

No. 861,884.

PATENTED JULY 30, 1907.

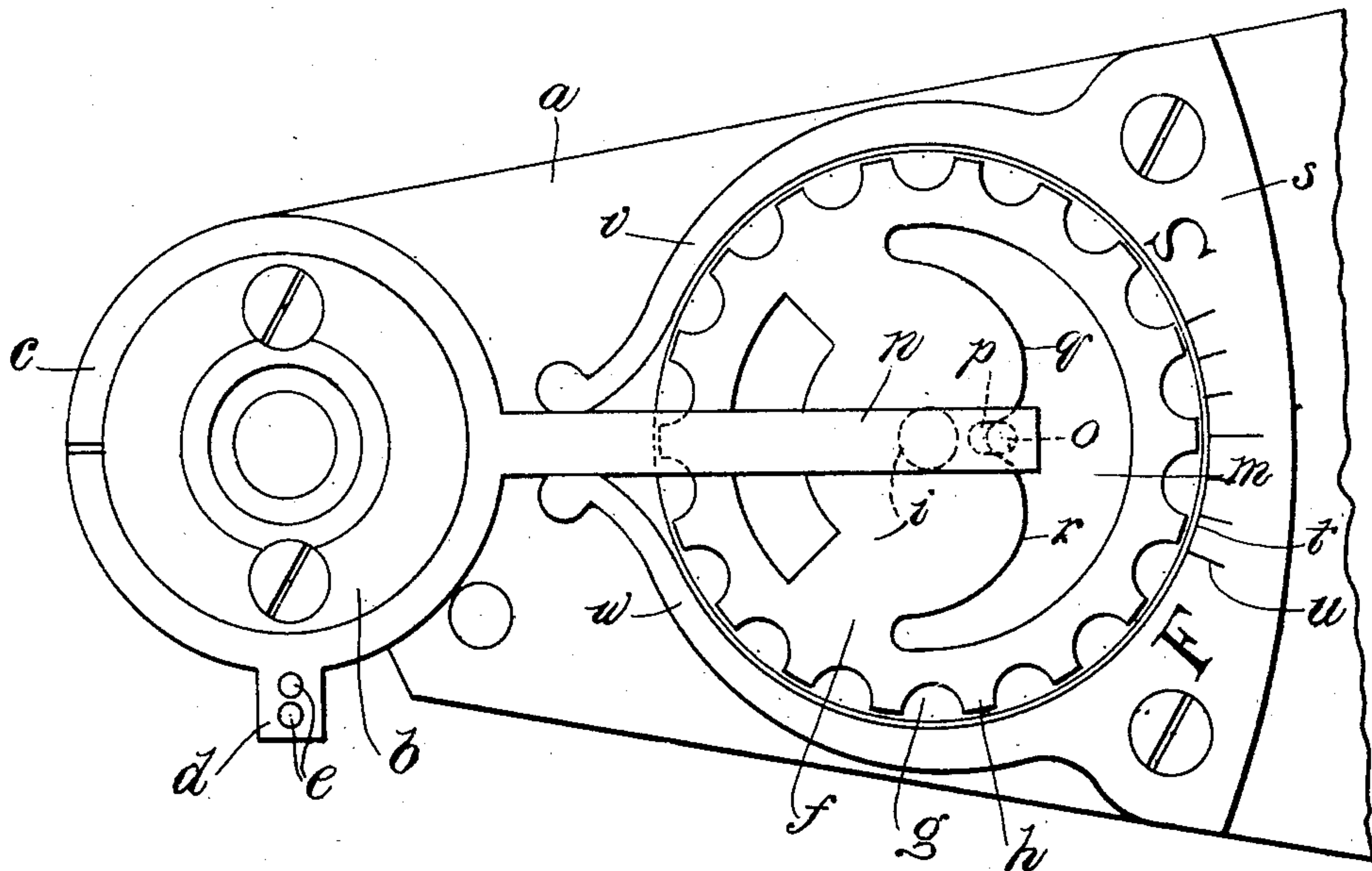
O. OHLSON.

WATCH REGULATOR.

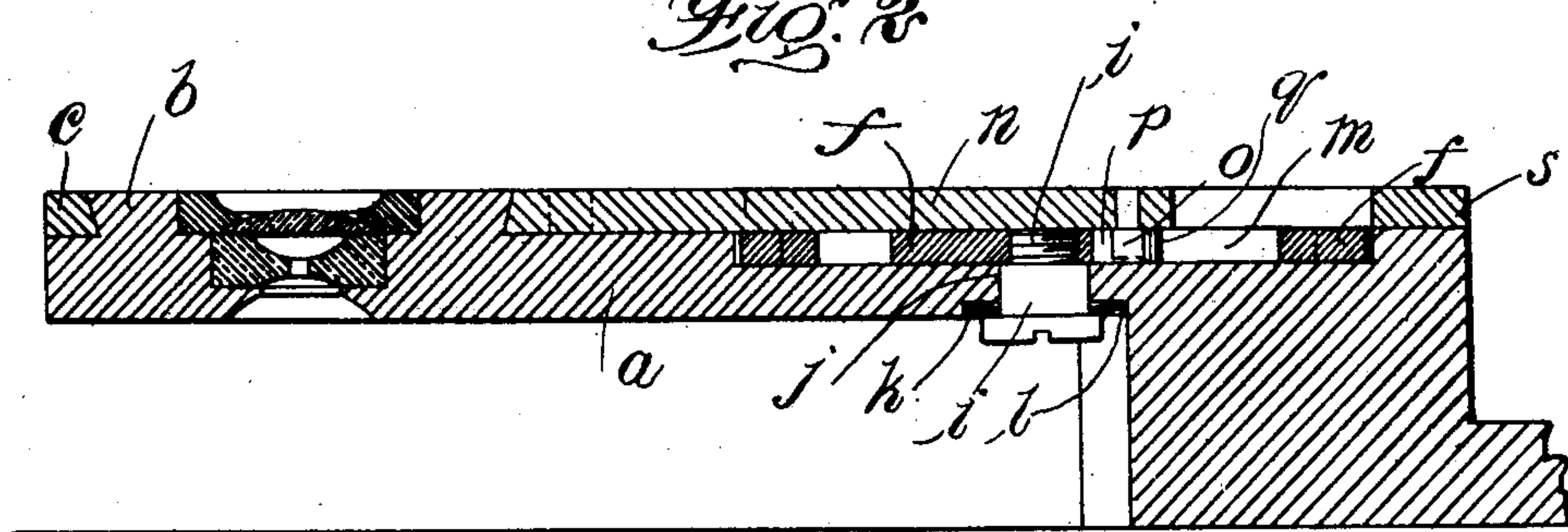
APPLICATION FILED JULY 24, 1905.

2 SHEETS—SHEET 1.

*Fig. 1*



*Fig. 2*



*Witnesses:*  
*Fred D. Sweet.*  
*A. C. Ratigan*

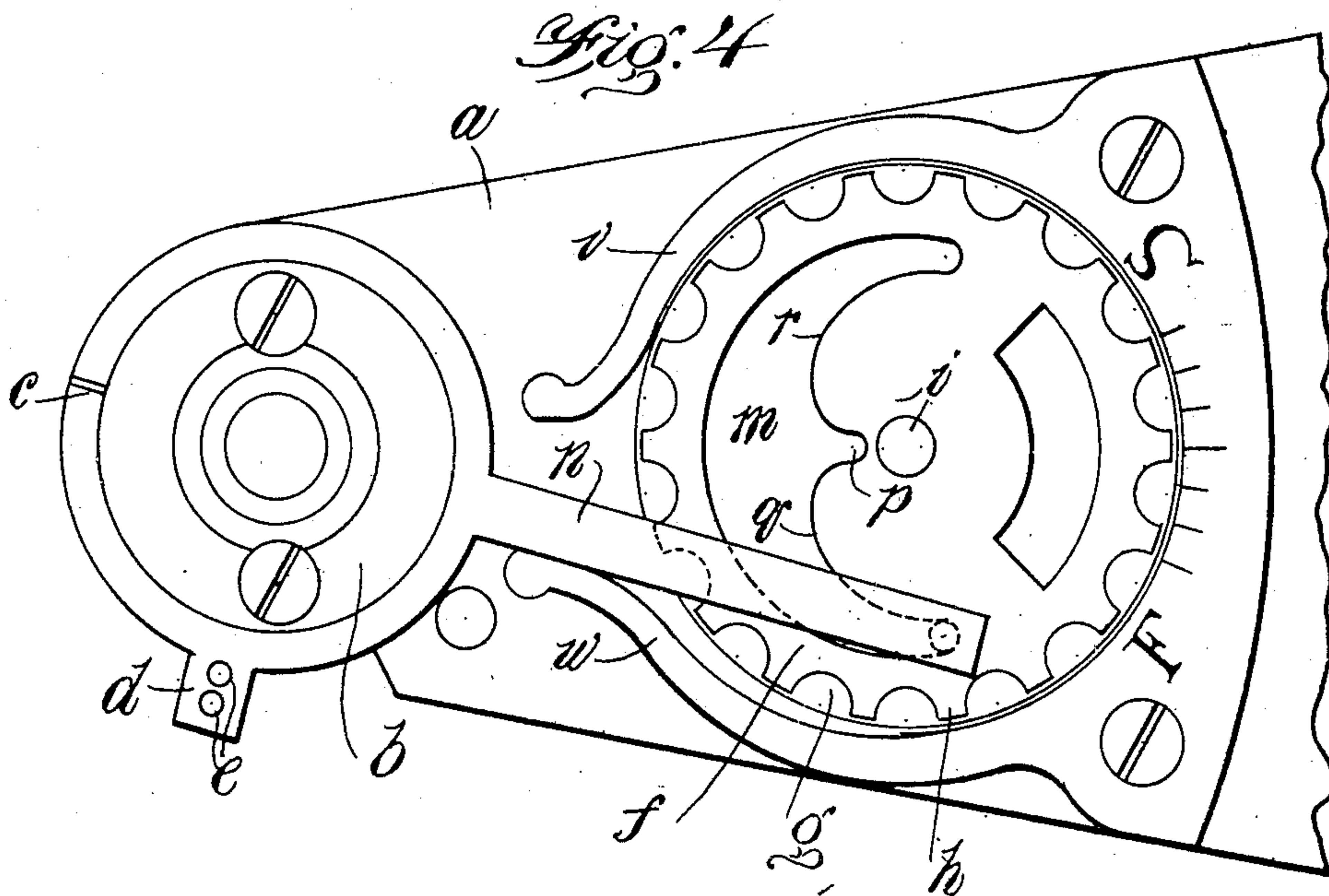
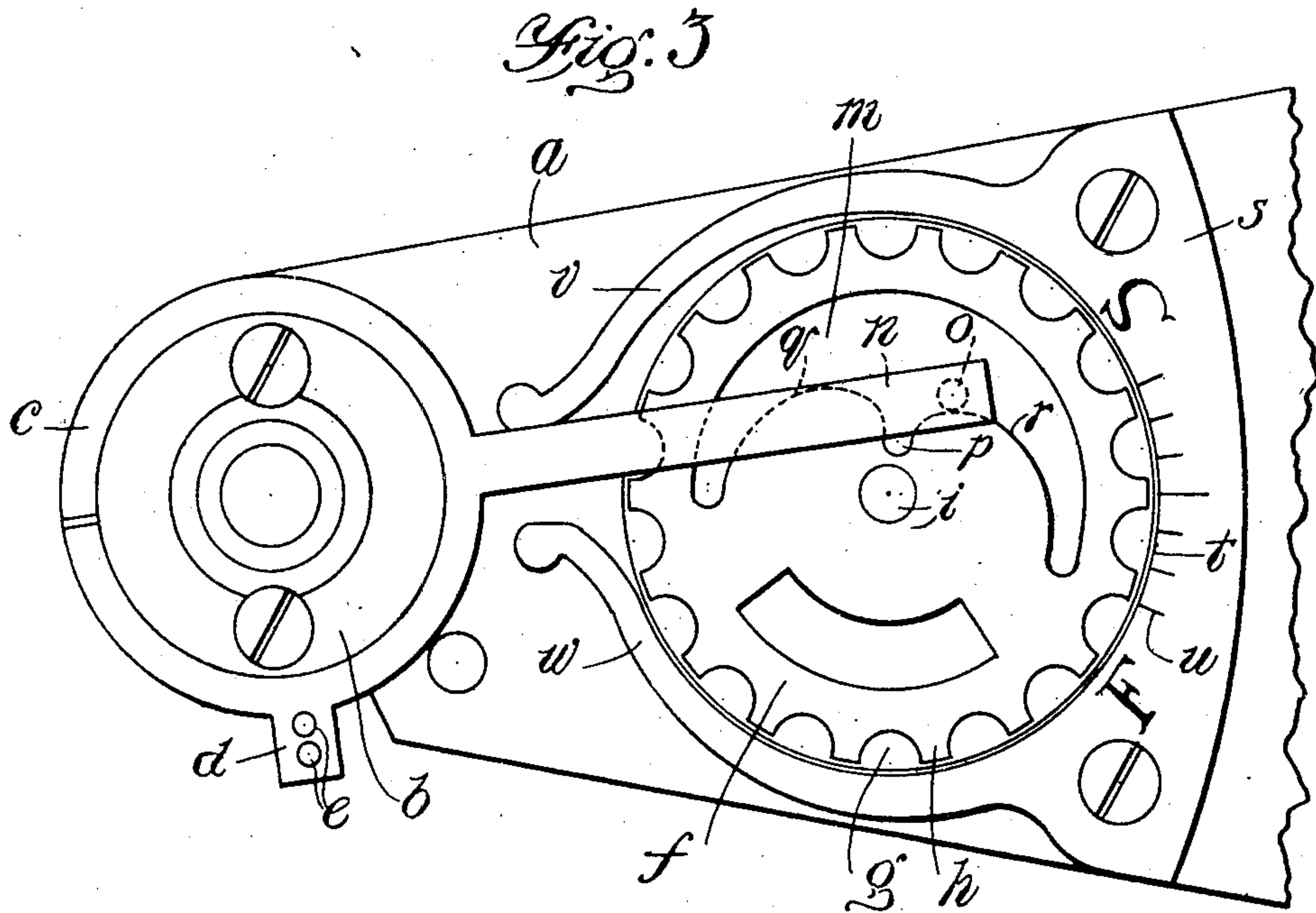
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2 SHEETS—SHEET 2.



*Witnesses:*  
Fred D. Sweet.  
A. C. Ratigan

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# UNITED STATES PATENT OFFICE.

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

## WATCH-REGULATOR.

No. 861,884.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed July 24, 1905. Serial No. 270,921.

*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 Watch-Regulators, of which the following is a specification.

The present invention relates to micrometer regulators for watches and has for its object to provide a novel and improved regulator of this character which is simpler in construction and more easily and economically made and assembled.

The details of the invention are set forth in the following specification and illustrated in the drawings, in which,—

Figure 1 represents a plan of a balance cock having my regulator set up thereon. Fig. 2 represents a longitudinal central section on line 2—2 of Fig. 1. Figs. 3 and 4 represent views similar to Fig. 1, and showing the parts of the regulator in different positions.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, *a* represents the balance-holding cock of a watch or clock movement which is constructed in the usual way. It has a circular undercut projection *b* at its end and over this is placed and held rotatably thereon an annular ring *c* provided with a lateral arm *d* carrying the curb-pins *e* which embrace the hair-spring in the usual manner and serve to vary the effective length thereof when moved to a greater or less distance from the end of such spring.

Pivoted upon the cock is a rotary disk or wheel *f* which has upon its periphery alternate depressions *g* and teeth *h* by which it may be engaged and turned. It is held to the cock by a stud *i* which is threaded into the wheel from the under side of the cock and has a circular bearing portion *j* which is journaled in a hole in the cock.

The wheel is caused to bear with a certain amount of friction against the cock so that it may be held in whatever adjusted position it is put, by means of a spring *k* located in a recess *l* of the cock, which spring bears against the head of screw *i* and tends to hold the latter away from the cock, drawing the wheel against the upper surface of the latter. In the wheel *f* is a curved slot or recess *m* of which the side that is normally nearest the balance-staff bearing is formed in a particular manner so as to constitute a cam. A regulator arm *n* is connected to the ring *c* and extends across over the wheel, carrying at its end a pin *o* which projects into the slot *m* and is adapted to be engaged by the cam surfaces. In a perfectly adjusted watch movement in which the hair-spring is of the proper length before the movement is assembled, the parts would occupy the position shown in Fig. 1, with the regulator

arm *n* on the line joining the centers of the disks and balance bearing. In this position the pin *o* is held between the sides of a notch *p* formed in the cam side of the slot.

From the notch *p* cam surfaces *q* and *r* extend to the right and left respectively, and extend substantially equal distances. These cam surfaces are formed as spiral curves, the radii of the several points on the surfaces varying uniformly with the angles of these points from the center line of Fig. 1. Therefore as the wheel is turned equal angles in either direction the points of the surface which act against the pin *o* are at correspondingly and uniformly increasing distances away from the center, and the pin is therefore moved and the arm *n* with it through distances varying proportionally to the angles through which the wheel is turned. The two curves *q* and *r* are exactly alike but are reversely arranged and it will therefore be seen that they are similar and symmetrically placed with respect to the center line of Fig. 2, which is a diameter of the wheel *f* passing through the middle portion of slot *m*.

Adjacent the wheel is a plate *s* which is rigidly attached to the cock and has an indexing edge *t* curved concentrically with the wheel located adjacent the periphery thereof and formed with index marks *u*. These index marks serve to determine in the usual manner the amount through which the wheel is rotated. The ends of the plate are reduced in width and curve about the outside of the wheel, being carried almost completely about the same, and their ends brought into engagement with opposite sides of a regulator arm *n*. These end portions of the plate constitute spring arms *v w* which press oppositely against the regulator arm and serve to hold the pin carried thereby against one of the cam surfaces *q r* depending upon the direction in which the arm is displaced. If the wheel *f* is turned in left-hand rotation the regulator arm is moved to the right and spring arm *v* is distorted, while spring *w* is left, while if the wheel is turned in the opposite direction, the cam surface *q* acts upon the pin and moves the regulator to the left, displacing spring *w*, leaving spring *v* in its normal position. When the arm is central, both of the springs press upon it and are in condition always to hold pin *o* against whichever cam surface may be acting upon it.

It will be seen that the regulator as above described combines the features of micrometer regulation with simplicity and ease of construction. There are no parts which require excessive care in the manufacture or in assembling them. The ordinary regulator arm having the ring and curb-pins may be used with the simple addition of applying the pin *o* to it, while the cam surfaces may be made very easily as great accuracy or care in constructing them is not required. The pin



is always held in contact with the cam which acts on it by one of the spring arms so that it can yield for inaccuracies of the surface so that the cams need not be as carefully made as would be the case if they were obliged to act positively to move the regulator arm in both directions. There is also no necessity for cutting gear teeth on the wheel or regulator bar, and this operation, which is one of the most expensive in the manufacture of the micrometer regulators now commonly used, is eliminated.

I claim:—

1. A regulator comprising a regulator arm, a rotatable disk provided with a plurality of similar spiral cam surfaces symmetrically arranged on opposite sides of a diameter of the disk and between the circumference and center thereof, a projection on said arm arranged to engage said surfaces and movable thereby past the center of the disk, and springs bearing against opposite sides of said arm and acting to hold said projection in contact at all times with one or the other of said cam surfaces.

2. A regulator comprising a toothed wheel having a curved slot, one of the sides of said slot being constructed to form a pair of spiral cams symmetrically arranged on opposite sides of a diameter of the wheel traversing the middle of the slot, a regulator arm having an extension for engaging the hair-spring and extending across the wheel, a pin carried by the arm projecting into the slot and adapted to engage the cams, and springs on opposite sides of the regulator arm arranged to bear against the same and retain the pin in engagement with one or the other of said cams.

3. A regulator comprising a toothed wheel having a curved slot, one of the sides of said slot being constructed to form a pair of spiral cams symmetrically arranged on opposite sides of a diameter of the wheel traversing the middle of the slot, a regulator arm having an extension for

engaging the hair-spring and extending across the wheel, a pin carried by the arm projecting into the slot and adapted to engage the cams, and spring arms surrounding the wheel and arranged to bear at their ends against the opposite sides of the regulator arm to hold the pin carried thereby in contact with one or the other of said cams.

4. A regulator for watches and clocks comprising a circumferentially toothed wheel pivoted to the balance cock of the watch or clock movement, a curved slot formed in the wheel with one of its sides shaped to make two spiral cams located symmetrically on opposite sides of a diameter of the wheel crossing the center of the slot, a regulator arm extending across the wheel, a pin mounted on the arm projecting into the slot, springs acting against the sides of said regulator arm to hold the pin in engagement with one or the other of said cams, and a plate mounted on the cock having a curved side bearing index graduations adjacent the rim of the wheel.

5. A regulator for watches and clocks comprising a circumferentially toothed wheel pivoted to the balance cock of the watch or clock movement, a curved slot formed in the wheel with one of its sides shaped to make two spiral cams located symmetrically on opposite sides of a diameter of the wheel crossing the center of the slot, a regulator arm extending across the wheel, a pin mounted on the arm projecting into the slot, a plate mounted on the cock having a curved side bearing index graduations adjacent the circumference of the wheel, and curved spring arms forming continuations of said plate carried around the wheel and arranged to act against the sides of said regulator arm to hold the pin at all times in contact with one or the other of said cams.

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

OLOF OHLSON.

Witnesses:

A. C. RATIGAN,  
ARTHUR H. BROWN.