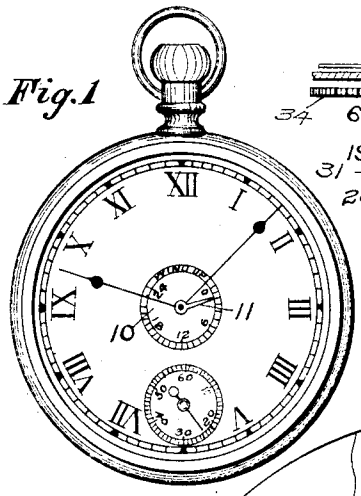
No. 790,513. PATENTED MAY 23, 1905.

J. MAZER.

WATCH WINDING INDICATOR.

APPLICATION FILED AUG. 22, 1904.

Fig. 1



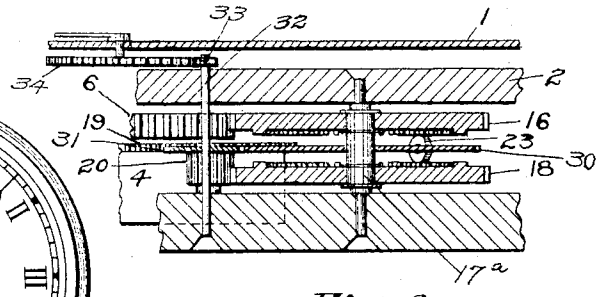


Fig. 4

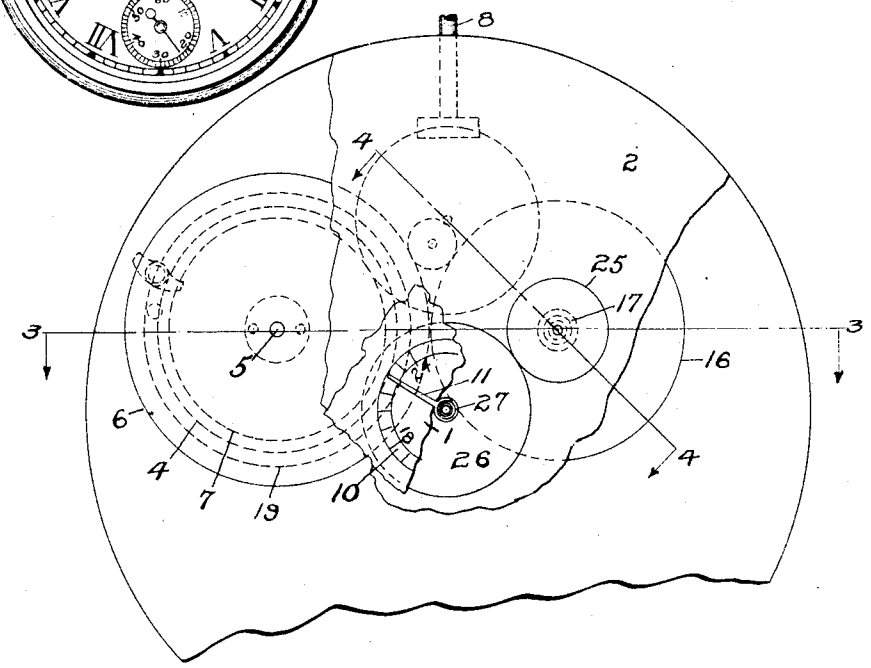


Fig. 2

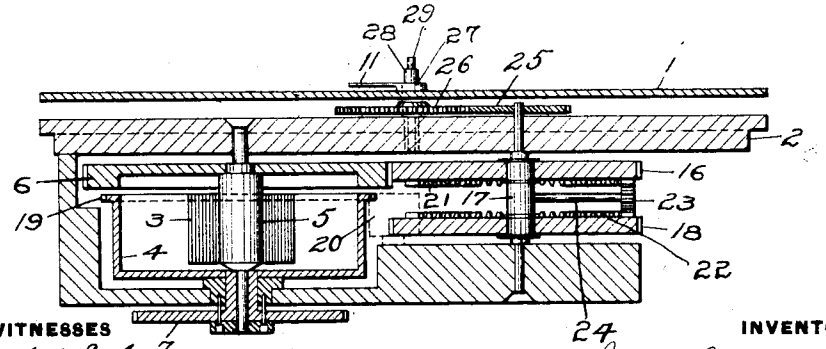


Fig. 3

WITNESSES

Lindsay & B. Little

G. Kremer

INVENTOR

Joseph Mazer

By Kay, Totten & Whites

His Attys.

No. 790,513. Patented May 23, 1905.

UNITED STATES PATENT OFFICE.

JOSEPH MAZER, OF SOUTH McALESTER, INDIAN TERRITORY.

WATCH-WINDING INDICATOR.

SPECIFICATION forming part of Letters Patent No. 790,513, dated May 23, 1905.

Application filed August 22, 1904. Serial No. 221,658.

To all whom it may concern:

Be it known that I, JOSEPH MAZER, a resident of South McAlester, Central District, Indian Territory, have invented a new and useful Improvement in Watch-Winding Indicators; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an attachment for watches, clocks, and the like, and which is designed to indicate the extent to which the mainspring is wound, so that the observer may know not only when the mainspring is fully wound or when it has run down, but also the extent to which it is wound at any particular moment, and the time when it will require rewinding.

In fusee or English-lever watches the winding-arbor turns one way when the watch is being wound and the opposite way when the watch is running, so that it is a simple matter to apply a winding-indicator thereto, it only being necessary to provide a train leading directly from the winding-arbor to the indicator-shaft, which train, arbor, and indicator-shaft turn one way when the watch is being wound and the opposite way when the watch is running; but in watches in which the winding-arbor after the watch has been wound remains stationary while the ordinary train of the watch is driven from the mainspring-barrel it has been difficult to employ a winding-indicator. It is not easy in such watches to design mechanism which will move the indicator when the watch is running to indicate the extent to which the spring is unwound and which will bring the indicator back to zero when the watch is being wound.

It has been attempted to apply winding-indicators to watches provided with going or safety barrels in several ways. Most of the mechanisms for this purpose have included in the train of gearing either a yielding or friction element, which slips when the watch is being wound, or said train included means whereby it could be connected to and disengaged from the arbor and barrel. In the last form of mechanism the train of gearing is necessarily complicated, and with either form of gearing there is always liability that the parts will not come back accurately to the original position—that is, either by a slip in the friction element or by the teeth of the disengageable gearing not always coming into correct mesh. As a result it is not certain in winding the watch that the indicator will be brought back to zero. Other attempts to apply winding-indicators to watches provided with a safety or going barrel have resulted in complicated trains of gearing, and generally a pair of trains have been found necessary, one operating during winding and the other while running.

The object of my invention is to provide a winding-indicator for watches or clocks provided with a main spring-barrel and in which simple gearing is employed and so arranged that it will insure the indicator being brought back exactly to zero when the watch or clock is wound.

To these ends my invention consists, generally stated, in providing a single train of gearing between the barrel and arbor on one hand and the indicator on the other, which train is positive and non-yielding, is constantly in mesh and never disengaged, and which will insure the indicator being moved through the same distance when winding as when running.

In the accompanying drawings, Figure 1 is a face view of a watch, showing a winding-indicator. Fig. 2 is a face view of the watch with the dial and parts of the plate broken away. Fig. 3 is a section on the line 3 3, Fig. 2; and Fig. 4 is a section taken on the line 4 4, Fig. 2, showing a modification.

In the drawings, 1 indicates the dial of the watch; 2, the bottom plate thereof; 3, the mainspring, which is inclosed in the barrel 4 and united at its outer end to said barrel and at its inner end to the arbor 5. The drawings show what is known in the art as a "safety-barrel," wherein the barrel portion 4, which incloses the mainspring, is connected to the winding mechanism and rotates while the watch is being wound, and one head thereof is formed as a gear 6, which is connected to the arbor 5 and rotates while the watch is running. This gear 6 is provided on its pe-

riphery with teeth which engage with the usual watch-train to drive the same in the ordinary way. Only a portion of such watch-train is indicated on the drawings, and as it has an ordinary mode of operation and has no bearing on the invention claimed it will not be described. The present invention, however, is applicable to any watch-movement having an arbor and mainspring-barrel, as well as to the safety-barrel shown. The barrel 4 will be connected to the winding mechanism in any suitable way, and is shown as having secured thereto the ordinary ratchet-wheel 7, which will be connected to the winding-stem 8 by the usual or any preferred mechanism. This mechanism also is well known in the art and description is not necessary.

The dial 1 is provided on its face with a small dial 10, which is marked with suitable designations—as, for instance, from zero ("0") to "24"—and with the words "Wind up," and over which travels the indicator-hand 11. This dial may be located in any position on the main dial 1. In Figs. 1 and 2 it is shown as located under the hours and minutes hands, while in the modification shown in Fig. 4 it is designed to be located opposite the seconds-dial.

Meshing with the head 6 of the safety-barrel is a gear 16, mounted loosely on an arbor 17, which is journaled in the plates of a watch-movement. On this arbor is also loosely mounted a gear 18, which is connected to rotate with the barrel 4 by being connected to gear-teeth 19, formed on said barrel, through an intermediate pinion or pinions 20. The barrel 4, barrel-head 6, and arbor 5 are the usual ones in safety-barrel constructions; but I have added to the barrel the gear-teeth 19. The gears 16 and 18 are concentrically mounted and are each provided with an annular series of suitable gear-teeth, preferably arranged on the facing sides of said gears, as shown at 21 and 22. These annular series of gear-teeth are of the same diameter, and located between the gears and meshing with both sets of gear-teeth is a perpendicularly-arranged pinion 23, which is mounted upon a suitable member carried by the arbor 17. As shown in Figs. 2 and 3, said pinion is mounted on the outer end of an arm 24, secured to or formed integral with the arbor 17. The arbor 17 projects through the lower plate 2 of the watch and at its outer end carries a pinion 25, meshing with a gear 26, secured to the indicator-sleeve 27, the latter surrounding the minutes and hours hands 28 and 29, respectively, and carrying at its outer end the indicator-hand 11.

The operation is as follows: We will assume that the watch is run down and that it is to be wound up. In this condition the indicator-hand 11 will be pointing toward the words "Wind up" on the small dial 10. In winding the watch the arbor 5, barrel-head 6, and gear 16 meshing therewith become the relatively stationary parts, while the safety-barrel 4 is rotated by the ratchet-wheel 7 to wind up the mainspring. The rotation of the barrel 4, through the intermediate pinion 20, imparts a rotary movement to the gear 18, which revolves loosely on the arbor 17. The rotation of the gear 18 rotates the perpendicular pinion 23 on the arm 24. Inasmuch as the gear 16 is stationary, this will cause the pinion 23 to travel around said gear 16, and thereby impart a rotary movement to the arbor 17, which by the gearing shown is transmitted to the indicator-hand 11. During the winding, therefore, the arbor 17 will be rotated practically directly from and at a constant relative speed with reference to the barrel 4. This movement will turn the indicator-hand back to the zero position, the number and sizes of the various gears being so arranged and proportioned that said hand will reach the zero-point on the dial 10 when the mainspring is fully wound up. When the watch is running, the barrel 4, together with the connected gear 18, become the relatively stationary parts, while the arbor 5 and barrel-head 6 are the rotary part. As a consequence the gear 16 will be rotated slowly on the arbor 17, thus imparting a rotary movement to the perpendicular pinion 23. This pinion will now travel around the stationary gear 18 in exactly the same manner, but in the opposite direction, as when winding, and will through the arm 24 give a slow rotary movement to the arbor 17. As a consequence the indicator-hand will be turned in the opposite direction over the dial 10 from "0" to "24," and if the watch is not then wound up it will move over the words "Wind up," when it will indicate to the observer that the watch must be wound.

In Fig. 4 is illustrated a slight modification. In this case the pinion 23 instead of being mounted on an arm 24 is mounted on a wheel 30, fast on an arbor 17^a. The wheel 30 is provided on its periphery with gear-teeth, which mesh with a gear 31, fast on an arbor 32, and which at its opposite end carries a pinion 33, meshing with a gear 34 on the arbor carrying the indicator-hand 11. In principle this modification is identical with the preferred form, although it is not as simple. Its mode of operation is identical with that described above.

By means of the indicator described it is possible at all times to determine to what extent the mainspring is still wound up and at what time the watch must be wound. The train of gearing described is never disconnected, neither does it contain any yielding or slip element, so that the movement of the indicator is always positive and accurate, and the indicator will always travel through the same distance when the watch is run-

ning that it does while the watch is being wound.

The present invention can be readily applied to ordinary "going-barrel" movements wherein the arbor 5 rotates when the watch is being wound and the barrel rotates when the watch is running.

By the term "barrel" in the claims I intend to include a going-barrel, as well as the safety-barrel illustrated.

What I claim is—

1. In a watch or the like, the combination with the mainspring, of a barrel and arbor connected to the opposite ends thereof, a winding-wheel connected to one of said parts, an indicator to show the condition of the mainspring, two wheels connected to rotate the one with the barrel and the other with the arbor by connections which are separate from and do not include the winding-wheel, gear-teeth on said wheels, a toothed member arranged to mesh with the teeth on both of said wheels, a rotatable member mounted concentric with said wheels and carrying said toothed member, and connections from said rotatable member to the indicator.

2. In a watch or the like, the combination with the mainspring, of a barrel and arbor connected to the opposite ends thereof, a winding-wheel connected to one of said parts, an indicator to show the condition of the mainspring, two wheels connected to rotate the one with the barrel and the other with the arbor by connections which are separate from and do not include the winding-wheel, gear-teeth on said wheels, a shaft concentric with said wheels, an arm thereon, a pinion rotatably mounted on said arm and arranged to mesh with the gear-teeth of both of said wheels, and connections from said shaft to the indicator.

3. In a watch or the like, the combination with the mainspring, of a barrel and arbor connected to the opposite ends thereof, a winding-wheel connected to one of said parts, an indicator to show the condition of the mainspring, two wheels connected to rotate the one with the barrel and the other with the arbor by connections which are separate from and do not include the winding-wheel, annular gear-teeth arranged on the facing sides of said wheels, a pinion interposed between said wheels and engaging the teeth on both thereon, a member rotatably mounted concentrically with said wheels and on which said pinion is mounted, and connections from said rotatable member to the indicator.

4. In a watch or the like, the combination with the mainspring, of a barrel and arbor connected to the opposite ends thereof, a winding-wheel connected to one of said parts, an indicator to show the condition of the mainspring, two gears connected to rotate the one with the barrel and the other with the arbor by connections which are separate from and do not include the winding-wheel, gear-teeth on the facing sides of said gears, a shaft mounted concentrically with said gears, an arm thereon, a pinion rotatably mounted on said arm and arranged perpendicularly and meshing with the teeth on both of said gears, and connections from said shaft to said indicator.

5. In a watch or the like, the combination with the mainspring, of a barrel and arbor connected to the opposite ends thereof, a winding-wheel connected to one of said parts, an indicator to show the condition of the mainspring, two horizontally-arranged wheels mounted concentrically and driven the one from a gear on the arbor and the other from the barrel and by connections which are separate from and do not include the winding-wheel, corresponding annular teeth on the facing sides of said wheels, a member mounted concentrically with said wheels, a pinion mounted on said member and arranged to engage the teeth on both of said wheels, and an indicator operated from said rotatable member.

6. In a watch or the like, the combination with the mainspring, of a barrel and an arbor connected to the opposite ends thereof, a winding-wheel connected to one of said parts, two horizontally-arranged wheels mounted concentrically and driven the one from the arbor and the other from the barrel and by connections which are separate from and do not include the winding-wheel, corresponding annular gear-teeth on the facing sides of said wheels, a shaft concentric with said wheels and on which they are loosely mounted, an arm on said shaft, a perpendicular pinion mounted on said arm and meshing with the annular teeth on both wheels, and an indicator operated from said shaft.

7. In a watch or the like, the combination with the mainspring, of a barrel and arbor connected to the opposite ends thereof, of a winding-wheel connected to the barrel to wind the mainspring, the arbor rotating while the watch is running, two concentrically-mounted wheels driven the one from the barrel and the other from the arbor by connections which are separate from and do not include the winding-wheel, corresponding annular gear-teeth on said wheels, a pinion meshing with the teeth of both of said wheels, a shaft arranged concentrically with said wheels and provided with an arm on which said pinion is rotatably mounted, a gear on said shaft, and an indicator operated by said gear.

8. In a watch or the like, the combination with the mainspring, of a barrel and arbor connected to the opposite ends thereof, a winding-wheel connected to one of said parts, a time-indicating hand, an arbor on which the same is mounted, a sleeve surrounding said arbor and carrying an indicator, con-

centrically-mounted wheels arranged to be driven the one from the barrel and the other from the arbor and by connections which are separate from and do not include the winding-wheel, corresponding annular gear-teeth on said wheels, a pinion meshing with said teeth, a rotatable member mounted concentric with said wheels and carrying said pinion, and connections between said rotatable member and the indicator-sleeve.

9. In a watch or the like, the combination with the mainspring, of a barrel and arbor connected to the opposite ends thereof, mechanism for turning the barrel to wind the mainspring, the arbor and barrel-head rotating while the watch is running, an indicator to show the condition of the mainspring, gear-teeth on said barrel, two wheels connected to be rotated the one from the gear-teeth on the barrel and the other from the arbor, gear-teeth on said wheels, a member provided with teeth arranged to mesh with the teeth on both of said wheels, a rotatable member mounted concentric with said wheels and carrying said toothed member, and connections from said rotatable member to the indicator.

In testimony whereof I, the said JOSEPH MAZER, have hereunto set my hand.

JOSEPH MAZER.

Witnesses:
P. D. CHASTAIN,
A. C. MARKLEY.