

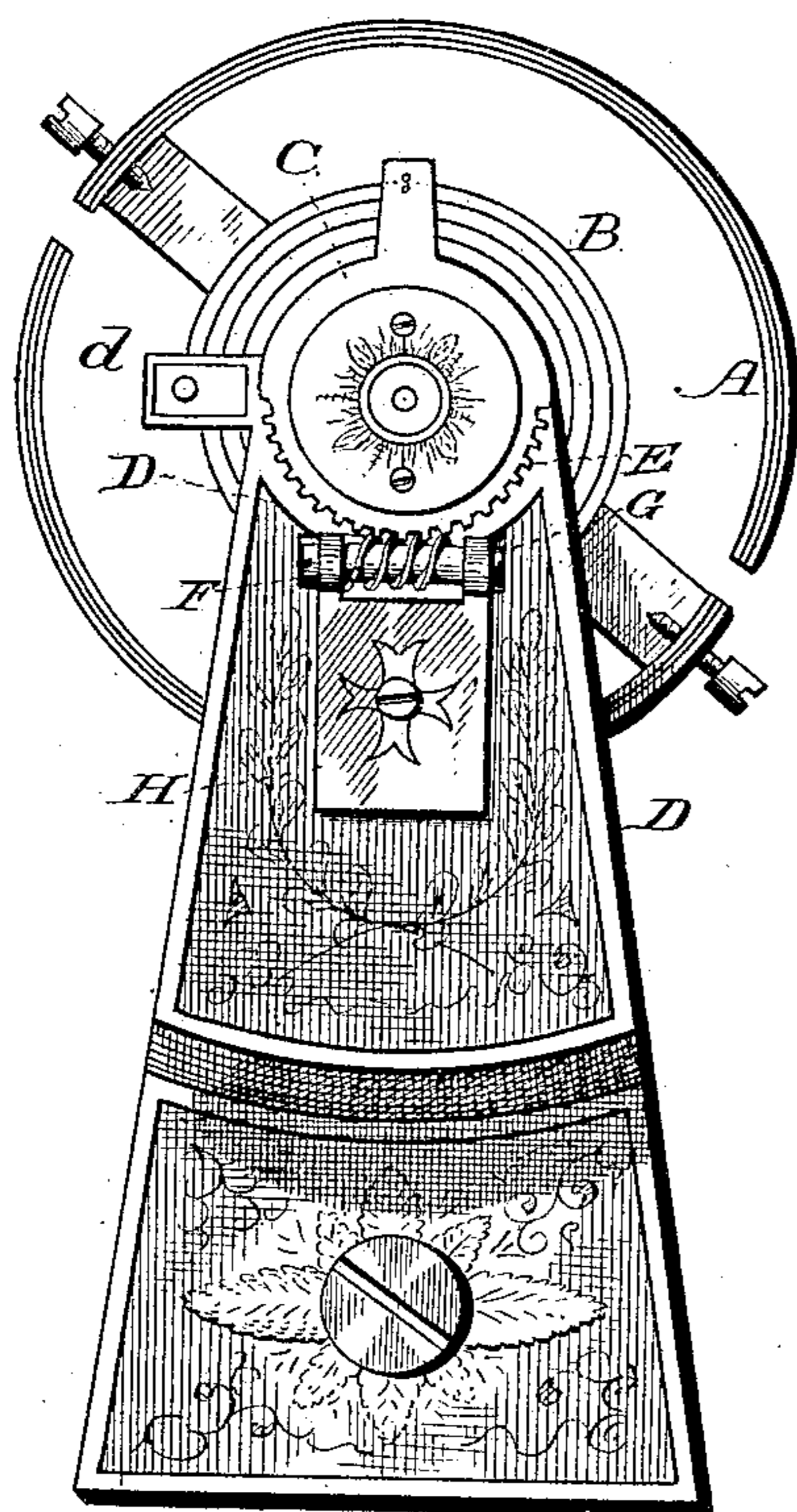
(No Model.)

P. & C. KAUL.  
WATCH REGULATOR.

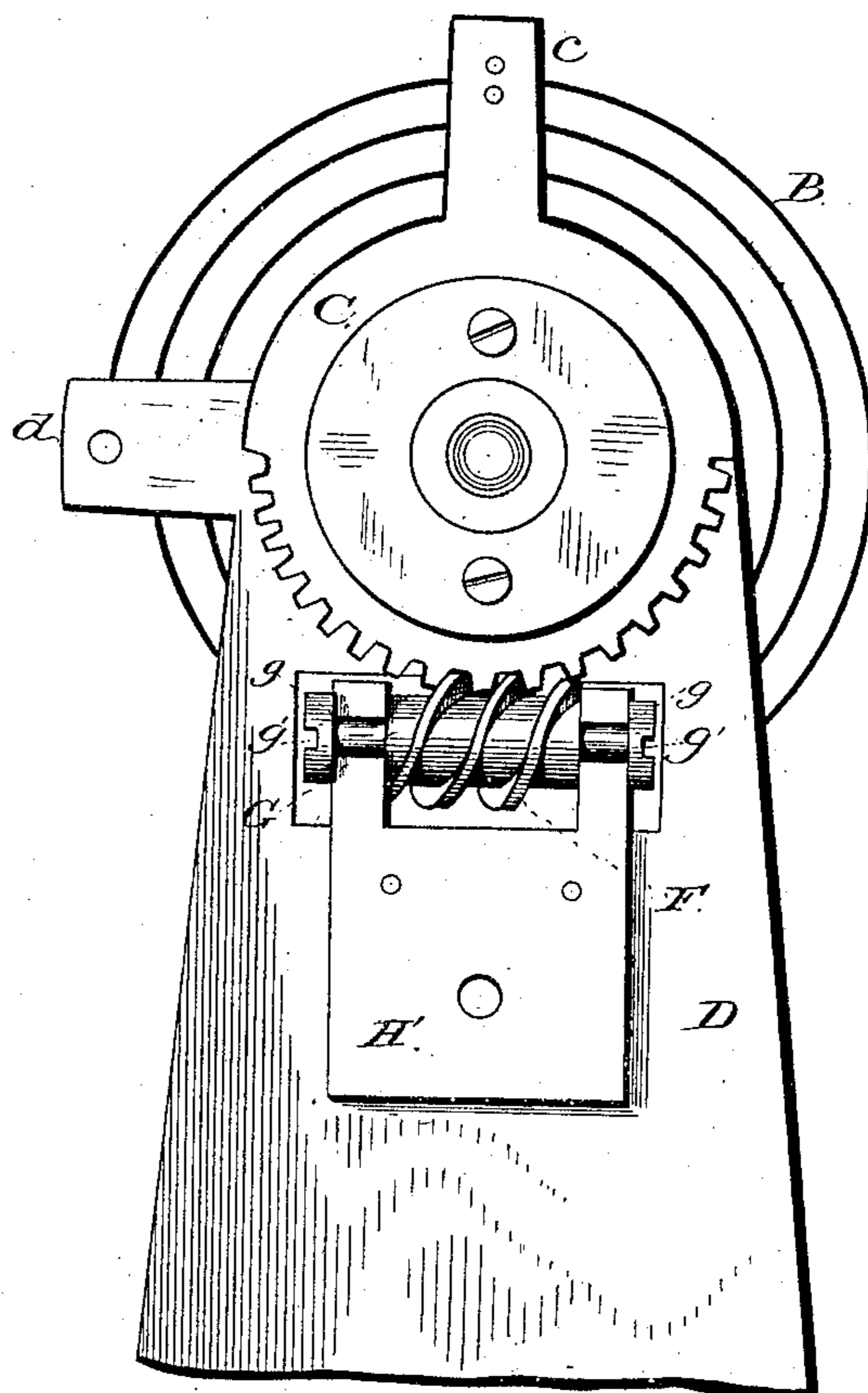
No. 322,185.

Patented July 14, 1885.

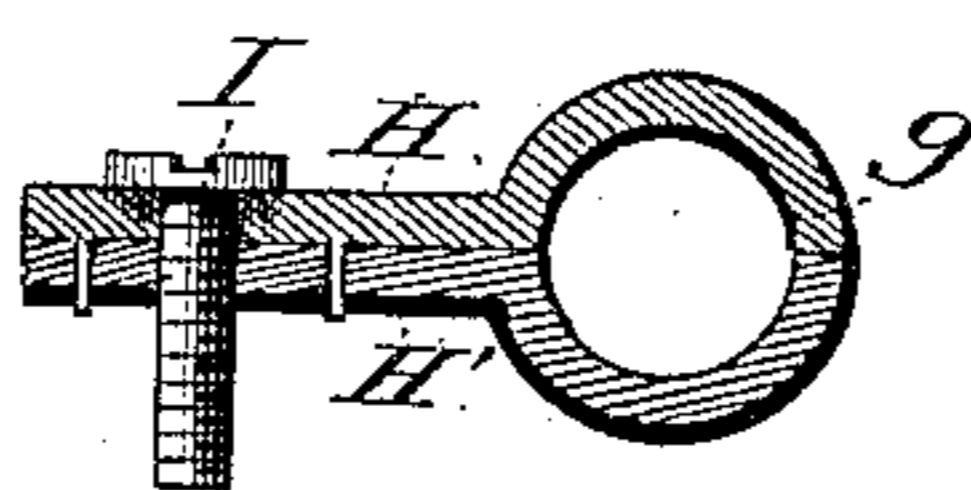
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES

*W. Reynolds*  
*W. R. Haight*

INVENTORS:

*Pius Kaul*  
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By Attorney

# UNITED STATES PATENT OFFICE.

PIUS KAUL AND CHARLES KAUL, OF LANCASTER, PENNSYLVANIA, AS-  
SIGNORS OF ONE-THIRD TO ERNEST ZEITZ, OF SAME PLACE.

## WATCH-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 322,185, dated July 14, 1885.

Application filed March 21, 1885. (No model.)

*To all whom it may concern:*

Be it known that we, PIUS KAUL and CHARLES KAUL, citizens of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented new and useful Improvements in Regulators for Hair or Balance Springs, of which the following is a specification.

This invention is an improvement on the lever-regulators now in use for adjusting the tension of the balance-springs of time-pieces.

It consists, chiefly, in the combination of a set of worm-wheel cog-teeth formed in the perimeter of the regulating-disk, with a worm on a shaft that is arranged to be turned in proximity to said disk, so that the intermeshing worm and cogs will take the place of the ordinary lever-arm as a means for regulating the spring.

The said invention also consists in the sectional plate, which affords bearings for said shaft, in combination with the latter and with the bridge to which said plate is attached.

In said drawings, Figure 1 represents a face view of the balance-wheel, balance or hair spring bridge, and regulating devices of a watch embodying my invention. Fig. 2 represents a similar view on a larger scale, the balance-wheel, a part of the bridge, and the outer section of the bearing-plate being removed. Fig. 3 represents a detail view of the bearing-plate in vertical section.

A designates the balance-wheel; B, the hair-spring; C, the regulating-disk, and D the bridge in which said disk turns, all as in an ordinary time-piece movement employing a hair-spring and a lever-regulator. The outer end of the spring is, as usual, attached to a lateral lug, *d*, of said bridge, a part of said spring passing through an eye on the rear side of a radial arm, *c*, of said disk C. A part of the circumference of said disk, on the side opposite to said arm *c*, is provided with a series of beveled teeth, E, which engage with the threads of a worm, F, on a shaft, G, which is journaled so as to have its axis approximately in the plane of the

motion of said disk. The bearings of this shaft are marked *g*, and are formed in the upper ends of two counterpart sections, H H', which together make up a bearing-plate, held to the face of bridge D by a screw, I. Between said bearings said plate is recessed to make room for the said worm F. The ends of shaft G are provided with slots *g'*, one in each end, after the manner of a screw, in order that said shaft may be operated conveniently. When said shaft is turned in one direction, the spring will of course be tightened. When turned in the other, it will be loosened. The worm F and shaft G will be ordinarily in one piece, as shown, forming a simple worm-screw adapted to be operated at either end. Such a screw is cheaper than the levers heretofore used, and there is less risk of catching against anything. The sectional bearing-plate is easily removed from the bridge when the worm-screw F is to be cleaned; or the outer section, H may be removed, leaving the other section, H', in place, but affording convenient access to the worm.

We are aware that the regulating-lever of a watch has been arranged to engage with a worm or screw directly, and also by means of a toothed segment carried by the tip of said lever. We do not claim or use either of these constructions, our object being to dispense with the lever altogether.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

A worm having screw-heads *g* in each end provided with slots *g'*, in combination with a toothed segment formed in the periphery of a regulating-disk, C, and a hair-spring, B, regulated thereby, substantially as set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

PIUS KAUL.  
CHARLES KAUL.

Witnesses:

ALLAN A. HERR,  
JOHN EVANS.