R. FOLSOM.
Watch.

No. 218,009. Patented July 29, 1879.

Fig:1.

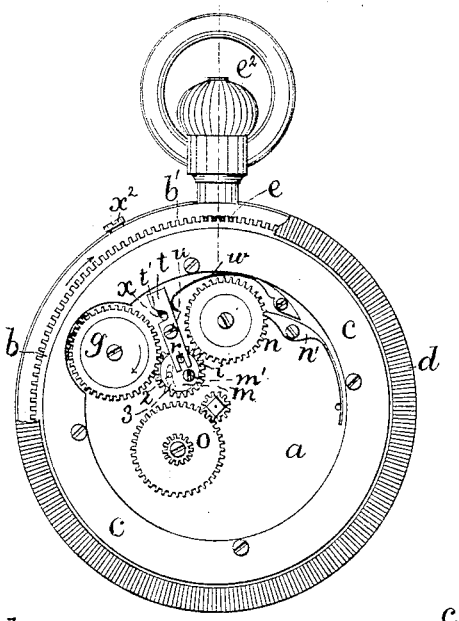


Fig:4.

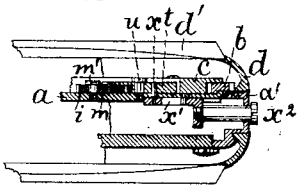


Fig:5

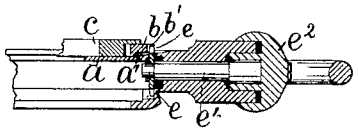


Fig:2.

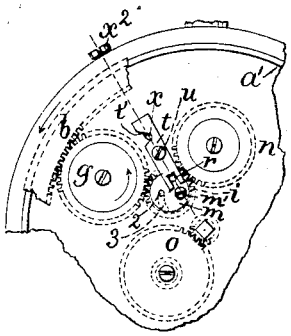
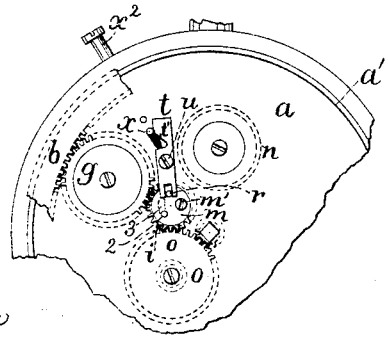


Fig:3.



Witnesses.
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Jeremiah J. Cronin

Inventor.
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UNITED STATES PATENT OFFICE.

RUFUS FOLSOM, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO SAMUEL MYERS, OF SAME PLACE.

IMPROVEMENT IN WATCHES.

Specification forming part of Letters Patent No. **218,009**, dated July 29, 1879; application filed June 9, 1879.

To all whom it may concern:

Be it known that I, RUFUS FOLSOM, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Watches, of which the following is a specification.

My invention relates to watches, and is shown in that class of watches known as "keyless watches," or those containing in themselves means to wind the watch and set its hands.

Watches of this kind have been commonly wound and set by rotating the pendent knob or stem, and are called "stem-winders," and various devices have been used to give the proper connections between the stem and the winding and hand arbors, such devices being usually turned by a pinion directly attached to the stem of the watch, the said pinions coming within the works of the watch and requiring a space to be left for them in designing it. It is impracticable to leave such a space at more than one point in the circumference of the watch, so that the same works cannot be used in an open-faced case, in which the stem or pendant is placed at the figure XII of the watch, and in a hunting-case, in which the pendant is at the figure III.

My invention consists in interposing a ring-gear surrounding the works of the watch, and suitably connected with the common winding and setting devices now in use in stem-winding watches, so that they may be wound and set irrespective of the position of the stem with relation to the works. The watch may be wound and set by rotating the ring-gear by any means, as by either the bezel or the stem.

The invention also consists in a new connecting mechanism, as hereinafter described, between the stem or bezel and the hands and winding arbors of the watch.

The connecting devices between the stem or bezel and the winding and hands arbors of the watch, as shown in my invention, consist of a ring-gear of slightly larger diameter than the main plates of the watch, and suitably connected thereto, and of proper form at its outer edge to permit the bezel of the watch to be snapped or fastened thereon if the watch is to be wound and set by the bezel; or, if the watch is to be a stem-winder, the said ring-gear is provided at its outer edge with suitable teeth to engage a pinion attached to the stem. In either case the ring-gear is provided with teeth on its inner edge, which engage, either directly or by a suitable intermediate gear, the teeth of the usual gear driven by the pinion on the stem of the watch to wind and set the same, and, in the connecting mechanism invented by me, engage a gear attached to one of the main plates of the watch, and which may be called the "driving-gear," which meshes with an eccentric or ring pinion, formed as a toothed ring turning on a movable disk or eccentric, the said disk being pivoted eccentrically upon the plate of the watch in such position that its pinion may mesh with a winding-gear upon the winding or mainspring arbor, or, by the proper motion of the eccentric, may mesh with one of the gears or pinions of the hands-train in order to set the watch, the pinion always remaining engaged with the driving-gear.

The eccentric is provided with pin under control of a lever, said lever being acted upon by a spring to keep the eccentric in proper position for its ring-pinion to engage the winding-gear, or, by suitable connections, being positively moved by the operator to cause the ring-pinion of the eccentric to engage and move the hands-train when desired to set the watch.

A second pin on the eccentric works in a slot in the watch-plate to prevent the ring-pinion from being carried too far into engagement with the teeth of the winding and hands gears.

This device forms a simple, cheap, and durable means of winding and setting a watch, and one which requires no mechanism between the main plates of the watch, and consequently may be applied in any common form of case, irrespective of the design or internal arrangement of the works of the watch, the bezel winding attachment being especially desirable in open-faced American watches.

Figure 1 shows a watch with my stem or bezel winding device applied to one of the main or pillar plates of the watch, here shown as the plate beneath the dial, the dial being removed. Figs. 2 and 3 are details showing

the eccentric and its ring-pinion in different positions. Fig. 4 is a section on the dotted line of Fig. 2, showing the device for throwing the eccentric gear into proper position to set the watch; and Fig. 5, a section on dotted line of Fig. 1, showing the stem and its pinion engaging the teeth of the ring-gear.

The main pillar-plate *a*, of usual form, is shown as suitably grooved or shouldered at *a'* to engage a shoulder on the ring-gear *b*, held in place by the annular piece *c* screwed to the plate *a*.

The ring-gear *b* may be of suitable shape to permit the bezel *d* of the watch to be snapped upon it where the said bezel may be, if necessary, secured in any usual way.

The bezel is here shown of usual form for open-faced watches, and provided with a crystal, *d'*. (See Fig. 4.)

If the watch is to be a stem-winder the ring-gear *b* is provided with suitable external teeth *b'*, to engage a pinion, *e*, on the stem e^1, rotated as usual by the pendent knob e^2, the said pinion being wholly outside the works of the watch, so that it may be placed at any point on the circle without interfering with said works.

The ring-gear *b* is provided with teeth at its inner edge to mesh with the teeth of the driving-gear *g*, pivoted to the plate *a*, and turned in either direction by the ring-gear *b*. It is obvious that this ring-gear may, either directly or by the interposition of a suitable intermediate gear, be made to turn the usual driving-gear of any common form of stem-winding watch.

The driving-gear *g* engages the ring-pinion *i*, shown as suitably shouldered, to be held in place by the eccentric disk *m*, upon which it turns, the said disk being eccentrically pivoted to the plate *a* at *m'*, in such position that by a slight motion on the pivot *m'* the ring-pinion *i* may engage either the winding-gear *n* or one of the hands-driving gears, herein shown as the minute-wheel *o*, the pinion *i* always remaining engaged with the driving-gear *g*.

The eccentric-disk *m* is provided with a pin, *r*, held in a slotted portion of the lever *t*, pivoted at *u* to the plate *a*, and acted upon by a spring, *w*, to keep the ring-pinion pressed toward the winding-gear *n*.

The lever *t* is provided with a notch having one side, *t'*, inclined and acted upon by a pin, *x*, in a slide, x^1, moved by the hand-setting rod x^2, said rod, when drawn out, as in Fig. 3, moving the slide x^1 and pin *x*, so that the said pin acts upon the inclined face *t'* of the notch in the lever to throw the said lever in proper position to bring, by the pin *r*, the ring-pinion *i* into engagement with the minute-wheel *o*.

The eccentric-disk *m* is provided with a pin, 2, which moves in a slot in the plate *a*, (shown in dotted lines at 3,) to limit the motion of the said eccentric *m*, so that the teeth of the ring-pinion may not be driven too far into those of the gears *n o*.

The winding-gear *n* is provided with a spring-pawl, *n'*, to limit its rotation to one direction.

The operation is as follows: The parts being in their normal condition, with the setting-rod x^2 not drawn out, as shown in Figs. 1 and 2, a motion of the gears *b* and *g* in the direction of the arrows shown thereon in Fig. 1 brings the teeth of the ring-pinion *i* against those of the winding-gear *n* in the direction to rotate it against the pawl *n'*, which prevents such rotation and stops the teeth of the ring-pinion, and in consequence the gear *g* does not turn the ring-pinion at first upon its eccentric *m*, but swings it with its eccentric toward the pinion *o*, the lever *t* and spring *w* yielding until coming to the position shown in Fig. 1. The driving-tooth of the ring-pinion passes over the tooth of the gear *n*, when the spring *w* and lever *t* throw the eccentric and its pinion back into engagement with the gear *n*, the ring-pinion having turned the distance of one tooth on its eccentric during the operation.

This operation of swinging the eccentric to and fro while its pinion turns thereon continues as long as the movement of the ring-gear *b* is kept up in the direction of the arrow in Fig. 1. If turned in the direction shown in Fig. 2, the ring-pinion remains in engagement with the winding-gear *n*, and rotating on the eccentric *m* as a pivot winds the watch.

When the setting-rod x^2 is drawn out, as in Fig. 3, the pin *x*, acting on the inclined face on the notch in the lever *t*, throws it over to bring the ring-pinion into engagement with the minute-wheel *o*, where it is held as long as the rod x^2 remains drawn out, and rotates on the eccentric to set the watch.

When the rod x^2 is pushed in, the spring *w* again acts to move the lever *t* and throw the eccentric and its ring-pinion out of engagement with the minute-wheel *o*, said pinion coming radially from the said wheel, so as not to disturb it in disengaging.

It is obvious that the ring-gear, being operated by the pinion *e* on the stem wholly outside the works of the watch, or by a portion of the case, as either the front or back bezel or cover of the case, or by a dust-ring, is totally independent of the relative position of the works of the watch and the pendant of the case, and may consequently be used with any design of stem-winding watch in either hunting or open-face case.

The ring-pinion may also be thrown in and out of engagement with the hands-train in various ways by the proper connections, as by a movement of the stem or pendent ring or pendant or equivalents, several of which I have successfully put in practice and consider mechanical equivalents of the device herein fully described, the essential feature being the eccentric disk and pinion.

The driving-gear and ring-pinion may be placed on either side of the winding-arbor of the watch, and the ring-pinion may engage

any of the wheels or pinions of the time-train, either directly or by an intermediate wheel.

I am aware that a ring-gear with internal teeth has been used in a stem-winding watch; but it was driven by a pinion extending into and requiring space in the works of the watch.

I am also aware that watches have been wound by rotating the bezel; but I do not know of any that could be both wound and set by the bezel.

I claim—

1. In a watch, a ring-gear provided with internal teeth and mechanism to engage the outer portion of and rotate the said ring-gear without interfering with the works of the watch, and connections between the said ring-gear and the winding and hands arbors of the watch to enable the watch to be wound and set, substantially as described.

2. In a watch, a ring-gear provided with internal teeth, and a connected bezel, and winding and hands arbors, combined with mechanism intermediate between the said ring-gear and arbors to wind and set the watch by the bezel, substantially as described.

3. In a watch, a pinion rotating on an eccentrically-pivoted disk, so placed that the said pinion shall always engage a driving-gear, and by motion of the eccentric-disk on its pivot be brought into engagement with the gear upon the winding-arbor of the watch, or with one of the hands-gears, but never engage both at the same time, substantially as described.

4. In a watch, an eccentric-disk, and a ring-pinion thereon, and gears to actuate the winding and hands arbors, combined with mechanism to hold the eccentric in adjusted position to cause its ring-pinion to engage the gear of either winding or hands arbors, substantially as described.

5. The ring-pinion and its eccentrically-pivoted disk, provided with a pin to engage a curved slot in the main plate of the watch to limit the motion of the said disk, as and for the purpose described.

6. In a watch, a ring-pinion to engage gears connected with the winding and hands arbors, and an eccentrically-pivoted disk therein provided with a pin, combined with a pivoted lever slotted at one end to engage said pin, and acted upon by a spring to move the ring-pinion toward the gear connected with the winding-arbor, and mechanism to move the lever positively to place the ring-pinion in engagement with the gear connected with the hands-arbor, substantially as described.

7. In a watch, the combination, with the driving and winding gears and minute-wheel and eccentric-pinion and eccentric provided with a pin, of the setting-rod, connected slide and slide-pin, and a lever provided at one end with an inclined notch to be acted upon by the said slide-pin, and slotted at its other end to embrace the pin upon the eccentric, as and for the purpose described.

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

RUFUS FOLSOM.

Witnesses:
M. R. MYERS,
JOS. P. LIVERMORE.