(Model.)

A. CT. DROZ.

STEM WINDING WATCH.

No. 307,027. Patented Oct. 21, 1884.

Fig. 1.

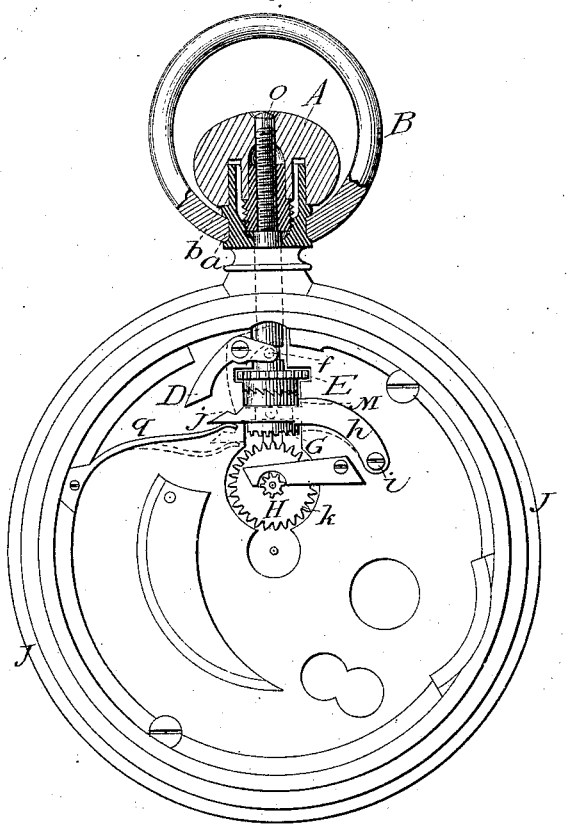


Fig. 2.

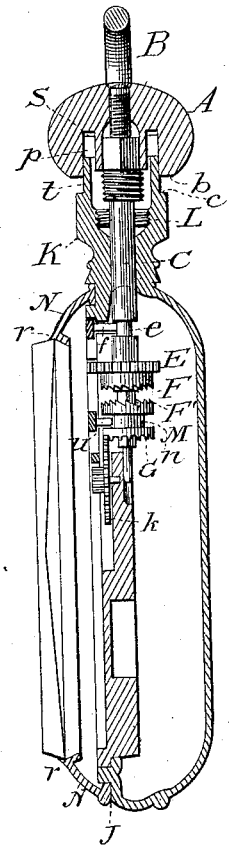
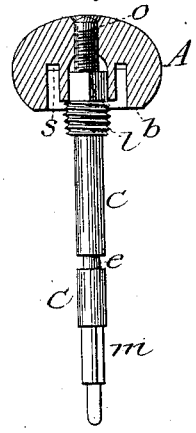


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALCIDE CT. DROZ, OF ST. IMIER, SWITZERLAND.

STEM-WINDING WATCH.

SPECIFICATION forming part of Letters Patent No. 307,027, dated October 21, 1884.

Application filed October 30, 1883. (Model.) Patented in England May 26, 1883, No. 2,624, and in France August 24, 1883, No. 155,286.

To all whom it may concern:

Be it known that I, ALCIDE CT. DROZ, a citizen of the Republic of Switzerland, residing at St. Imier, in the Canton of Berne, in said Republic of Switzerland, have invented certain new and useful Improvements in Watches, of which the following is a description in such full, clear, concise, and exact terms as to enable any one skilled in the art to which my invention belongs or with which it is most nearly connected to make and use the same, reference being had to the accompanying drawings, making part of this specification, and to the letters and figures of reference marked thereon.

In said drawings, Figure 1 represents a front view of my improved watch with the bezel-ring, face, and crystal removed and the pinion or key in connection with the winding mechanism. Fig. 2 is a side view of the same with the bezel-ring, face, and crystal in place and the said pinion or key in connection with the setting mechanism; and Fig. 3 represents the winding and setting pinion and crown.

My invention consists of two parts—viz., an improved watch-case which is absolutely dust-proof and water-tight, and certain parts and combination of parts comprising the winding and setting mechanism of a watch.

Referring to Fig. 3 of the drawings, C is the winding and setting pinion of a watch, which is cut at its upper end into the screw-thread *o*. The ring *l*, provided on its outer circumference with a screw-thread, as shown, screws upon the end of said pinion, as does also the crown A. This pinion is formed with groove *e* and the rectangular section *m*. The pendant K, Fig. 2, which terminates in a cylindrical shoulder, *t t*, has, at positions diametrically opposite each other, the indentations or recesses *a a*, which form seats for the bow B, into which the said bow is sprung. These indentations do not, as may be seen in the drawings, penetrate to the interior of said pendant. The bore of this pendant K is provided with a short female screw-thread, L, Fig. 2, which engages the screw-thread *l* on the pinion C when the same is turned with a left-hand rotary motion.

Pivoted to a movement-frame is the bent lever D, having upon its shorter arm a pin, *f*, projecting at right angles therefrom, and engaging in the groove *e*, formed on the circumference of the winding and setting pinion C, and having its longer arm pointed, as shown. The cylinder M, which embraces and fits the rectangular section *m* of the pinion C, has upon its circumference the groove *n*, its lower rim being cut into the cogs G and its upper rim into the ratchet-teeth F′, so that when the said cylinder is in the position illustrated in Fig. 1 its ratchet-teeth mesh into the ratchet-teeth F on the cylinder which supports the cog-wheel E, and when it is thrown down in the position shown in Fig. 2 its cogs G are brought into connection with the cogs *k* on the wheel H to operate the hands of the watch. The cog-wheel E operates in any well-known manner to wind the mainspring of the watch, and on the lower rim of the cylinder carrying this wheel the ratchet-teeth F are cut. The pivoted arm *h* is held in the position illustrated in Fig. 1 by means of the bent spring *q*, and has a pin, *u*, projecting at right angles from the said arm, which forms connection with the groove *n*, cut on the circumference of the cylinder M. The bezel-ring N N, where it rests against the watch-case, is made with a broad flat surface, as is also the bezel-seat J. In other respects this bezel does not differ from those commonly employed. The back and sides of my watch-case are stamped out of a single piece of metal.

The connection and operation of these parts are as follows, reference being had, in the first place, to the devices and combination of devices which render my improved watch-case dust-proof and water-tight: A thin film of wax is spread around the inner rim, *r*, of the bezel which embraces and holds the watch-crystal, and a thin film of wax is also spread upon the bezel-seat J of the watch-case before the bezel is snapped thereon. The bow B is snapped into the recesses or seats *a a*, and held, if necessary, with a screw, which recesses or seats do not, as I have hitherto observed, penetrate to the interior bore of the pendant. By means of the screw-thread *l* on the shaft C and the corresponding female screw-thread, L, on the interior of the pendant K, the crown, on being turned with a left-hand revolution, will be brought down upon the shoulder *c*, and the packing *s* in the top of the annular bore in said crown will be brought down upon the cylinder *t*, in which the pendant terminates.

By the means I have here described it is ob-

vious that all the exterior joints of the watch-case may be made water-tight. The fact that the joint between the watch-case and bezel-ring is hermetically sealed with wax or a suitable substitute therefor, which must be renewed every time the bezel is taken off or put on, does not militate against the practical value of this method of securing the desired imperviousness to water or dust, since in a watch of the description I here employ, in which both the winding and setting mechanisms are operated by the crown A, the necessity of having frequent access to the interior is very much diminished.

Having explained that part of my invention which has reference more particularly to the water-tight qualities of my watch, I will now proceed to describe the operation of the devices by means of which I operate the winding and setting mechanism.

Reference being had to Fig. 1 of the drawings, when the crown A is turned with a right-hand revolution, the cylinder M is rotated, and the ratchet-teeth F′ being held in connection with the ratchet-teeth F by means of the spring *q* and the pin *g*, this motion is communicated to the cog-wheel E, which operates the winding mechanism. At the same time the watch is thus being wound the male thread *l* on the pinion C rides up the female thread L until it emerges therefrom, when the longitudinal motion of the pinion C ceases. The right-hand revolution of the crown may be then continued until the watch is wound up, which is determined by the noise which the end of the main-spring makes in jumping from notch to notch inside the barrel, as I prefer to use in this watch a spring which is not provided with stop-work. The crown is then turned with a left-hand revolution until it is drawn down firmly to its seat, as has already been explained, the ratchet-teeth F′ in this instance riding up and down the ratchet-teeth F without communicating motion to the cog-wheel E.

When it is desired to set the hands of the watch, the crown A is revolved with a right-hand motion until the thread *l* disengages from its mate L. It is then pulled longitudinally upward or outward. The result is as follows: The pin *f*, projecting from the shorter arm of the lever D, which engages with the groove *c* of the shaft C, is raised, and the longer arm of the lever thereby thrown down until the point thereof, depressing the pivoted spring-arm *h*, at length seats itself in the V-shaped notch *j* formed for its reception. The arm *h* being thus forced and held down, the cylinder M, by means of the groove on its circumference and the pin *g*, is depressed and the cogs G mesh into the cogs on the wheel H, which, as I have said, controls the hands of the watch. Since the male thread *l* is now raised and supported far above, and therefore out of connection with, the female thread L, the crown A may be turned at pleasure in either direction.

Fig. 2 illustrates the position of the several parts of the watch under the last-named conditions, as do also the dotted lines in Fig. 1.

By reversing the operation I have here described and pressing the pinion C down, the point of the lever D will ride out of the notch *j*, and the bent spring *q*, pressing on the under side of the arm *h*, will elevate the cylinder and bring the ratchet-teeth F′ and F again in connection.

For the purpose of hermetically sealing the joints of the watch about the bezel, I prefer to use a mixture of beeswax and oil; but other preparations or materials may be used with good results—such as india-rubber, for example.

Having thus described my invention, I claim, and desire to secure by Letters Patent, the following:

1. In a watch, a movement having winding and setting mechanism adapted to be brought into connection by the endwise movement of a winding-stem, C, provided with a screw-thread and supporting-catch D *j*, and combined with a crown, A, and a pendant, K, provided with a tubular screw-thread, said pinion being capable of being raised so that the said thread thereon shall be out of connection with the said thread of the pendant, and being self-sustained in such elevated position, substantially as and for the purpose set forth.

2. In a stem winding and setting watch, the combination of a crown, A, winding-pinion C, provided with groove *e*, a bent lever, D, one arm of which is pointed and the other provided with a pin, *f*, a cylinder, M, operated by said pinion, and having groove *n*, ratchet-teeth F′, and cogs G, the pivoted arm *h*, provided with pin *u*, notch *j*, and spring *q*, cog-wheel E, and ratchet-teeth F, substantially as described, for the purpose specified.

3. In a water-proof stem winding and setting watch, the combination of a crown, A, winding and setting pinion C, provided with a screw-thread, *l*, and a groove, *e*, a pendant provided with shoulders C, and a tubular screw-thread, L, a bent lever, D, one arm of which is pointed and the other provided with a pin, *f*, a cylinder, M, operated by said pinion, and having groove *n*, ratchet-teeth F′, and cogs G, the pivoted arm *h*, provided with pin *u*, notch *j*, and spring *q*, cog-wheel E, and ratchet-teeth F, substantially as described, for the purpose specified.

4. In a stem winding and setting watch, and connected with the winding and setting mechanism thereof, a stem, C, pointed lever D, connected thereto, and notched spring-arm *h*, all being combined and connected to alternately engage the winding and setting mechanism of the watch by the longitudinal movement of said stem, substantially as described.

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