

G. E. HART.

WATCH.

No. 364,105.

Patented May 31, 1887.

Fig. 1.

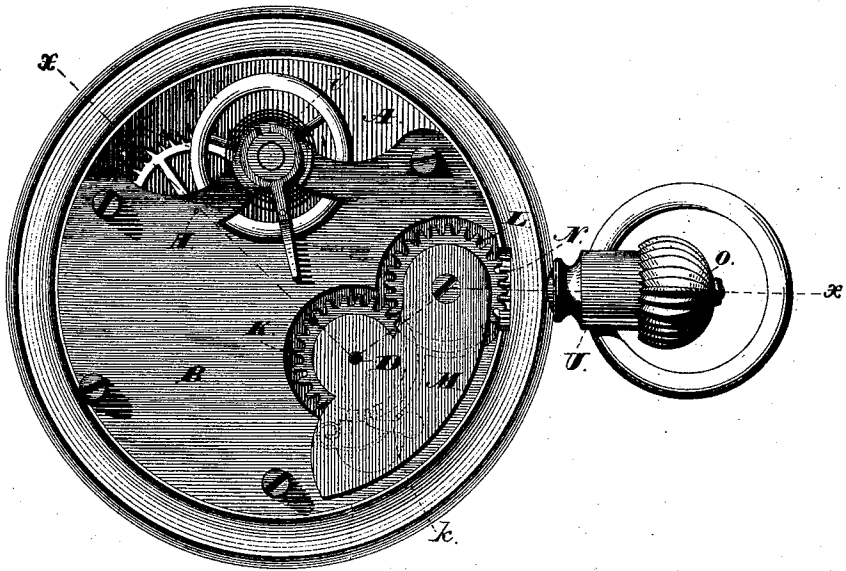
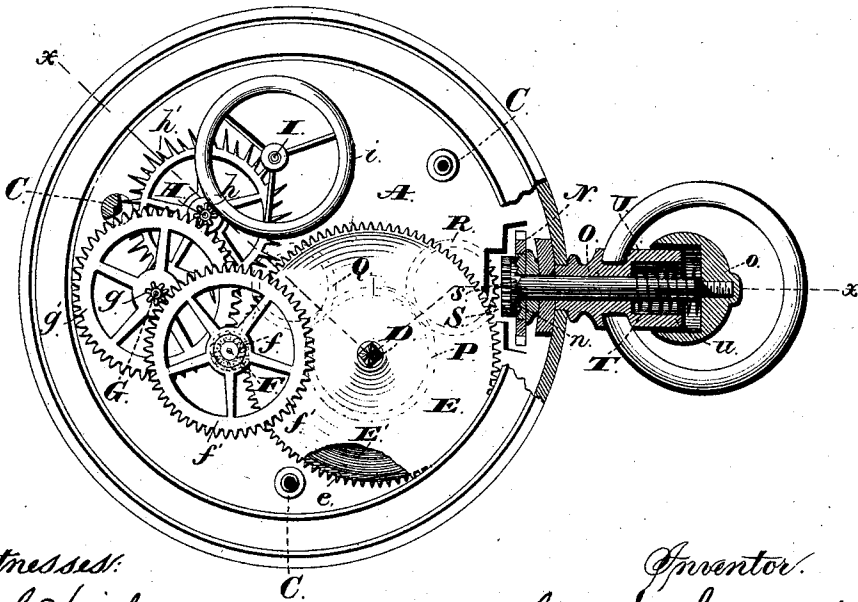


Fig. 2.



Witnesses:
 Jas. C. Hutchinson.
 Henry C. Hazard

Inventor.
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Fig. 3.

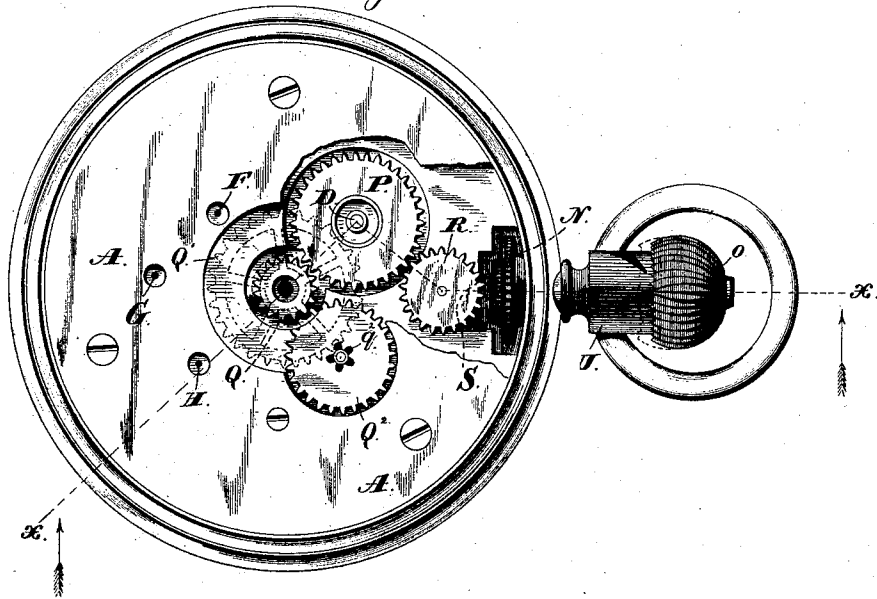


Fig. 4.

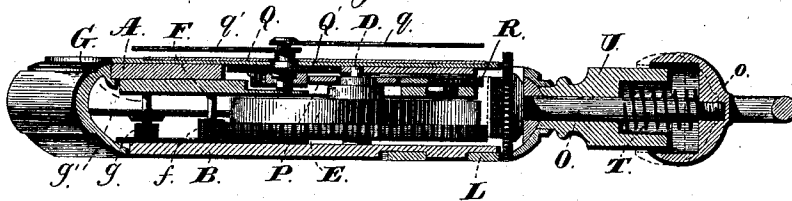


Fig. 5.

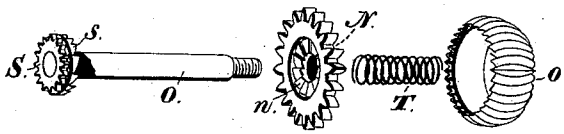
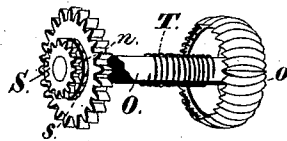


Fig. 6.



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Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE E. HART, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE
WATERBURY WATCH COMPANY, OF SAME PLACE.

WATCH.

SPECIFICATION forming part of Letters Patent No. 364,105, dated May 31, 1887.

Application filed July 14, 1885. Serial No. 171,591. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. HART, of Waterbury, in the county of New Haven, and in the State of Connecticut, have invented certain new and useful Improvements in Watch-Movements; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my watch from the rear side, the case-back being removed to show the movement. Fig. 2 is a like view of the same with the back plate removed and the stem and its connecting parts in longitudinal section. Fig. 3 is a plan view of the faceside of said watch, the dial being removed and a part of the pillar-plate broken away. Fig. 4 is a section upon lines *x x* of Figs. 1, 2, and 3. Fig. 5 is an enlarged perspective view of the stem-arbor, winding-pinion and ratchet-section, hands-setting pinion and ratchet-section, and arbor-spring separated from each other and from the stem; and Fig. 6 is a like view of said parts combined.

Letters of like name and kind refer to similar parts in each of the figures.

My invention relates partly to the time-train and in part to the winding and setting mechanism; and it consists, principally, in the time-train constituted, substantially as and for the purpose hereinafter specified.

It consists, further, in the means employed for actuating the dial-wheels, substantially as and for the purpose hereinafter shown.

It consists, finally, in the means employed for winding the mainspring and setting the hands, substantially as and for the purpose hereinafter set forth.

In the construction of my watch I employ a pillar-plate, A, and a back plate, B, which are connected together in the usual manner by pillars C, and constitute the frame of the movement. Journalled between the plates A and B is a spring-arbor, D, to which is attached a barrel, E, that contains a long light mainspring, E', one end of which spring is attached to said arbor or to a collet secured thereto, while its opposite outer end is attached to the inner periphery of said barrel, all in the usual manner.

At one side of the barrel E is journalled an

arbor, F, which is provided with a pinion, *f*, and toothed wheel *f'*, the first of which meshes with the teeth *e* of said barrel. A second arbor, G, having a pinion, *g*, and toothed wheel, *g'*, is journalled at one side of said arbor F, and receives motion therefrom through the engagement of said pinion with said wheel *f'*, while a third arbor, H, journalled at one side of said arbor G, is provided with a pinion, *h*, which meshes with said wheel *g'*, and causes the motion of said arbor G to be imparted to said arbor H.

The arbor H carries a duplex escape-wheel, *h'*, which is engaged by an arbor, I, that is provided with a balance-wheel, *i*, and hair-spring *i'*, the arrangement being such that said arbor I and balance-wheel are caused to vibrate by the engagement of said escape-wheel, and that by means of such vibration the train described is permitted to move intermittingly, all in the usual manner.

The rear end of the spring-arbor D is squared, and upon the same is fitted a toothed wheel, K, that meshes with and receives motion from a similar wheel, L, which is journalled between the back plate, B, and a bridge, M, and in turn meshes with a wheel or pinion, N, that is placed upon and rotates with a stem-arbor, O, the arrangement being such that the rotation of said stem-arbor in the right direction will operate to wind the mainspring. A spring-actuated pawl, *k*, placed between said plate and bridge, engages with said wheel K and prevents the same from rotating backward, while permitting it to move freely in a forward direction.

The hands of the watch are driven by means of a wheel, P, which is journalled upon the front end of the spring-barrel E, and is caused to rotate therewith by friction. Said wheel meshes with a minutes-pinion, Q, that is independently journalled within the center of the pillar-plate A, (which plate is double,) and carries upon its projecting end a minutes-hand, *q*. An hours-wheel, Q', carrying an hours-hand, *q'*, is journalled upon said pinion, and by means of an intermediate dial-wheel, Q², and pinion *q*² is connected with said pinion Q, and is driven by the same in the usual manner.

In order that the hands may be set from the

stem, a wheel, R, is journaled upon or within the plate A, directly in front of the inner end of the stem-arbor O and in engagement with the wheel P, but not normally in engagement with the wheel S.

The wheel N is loosely journaled upon the arbor O, and is provided within its front face with ratchet-teeth *n*, while upon the inner end of said arbor is secured a pinion, S, which at its rear end has ratchet-teeth *s*, that correspond to and are adapted to engage with said ratchet-teeth *n*. The stem-arbor O has such freedom of longitudinal motion as to enable the pinion S to be moved into engagement with the wheel R, when by the rotation of said arbor the dial-wheels may be rotated so as to set the hands. When said pinion S is engaged with the hands setting train, it is disconnected from the winding-wheel N, and when connected with the latter it is free from engagement with said hands-setting train.

A spiral spring, T, placed around the stem-arbor O, within an enlargement, *u*, of the case-stem U, is confined longitudinally between the bottom of said enlargement and the crown *o* at the outer end of said arbor, where it exerts a sufficient outward pressure to hold the ratchet-face *s* of the pinion S normally in engagement with the ratchet-teeth *n* of the winding-wheel N. To place said pinion in engagement with the setting-train, it is necessary to press said stem-arbor longitudinally inward with sufficient force to overcome the resistance of said spring, and when such inward pressure ceases said arbor will be automatically returned to its normal position.

As the ratchet-teeth *n* and *s* are adapted to slip over each other when the stem-arbor is turned backward, no possible injury can result from such movement.

Having thus fully set forth the nature and merits of my invention, what I claim is—

1. A watch-movement having a time-train which is composed of a going-barrel and arbor, a second arbor having a pinion and toothed wheel, a third arbor provided with a pinion and toothed wheel, a fourth arbor having a pinion and a duplex escape-wheel, and a balance-wheel and arbor, said parts being combined, substantially as and for the purpose specified.

2. In a time-piece, the combination of a bal-

ance-wheel and arbor, a duplex escape-wheel with its arbor and pinion, a third arbor provided with a toothed wheel and pinion, a second arbor having a toothed wheel and pinion, a spring-barrel and arbor, a toothed wheel upon the spring-barrel, and dial-wheels which engage with and receive motion from said spring-barrel toothed wheel, substantially as and for the purpose shown.

3. In a time-piece, the combination of independently-journaled dial-wheels with a toothed wheel which is placed upon and rotates with the mainspring barrel or arbor and engages directly with one of said dial-wheels, substantially as and for the purpose set forth.

4. In a time-piece, in combination with independently-journaled dial-wheels and with an engaging-wheel which is journaled upon and connected by friction with the spring barrel or arbor, means whereby said friction-moved wheel may be rotated in either direction upon its bearing, substantially as and for the purpose shown and described.

5. In a time-piece, the combination of a mainspring-arbor upon which is journaled a going-barrel, a winding-wheel that is secured upon and is adapted to rotate said arbor, a setting-wheel which is journaled upon said barrel and caused to rotate therewith by friction, a stem-arbor which has journaled thereon a winding-pinion that is in constant engagement with said winding-wheel and has rigidly secured to its inner end a setting-pinion which, by the longitudinally-inward movement of said stem-arbor may be caused to engage with said setting-wheel, together with means whereby said winding-pinion will be connected with and rotatable by said stem-arbor when the latter is at the outer limit of its longitudinal motion, and will be disconnected from said stem-arbor when the same is moved longitudinally inward, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of June, A. D. 1885.

GEORGE E. HART.

Witnesses:

GEO. S. PRINDLE,
HENRY C. HAZARD.