(No Model.)

W. E. PORTER.

STEM WINDING AND SETTING WATCH.

No. 590,856. Patented Sept. 28, 1897.

Fig. 1

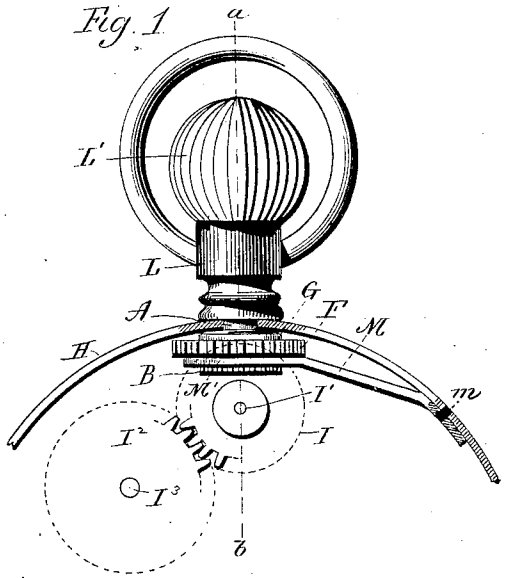


Fig. 3

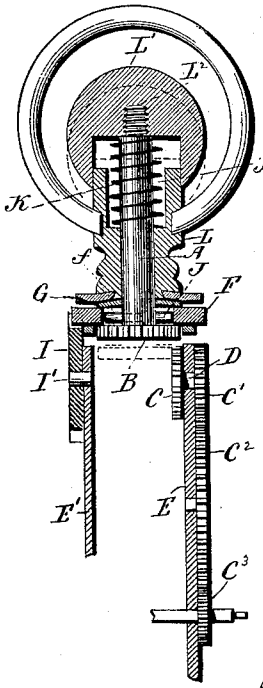


Fig. 2

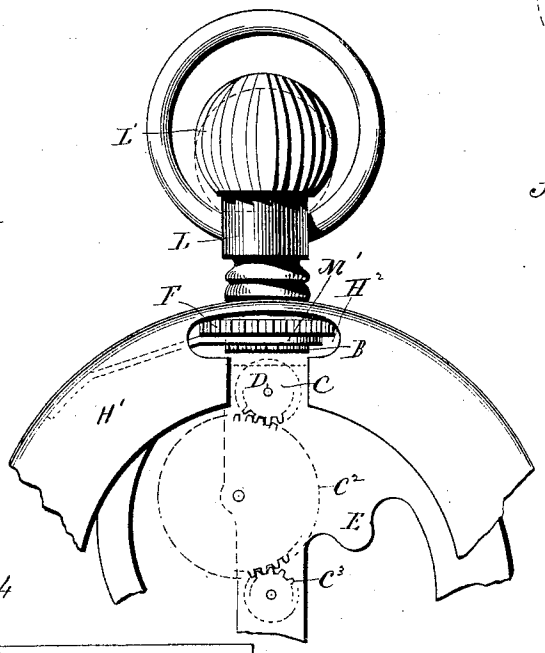


Fig. 5

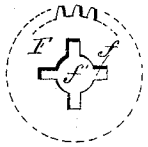


Fig. 6

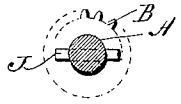


Fig. 7

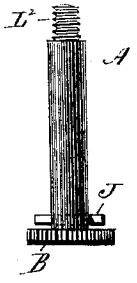
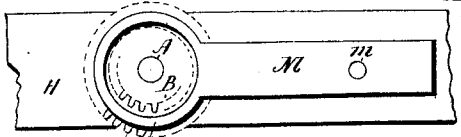


Fig. 4



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Lillian D. Kelley.

Wilson E. Porter,
Inventor
By atty's Earle & Seymour

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILSON E. PORTER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE NEW HAVEN CLOCK COMPANY, OF SAME PLACE.

STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 590,856, dated September 28, 1897.

Application filed December 8, 1894. Serial No. 531,221. (No model.)

To all whom it may concern:

Be it known that I, WILSON E. PORTER, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Stem-Winding and Stem-Setting Watches; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a broken view, partly in section and partly in rear elevation, of a watch containing my invention; Fig. 2, a similar front view; Fig. 3, a transverse view of the watch on the line *a b* of Fig. 1; Fig. 4, a detached broken view, in inside elevation, of the watch-case, showing in particular the spring employed to hold the winding-pinion in place; Fig. 5, a detached view of the winding-pinion; Fig. 6, a detached view of the setting-pinion, showing also the coupling-pin and the stem, which is represented in section; Fig. 7, a detached view, in side elevation, of the stem.

My invention relates to an improvement in stem-winding and stem-setting watches, the object being to produce a simple, durable, and effective construction, not liable to derangement, and constructed with particular reference to passing from its setting to its winding adjustment without disturbing the setting-train.

With these ends in view my invention consists in a stem-winding and stem-setting watch having certain details of construction, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention I rigidly attach to the inner end of the longitudinally-movable and rotatable stem A a setting-pinion B, which lies in a plane at a right angle to the longitudinal plane of the stem, which, when forced inward, carries the said pinion into mesh with an inner intermediate setting-pinion C, rigidly secured to the inner end of a short shaft D, mounted in the front movement-plate E and having rigidly attached to its outer end an outer intermediate setting-pinion C′, which meshes into the dial-wheel C^2 of the setting-train. The said dial-wheel C^2 is of ordinary construction and meshes into the dial-pinion C^3, by which it is actuated and which is located upon the center arbor E of the watch. An intermediate winding-pinion F is loosely mounted upon the stem A, being interposed between the outer face of the intermediate setting-pinion B aforesaid and a washer G, which holds the said winding-pinion out of contact with the watchcase H and affords a bearing for its outer face. The said winding-pinion is constantly in mesh with an intermediate winding-pinion I, journaled upon a stud I′, mounted in the back movement-plate E′ of the watch. The said intermediate winding-pinion meshes into the ratchet-wheel I^2, which is of ordinary construction and attached to the spring-arbor I^3. The said winding-pinion F is normally coupled for rotation with the stem A by means of a coupling-pin J, passing transversely through the said stem, projecting at its opposite ends beyond the opposite faces thereof, and adapted to have its ends entered into slots *f*, leading out of the central opening *f′*, formed in the pinion for the passage through it of the stem. There are four of the slots *f*, arranged in two pairs, of which the slots of the respective pairs are located opposite each other, as clearly shown in Fig. 5. The said pin J, it will be observed, is located close to the outer face of the fixed setting-pinion B, so that when the pin is in the respective slots of one of the two pairs of slots in the winding-pinion the outer face of the setting-pinion will bear against the inner face of the winding-pinion.

The stem A is maintained in its normal or outward position, in which the pin J couples the winding-pinion with it, by means of a spiral spring K, encircling its outer end and located in a spring-chamber K′, formed to receive it in the outer end of the pendant L, which is secured to the watchcase H in the usual manner. The inner end of the said spring impinges against the bottom of the said chamber, and its outer end impinges against the crown L′ of the pendant, the said crown being adapted to be applied to a screw L^2, located at the outer end of the stem. By removing the crown the stem may very read-

ily be taken out of the watch by first pushing it inward and then seizing it by its inner end and drawing it into the watchcase until it is free. On the other hand, to restore the stem its outer end is entered into the winding-pinion, after which the stem is pushed outward until the setting-pinion located at its inner end engages with the inner face of the winding-pinion. For the purpose of holding the winding-pinion in place when the stem is pushed inward I employ a spring M, having a shank which is secured by a rivet *m* to the case H, and having a ring-like free end M′, smaller in its external diameter than the diameter of the winding-pinion, against the inner face of which it bears, and larger in internal diameter than the setting-pinion, with which it therefore does not interfere; but I do not limit myself to the use of this spring for holding the winding-pinion in place. As herein shown the front of the watchcase is constructed with an integral inwardly-projecting flange H′, having a clearance-opening H^2 located adjacent to the pendant L for clearing the winding-pinion and the outer intermediate setting-pinion, as clearly shown in Fig. 2.

The spiral spring K will normally maintain the stem A in its outward position, in which the coupling-pin J will couple the winding-pinion F with it, so that when the stem is rotated forwardly, or from left to right, the watch will be wound through the medium of the said winding-pinion F, the intermediate winding-pinion I, and the ratchet-wheel I^2. I have not provided any means for permitting "ratcheting back," as the reverse rotation of the stem is commonly spoken of, but I provide against any injury to the watch by the reverse rotation of the stem through the crown, which will unscrew as soon as the lash or lost motion of the parts has been taken up by a reverse rotation of the stem. Then when the stem is turned forward the crown will tighten itself thereupon. For setting the watch the stem is pushed inward against the tension of the spring K, whereby the coupling-pin is caused to move inward and out of engagement with the winding-pinion, from which the stem is thus uncoupled, and whereby also the setting-pinion is brought into mesh with the inner intermediate setting-pinion. The stem A may now be rotated in either direction for actuating the setting-train, comprising the pinions C and C′, the dial-wheel C^2, and the dial-pinion C^3. After the hands of the watch have been brought into the required position pressure upon the stem is relieved, whereby the spring K reasserts itself and immediately retracts the stem, thereby disengaging the setting-pinion B from the inner intermediate setting-pinion C and reëngaging the coupling-pin J with the winding-pinion F. I would call attention to the fact that the movement of the setting-pinion B is directly away from the intermediate setting-pinion C, so that the setting-train cannot possibly be disturbed and the hands moved from the positions in which they were set by the passing of the watch from its setting to its winding adjustment.

It is apparent that in carrying out my invention some changes from the construction herein shown and described may be made, and I would therefore have it understood that I do not limit myself to such construction, but hold myself at liberty to make such changes and alterations as fairly fall within the scope of my invention. Thus, although I have herein shown the setting-train in combination with the front movement-plate and the winding-train in combination with the back movement-plate, I may reverse the positions of those trains, in which case I should still employ a wheel corresponding to the dial-wheel herein shown, but inasmuch as it would be located upon the back movement-plate it could not with propriety then be called a dial-wheel.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a stem-winding and stem-setting watch, the combination with a longitudinally-movable and rotatable stem, of a setting-pinion rigidly secured to the inner end thereof, a winding-pinion loosely mounted upon the said stem, with which it is coupled for rotation when the stem is moved longitudinally outward, an intermediate winding-pinion placed against the outer face of the back movement-plate, mounted upon a stud projecting outwardly therefrom, and constantly in mesh with the said winding-pinion; an inner intermediate setting-pinion placed against the inner face of the front movement-plate and mounted upon a shaft passing through the said plate near the edge thereof, and projecting beyond its outer face; an outer intermediate setting-pinion secured to the projecting outer end of the said shaft, and bearing against the outer face of the said front movement-plate, a dial-wheel into which the pinion last mentioned meshes, a dial-pinion, a spring coacting with the said stem to force the same outward and maintain it normally in that position, and means interposed between the case and the watch-movement proper for holding the winding-pinion against displacement when the stem is pushed inward against the tension of the said spring.

2. In a stem-winding and stem-setting watch, the combination with a longitudinally-movable and rotatable stem, of a setting-pinion rigidly secured to the inner end thereof, a winding-pinion loosely mounted upon the said stem with which it is coupled for rotation when the stem is moved longitudinally outward, an intermediate winding-pinion with which the winding-pinion mounted on the stem is always in mesh, an intermediate setting-pinion into which the setting-pinion carried by the stem is meshed when the stem is pushed inward, a spring coacting with the

said stem to force the same outward and maintain it in that position, and a spring engaging with the inner face of the winding-pinion for holding the same against displacement when the stem is pushed inward against the tension of the spring first mentioned, and arranged to clear the said stem, the inward longitudinal movement whereof it does not restrain, substantially as described.

3. In a stem-winding and stem-setting watch, the combination with a longitudinally-movable and rotatable stem, of a setting-pinion rigidly secured to the inner end thereof, a winding-pinion loosely mounted upon the said stem with which it is coupled for rotation when the stem is moved longitudinally outward, an intermediate winding-pinion with which the winding-pinion mounted on the stem is always in mesh, an intermediate setting-pinion into which the setting-pinion carried by the stem is meshed when the stem is pushed inward, a spring coacting with the said stem to force the same outward and maintain it in that position, another spring consisting of a shank which is attached to the watchcase, and a ring-like free end smaller in external diameter than the winding-pinion, and larger in internal diameter than the setting-pinion which is thus allowed to bear against the inner face of the winding-pinion, whereby the said spring is adapted to hold the winding-pinion in place without affecting the action of the stem, or the spring coacting therewith, substantially as described.

4. In a stem-winding and stem-setting watch, the combination with a watchcase, the front of which is constructed with a flange having a clearance-slot located adjacent to the pendant of the case, of a longitudinally-movable and rotatable stem mounted in the said pendant, a setting-pinion secured to the inner end of the stem, a winding-pinion interposed between the said setting-pinion and the case, and loosely mounted upon the stem with which it is coupled for rotation when in its outward position, an intermediate winding-pinion with which the winding-pinion loosely mounted on the stem is always in mesh, an inner intermediate setting-pinion into which the said setting-pinion carried by the stem is meshed when the stem is pushed inward, and an outer intermediate setting-pinion which is located in the clearance-space of the case, the said space also clearing the winding-pinion loosely mounted on the stem, substantially as set forth.

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

WILSON E. PORTER.

Witnesses:
FRED. C. EARLE,
LILLIAN D. KELSEY.