

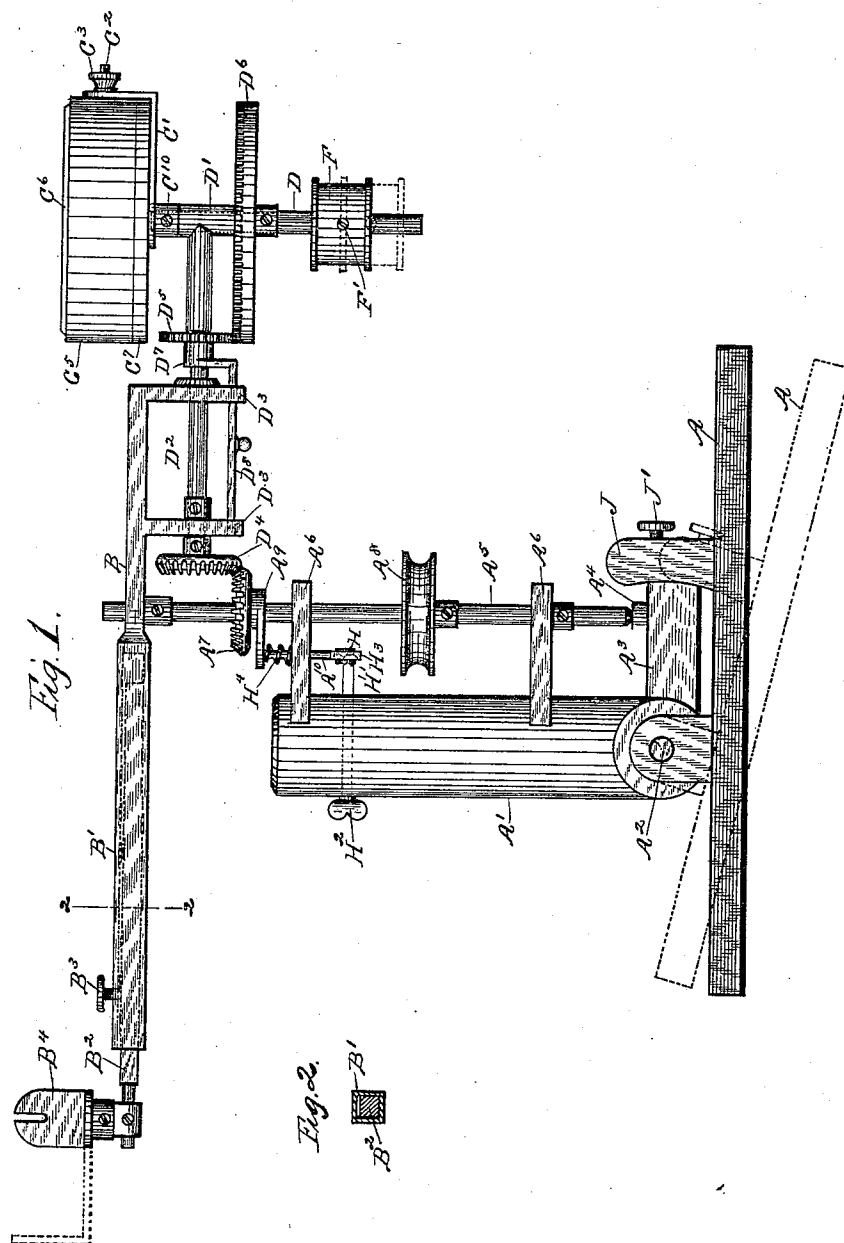
(No Model.)

2 Sheets—Sheet 1.

B. COPELAND.
MECHANISM FOR TESTING WATCHES.

No. 443,695.

Patented Dec. 30, 1890.



Witnesses:
Frank C. Curtis
Henry Speck

Inventor:
Brommie Copeland,
by Geo. Amosher
Atty.

(No Model.)

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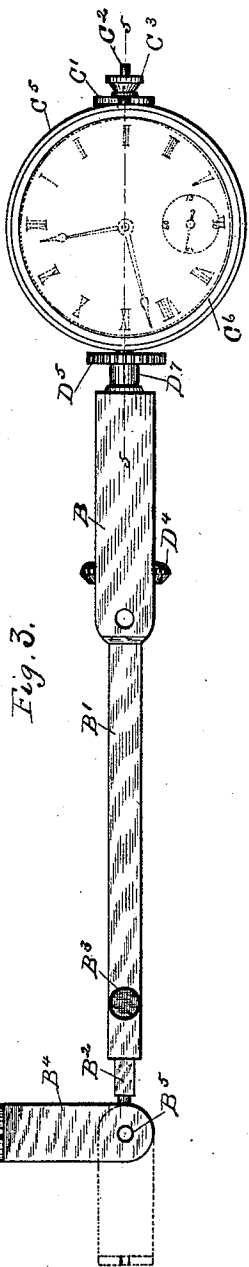


Fig. 3.

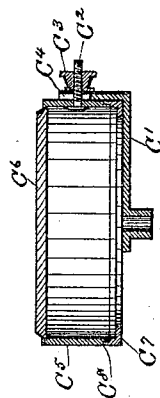


Fig. 5.

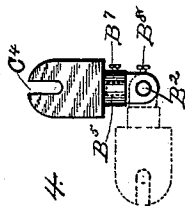


Fig. 4.

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UNITED STATES PATENT OFFICE.

BROMMIE COPELAND, OF SALEM, NEW YORK.

MECHANISM FOR TESTING WATCHES.

SPECIFICATION forming part of Letters Patent No. 443,695, dated December 30, 1890.

Application filed April 29, 1890. Serial No. 349,885. (No model.)

To all whom it may concern:

Be it known that I, BROMMIE COPELAND, a citizen of the United States, residing at Salem, county of Washington, and State of New York, have invented certain new and useful Improvements in Machines for Testing Watches, of which the following is a specification.

My invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described, and subsequently claimed.

Reference may be had to the accompanying drawings and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in side elevation of my improved machine for testing watches. Fig. 2 is a vertical cross-section of the adjustable beam, taken on the broken line 2 2 in Fig. 1. Fig. 3 is a top plan view of the revoluble watch-supporting beam. Fig. 4 is a view in elevation of the end shown at the left in Fig. 3. Fig. 5 is a vertical central section of the watch-supporting case and arm, taken on the broken line 5 5 in Fig. 3.

It is well-known to those skilled in the art of making or repairing and regulating watches that a watch tested and regulated or adjusted to mark time correctly while at rest will require still further adjustment when carried upon the person of the user, and not infrequently the adjustment must be adapted to the occupation of the person carrying the watch. I therefore provide a testing-machine which will subject a watch to continued movements while being tested and regulated; also, means for varying the character of the movements and the position of the watch while subjected to the various movements.

The bed-plate A supports a post A', pivoted at A² upon the plate and provided at its lower end with an arm A³. Upon the arm is a step-bearing A⁴, which supports the vertical spindle A⁵, rotary in such step. The spindle is also supported laterally by the arms A⁶, projecting laterally from the post and

having in their projecting ends bearings for the spindle. The spindle supports at its upper end a cross-sweep B, fixed upon the spindle and consisting of an extensible watch-supporting beam at one end and a revoluble watch-supporting frame at the other end. The extensible beam consists of the beam-socket B' and the bar or beam B², movable longitudinally within the socket and adapted to be adjustably secured therein by the thumb-screw B³. The projecting end of the beam is provided with the case-supporting arm B⁴. This arm is pivoted at one end upon the pivot B⁵ to swing in a plane parallel with a plane passing through the longitudinal center of the beam, and the pin is provided with a socket adapted to receive and turn upon the end of the beam, permitting the arm to swing in a plane right-angular to the longitudinal center line of the beam. The latter swing movement is indicated by the dotted lines in Fig. 4 and the former swing movement by the dotted lines in Figs. 1 and 3. The position of the arm (shown by the solid lines in Fig. 4) is the position indicated by the dotted lines in Figs. 1 and 3. When the arm has been swung to the desired position, it can be secured therein by the set-screws B⁷ and B⁸. The arm is shown with the case for holding the works of a watch detached. The case and means for attaching it to the arm are precisely the same as those shown upon the other end of the sweep, where the case C is shown secured to the arm C', which is like the arm B⁴, by means of a threaded bolt or pin C² and a thumb-nut C³. The bolt passes through the slot C⁴. The case is formed of a cylindrical shell C⁵, closed at one end by a glass C⁶, like a watch-crystal, and adapted to slide onto or into a bottom or base C⁷, like a cover upon a cylindrical box, the division between the case and bottom being shown at C⁸. The bottom may be solid, or it may be simply a flanged ring, such as I have shown in Fig. 5, to hold the works of a watch within the shell, wherein they are accessible on the back or lower side for winding and visible through the glass on the upper or face side, as indicated by the dotted lines in Fig. 3.

The arm C' is secured by set-screw C¹⁰ upon the upper end of the shaft D, which is rotary in the sleeve D'. The sleeve is fixed upon one end of the shaft D², the axial line of which is right angular to the axial line of shaft D and the sleeve.

The shaft D² has its bearings in the hangers D³, depending from the sweep, and is provided with the fixed bevel-gear D⁴, adapted to engage with the bevel-gear A⁷, loose upon the spindle A⁵, which is free to turn within it; also, with a loose gear-wheel D⁵, adapted to engage with the gear-wheel D⁶, fixed upon the shaft D.

The spindle A⁵ is provided with a fixed drive-pulley A⁸, adapted to be connected by belt with a motor, (not shown,) by which a rotary movement may be communicated to the spindle and the ends of the sweep caused to revolve about the axial line of the spindle.

The gear-wheel A⁷ is held in a fixed position and prevented from turning by the bracket-lever A⁹, projecting laterally from the rod or link A¹⁰, which is supported by the arm A⁶, and the gear-wheel D⁵ is prevented from turning with the shaft D² by the bracket-lever D⁷, projecting laterally from the rod D⁸, which is supported by the hangers D³.

When the watch-supporting frame on the sweep revolves about the axial line of the spindle, rotary movements are communicated to the shaft D by the engagement of the bevel-gears, which causes the case C and gear-wheel D⁶ to revolve about the axial line of shaft D². The latter revoluble movement causes the gear-wheel D⁶ to engage with the restrained gear-wheel D⁵ and communicate a rotary movement to the case-supporting shaft D. I am thus able to maintain simultaneously three distinct and continuous movements of the watch-supporting case, consisting of a revoluble movement about the axial line of shaft D², a rotary movement upon the axial line of shaft D, and a revoluble movement about the axial line of spindle A⁵. The weight F is adapted to slide longitudinally of the shaft D, and can be adjustably secured thereon, as indicated by the dotted lines, in any desired position by means of the set-screw F'. The weight serves to balance the weight of the case and its inclosed watch. The rotary movement may be eliminated without affecting the other two movements by sliding the movable rod D² and lever D⁷ backward to remove the gear-wheel D⁵ from engagement with gear-wheel D⁶, as shown in Fig. 3.

The movement of the watch-case can be limited to a revoluble movement about the axial line of the spindle by withdrawing the bevel-gear A⁷ from engagement with the bevel-gear D⁴. As a means for controlling the engagement of the bevel-gears, I have shown an eccentric H, which is fixed upon a stem H',

rotary in the post A' and provided with an operating-handle H². The eccentric works in the cross-head H³ in the usual well-known manner to communicate reciprocating movements to the rod A¹⁰ and force the bevel-gear A⁷ down out of engagement with the bevel-gear D⁴. A coil-spring H⁴ serves to retain the gears in engagement when they are not disengaged by the eccentric. The post A' can also be secured in an inclined position by means of the segment J, erected from the bed-plate and provided with a thumb-screw J', adapted to engage with the end of the arm A².

For convenience in illustration I have shown the relative position of the parts when the post is inclined by representing in dotted line in Fig. 1 a movement of the bed-plate and segment. When the post is inclined, the sweep can be moved much more easily if its ends are made to balance upon its supporting-spindle. The ends can easily be made to balance by attaching to each of the case-supporting arms a case containing the works of a watch and lengthening or shortening the extensible beam of the sweep.

It is obvious that the works of a watch can be subjected in my improved machine to almost every conceivable kind of movement. While the watch is being regulated and tested it should be subjected to the movement or movements approaching most nearly to those it will receive while in use by the wearer.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a watch-testing machine, the combination, with a spindle, spindle-bearing supports, and means for imparting rotary movements to the spindle, of a cross-sweep fixed upon the spindle and a watch-support adjustably fixed upon the end of the sweep, substantially as described.

2. In a watch-testing machine, the combination, with a spindle, spindle-bearing supports, and means for imparting rotary movements to the spindle, of a cross-sweep fixed upon the spindle, a rotary shaft, shaft-bearing supports fixed upon one end of the sweep, a cross-shaft, cross-shaft bearings fixed upon the sweep-supported shaft, a watch-support fixed upon the cross-shaft, and means, substantially as described, for communicating rotary movements to such shafts, substantially as described.

3. In a machine for testing watches, the combination, with a watch-supporting case consisting of a shell closed at one end by a glass plate and having a key-aperture in the other end, of a case-supporting arm having one end secured to the side of the shell and the other end projected to the axial line of the shell, and an arm-supporting stem extended longitudinally of such axial line, substantially as described.

4. In a machine for testing watches the

combination, with the sweep-supporting spindle, of an oscillatory spindle-supporting post pivoted at one end to a fixed support, and means, substantially as described, for adjust-
5 ably securing the post in its oscillatory arc.

5. In a watch-testing machine consisting of a cross-sweep fixed upon a rotary spindle and adapted to support a watch upon one end, an extensible watch-supporting beam upon

the other end of the sweep, substantially as is described.

In testimony whereof I have hereunto set my hand this 25th day of April, 1890.

BROMMIE COPELAND.

Witnesses:

GEORGE AUSTIN,
B. C. HAGGART.