the space occupied by the movement and engaged with the flange of the pipe, and the movement, having the stem-winding and hand-  
15 setting mechanism and a device interposed between the yoke of said mechanism and the pivoted lever, whereby said lever, when moved by the retraction of the pipe O, is caused to make the hand-setting mechanism operative,  
20 as set forth.

3. In a watch having an externally-threaded stem and an internally-threaded cap or crown

on the pipe of the winding-arbor, the case G, having the orifice *m*, arranged to allow a tool to be inserted into the case to disengage the  
25 winding-arbor from the winding-wheel *i*, substantially as and for the purpose specified.

4. In a stem-winding watch, the combination, with the winding-arbor M, of the pipe-key O, terminating outside the movement, the  
30 sleeve *r'*, provided with an enlarged aperture, *u*, and the crown R, formed with a recess, *r*, whereby the pipe O is adapted to oscillate or tilt in the stem to allow the withdrawal of the movement from the case, substantially as shown  
35 and described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 7th day of April, 1882.

CHAS. V. WOERD.

Witnesses:

A. C. SMITH,  
C. F. BROWN.