(No Model.) 2 Sheets—Sheet 1.

G. E. HART.

MEANS FOR JEWELING AND END SHAPING ARBOR PIVOTS.

No. 418,127. Patented Dec. 24, 1889.

Fig.

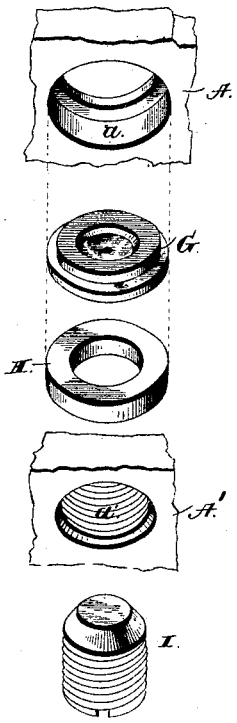


Fig. 2.

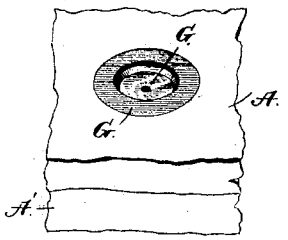


Fig. 3.

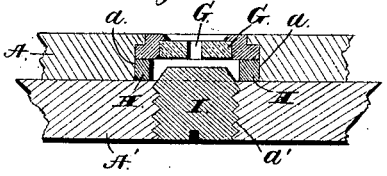
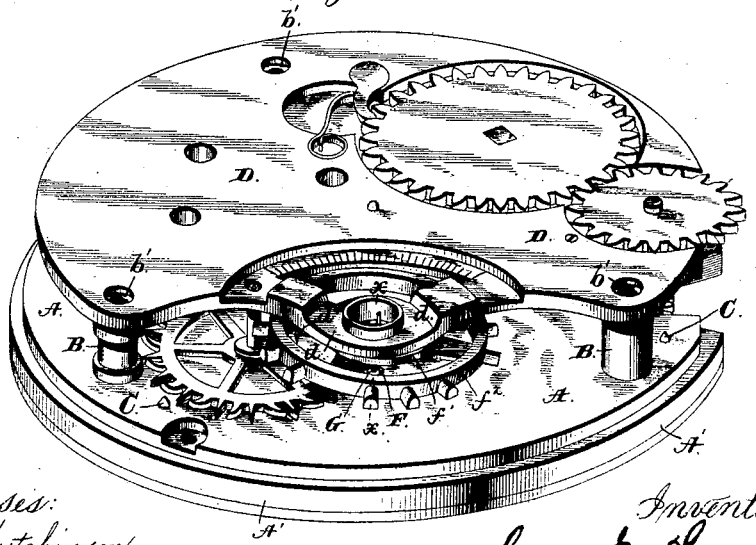


Fig. 4.



Witnesses:
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Inventor.
Geo. E. Hart, by
Pindle and Russell, his Attys

(No Model.) 2 Sheets—Sheet 2.

G. E. HART.

MEANS FOR JEWELING AND END SHAPING ARBOR PIVOTS.

No. 418,127. Patented Dec. 24, 1889.

Fig. 5.

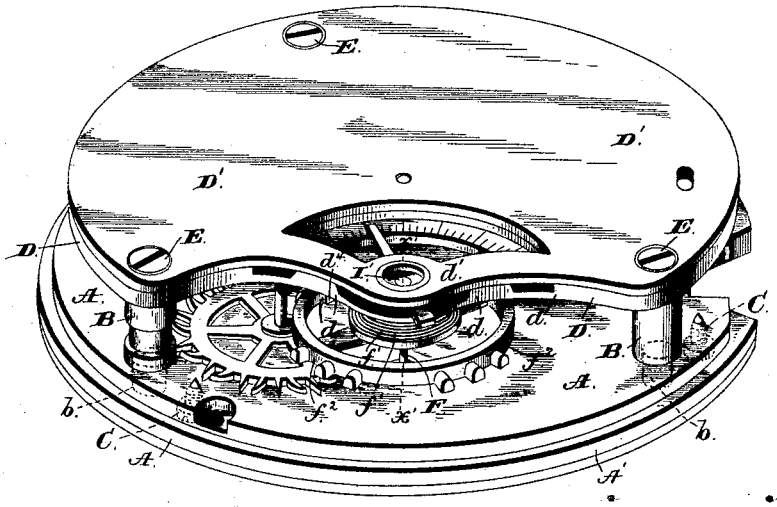


Fig. 6

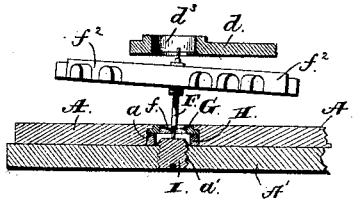


Fig. 7.

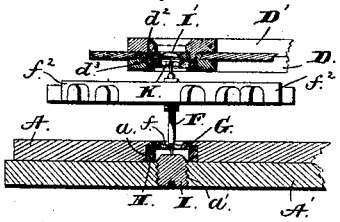
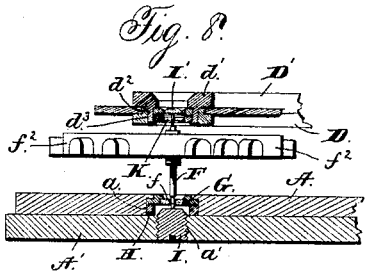


Fig. 8.



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

Inventor.
Geo. E. Hart, by
Prindle & Russell, his Attys

UNITED STATES PATENT OFFICE.

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

MEANS FOR JEWELING AND END-SHAKING ARBOR-PIVOTS.

SPECIFICATION forming part of Letters Patent No. 418,127, dated December 24, 1889.

Application filed August 22, 1888. Serial No. 283,407. (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 Mechanism for Jeweling and End-Shaking the Pivots of a Watch; 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 perspective view of the parts of my improvement separated from each other. Fig. 2 is a like view of the same when combined for use. Fig. 3 is a section through the axis of the jewel. Fig. 4 is a perspective view of a watch-movement containing my improvement, with the train in place, but before the jewel for the rear end of the balance-arbor has been placed in position. Fig. 5 is a like view of the same after said jewel is in place. Fig. 6 is a section of said parts upon line $x\ x$ of Fig. 4. Fig. 7 is a like view of the same upon line $x'\ x'$ of Fig. 5, and shows the relative position of parts before the end-shake of the balance-arbor has been regulated; and Fig. 8 is a like section upon line $x'\ x'$ of Fig. 5, and shows the positions of parts after the adjustment of the end-shake of the balance-arbor.

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

The object of my invention is to facilitate the setting up of a watch-movement and the adjustment of the end-shake of its balance-arbor; to which end such invention consists, principally, in the mechanism employed for jeweling and end-shaking the pivot of an arbor, substantially as and for the purpose hereinafter shown.

It consists, further, in the means employed for jeweling an arbor-pivot, substantially as and for the purpose hereinafter set forth.

It consists, further, in the means employed for jeweling and end-shaking the pivot of an arbor, substantially as and for the purpose hereinafter shown and described.

It consists, finally, in the construction and combination of parts, substantially as and for the purpose hereinafter specified.

In the carrying of my invention into practice I employ a front plate which is composed of an inner or main section A, that is secured to or upon three or more pillars B and B, and an outer or supplemental section A′, which is adapted to fit over the outer face of said main section and to be secured thereon by means of screws C and C, that pass through the former and have their threaded ends contained within correspondingly-threaded openings in the latter. For the purpose of securing a ready adjustment of said outer section to place the ends b and b of said pillars project above said main section, and, engaging with corresponding openings in said outer section, act as steady-pins.

Upon the opposite ends of the pillars B and B is secured a back plate, which, like the front plate described, is composed of a main or inner section D, that engages with and fits over the shouldered ends b' and b' of said pillars, and an outer section D′, which is superimposed upon said inner section and secured in place thereon by means of screws E and E, that pass through said parts and have their threaded inner ends contained within correspondingly-threaded axial openings in said pillars.

The pivot or jewel openings for the train of the movement are formed generally in either section of each movement-plate, as desired, with exception of those for the balance-arbor F, which is pivoted within the inner section of the front plate and the outer section of the back plate, for reasons hereinafter given.

At a suitable point within the inner section A of the front plate is provided an opening a for the reception of a pivot-jewel G for the front pivot f of the balance-arbor F. Said opening is recessed from the front side to permit of the insertion from such side of said jewel, and the setting of the latter is correspondingly formed, so that when in place within said opening the inner face of the jewel will be substantially flush with the inner face of said plate A. The thickness of the jewel G and its setting is somewhat less than the thickness of the plate A, so that between the front side of the former and the front face of the latter is left a space into which is fitted loosely a metal ring H, that has such thickness as to cause it to fill the

space with its outer face flush with or slightly above the corresponding face of said plate, in which position said ring is engaged by the inner face of the outer section A′ and operates to hold said jewel firmly in place within its opening.

Within the outer section A′ of the front plate is provided a threaded opening a', which is in a line with the axis of the jewel-opening a of the inner section A, but has a less diameter than the same. Said opening receives and contains a screw I, that at its inner end has such diameter as to enable it to pass into the ring H, and has a length that will permit of the adjustment of its said end against or as near to the outer face of the jewel G as may be desired without causing its outer end to project beyond the outer face of said plate-section A′. Said screw furnishes an end bearing for the pivot f of the balance-arbor, and may be formed of steel or any desired metal, and, if desired, may have an end jewel set within its said inner end.

For the pivoting of the rear end of the balance-arbor F the sections D and D′ of the back plate are provided with coinciding bridges d and d', respectively, the latter of which has upon its inner face a cylindrical boss d^2, that projects into a corresponding opening d^3, which is formed within the inner bridge d. Said boss is recessed from its inner end and receives and contains a cap-jewel I and a pivot-jewel K, of usual form, which jewels are fitted closely to place, so as to retain their positions by friction. As thus constructed said jewels I and K are contained wholly within the bridge of the outer section D′ and are removed and replaced with such section. A stud d^4 is provided upon the inner face of the bridge-section d for the reception of the outer end of the hair-spring f' of the balance f^2.

In setting up a watch the outer section of the back plate is left off until the entire train has been placed in position, the balance-wheel, as seen in Fig. 6, being pivoted in the front-plate jewel, with the rear end of its arbor resting loosely within the bridge-opening of the inner section of said back plate, after which said outer section may be readily placed in position and its pivot-jewel caused to engage with the pivot upon the adjacent end of said balance-arbor. This method of setting up the train lessens the time and trouble required for such operation and prevents such injury to or breakage of the pivots of the balance-arbor as has heretofore been of frequent occurrence in setting up movements in which the balance-arbor jewel was secured within a solid back plate, and such arbor required to have its pivots entered at the same time as the pivots of the other arbors of the train. After the outer section of the back plate has been secured in place the end-shake of the balance-arbor is easily and accurately adjusted by means of the end-shake screw of the front plate, when the setting up of the movement is complete.

Having thus described my invention, what I claim is—

1. As a means for setting a pivot-jewel, the combination of a movement-plate which is provided with an outwardly-opening jewel-recess, a ring or washer which is adapted to fill the outer portion of such recess above the jewel, and a plate that is adapted to be superimposed upon and secured to said movement-plate and to extend over said ring or washer, substantially as and for the purpose set forth.

2. As a means for jeweling and end-shaking an arbor-pivot, the combination of a movement-plate which is provided with an outwardly-opening jewel-recess, a pivot-jewel that is placed within the lower or inner end of such recess, a ring or annular washer which is adapted to fill the outer portion of said recess, a plate that is superimposed upon and secured to the movement-plate and extends over said annular washer, and a peripherally-threaded end bearing that is contained within a threaded opening in the confining-plate and extends into or through said annular washer, substantially as and for the purpose shown and described.

3. As an improvement in the jeweling and end-shaking of an arbor-pivot, the combination of the inner section of the movement-plate provided with a jewel-recess, the outer section of the movement-plate which is adapted to be secured upon the said inner section and is provided with a threaded opening that coincides axially with the jewel-recess, the pivot-jewel that is placed within the inner end of said jewel-recess, the annular washer which is placed within the outer end of the same, and the peripherally-threaded end bearing that is placed within said threaded opening and extends into or through said annular washer, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of August, 1888.

GEORGE E. HART.

Witnesses:
GEO. E. TERRY,
NATHANIEL R. BRONSON.