(No Model.)

E. H. FLINT.

STEM WINDING AND SETTING WATCH.

No. 510,393. Patented Dec. 5, 1893.

FIG. 1.

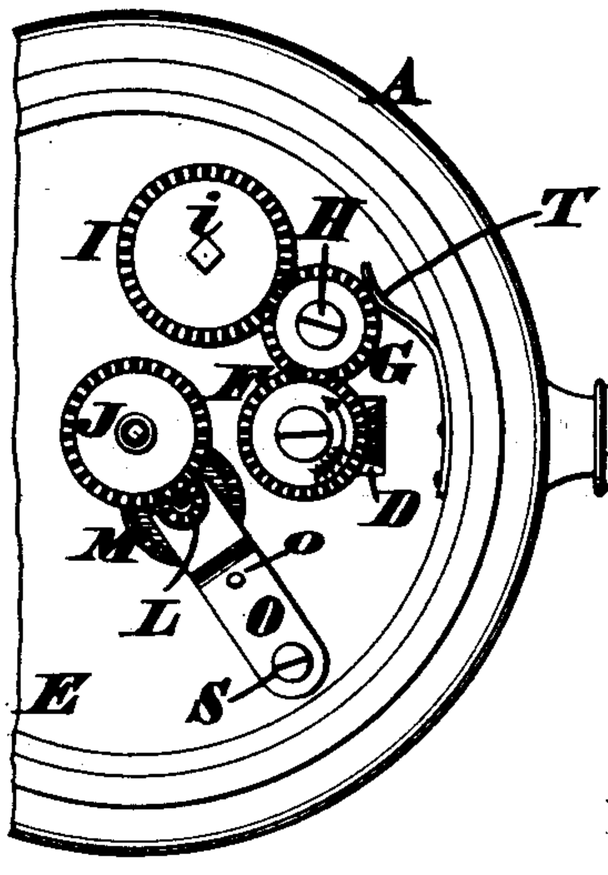
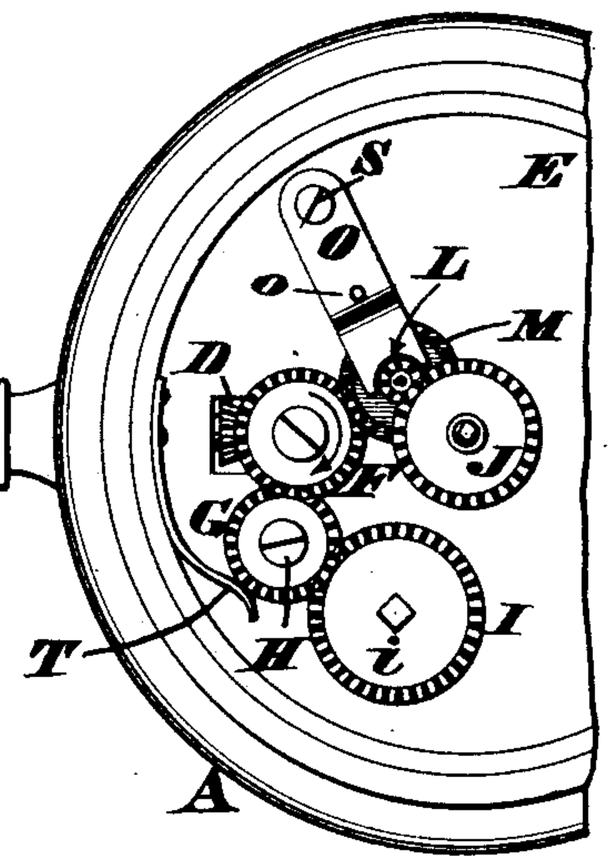


FIG. 2.



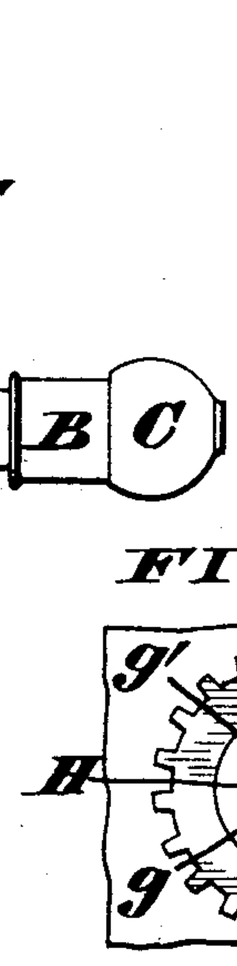


FIG. 7.

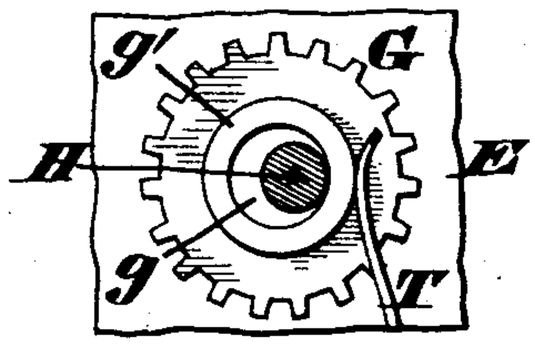


FIG. 3.

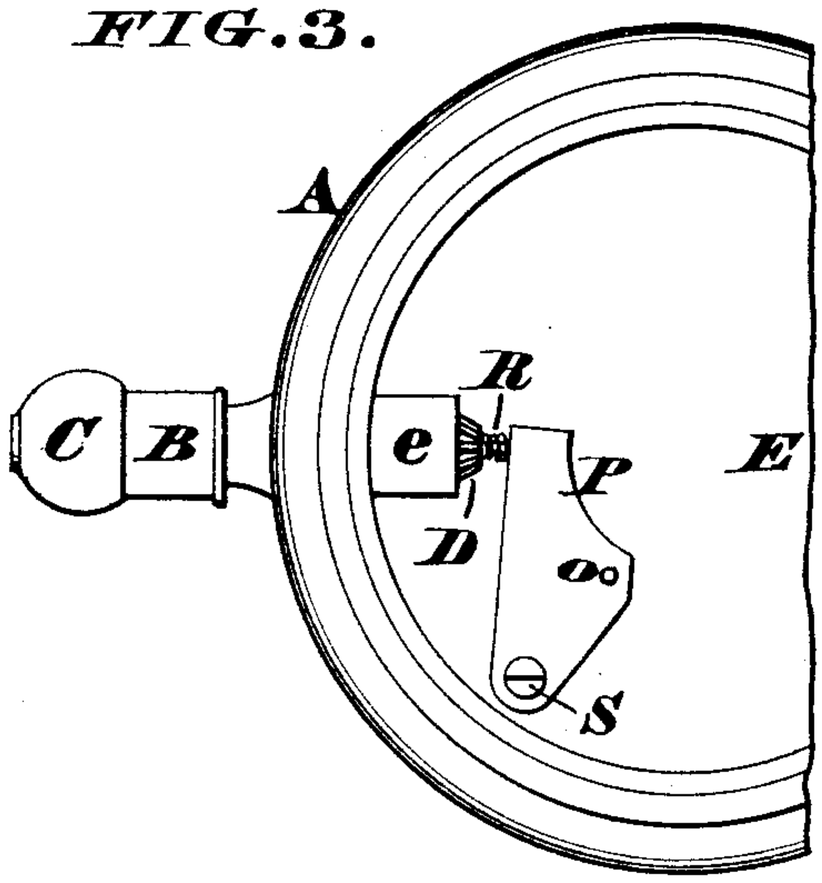


FIG. 4.

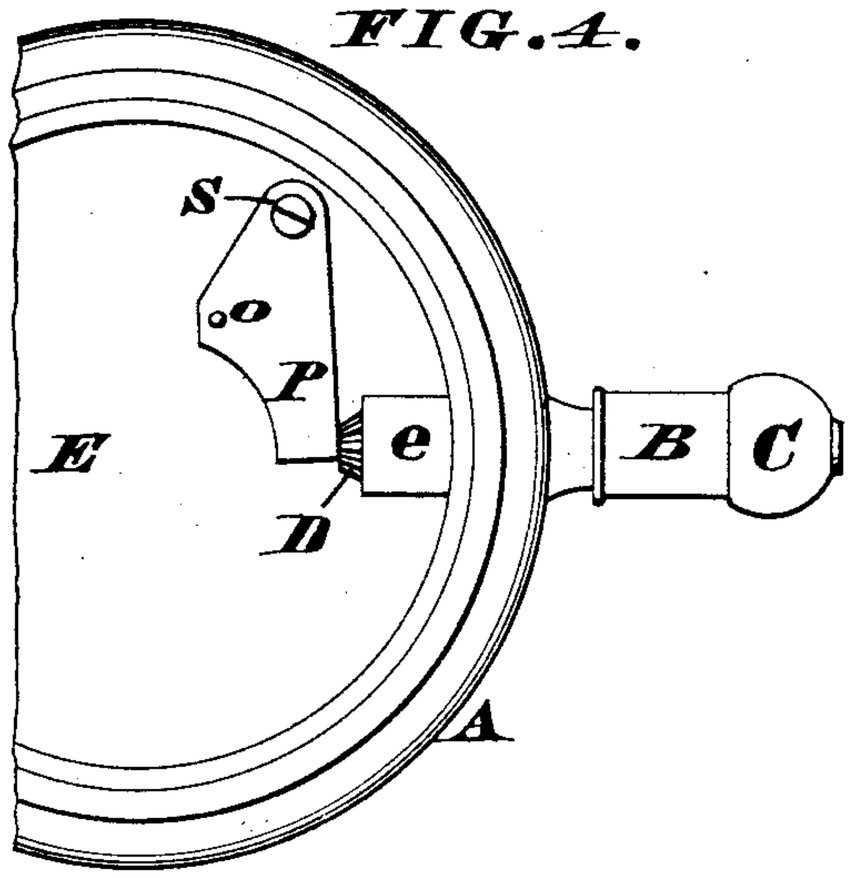


FIG. 5.

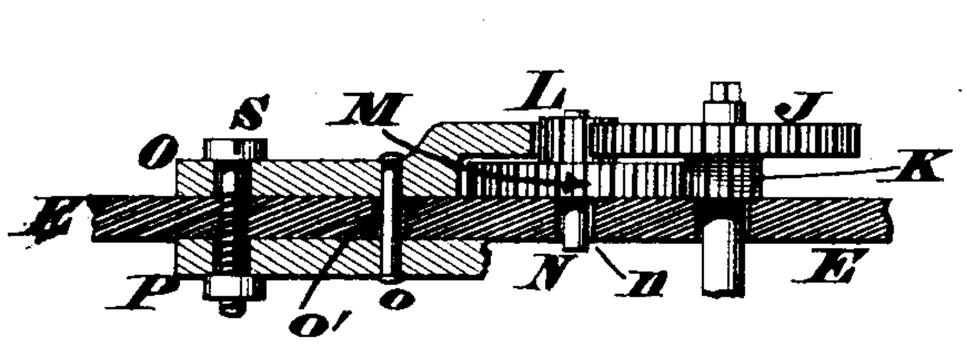
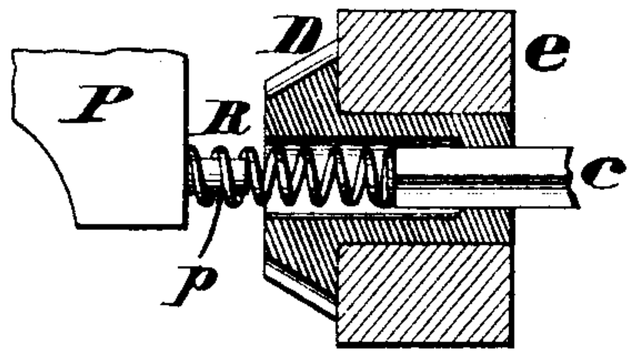


FIG. 6.



Attest:
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UNITED STATES PATENT OFFICE.

EDWIN H. FLINT, OF CINCINNATI, OHIO.

STEM WINDING AND SETTING WATCH.

SPECIFICATION forming part of Letters Patent No. 510,393, dated December 5, 1893.

Application filed April 1, 1893. Serial No. 468,705. (No model.)

To all whom it may concern:

Be it known that I, EDWIN H. FLINT, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Watches; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

This invention relates to those watches which can be both wound and set by properly turning a stem fitted within the case-pendant, and the essential feature of my improvements is a gravitating-lever pivoted at one end to a fixture of the case, and carrying at its free end a pair of wheels that constantly engage with the ordinary dial or hand-wheels, but when it is necessary to set the hands, the case is so inclined as to cause this lever to automatically swing to one side and thereby compel its wheels to engage, also, with a winding wheel, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a front elevation of that portion of a watch to which my improvements are applied, the watch being shown in the proper position for winding. Fig. 2 is a similar elevation, but showing the pendant-crown retracted, and the watch held in such a position as to bring the hand-setting wheels into action. Fig. 3 is a rear elevation of the watch when the wheels thereof are in the same position as in Fig. 1. Fig. 4 is a similar elevation when the wheels are in the same position as in Fig. 2. Fig. 5 is an enlarged longitudinal section through the coupled levers and their accessories. Fig. 6 is an enlarged section of the winding pinion and its accessories, said section being taken in the plane of the pendant arbor. Fig. 7 is an enlarged plan of a modified form of the back-ratchet wheel of the watch, the pivot or bearing of said wheel being sectioned.

A represents a portion of a watch case, B is the pendant of the same, and C is the crown or knob of the pendant, said knob being provided with a square arbor or stem *c*, that engages with the winding pinion D, as seen in Fig. 6, the hub of this pinion being journaled in a block *e*, attached to a plate E that carries my winding and setting appliances. Pinion D engages with an unshiftable wheel F, that drives a laterally shiftable wheel G, journaled on a screw H, tapped in the plate E, the central circular-opening *g*, of this wheel, being somewhat larger in diameter than said screw, or other bearing, as seen in Fig. 7. Wheel G engages with another unshiftable wheel I, to whose arbor *i* the main spring of the watch is attached in the usual manner.

J and K in Fig. 5 are the dial wheels, which devices J, K, are fitted in the plate E and operated in the same way as in all ordinary watches.

L is a pinion engaged with the wheel J, and M is a wheel that meshes with the pinion K, these two wheels L, M, being rigidly secured to a common shaft N, adapted to have a slight lateral-play within a slot *n* of plate E. Pivoted to the front of this plate is a lever O, whose free end is notched to surround a portion of the pinion L, but this notch must be of such a size as not to interfere with the turning of said pinion.

P is a secondary lever, pivoted to the rear of plate E, and coupled to the front lever O by a pin *o* having a slight lateral play within a slot *o'*, of said plate. Projecting laterally from this secondary lever is a stud *p*, around which is coiled one end of a spring R whose other end is in contact with the winding arbor *c*, as more clearly represented in Fig. 6. S is a common pivot to which these two levers O, P, are coupled.

T, is a spring, one end of which is attached to plate E, while its free end is adapted to bear against the periphery of wheel G in such a manner as to keep said wheel normally in gear with the wheels F and I.

In the normal condition of my watch, the lever O, gravitates in the direction seen in Fig. 1, and as the other lever P is coupled to switch O, the latter gravitates to the position represented in Fig. 3, and when stem *c* is advanced sufficient pressure is exerted against the spring R to hold the setting wheels L, M, in yielding contact with dial wheels J, K, as more clearly seen in Fig. 5, the wheel M being now disengaged from wheel F. Therefore, when the knob C is so turned as to re-

volve wheel F in the direction of the arrow on it, in Fig. 1, the watch will be wound in the usual manner, the wheel G escaping from wheel I every time said knob is turned back. This "back ratchet movement" of wheel G, is due to the fact that its central circular-opening *g* is larger in diameter than the screw H, and, on this account, said wheel automatically disengages itself from the wheel I, when wheel F is turned in a direction reverse to the arrow. It will thus be seen that the act of winding my watch is accomplished in the usual way, but when its hands require setting, a special manipulation is necessary. To accomplish this setting, the knob C must first be retracted or pulled away from the case A, as represented in Figs. 2 and 4, which act relieves the lever P of all pressure, because the arbor *c*, is now drawn back. The watch is then turned to render the plate E about vertical and is tilted until a position is reached where the levers O, P, will gravitate or swing on their pivots S, and bring wheel M in gear with wheel F, as seen in Fig. 2. Knob C is then turned in the reverse direction for winding as indicated by the arrow on the aforesaid wheel, the result being the moving of the hands forward, until they have reached the required numbers on the watch face. It will be noticed that while this setting operation is being performed the four wheels M, F, G and I are geared together, but the winding wheel I is not turned, because the wheel G "back ratchets" out of said wheel I every time the knob is turned to move the hands. As soon as this setting movement is begun, the watch can be turned with its face up to render the travel of the hands more distinct, the engagement of the wheels F, M, being all that is necessary to prevent any accidental shifting of the levers O, P. After setting the hands, the knob C is again pushed forward thereby throwing the levers aside, and then the watch is at once in its normal condition for winding.

From the above description it is evident the setting wheels L, M are constantly in gear with the dial wheels J, K and are turned by the latter, except when the watch is being set, and then the wheels L, M, turn said wheels J, K, because said wheels L M are now driven by the wheel F. It is also evident that these setting wheels L, M, are thrown in gear and out of gear with the wheel F simply by gravitation, but are held in lock with the dial wheels J K by the advancement of stem *c*, the spring R, interposed between said stem and the lever P, affording a yielding connection that prevents injury to the watch movements in case the wheels do not gear accurately when first brought in contact with each other. Finally, as the setting wheels L, M, are operated by a lever that acts solely by gravity, I am enabled to dispense with springs, shifters and other complicated and expensive devices heretofore used for this purpose, and for this reason, my invention can be applied to a watch at a mere nominal cost, and will not be liable to get out of order.

In the modification of my invention, seen in Fig. 7, the spring T bears against an annular flange *g'*, of wheel G to prevent its teeth being worn by contact with said spring.

I claim as my invention—

1. The combination, in a watch, of a winding train, a pair of dial wheels, a wheel F operated by the winding pinion D, a back-ratchet wheel G, gearing with said wheel F and the winding train, and a gravitating lever carrying a pair of wheels that engage with the winding train and dial wheels, as herein described.

2. The combination, in a watch, of a winding train, a pair of dial wheels, a wheel F operated by the winding pinion D, a back-ratchet wheel G, gearing with said wheel F and the winding train, and a gravitating lever carrying a pair of wheels that engage with the winding train and dial wheels, and are locked in gear with said dial wheels by advancing the pendant stem, substantially as herein described.

3. The combination, in a watch, of a winding train, a pair of dial wheels J, K, a wheel F operated by the pinion D, a shiftable wheel G, gearing with said wheel F and the winding train, and having an opening *g* of greater diameter than the pivot H, of said wheel, a gravitating lever O carrying the wheels L, M, that constantly gear with said dial wheels J, K, and another lever P, coupled to lever O, by a rigid connection *o*, all as herein described.

4. A watch, having a winding train, a pair of dial-wheels, and a pair of shiftable wheels secured to a common shaft, which shiftable wheels constantly gear with said dial-wheels, but are capable of gravitating into gear with a wheel that drives the winding-train, substantially as described.

5. A watch, having a spring R, inserted between the stem *c*, and lever P, for the purpose described.

6. The combination, in a watch, of a fixed pivot H, a back-ratchet wheel G journaled thereon and having an opening *g* of greater diameter than said pivot, an annular-flange *g'*, surrounding said opening, and a spring T having its free end in contact with the outer wall of said flange, for the purpose herein described.

7. A watch having a vibrating lever capable of swinging in opposite directions solely by gravity, and laterally-shiftable gravitating-gears that constantly engage with the dial-wheels, but can also be engaged with the winding-train, said gears being operated by said lever, for the purpose described.

8. A watch having a pair of connected vibrating-levers capable of simultaneously swinging in the same direction solely by gravity, laterally-shiftable gravitating-gears operated by the main lever, and a longitudinally-

shiftable pendant-stem that bears against the secondary lever and causes said gears to engage with the dial-wheels, substantially as herein described.

9. A watch having a pair of dial wheels, a winding-train, and laterally-shiftable gravitating-gears, which gears constantly engage with said dial wheels, but can be engaged with a back-ratchet wheel included in the winding train, for the purpose described.

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

EDWIN H. FLINT.

Witnesses:
JAMES H. LAYMAN,
FRANCIS M. BIDDLE.