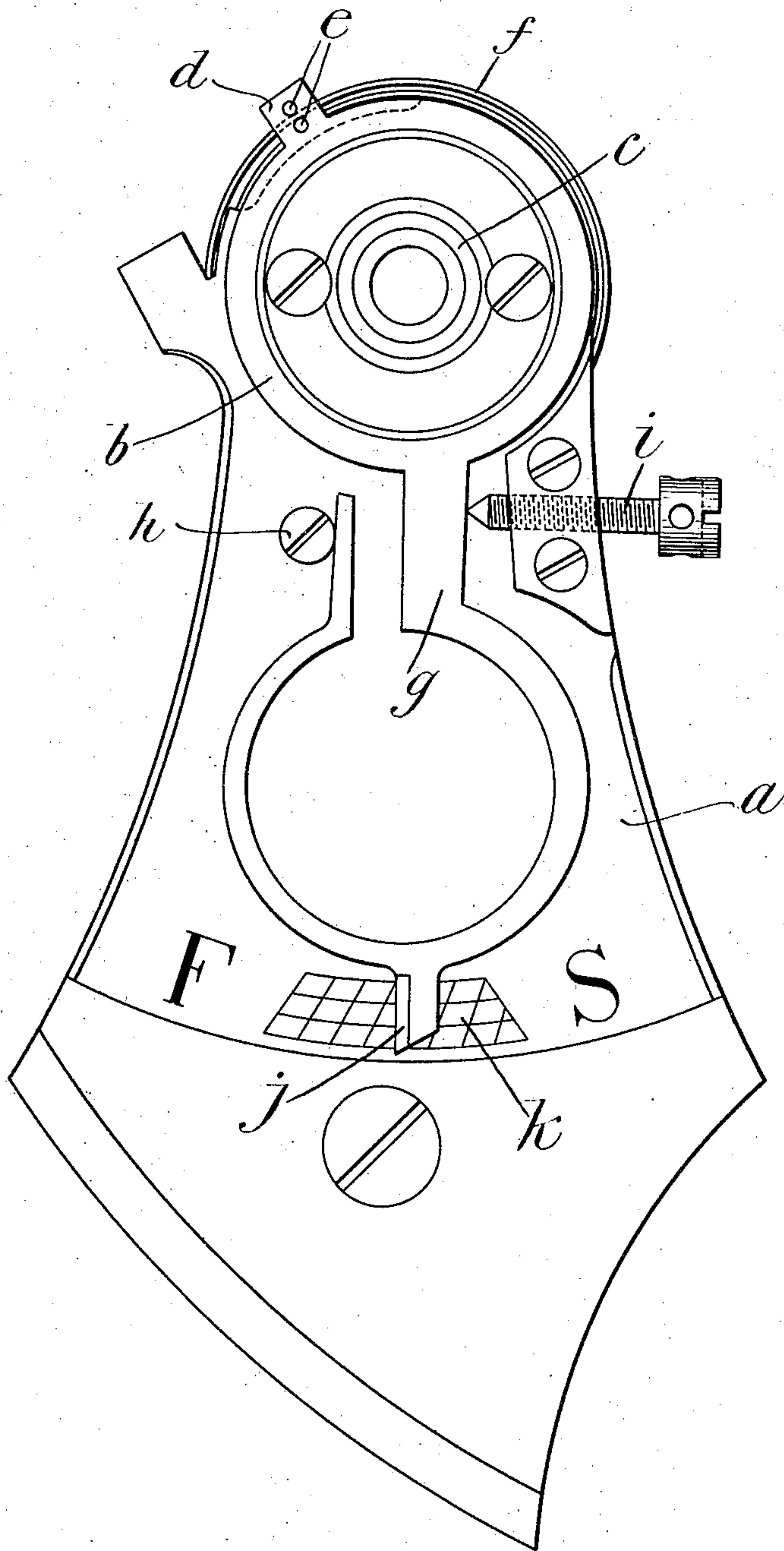


No. 894,457.

PATENTED JULY 28, 1908.

O. OHLSON.  
REGULATOR FOR TIMEPIECES.  
APPLICATION FILED APR. 10, 1908.



Witnesses.  
*P. H. Pyette*  
*F. R. Rollstone*

Inventor:  
*O. Ohlson*  
by *Wright, Brown, Quincy & May*  
*Attys*



# UNITED STATES PATENT OFFICE.

OLOF OHLSON, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO WALTHAM WATCH COMPANY,  
OF WALTHAM, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## REGULATOR FOR TIMEPIECES.

No. 894,457.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed April 10, 1908. Serial No. 426,223.

*To all whom it may concern:*

Be it known that I, OLOF OHLSON, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Regulators for Timepieces, of which the following is a specification.

This invention relates to a new and improved hair-spring regulator for watches and other time-pieces of which the escapement is governed by a balance and hair-spring.

The invention consists in constructing a regulator, which is adjusted by a screw, so that it is self-maintained in contact with the screw and will automatically restore itself when the screw is retracted without the necessity of additional springs for moving it, thus making the regulator and its governing spring in one piece.

The drawing shows on an enlarged scale, the balance cock of a watch and a regulator embodying the substance of my invention mounted thereon.

*a* is the balance cock, and *b* the regulator, which is constructed in the ordinary manner with one annular portion mounted so as to rotate about the bearing *c* of the balance staff, and having a short arm *d* carrying the pins *e*, between which the hair-spring *f* is grasped, and by which its effective length is lengthened or shortened to regulate the speed of the balance.

The improvement constituting the essence of the present invention resides in the regulator arm *g* which is integrally formed with, and extends away from, the annular body *b* of the regulator. This arm or bar *g* is made resilient, and is caused to bear against a fixed stop *h*. It is moved so as to regulate a watch by an adjusting screw or other suitable actuator *i*, by which a very fine adjustment may be made. The stop *h* is so arranged as to hold the arm in contact with the actuator *i* wherever the latter may be positioned within the limits of the regulating swing of the arm.

In order to get sufficient range of movement without either making the spring too weak or requiring an excessive pressure to move the arm into its extreme position, the arm is bowed, being carried back upon itself and terminating near the body portion *b*. This gives the maximum length of arm within the compass and enables the stop to be placed near the screw *i* and on the remote side of the arm therefrom. When the screw

actuator is turned so as to swing the arm from right to left, it bends the arm and increases the tension upon the same, while when the actuator is retracted, the resilience of the arm reacting against the stop, swings the arm back again and maintains it constantly in contact with the actuator.

It is to be noted that the actuating screw bears on the regulator-arm *g* at a point as near as practicable to the junction of said arm with the annular portion of the regulator. At this point the arm has its greatest thickness and rigidity, and the bearing point of the screw is so close to the ring or body portion that there is practically no possibility of the arm springing, and thus it is impossible to turn the screw *i* and move the arm *g* without at the same time turning the ring portion *b* about its bearing and effecting the regulation of the hair-spring. On the other hand, when the screw is retracted, the bar cannot spring back into contact with it without also moving the ring *b*. This insures an adjustment of the bearing for the regulator which will not be too tight, and necessitates the correct adjustment of every watch before it leaves the factory. With other forms of regulator in which the actuator exerts its force on the regulator arm at a remote point from the body, there is a possibility of the adjustment of the bearing being too tight, so that the arm may move without actually affecting the regulation in the least, and such an error might easily fail detection. In a regulator of the character here shown and described, however, too tight adjustment of the bearing must be at once detected upon retracting the screw *i*, and can be corrected before the watch is delivered.

At the point on the arm most remote from the bearing, there is an index or pointer *j* which travels over a graduated scale *k* engraved upon the balance cock. This scale has graduations of a different character from those ordinarily found in time-pieces, being provided with lines parallel to the swinging movement of the arm, and transverse lines which are inclined with respect to the indicating edge of the pointer *j*. By means of this arrangement of the transverse lines and their intersection with the longitudinal lines, more minute movements of the regulator may be noted than is the case where the graduations are radial, and thus a finer adjustment is rendered possible.



I claim:—

1. A regulator for time-pieces mounted to rotate concentrically with the balance, having a resilient arm, and a positive slow-speed actuator for said arm.
2. A regulator for time-pieces mounted to rotate concentrically with the balance, having a resilient arm, and a positive slow-speed actuator bearing against said arm, the latter being maintained by its own resilience in continual contact with said actuator.
3. A rotative hair-spring regulator including a spring arm, an actuator bearing positively in one direction only on said arm, and a stop placed to oppose the thrust of said actuator, whereby the arm is automatically maintained in contact at all times with the actuator.
4. A hair-spring regulator rotative bodily about the axis of the balance, including an arm and an actuator positive in one direction, the arm being self-maintained in contact with the actuator at all times within its limits of travel.
5. A hair-spring regulator mounted to rotate as a whole about the axis of the balance, including an arm and a screw bearing against one side of said arm for adjusting the regulator, the arm being self-maintained at all times within its limits of travel against said screw.
6. A hair-spring regulator rotative about a bearing concentric with the balance, including a flexible arm, an actuator positive in its action in one direction bearing against said arm to adjust the regulator, and a rigid stop against which the arm is pressed by said actuator and whereby the arm is enabled by its own resilience to maintain itself in contact with the actuator.
7. A hair-spring regulator including an annular portion mounted in a bearing concentric with the balance, a flexible arm, an actuator positive in its action in one direction bearing against said arm to adjust the regulator, and a stop arranged so as to be engaged by the arm and to resist the thrust applied thereto by the actuator, said arm being adapted to yield and by its resilience to maintain

itself against the actuator during retraction of the latter.

8. A hair-spring regulator having an arm provided with a spring portion extending back toward the point of support of the arm, a positive actuator bearing against said arm for giving a micrometric adjustment to the regulator, and a stop on the remote side of the spring portion, against which the latter is pressed by the thrust of said actuator.

9. A hair-spring regulator having an arm provided with a spring portion extending back toward the point of support of the arm, a positive actuator bearing against said arm for giving a micrometric adjustment to the regulator, a stop on the remote side of the spring portion, against which the latter is pressed by the thrust of said actuator, and an index on the most remote point of the arm from its pivotal axis for indicating, in coöperating with a scale, the distance of adjustment of the regulator.

10. A hair-spring regulator having an arm provided with a spring portion extending back toward the point of support of the arm, a positive actuator bearing against said arm for giving a micrometric adjustment to the regulator, a stop on the remote side of the spring portion, against which the latter is pressed by the thrust of said actuator, and an index pointer on the arm, in combination with a scale having graduation lines inclined relatively to the edge of the index.

11. A hair-spring regulator consisting of an annular portion rotatively mounted and a resilient arm of diminishing thickness extending therefrom, together with a screw actuator bearing against said arm near its union with said annular portion, where it has the greatest rigidity, and a fixed stop on the opposite side of the arm from said actuator and against which the end of the arm is held thereby.

In testimony whereof I have affixed my signature, in presence of two witnesses.

OLOF OHLSON.

Witnesses:

L. C. LANE,  
A. AUNE.