(No Model.)

R. HEUNSCH.

WINDING INDICATOR FOR TIME PIECES.

No. 307,043. Patented Oct. 21, 1884.

Fig. 1

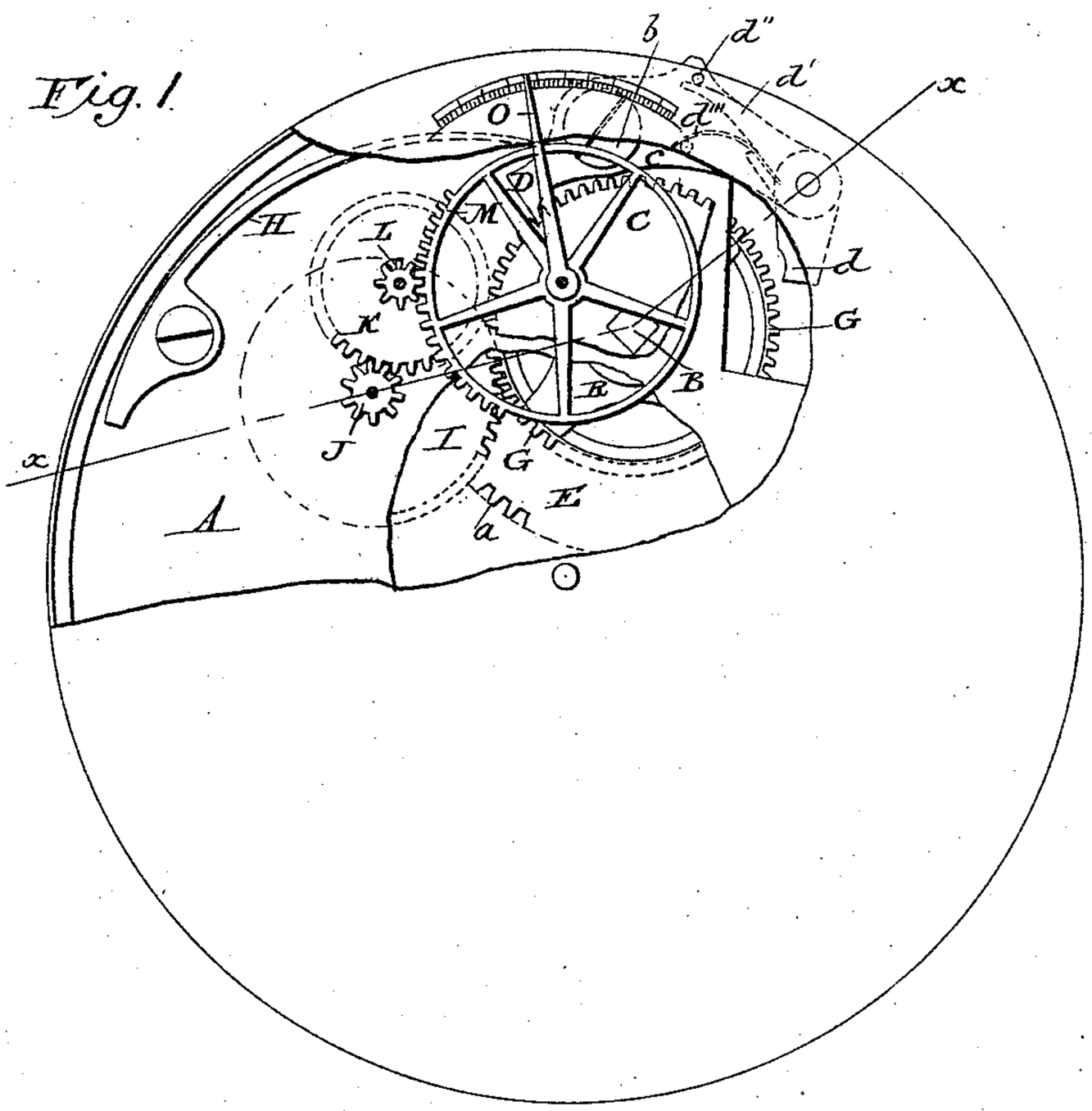


Fig. 2
on x — x

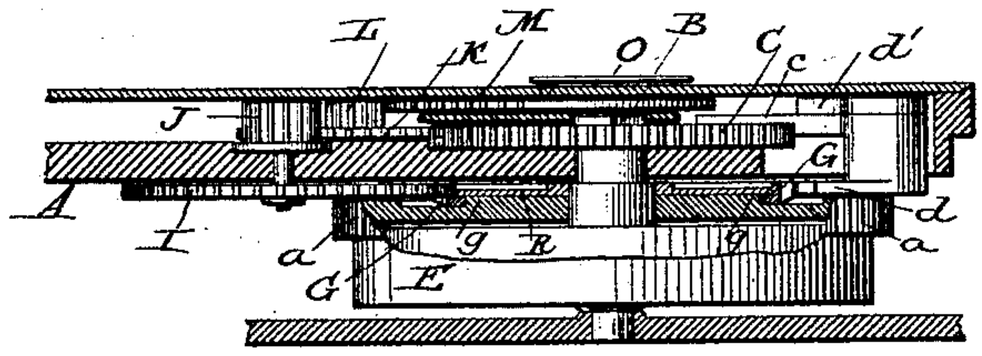


Fig. 3.

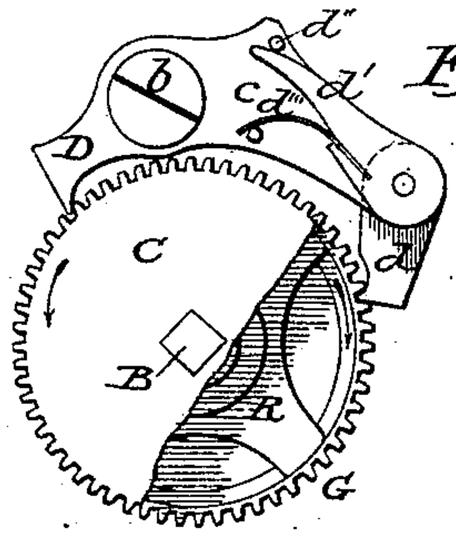
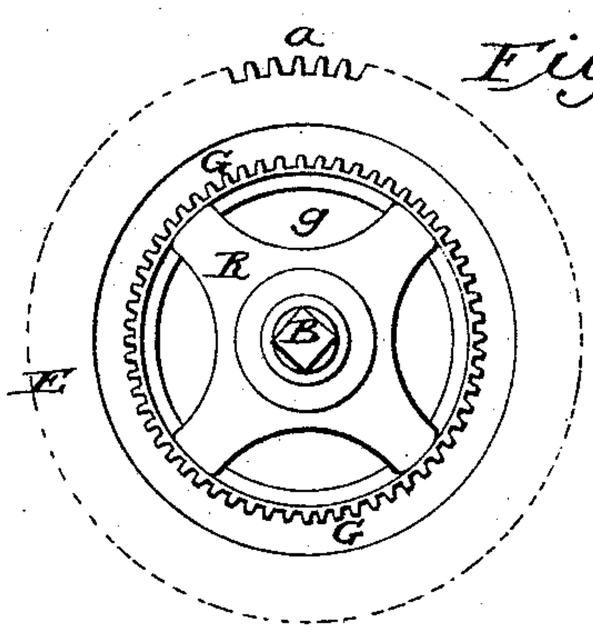


Fig. 4.



WITNESSES

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WINDING-INDICATOR FOR TIME-PIECES.

SPECIFICATION forming part of Letters Patent No. 307,043, dated October 21, 1884.

Application filed June 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH HEUNSCH, of Washington, in the District of Columbia, have invented certain Improvements in Winding-Indicators for Spring-Motors, Watches, &c., of which the following is a specification.

The object of this invention is to provide a simple attachment for spring-actuated mechanisms—such as spring-motors, watches, &c.—in which going-barrels are used, to indicate at all times the extent to which the mainspring is wound.

To this end it consists in an indicating mechanism operated by the peculiar arrangement of devices hereinafter described from a supplemental wheel having a frictional connection with the barrel.

For convenience of illustration I have represented my improvement as applied to a watch-movement.

The drawings represent so much of the same as is necessary to an understanding of the invention, the remaining portion of the organization being identical with those in common use.

Referring to the accompanying drawings, Figure 1 represents a face view of the movement with the dial removed, a portion of the click-wheel for holding the mainspring under tension being broken away in order to show the action of the other parts. Fig. 2 is a section on the line *x x* of Fig. 1. Fig. 3 is a diagram on an enlarged scale, illustrating more clearly the manner in which the indicating mechanism is actuated from the barrel. Fig. 4 is a top plan view of the barrel and friction devices connected therewith.

Referring to the drawings, A represents the front plate of the movement; B, the winding-arbor, to one end of which the spring is secured; C, the usual ratchet-wheel or click-wheel secured to the arbor, and engaged by a pawl or click, D, to prevent a retrograde motion of the arbor, and thus hold the spring under tension; and E, the going-barrel, which incloses and is secured to the outer end of the mainspring, and provided, as usual, with the gear-teeth *a*, through which motion is transmitted to the train or movement of the watch in the ordinary manner.

With the exception of a peculiarity in the pawl or click, which will be presently explained, the foregoing parts have the ordinary mode of action.

In applying my improvement I mount at one end of the barrel, loosely around the winding-arbor, a spur-wheel, G, which may have teeth of a ratchet form or of any other suitable form. I connect this wheel with the barrel by means of frictional devices of the form hereinafter described, or of any other suitable form, whereby it is caused to revolve in a forward direction with the barrel under ordinary circumstances, but permitted to turn in a backward direction independently of the barrel during the winding operation, when it is subjected to a strain sufficient to overcome the resistance of the frictional devices.

The pawl D, instead of being terminated at or near its pivot *b*, as usual, is extended beyond the same in the form of an arm, *c*, to the outer end of which there is pivoted a second pawl or click, *d*, arranged in position to engage the frictionally-driven wheel G. The pawl *d* is provided with an arm, *d'*, the movement of which in one direction is limited by means of a pin, *d''*, mounted on the arm of the main pawl D. A spring, *d'''*, acts against the arm of the secondary pawl, as shown in Fig. 1, for the purpose of urging its end inward toward the wheel G, for the purpose hereinafter explained. A spring, H, acts upon the main pawl D, as usual, to hold its active end in engagement with the main wheel C. When the arbor is turned to wind the spring, the ratchet-wheel turns therewith, as usual. As each tooth of the wheel passes the inner end of the pawl D it forces the same outward, causing its opposite end to swing inward and advance the pawl D against the teeth of the frictionally-held wheel G. In this manner the wheel G is turned forward tooth by tooth in the opposite direction from that in which the wheel C revolves, the two wheels being turned to the same extent. In other words, the rotation of the wheel C in a backward direction imparts a like motion in the opposite direction to the wheel G. When the main pawl D engages behind the tooth of the wheel C, the pawl *d* at its opposite end is carried wholly out of engagement with the wheel G, in the manner represented in Fig. 1, and the parts remain nor-

mally in this position, the pawl *d* remaining wholly inactive during the operation of the watch.

With the wheel G, I propose to connect the gear-train, of any suitable character, for operating the indicator.

The construction of the train and of the indicator may be modified to any extent desired, provided they have a mode of action substantially such as that represented in the drawings. This train shown consists of a wheel, I, engaging permanently with the wheel G, and carrying on its spindle a pinion, J, which in turn drives a large gear-wheel, K, fixed upon the same arbor with the pinion L. The pinion L in turn engages a spur-wheel, M, the shaft of which is extended through a dial and provided on the forward end with a pointer or indicator, O, arranged to travel over a suitably graduated scale.

Passing now to the details of the frictional connection between the wheel G and the drum, attention is particularly directed to Figs. 2 and 3. The wheel G is made in an annular or ring form, and is fitted to revolve loosely around a hub or boss, *g*, formed centrally on the top of the barrel. An elastic plate to washer R, having a series of radial arms, is affixed centrally on the hub or projection on the barrel, the ends of its arms bearing upon the wheel G, as shown. The friction of this plate upon the wheel and the friction produced by the pressure of the latter against the barrel is sufficient to cause the wheel G to revolve with the barrel in the ordinary operation of the parts.

The operation of the entire device is as follows: The normal position of the parts while the watch is running is represented in Fig. 1. The pawl D, engaging the ratchet-wheel C, holds the spring under tension, while the secondary pawl *d* is wholly inactive and out of engagement with the wheel G. The barrel revolves as usual with the spring, and imparts motion through the friction devices to the wheel G, which in turn, through the intermediate mechanism, causes the pointer or indicator O to traverse the dial from the point which indicates that the spring is wound toward that which indicates that it is unwound. When the winding of the watch has commenced, the wheel C is turned in a backward direction on the arbor, causing a vibratory motion to be imparted to the pawl D, whereby the secondary pawl *d'* at the opposite end is caused to actuate the wheel G in a positive manner, overcoming the resistance of the frictional devices, and compelling the wheel to revolve in the opposite direction from that of the barrel. The effect of this reverse rotation of the wheel G is, through the intermediate train, to turn the indicator or pointer O backward toward the point which indicates that the spring is wound.

The essence of the invention consists in the employment of a pawl or equivalent device by which motion is imparted from teeth or projections on the ratchet-wheel C to a wheel for returning the pointer to its original position.

It will be manifest to those skilled in the art that the details of construction and arrangement may be modified in various respects without passing beyond the limits of my invention or changing the general mode of action.

Having thus described my invention, what I claim is—

1. An actuating-spring, a going-barrel, and a winding-arbor connected to opposite ends thereof, in combination with a toothed wheel fixed to revolve with the arbor, a second toothed wheel connected by frictional devices with the barrel, a pawl actuated by the backward rotation of the first-named wheel, and serving to turn the second wheel in a reverse direction, and a winding-indicator actuated by the second wheel.

2. A mainspring and a winding-arbor and going-barrel connected therewith, in combination with a toothed wheel fast on the arbor, a pawl engaging said wheel, a second wheel connected by frictional devices with the barrel, and a secondary pawl mounted on the first pawl and engaging the second wheel, whereby the backward rotation of the arbor and its wheel is caused to actuate the second pawl and turn the second wheel in the reverse direction.

3. The mainspring, the going-barrel, the arbor, the toothed wheel fast on the arbor, and the second wheel connected through frictional devices with the barrel, in combination with a vibrating device, substantially as shown, actuated by the teeth of the first wheel and engaging the teeth of the second wheel to turn the same in the reverse direction.

4. A mainspring, winding-arbor, and going-barrel, in combination with a rotary winding-indicator, a wheel attached to the arbor, a pawl engaging the teeth of said wheel, and intermediate gearing, substantially as described, actuated by the pawl to turn the indicator in a backward direction.

5. The barrel, the wheel G, and spring-washer R, in combination with the main spring, the winding-arbor B, the wheel C thereon, the pawl D, spring H, pawl *d*, stop *d''*, spring *d'''*, and an indicator actuated by wheel G.

6. A mainspring, a barrel which turns always in one direction, an arbor which turns only in the opposite direction, a toothed wheel fast to the arbor, a spring-actuated pawl engaging said wheel, a second wheel independent of the first, and a dog or pawl to turn the second wheel, connected with and receiving motion from the first-named pawl.

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Witnesses:
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