

No. 641,478.

Patented Jan. 16, 1900.

E. TORRES.

REPEATING WATCH.

(Application filed July 29, 1899.)

(No Model.)

Fig. 1.

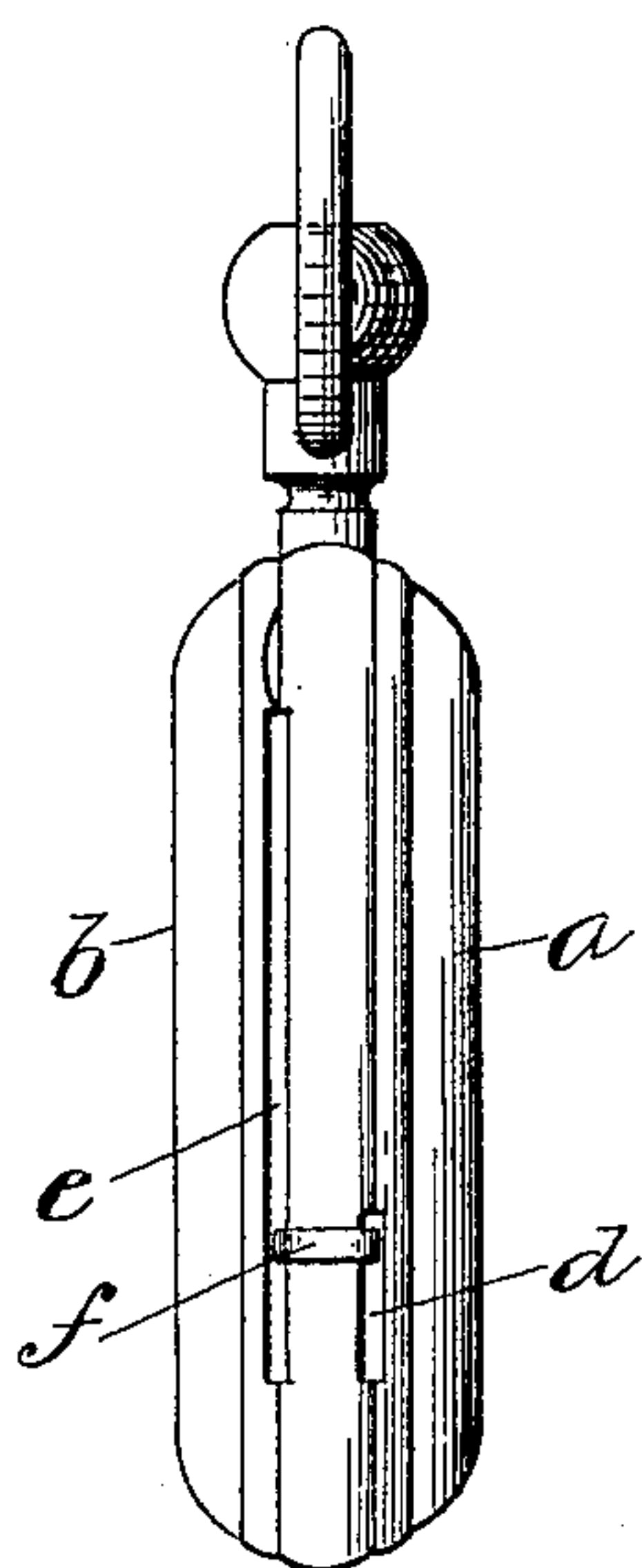


Fig. 2.

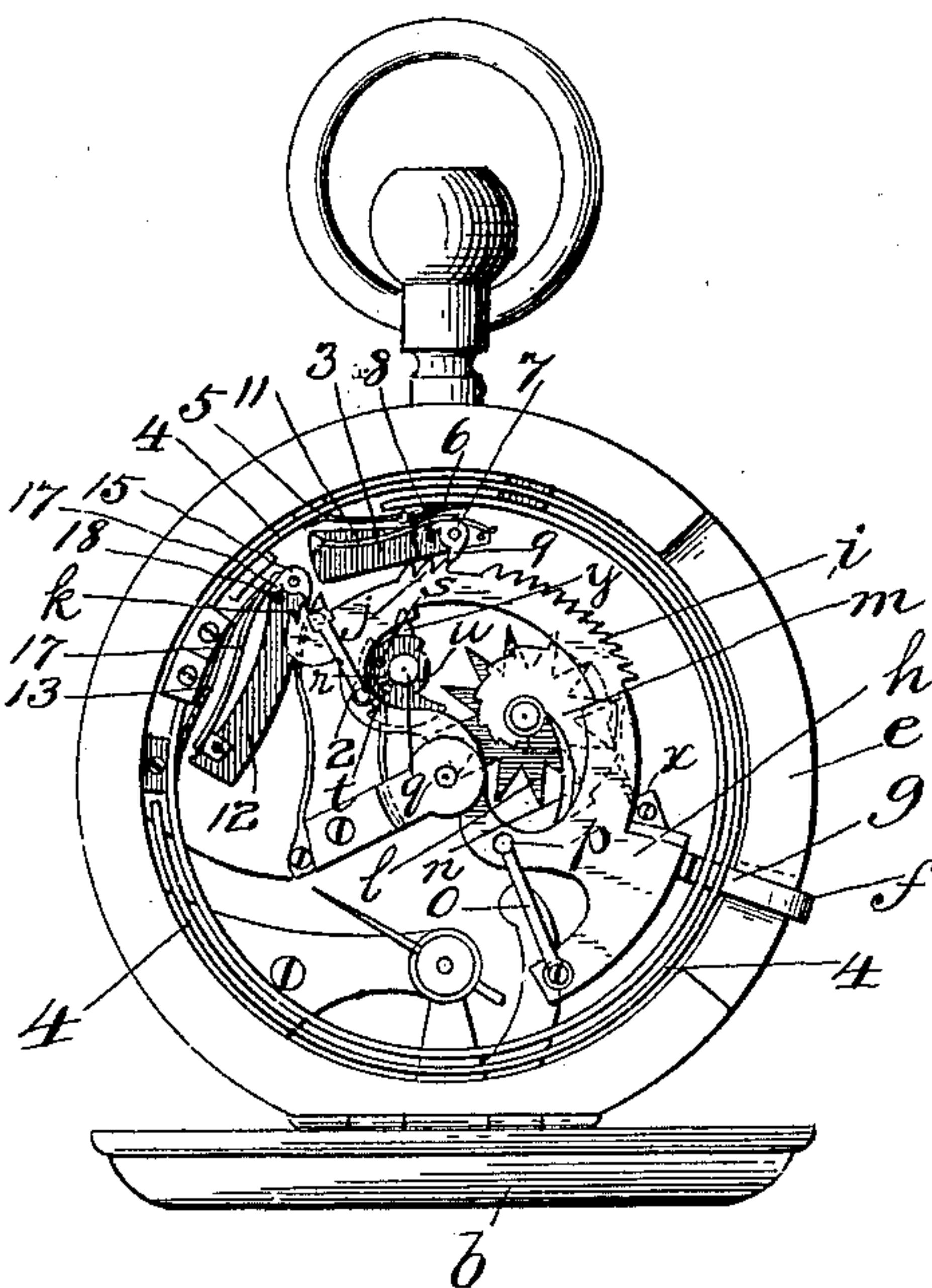


Fig. 3.

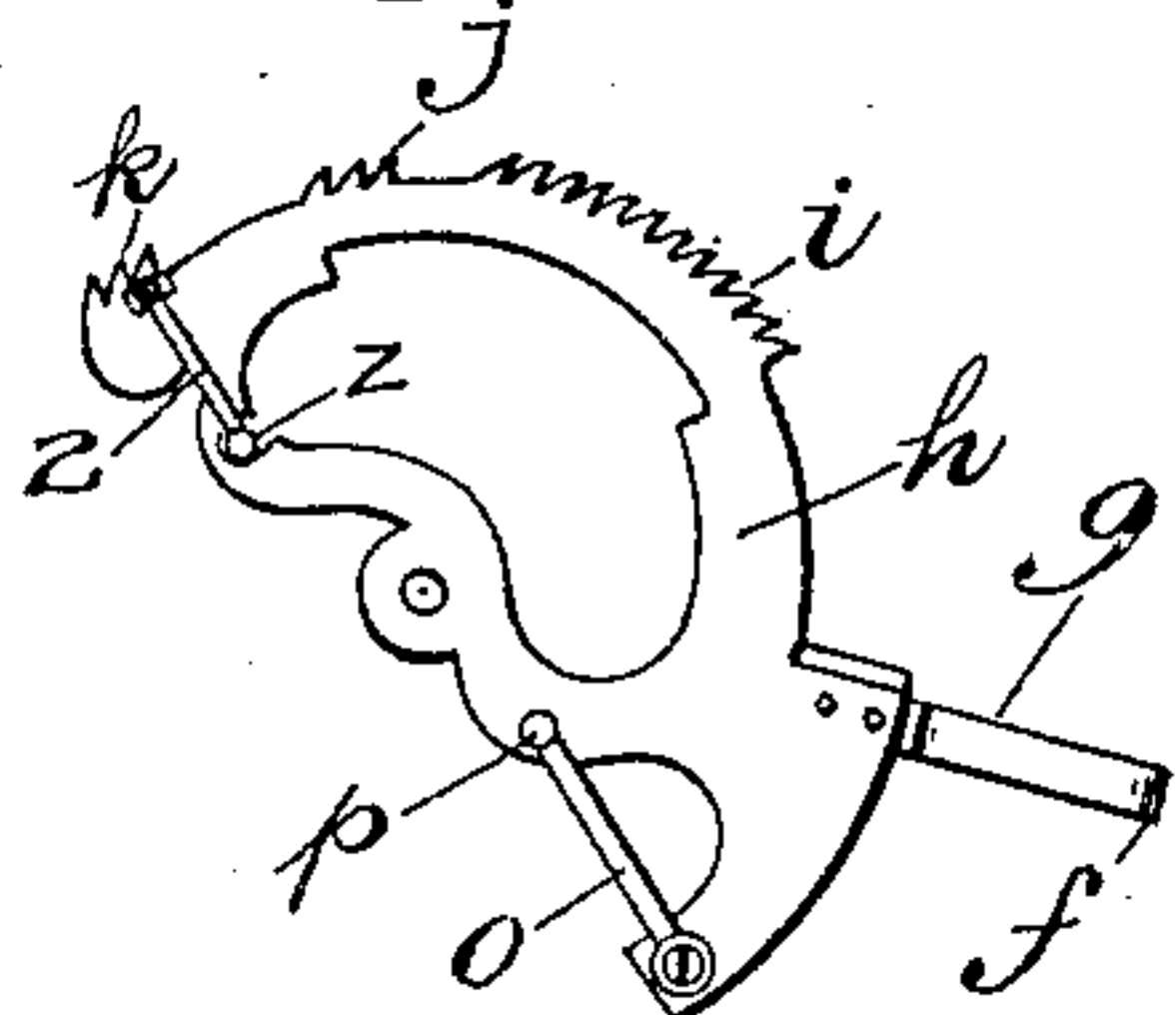


Fig. 4.

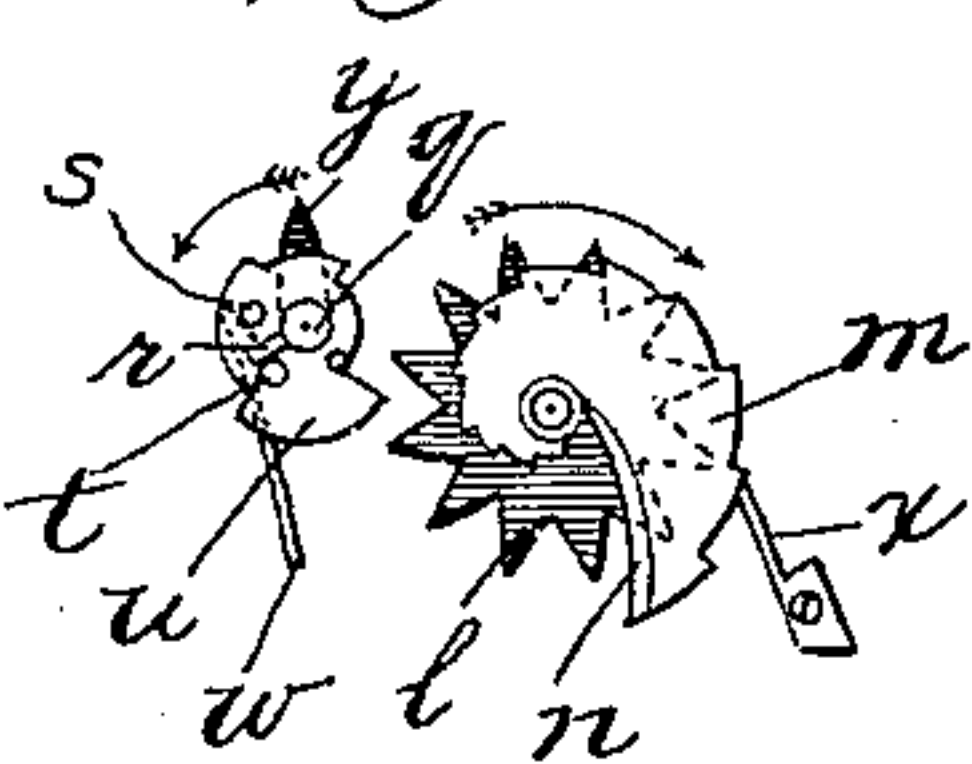


Fig. 5.

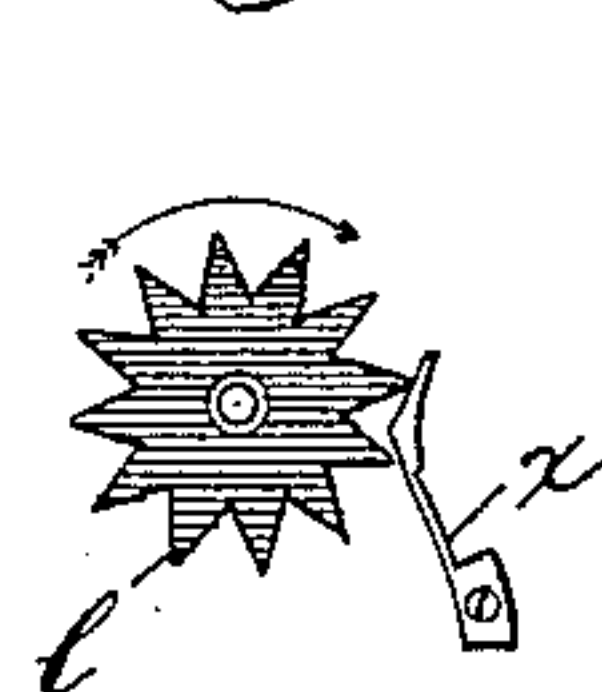


Fig. 6.

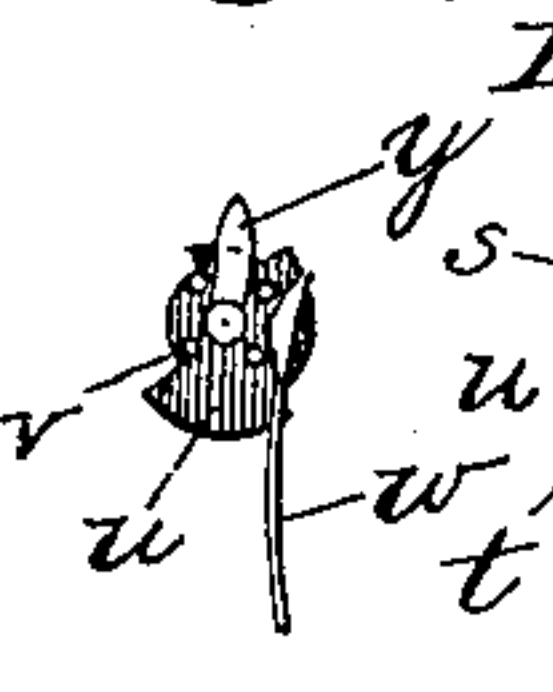


Fig. 7.

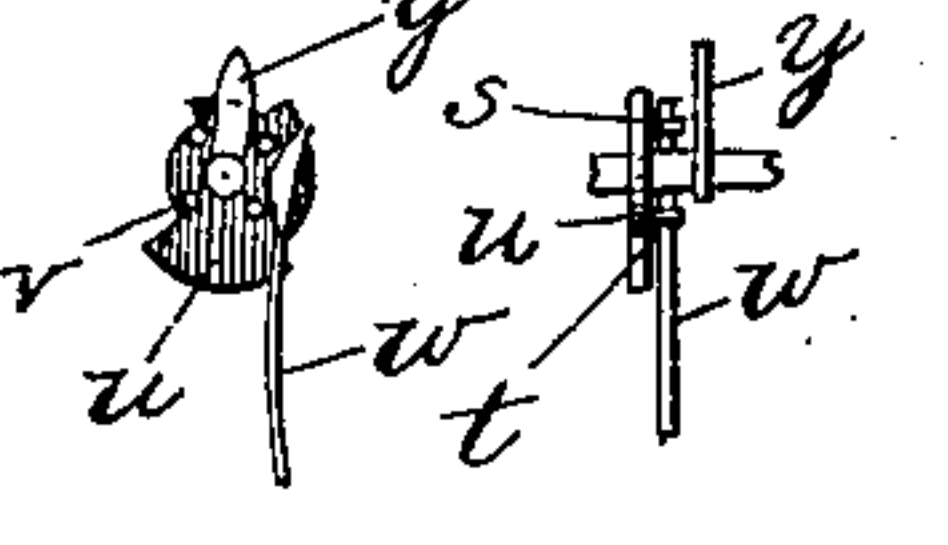


Fig. 8.

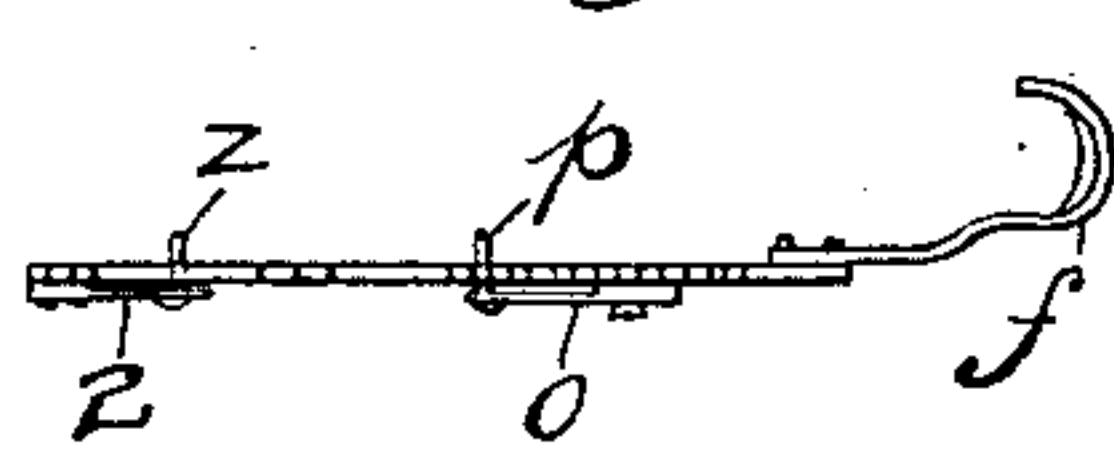


Fig. 11.

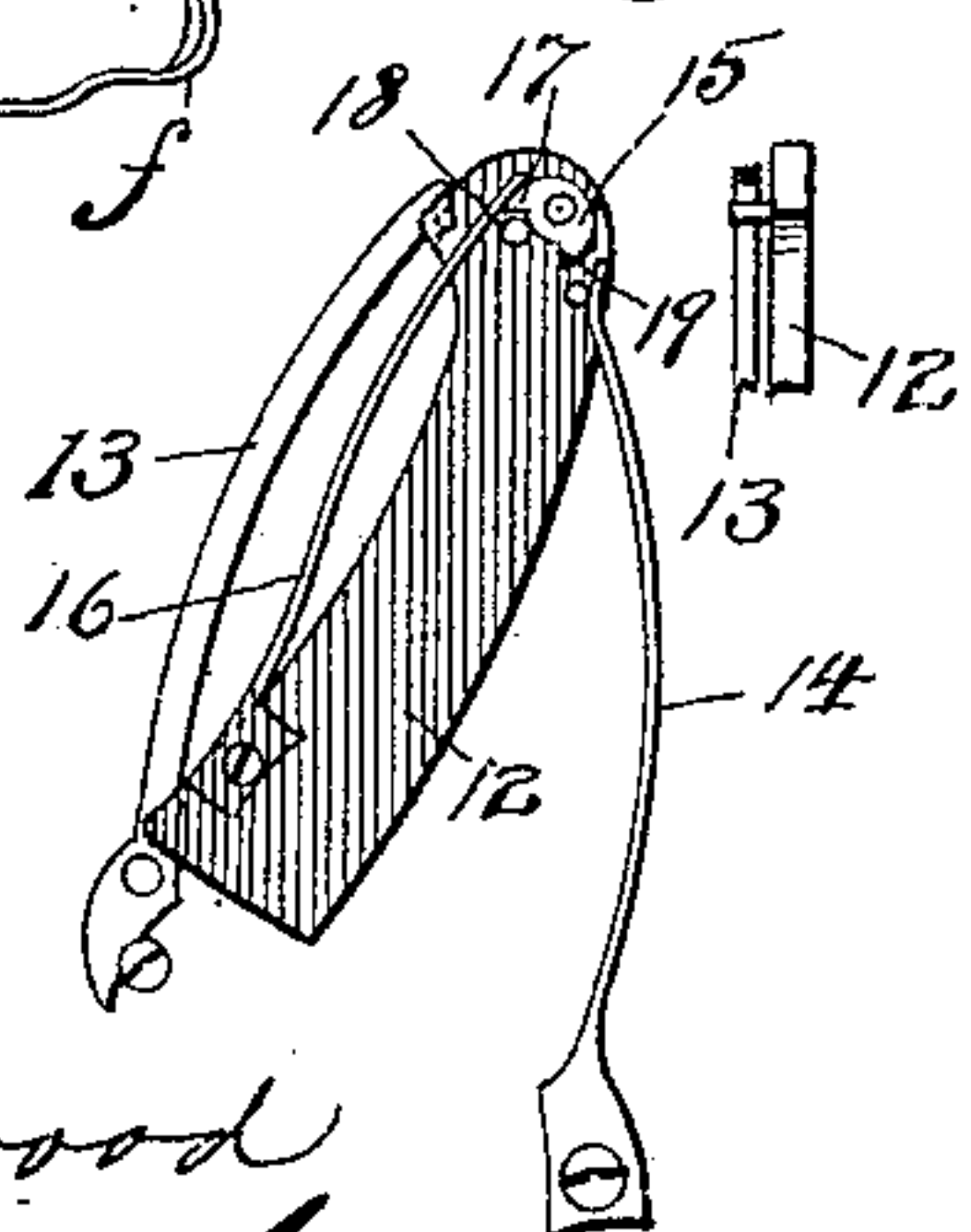


Fig. 9.

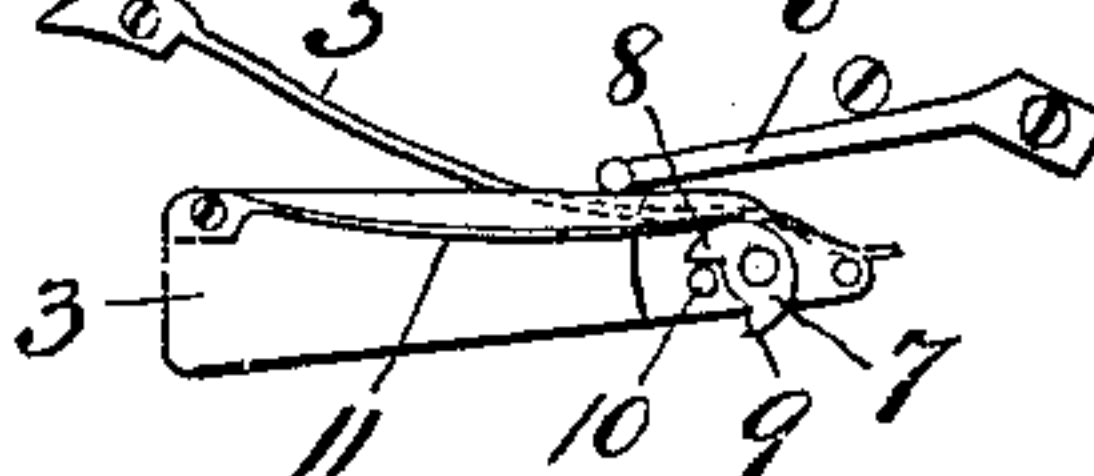
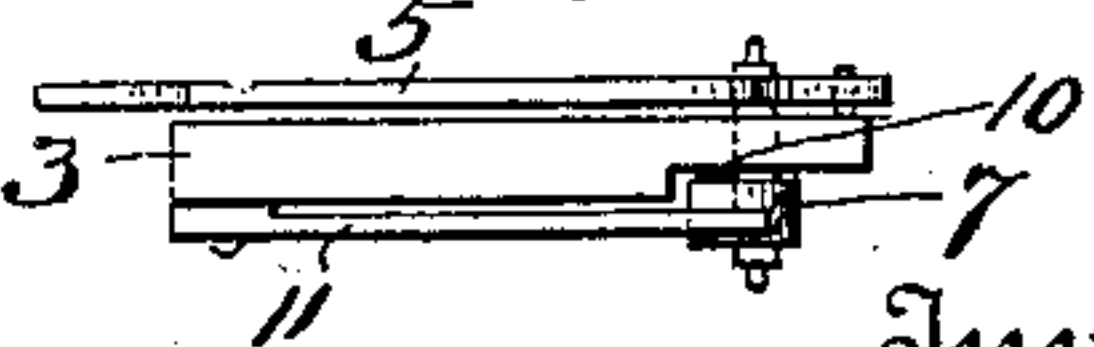


Fig. 10.



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UNITED STATES PATENT OFFICE.

ENRIQUE TORRES, OF GUADALAJARA, MEXICO.

REPEATING WATCH.

SPECIFICATION forming part of Letters Patent No. 641,478, dated January 16, 1900.

Application filed July 29, 1899. Serial No. 725,500. (No model.)

To all whom it may concern:

Be it known that I, ENRIQUE TORRES, a citizen of the Republic of Mexico, residing at Guadalajara, State of Jalisco, Mexico, have invented a new and useful Repeating Watch, (Case D,) of which the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a repeating watch capable of being operated at any time to sound the hour and the quarter last indicated by the watch-hands, and has for its objects to provide for such watch a very simple construction, having few and inexpensive parts, which will not readily get out of order and can be easily and cheaply manufactured and applied to a watch of ordinary construction, to provide means for producing different sounds to indicate the hours and the quarters, and to provide means whereby the sliding repeater-lever must be returned to its normal or starting position before the watchcase can be closed, and thereby prevent the striking of any interval except that last indicated.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is an edge view of watch, showing the slots in the case through which projects the repeater-lever; Fig. 2, a rear view in elevation of interior of watch, showing the parts of the repeating mechanism; Fig. 3, a detail plan of the bell-hammer-actuating rack; Fig. 4, a detail plan showing in relative positions the quarter-snail on minute-arbor and hour-snail and star-wheel; Fig. 5, a detail plan of star-wheel on hour-snail and its bottom detent; Fig. 6, a detail plan of quarter-snail and its detent; Fig. 7, an edge view of parts in Fig. 8. Fig. 8 is an edge view looking down on the parts shown in Fig. 3; Fig. 9, a detail plan of hour-striking hammer; Fig. 10, a top edge view of Fig. 9; Fig. 11, a detail plan of quarter-striking hammer.

Referring to the drawings, *a* is the front hinged cover, and *b* the rear hinged cover, of the watch. A short slot *d* is cut in the edge of cover *a* and a long slot *e* in the edge of cover *b*. In these slots moves the curved end of a repeater hand-lever *g*. The slot *d* prevents an operative movement of the lever *g* when the

cover *a* is closed. The lever *g* is secured to a rotatable or swinging rack *h*, mounted on a central pin and a bridge, having upon its edge three series or sections of teeth *i*, *j*, and *k*. In the first series are twelve teeth and in each of the other series three. The series *j* and *k* are separated a greater distance than *i* and *j* for the purpose hereinafter described. A star-wheel *l* of twelve points is mounted on a pin and carries a snail *m*, having twelve teeth, corresponding to the hours. The side edge of the highest tooth is beveled at *n*. To one end of the rack *g* is secured a spring *o*, having a pin or detent *p*, which passes through the rack and is adapted to engage the teeth of snail *m* for the purpose of limiting the swinging movement of the rack.

The end of the minute-hand arbor *q* is provided with a lug *r*, which extends between the two pins *s* *t*, projecting from a snail *u*, mounted loosely on arbor *q*. The snail is provided with four steps or teeth of varying lengths, corresponding to the four quarters of an hour. The snail is provided on its inner or under surface with four pins *v*. (Shown in Fig. 6.) With these pins is adapted to engage a retaining spring-detent *w*, secured to the case. A similar spring-detent *x* engages the star-wheel *l*. A tooth *y* is secured to the arbor *q* and is adapted to contact with and move the star-wheel *l* one tooth every hour.

A lug or pin *z* is mounted on spring 2 of the rack and serves to bear against the snail *u* to control the return movement of the rack for the purpose of striking the quarters.

Pivoted to the watchcase is a hammer 3. This hammer strikes against a bell formed of a coiled piece of resonant spring metal 4, secured near its center to the watchcase. A spring 5 presses on the pivoted end of the hammer and serves to hold it normally outward against or near the spring-bell, while a spring 6 limits such outward movement of the hammer. 7 is a dog or catch pivoted to the hammer and having a tooth 8 9 at the outer and inner ends, respectively. The tooth 8 of this dog is kept normally pressed against a pin 10 of the hammer by a spring 11 bearing on the outer part of the dog. Another hammer 12 is pivoted to the watchcase and is provided with a spring 13, bearing on its pivoted

end, a counter-spring 14, a dog or latch 15, pressed by spring 16, and having a tooth 17, to engage pin 18, and a second tooth 19, to engage the rack, such parts corresponding to those of hammer 3.

The operation of the repeating mechanism is as follows: The minute-hand arbor *q* in rotating will by means of its lug *r* turn the snail *u*, and as each quarter of an hour is reached one of the four pins *v* will be released from detent *w* and the detent will engage the succeeding pin, throwing forward at the same time by a rack positive action the snail until the pin *t* strikes against lug *r*. The lug will then continue its rotation for about five minutes before it again comes in contact with pin *s* of the snail, wherefore it will again turn the snail. As the snail is recurrently released by the detent the successive ranged steps of the snail will be presented for engagement to the lug *z*. When the snail completes a rotation through the four quarters, the tooth *y* strikes the star-wheel *l* and turns the same one point and the snail *m* one step, so as to present a new hour-step to the lug *p* of the rack. When it is desired at any time to repeat the hour and quarter last indicated, the outer cover *a* must be opened and the handle-lever *g* moved toward the stem as far as it will go. This movement will carry forward the rack a certain number of teeth, which will correspond to the step of the snail *m* with which pin *p* contacts. The spring dog or click 7 will yield from the rack-teeth in their stemward movement. The teeth of series *i* and *j* do not project far enough to contact with latch 15; but those of series *k* will press against the latter latch. The repeater hand-lever is then moved back to starting position, whereupon the rack-teeth will engage latch or click 7 and vibrate the hammer 3 against the bell, this vibration being according to the number of teeth passing the click. If merely the hour has been last indicated, the highest steps of snail *u* will be presented to lug *z*, and consequently the rack cannot move far enough in its return movement to engage the teeth of series *j* with the click 7 so as to sound the quarters. One tooth of series *k* will contact with and release latch 15, causing one sound of hammer 12. If the hour and one quarter have been last indicated, the next highest step of snail *u* will be presented to the rack, and the latter will be permitted to return until one tooth of series *j* engages and releases latch 7, vibrating hammer 3 once. One tooth of series *k* having just before released hammer 12, a double sound or two notes of different tone will thus be struck to indicate the first quarter. At the half-hour a lower step of snail *u* will be engaged by the rack and two teeth of both series *j* and *k* caused to move their hammers so as to sound two double notes. At three quarters three double notes will be in similar manner sounded. When the edge of the highest step of snail *u* reaches lug *z*, the latter by means of its spring will yield and

allow the snail to pass under it. In like manner if the repeater-lever should be left in its outer position near the stem and the snail *m* be rotated by the time-train until its highest step is opposite lug *p* the spring action of the latter will allow the beveled edge of the snail-step to pass under it.

It is obvious that if the repeater-lever be left out at the end of its first or setting movement until a quarter or other striking interval of time has passed that on the return movement of the rack not the last time interval indicated, but the interval at which the lever was moved out, will be struck. Hence the short slot *d* in the cover is provided, which makes it necessary to return the lever to its starting position before the watch can be closed.

Having thus described my invention, what I claim is—

1. In a repeating timepiece, in combination with a bell and a hammer, a hammer-vibrating member, an operating handle-lever directly and integrally attached to said member to move it, and a pawl connection between said vibrating member and hammer to enable said vibrating member to move freely past the hammer when pushed in one direction by the handle and to vibrate the hammer when the handle is pulled back, whereby the vibrating member is positively positioned for vibrating the hammer and positively pulled back to vibrate the hammer, by said handle-lever, substantially as described.

2. In a repeating timepiece, in combination with a bell and hammer, a swinging rack, a click intermediate said rack and hammer, an operating-handle directly and integrally attached to said rack for positively pushing it past the click and for positively pulling it back to engage the click and vibrate the hammer, substantially as described.

3. In a repeating timepiece, in combination with a bell and a plurality of hammers, for striking the hours and fractions of an hour, a swinging rack having a series of teeth corresponding to the hours and a plurality of series of teeth corresponding to the fractions of an hour, the teeth of all the series pointing in the same direction, whereby the rack moves freely past the hammers in one direction but is adapted to engage them in the other direction and caused to give a double sound to indicate the fractions of an hour, and an operating-handle directly and integrally attached to said rack for positively swinging the same, substantially as described.

4. In a repeating watch, in combination with a hammer and actuating means therefor, an operating-lever, a handle therefor, said handle extending outside the case, a locking-slot in the cover of the watch through which said handle projects when the cover is closed, said slot extending from the starting end of the sliding movement of the handle for a shorter distance than the length of movement of the handle whereby the handle and

actuating means must be returned to starting position before the watch can be closed, substantially as described.

5 In a repeating watch, in combination with the hours and quarters snails, the swinging hammer-actuating rack, an operating-handle positively attached to said rack, said handle extending outside the case, a slot in the face-cover of the watch through which said
10 handle projects, said slot at the starting end of the movement of said handle and shorter

than the length of said movement whereby the handle and rack must be returned to starting position before the watch can be closed, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ENRIQUE TORRES.

Witnesses:

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