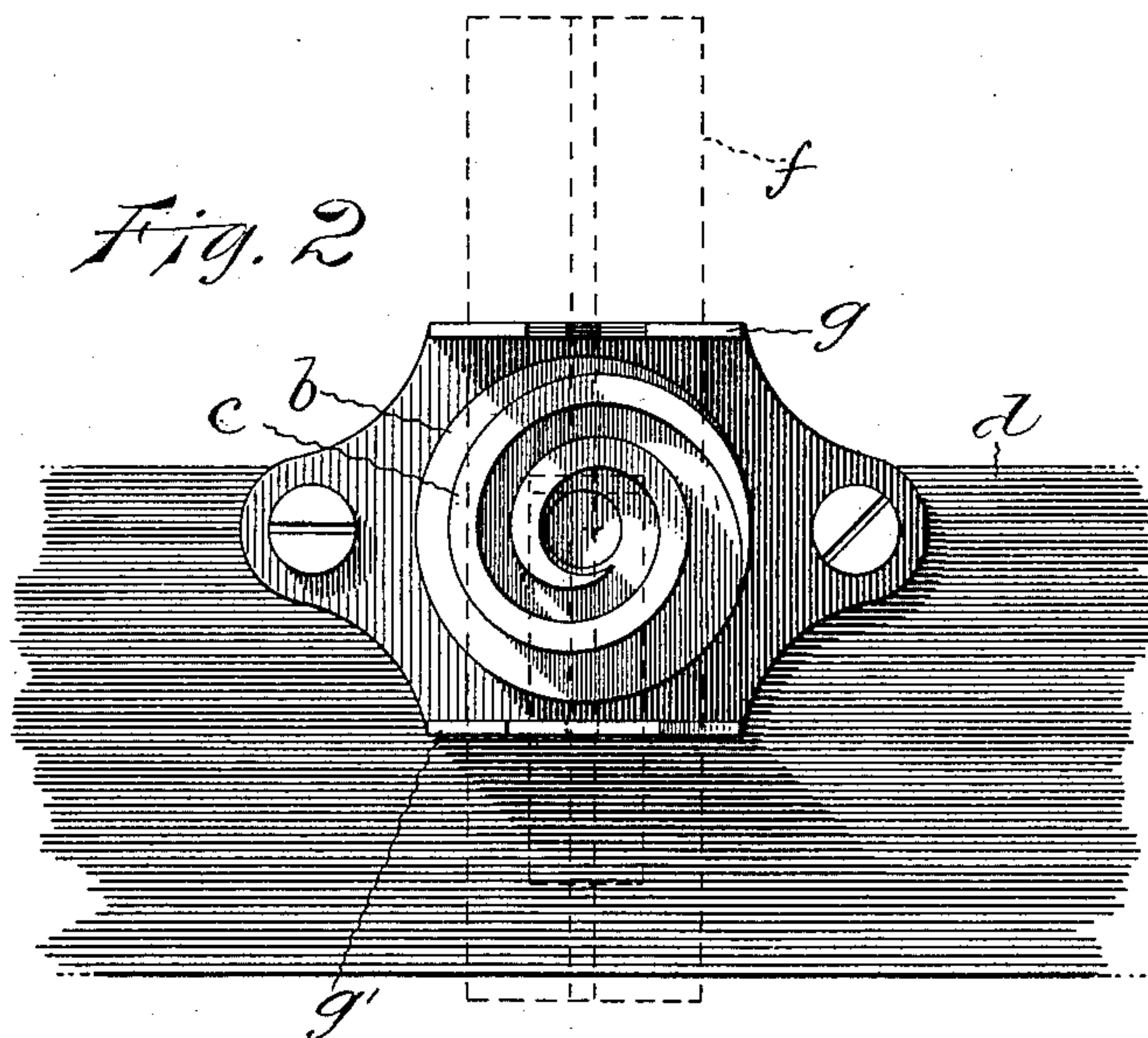
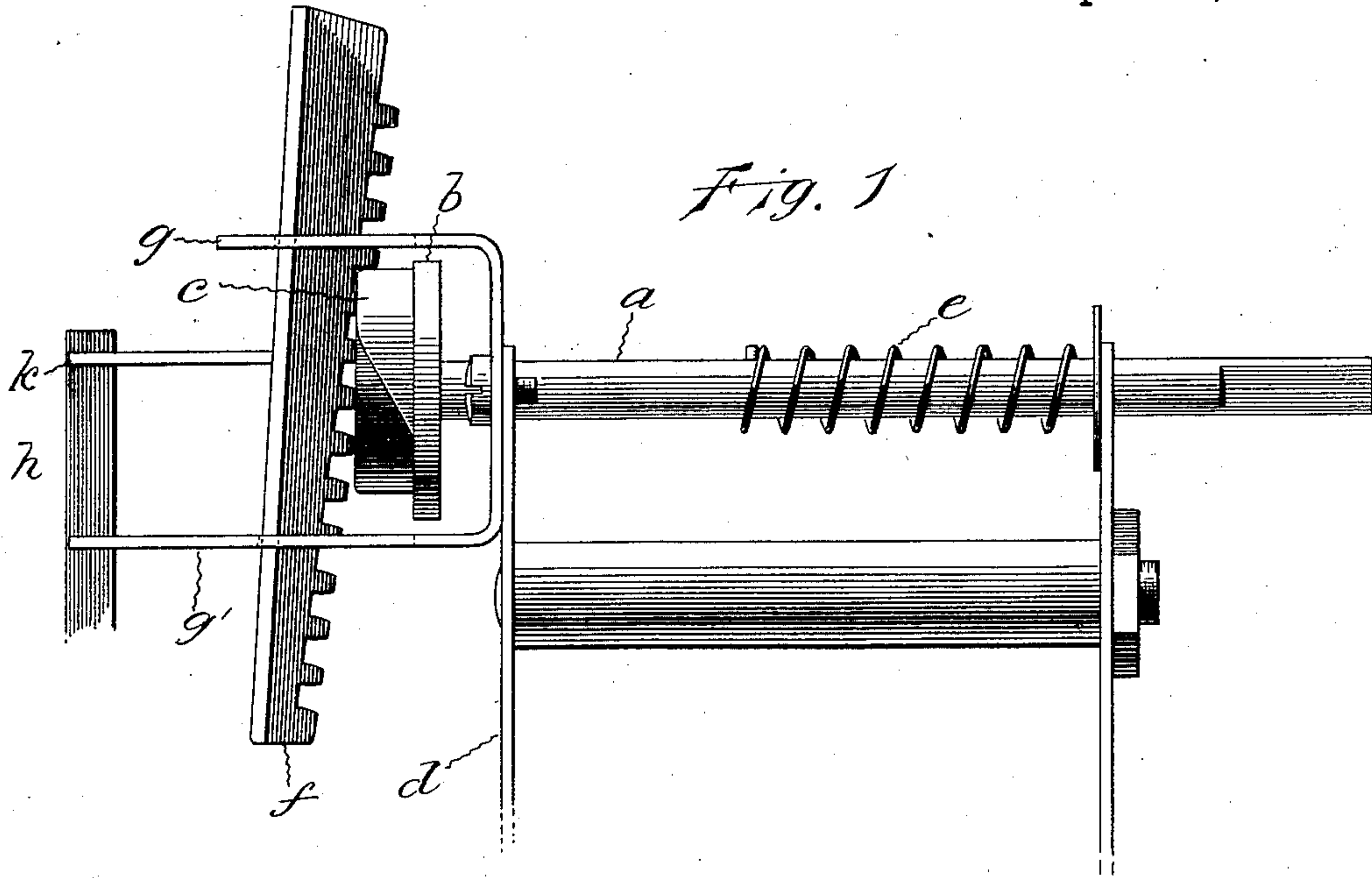


(No Model.)

G. B. WOODRUFF & T. W. R. McCABE.  
CLOCK REGULATOR.

No. 559,070.

Patented Apr. 28, 1896.



Witnesses

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# UNITED STATES PATENT OFFICE.

GEORGE B. WOODRUFF AND THOMAS W. R. McCABE, OF WINSTED, CONNECTICUT, ASSIGNORS TO THE WILLIAM L. GILBERT CLOCK COMPANY, OF SAME PLACE.

## CLOCK-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 559,070, dated April 28, 1896.

Application filed October 16, 1895. Serial No. 565,823. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE B. WOODRUFF and THOMAS W. R. McCABE, citizens of the United States of America, residing at Winsted, in the county of Litchfield and State of Connecticut, have invented a certain new and useful Improvement in Regulators Applicable to, among other things, Pendulum Clocks, of which the following is a description, reference being had to the accompanying drawings, wherein—

Figure 1 is a side view. Fig. 2 is a face view of the rotary convolute leaf made use of.

The object of the improvement is the production of a mechanical device applicable to a variety of uses and especially applicable to the practical lengthening or shortening of the pendulum of a clock in order to cause the clock to run faster or slower, as may be desired.

In the accompanying drawings the letter *a* denotes a rotary shaft.

*b* denotes a disk carried by the shaft, and *c* denotes a convolute leaf carried by the disk, producing what may be called a "rotary convolute leaf."

The shaft *a* is hung in the frame *d* and, by preference, is pressed to contact with the toothed rack, shortly to be described, by means of the spring *e*.

The letter *f* denotes a toothed rack having reciprocating motion in the supports *g g'*. The teeth of this rack engage with the rotary convolute leaf, so that by rotating such convolute leaf the rack is reciprocated in either direction, as desired. The face-line of the teeth of this rack is oblique to the line of the reciprocation of the rack as a whole, so that the teeth will only engage with the convolute leaf at one place; and it is a practical advantage of this construction that although the rack be run to either end of its reciprocating play no breakage or other harm results if the rotation of the convolute leaf be still continued. If it were only desired to give the toothed rack a limit of reciprocation from

about the center of the convolute leaf to its periphery, then the mechanism would operate without giving the teeth of the rack the oblique face already described; but when it is desired to give the larger limit of reciprocation already indicated it is then necessary to make the face-line of the teeth oblique, as already described.

In the drawings, the letter *h* denotes a pendulum-support.

*i* denotes the upper part of the pendulum, made thin and flexible, as ordinarily, and *k* denotes the ordinary slotted stay. By raising or lowering the pendulum-support *h*, which is an attachment of the toothed rack *f*, the practical length of the pendulum is regulated at pleasure, with the ordinary result of making the timepiece run fast or slow.

We claim as our improvement—

1. The regulator for clock-pendulums hereinafter described, consisting of the rotary shaft *a*, disk *b*, convolute *c*, frame *d*, spring *e*, operating upon the rotary shaft, oblique-faced toothed rack *f*, supports *g g*, pendulum-support *h* and slotted stay *k*, whereby the length of the pendulum may be adjusted throughout a range commensurate with the length of the oblique-faced toothed rack-bar *f*, substantially as and for the purpose specified.

2. As an improvement in clock-pendulum regulators, the combination of the pendulum-blade, the pendulum-support, the slotted stay, the oblique-faced toothed rack-bar carrying the pendulum-support, the spiral or convolute engaging with the toothed rack-bar at a single tooth, the rotary shaft carrying the convolute and squared for the reception of a key, and the spring *e*, pressing the rotary shaft and convolute toward and into engagement with the toothed rack-bar, all substantially as and for the purpose specified.

GEO. B. WOODRUFF.

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Witnesses:

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