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C. C. SIBLEY.

REGULATOR FOR TIMEPIECES.

APPLICATION FILED OCT. 9, 1901.

NO MODEL.

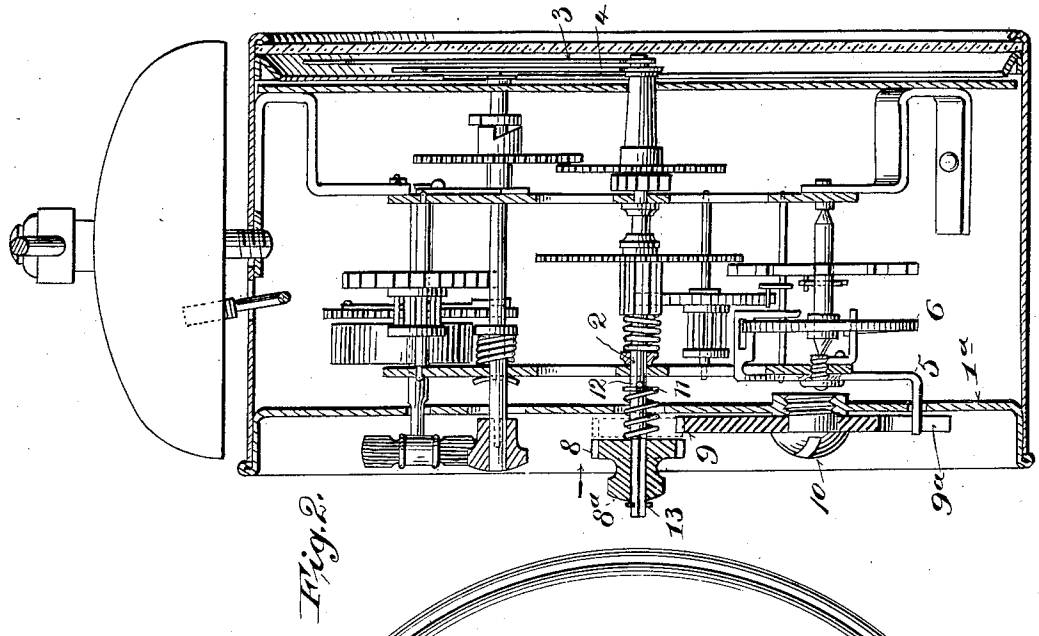


Fig. 2.

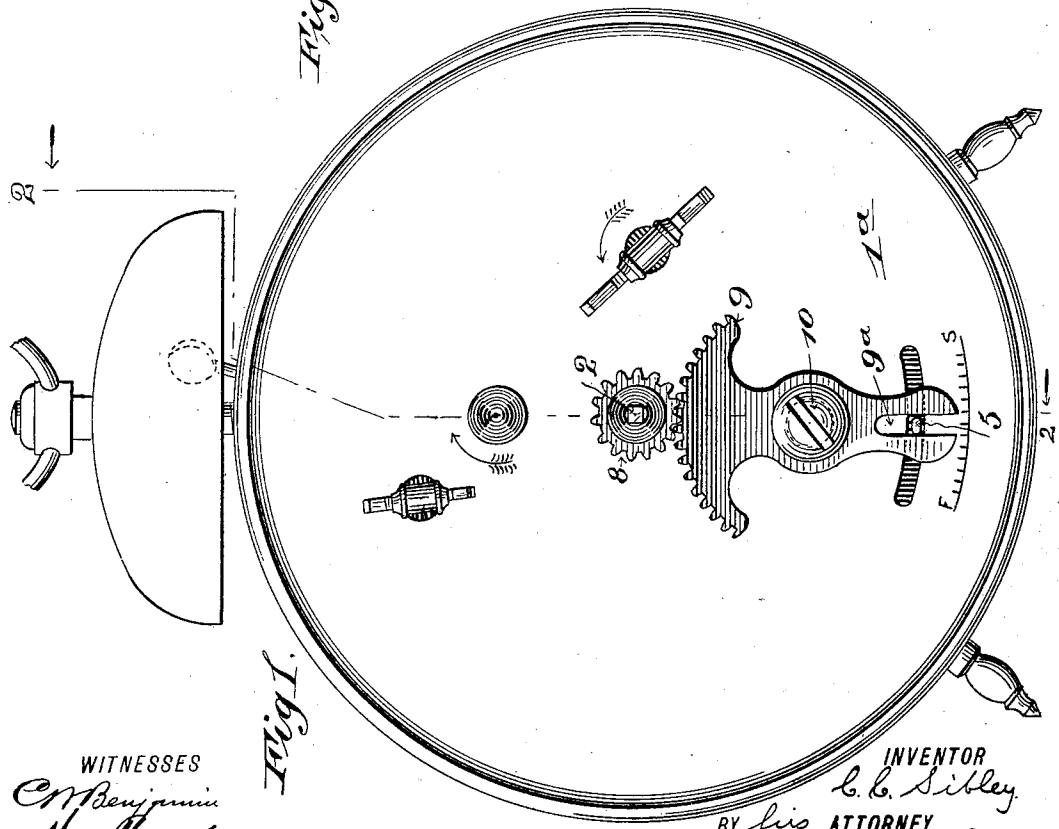


Fig. 1.

WITNESSES

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No. 731,819. Patented June 23, 1903.

UNITED STATES PATENT OFFICE.

CLARENCE C. SIBLEY, OF PERTH AMBOY, NEW JERSEY.

REGULATOR FOR TIMEPIECES.

SPECIFICATION forming part of Letters Patent No. 731,819, dated June 23, 1903.

Application filed October 9, 1901. Serial No. 78,044. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE C. SIBLEY, a citizen of the United States, and a resident of Perth Amboy, Middlesex county, State of New Jersey, have invented certain new and useful Improvements in Timepieces, of which the following is a specification.

In timepieces as generally in use if they run fast or slow it is customary to regulate the mechanism by adjusting the regulator of the hair-spring or pendulum to an amount which may be thought correct, and so on as many times as may be necessary to make the timepiece run accurately, but there is no provision in such timepieces, so far as I am aware, for mechanically or mathematically determining to what extent the regulator should be adjusted to accord with the amount of time that the timepiece has gained or lost.

It is the object of my invention, therefore, to provide means that will cause the regulator to be adjusted by and to an amount coincident with the forward or backward movement of the minute-hand required in setting the hands to the correct time, and to this end I provide a rack and pinion interposed between the hand-setting member or arbor and the regulator of the hair-spring or pendulum of a timepiece, (provision being being made for moving the rack and pinion into coöperative relation at the time the setting of the hands is to be effected,) whereby through the medium of said rack and pinion the distance that the regulator shall be adjusted and the direction of such adjustment will accord with the distance forward or back that the minute-hand is adjusted in setting the timepiece from inaccurate to accurate time.

The invention also comprises the novel details of improvement, that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a face view of the back of a spring-balance clock provided with my improvements. Fig. 2 is a section on the plane of the line 2 2 in Fig. 1.

Similar numerals of reference indicate corresponding parts in both views.

In the accompanying drawings the numeral 1 indicates generally the works or gearing of a timepiece, wherein 2 is the minute-hand arbor, and 3 4 the minute and hour hands, respectively.

In Figs. 1 and 2 the numeral 5 indicates the regulator for the hair-spring 6 of a spring-balance type of timepiece, and in Figs. 3 and 4 the numeral 5^a indicates the regulator block or member used in conjunction with the spring-support 6^a of a pendulum 7, said parts all being of suitable or usual construction and operating in well-known manner.

In Figs. 1 and 2 I have shown a pinion 8 connected with the minute-hand arbor 2, so as to rotate therewith, and said pinion is adapted to mesh with a rack or toothed sector 9, shown pivotally supported, as at 10, and adapted to engage the regulator 5 to shift the latter to the right or left, the bar of the rack being shown provided with a slot 9^a to engage the regulator 5. The pinion and rack are normally disengaged, and in Fig. 2 I have shown the pinion as provided with a thumb-piece 8^a and as mounted upon the squared end of arbor 2, so as to rotate with said arbor, the thumb-piece 8^a serving to simultaneously rotate the pinion 8 and arbor 2 for setting the hands. To keep the rack and pinion normally disengaged, I have shown a spring 11 coiled upon arbor 2 and bearing against a stop 12, (shown in the form of a washer and pin carried by the arbor,) a stop 13 on arbor 2 beyond the thumb-piece 8^a limiting the outward movement of the latter and the pinion. In this arrangement I have shown the rack 9 as pivotally carried upon the casing 1^a of the timepiece; but it is evident that the rack may be carried by the frame of the mechanism or in any other suitable manner.

By the arrangements shown in Figs. 1 and 2 when it is desired to set the timepiece the pinion 8 is first pushed into mesh with the rack 9 and then rotated in the proper direction to set the minute-hand forward or back, as the case may require, whereupon the rack 9 will rock on its pivot 10, and thereby the regulator 5 will be moved in the proper direction for causing the timepiece thereafter to run fast or slow. The relation of the parts is such that as the minute-hand is set for-

ward or back the regulator 5 will be moved a distance coincident with or corresponding to that required to cause the timepiece to run as much faster or slower as it had lost or gained up to the time of setting. It will thus be seen that judgment or skill in adjusting the regulator 5 to compensate for a gain or loss in time is not required, because the movement of the rack and pinion caused by the setting of the hand communicates mechanically to the regulator the movement required to adjust the latter. Of course if the timepiece does not keep accurate time after one setting through the medium of the pinion and rack it may be again set, each time requiring less movement of the regulator 5 until accurate running is produced. The pinion 8 after setting is moved out of mesh with rack 9, so that during the running of the timepiece there will be no movement of the regulator by the rack and pinion.

My improvements are applicable to all styles of timepieces, and while I have shown them as applied to clocks it is evident that they may be applied to watches as well, and as there are a great variety of regulators for watches it will be understood that my improvements will be interposed between the hand-setting member or minute-hand arbor and the hair-spring regulator in such manner as to produce the effects described with respect to the hair-spring regulator in Figs. 1 and 2 of the drawings.

While I have shown and described a rack and a pinion interposed between the hand-setting member and the regulator, it will be understood that friction-surfaces may be utilized between the parts 8 and 9 for operating one by the other instead of teeth, as shown, and I therefore wish it understood that in this specification and the claims where I use the terms "rack" and "pinion" I mean them to include friction-surfaces as the mechanical equivalent of the teeth. Nor do I limit my invention to the details of improvement shown and described, as they may be varied and modifications made to adapt them to the necessities of various styles of timepieces without departing from the spirit of my invention.

Having now described my invention, what I claim is—

1. A timepiece having a minute-hand arbor, a pinion mounted thereon and having a thumb-piece for operating the arbor, a regulator, a rack to operate the same, and means for causing the pinion to operate the rack to adjust the regulator coincidently with the setting of the hand through the medium of the thumb-piece, substantially as described.

2. A timepiece having an arbor, a pinion adjustably connected therewith, a regulator, a rack to operate the regulator, and means for adjusting the pinion and rack into and out of operative relation, substantially as described.

3. A timepiece having an arbor, a pinion mounted to slide thereon, a rack, a spring to maintain the pinion and rack out of mesh, and a regulator connected with the rack to be operated by the latter, substantially as described.

4. A timepiece having an arbor, a pinion mounted to slide thereon, a spring and stop to maintain the pinion in the normal position, a rack normally out of mesh with said pinion, and a regulator connected with said rack to be operated by the latter, substantially as described.

5. A timepiece having a hand-setting member, a pinion connected therewith, a regulator, and a rack to be operated by said pinion, said rack having a slotted portion receiving said regulator and having its pivotal support between the regulator and the pinion, substantially as described.

6. A timepiece having a hand-setting member, a pinion mounted to slide thereon, a pivotal regulator connected with a hair-spring, and a rack to be operated by said pinion and normally out of mesh therewith, said rack having a movable connection with said regulator and having its pivotal support between the regulator and the rack, substantially as described.

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Witnesses:
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