(No Model.) 2 Sheets—Sheet 1.

J. J. L. BRUN.

SELF-WINDING WATCH.

No. 271,030. Patented Jan. 23, 1883.

Fig. 1.

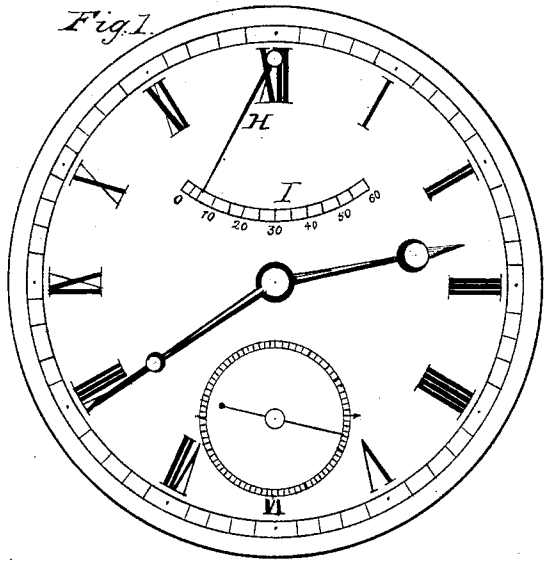


Fig. 4.

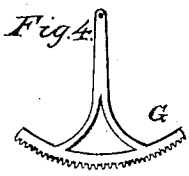
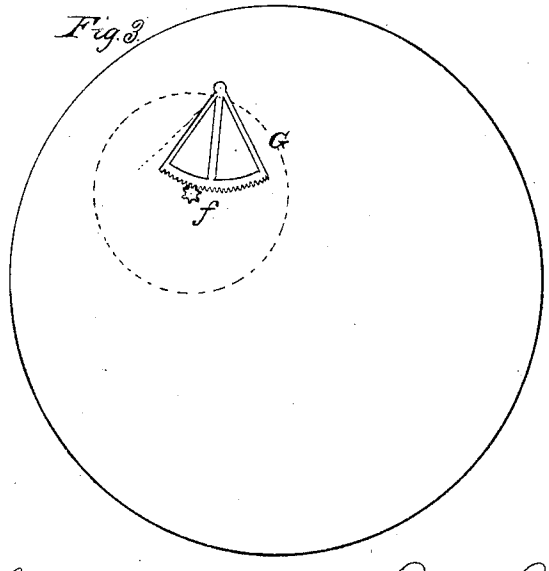


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

J. J. L. BRUN.

SELF-WINDING WATCH.

No. 271,030. Patented Jan. 23, 1883.

Fig. 2.

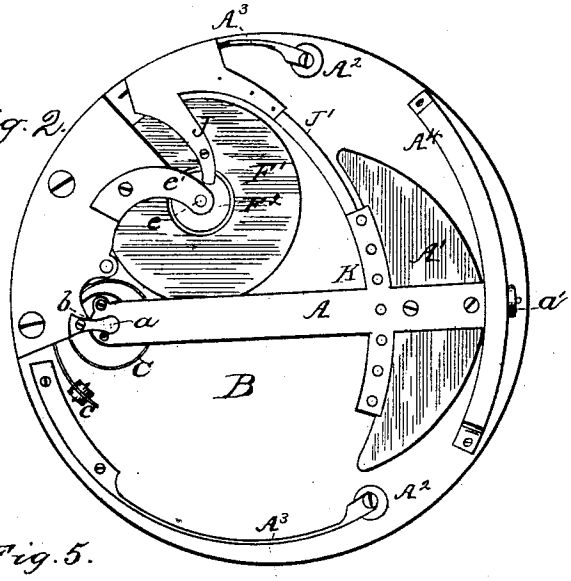


Fig. 5.

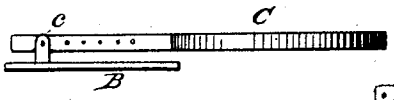


Fig. 6.

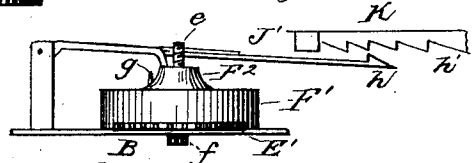


Fig. 8.

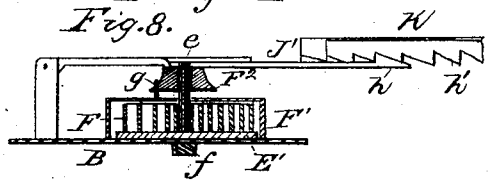


Fig. 7.

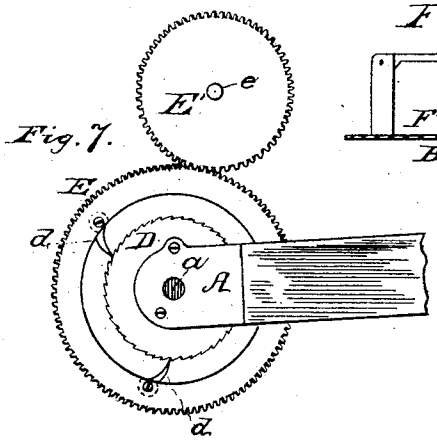
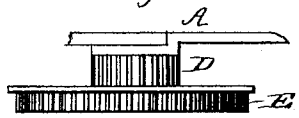


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

JEAN J. L. BRUN, OF HIGHLAND, ILLINOIS, ASSIGNOR OF ONE-HALF TO TIMOTHY GRUAZ, OF SAME PLACE.

SELF-WINDING WATCH.

SPECIFICATION forming part of Letters Patent No. 271,030, dated January 23, 1883.

Application filed October 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, JEAN JAQUES LOUIS BRUN, a citizen of the United States, residing at Highland, in the county of Madison and State of Illinois, have invented certain new and useful Improvements in Self-Winding Watches; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in watches, and is self or automatically winding, and is adapted to indicate the length of time for which it is wound up, and to arrest the action of the winding mechanism at the proper time; and the nature of the invention consists in the employment of a vibrating weighted lever actuating a ratchet, pawls, and pinion gearing with a pinion on the mainspring-axis, said lever being suspended in position by means of a spring, while at points at the ends of its strokes are arranged spring rolls or cushions.

It consists, also, of a toothed segment or quadrant, engaging with a pinion on the mainspring-axis, and carrying an index or pointer registering with a graduated arc on the watch face or dial.

It consists, further, in the employment of a two-armed plate or lever, suitably hung or pivoted in position, with one arm adapted to bear on a nut riding upon a screw-thread of the mainspring-axis, and the other arm to arrest the movement of the aforesaid lever after the winding up of the watch, substantially as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a face view of a watch-dial embodying my improvement in part, and Fig. 2 is a view of the inner disk or plate of a watch or its frame with the remaining parts of my invention applied thereto. Figs. 3 to 9 are detail views of my invention.

In carrying out my invention, I employ a lever, A, pivoted at one end upon an axis or pivot, *a*, supported in the disk or plate B of the watch-frame, and a bracket, *b*, secured to an additional piece of the watch-frame. Said end of the lever is secured to one end of a strong, powerful spring, C, the opposite end of which is fastened to the watch frame disk or plate at *c*, which holds it in a suspended position. The spring C has a series of apertures in one end to enable the taking up the slack or regulating the tension. The lever A is also fastened at the same end to a ratchet, D, with which engage pawls *d d*, hung upon the inner circumference of an annular flange of a large pinion, E, said ratchet and pinion turning upon the axis or pivot *a* of the lever A. The wheel or pinion E is adapted to gear with a pinion, E′, on the mainspring-axis *e*, whereby its movement, received through the ratchet and pawls from the lever, the operation of which will be presently described, is transmitted to and causes the winding up of the mainspring. The opposite end of the lever A has affixed to it a weight, A′, to impart momentum thereto in its suspended position, and, held under the action of the spring C, as the watch, with the lever, is carried in the pocket, partakes of the vibrations of the body of the carrier, whereby the operation of winding up the mainspring of the watch will be effected automatically. The weight is prevented from striking the watch-case, and concussion thereof overcome by disposing frictional rolls A^2 at the two extremes or points limiting the movement of the weight, said rolls being hung or having their bearings in the bifurcated ends of curved springs A^3, fastened to the disk B of the watch case or frame. The lever A has also at the latter end a frictional roll, *a′*, which travels between and against the disk B, and a raised rail or bar, A^4, fastened to the said disk at its ends, and which prevents lateral or side movement of the lever.

The mainspring F (seen in Fig. 8) is inclosed within a circular case, F′, secured to the disk or plate B, while its axis *e* turns in a suitable bearing-plate fastened to the disk and in a bracket, *e′*, said axis being screw-threaded and carrying a nut, F^2. The axis *e* extends a short distance beyond the inclosing-case of the spring F, to permit the required movement thereon of its nut during winding and unwinding of the spring, the purpose of which will be seen directly. On the end of the axis *e* next to the dial is a small pinion, *f*, (see Fig. 3,) which engages with a toothed segment or quadrant, G, suitably hung or pivoted in position upon the plate B, and carrying upon its pivot, which projects through the dial, an index or pointer,

II. This index or pointer registers with a graduated arc, I, on the dial, as seen in Fig. 1, its graduation indicating, in the present instance, sixty (60) hours divided up into intervals of ten hours. It will be therefore seen that when the mainspring or the watch is wound up the quadrant G will travel in one direction as the pinion *f*, with which it gears, is turned by such winding-up action of the spring, and thus cause its pointer or indicator H to move and register on the graduated arc I on the watch-dial with the number indicative of the length of time for which the watch is wound up. Upon the unwinding of the spring or the "running down" of the watch it will of course follow that the movement of the pinion *f* will be reversed, and the quadrant will move in the opposite direction, carrying its pointer back to the starting-point, when it will be ready to be again carried forward, as before.

J J′ are two arms, fastened to or formed with a connecting-piece at their upper ends, which is hinged or pivoted to the disk B, to enable the arms to swing outward therefrom at their lower ends. One arm, J, is curved inward, and bears against and enters a recess in the end of the nut F^2 of the mainspring-axis *e*, said nut being prevented from turning, as it rides outward and inward, upon said axis by a guide-pin, *g*, fixed to the case F′, and projecting through an aperture or slot in said nut. The other arm, J′, has a tooth, *h*, at its lower end, which engages with a series of teeth, *h′*, on the inner surface of a slightly-curved vertical cross-bar, K, of the lever A.

It will be noticed that when the mainspring or watch has been wound up, at which time the nut F^2 will have traveled to the outer end of its screw or axis, as before explained, the arm J, bearing against said nut, will be carried outward by the movement of the nut, which will cause its fellow arm J′ to have like movement and bring its tooth into engagement with the coincident notch between two of the teeth of the bar K of the lever A, and thus arrest further action or movement of the lever, and consequently stop the winding operation.

By means of this invention an automatically or self winding watch is obtained, and one whereby also the length of time for which it is wound up is indicated and the winding-up operation or tightening of the mainspring is arrested at the proper moment.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a watch, the combination, with the mainspring and its screw-threaded axis carrying an outward and inward moving nut, of the arms J J′, with their connecting-piece hinged or pivoted to enable them to swing laterally, one being adapted to bear against said nut and the other to arrest the movement of the lever operating to wind up the mainspring, substantially as and for the purpose set forth.

2. In a watch, the combination, with the mainspring having a screw-threaded axis carrying a nut, of the spring, pendulum-lever operating mechanism adapted to wind up or tighten the said spring, the toothed quadrant or curved rack gearing with a pinion on the mainspring-axis and carrying a pointer or index, and the hinged or pivoted arms, one bearing against the mainspring-axis nut and the other adapted to arrest the movement of the pendulum, substantially as and for the purpose set forth.

3. In a watch, the combination, with the mainspring F and its axis *e*, provided with a pinion, of the wheel E, having the pawls *d*, the ratchet D, spring C, axis *a*, lever A, having the weight A′, and the spring-supported rolls or cushions A^2 A^3, substantially as and for the purpose set forth.

4. In a watch, the combination, with the mainspring F and its axis carrying a pinion, of the wheel E, having the pawls *d*, the ratchet D, spring C, axis *a*, weighted lever A, carrying at one end a frictional roll, *a′*, and the elevated rail or bar A^4, substantially as and for the purpose set forth.

5. In a watch, the combination, with the mainspring F, having a screw-threaded axis, *e*, carrying a nut, F^2, with its guide-pin *g*, of the hinged or pivoted arms J J′, one bearing against the said nut and the other having a tooth at one end, and the weighted spring-lever A, having the toothed bar K, and adapted, in connection with other mechanism, to wind up or tighten the mainspring, substantially as and for the purpose set forth.

6. In a watch, the combination, with the mainspring F, the screw-threaded axis *e*, having a pinion, and nut F^2, with its guide-pin *g*, of the arms J J′, one bearing against the said nut and the other having a tooth, the weighted lever A, having the toothed bar K, the spring C, ratchet D and toothed wheel E, having pawls *d*, and axis *a*, substantially as and for the purpose set forth.

7. In a watch, the combination, with the mainspring F, having the screw-threaded axis *e*, carrying the guided nut F^2 and a pinion on each end, (one marked *f*,) of the lever A, having the weight A′, the toothed bar or rack K, and the frictional roll *a′*, frictional rolls A^2, springs A^3, elevated rail or bar A^4, plate B, spring C, ratchet D, wheel E, having pawls *d*, toothed quadrant or segmental rack G, carrying an index, H, graduated arc or scale I, and the pivoted or hinged arms J J′, one bearing against the nut F^2, and the other having a tooth engaging with a rack, K, of the lever A, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JEAN JAQUES LOUIS BRUN.

Witnesses:
GEORGE X. RUEGGER,
TIMOTHY GRUAZ.