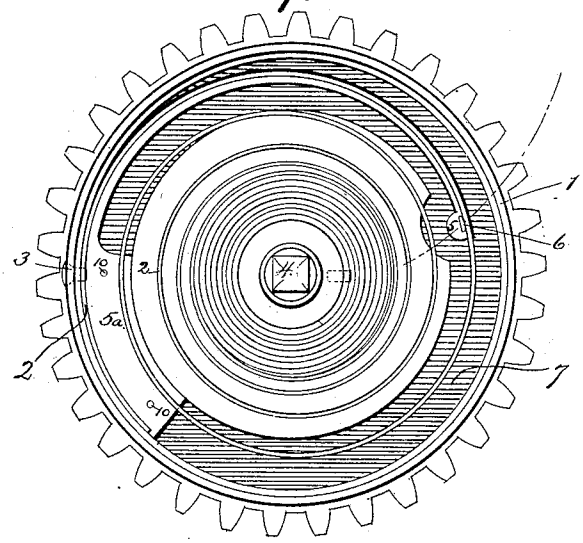
(Model.)

J. HAY.

WATCH BARREL.

No. 316,965. Patented May 5, 1885.

Fig. 1.



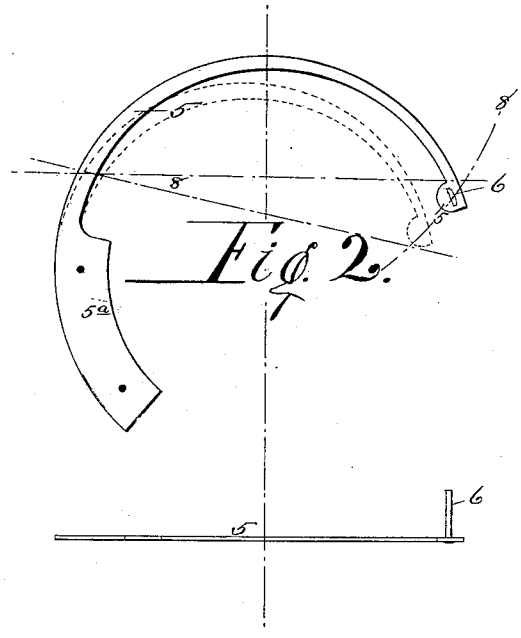


Fig. 2.

Witnesses:
John Thomson
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UNITED STATES PATENT OFFICE.

JOHN HAY, OF ROCHESTER, ASSIGNOR TO J. E. THOMSON, OF MARION, N. Y.

WATCH-BARREL.

SPECIFICATION forming part of Letters Patent No. 316,965, dated May 5, 1885.

Application filed May 27, 1884. (Model.)

To all whom it may concern:

Be it known that I, JOHN HAY, of the city of Rochester, county of Monroe, and State of New York, have invented certain new and useful Improvements in Horological Instruments, of which the following is a specification.

My invention relates to horological instruments, and particularly to the mainsprings of watches.

The object of my invention is, first, to improve the resilient action of mainsprings, whereby to derive a greater degree of energy from a given gage of spring; and, second, to cause the spring to give out its energy with more perfect uniformity than heretofore between the times of its maximum and minimum tension.

My invention consists in the application of a separate spring of such form, and so connected to the mainspring with respect to the point of securement of the outer coil, that the inherent tendency of the coils of the said mainspring to "set over" toward the point of securement of its outer coil is neutralized by the effect of the separate spring acting in an opposing direction.

In the usual manner of applying mainsprings to watches and other horological instruments heretofore the coils of the spring are subjected to abrasion each upon the other in consequence of the fixed outer coil tending to draw the intermediate coils over toward the outer point of attachment. In a correctly-formed spring this will not occur during the first two or three turns of the spring. There is, therefore, a time during which the coils act in space as they should. Beyond this, however, the action is obviously variable, and to this cause is mainly due, in my judgment, the fact that fine instruments vary in their rate between the times of winding—that is, the rate will return diurnally in consequence of the sum of the power of the mainspring being constant, but during portions of the day the rate will be variable in consequence of the unequal giving up of the energy of the spring.

I obviate the difficulty and result cited in the manner now to be described.

In the drawings, Figure 1 is a plan view of a mainspring-barrel the cover of which has been removed, thereby exposing the mainspring with my improved device in operative position. Fig. 2 is a detached plan and side view of the auxiliary spring, which constitutes the essential element of the said improvement.

1 is the mainspring-barrel. 2 is the mainspring. 3 is the "hook" or pin securing the end of the outer coil to the rim of the barrel; and 4 is the arbor to which the end of the inner coil is secured, all as in ordinary practice.

In the bottom of the outer portion of the barrel is formed an annular recess, 7, within which is placed what will be herein termed the "equalizing-spring" 5, the thickness of which is preferably equal, or nearly so, to the depth of the recess. The breadth of the "heel" 5^a of the equalizing-spring is preferably such as to equal the breadth of the groove 7 in the barrel, the spring being thus centered, but otherwise held in proper location by a screw or pins, as 10.

At the extremity of the free end of the equalizing-spring and projecting outward from its face is formed or attached a narrow spur or pin, 6, which engages the mainspring, as shown. The form of the equalizing-spring is such that in its normal position it hugs the rim of the barrel, acting outward. The relative location of the spur or pin upon the equalizing-spring is such that, with the said spring in its normal position, there is a space between it and the rim of the barrel equal, or nearly so, to the thickness of the mainspring. The relative locations of the spur or pin 6 and the point of securement of the outer coil of the mainspring, as 3, are preferably diametrically opposite, or nearly so, each from the other. The said spur or pin is made as thin as may be, that it may occupy the least space when the coils of the mainspring are completely unwound.

The power of the equalizing-spring is such that it exactly balances the inherent tendency of the outer coils of the mainspring to draw over toward the point of securement to the barrel.

It will now be apprehended that upon winding the mainspring and throughout the return of its energy as a motive power the equalizing-spring will act as a constant corrective

to maintain a separation of the working-coils, so that each from the other shall practically work in space, as illustrated in the main figure of the drawings. In thus eliminating the friction that would otherwise be developed by the abrasion of the sides of the mainspring I obtain the nearest to the theoretical efficiency, both as to the force and synchronism, of any given gage or grade of spring.

In the operation of the equalizing-spring there is, comparatively, but an infinitesimal loss of energy, in consequence of so locating the equalizing-spring with respect to the mainspring that the angles subtended by their vibratory action inward and outward tend toward coincidence each with the other, as indicated by the line 8; hence the contact of the spur against the side of the mainspring is practically free from any abrasive movement and without friction. Were the position of the equalizing-spring reversed from that shown in the drawings, the vibratory angles of the springs would be opposed each to the other; hence the spur would have a sliding contact with the mainspring and develop friction.

To insert the mainspring in the barrel, it is simply required that the outer coil shall be placed within the spur and the next and following coils outside of the spur, as shown.

It will be seen that but comparatively little extra space is occupied by the device, and that no changes of consequence are necessary to its application, thus adapting it to instruments already in use by mechanicians of ordinary skill.

I claim—

1. In a watch or other time-piece, the combination, with a mainspring and a barrel or other means for securing the same, of a separate equalizing-spring the function of which is to prevent the coils of the said mainspring from abrading each upon the other, substantially as and for the purpose specified.

2. The combination, with the barrel and the mainspring, of the equalizing-spring and the spur, for the purpose of maintaining a separation of the coils of the said mainspring, substantially as set forth.

3. In combination, the mainspring, the barrel in the bottom of which is formed an annular groove, the separate equalizing-spring disposed within the said groove, and the spur, as 5, substantially as and for the purpose specified.

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

JOHN HAY.

Witnesses:
J. W. STANTON,
WILLIAM WADE.