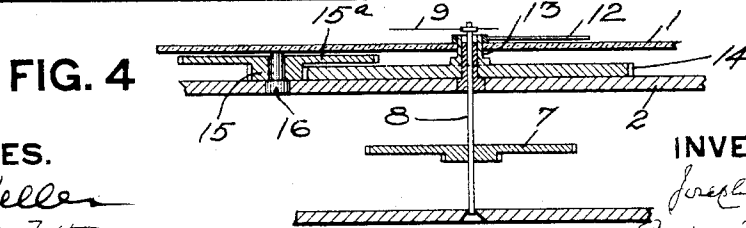
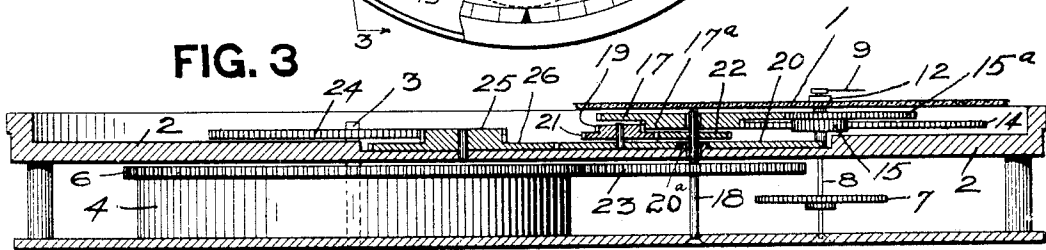
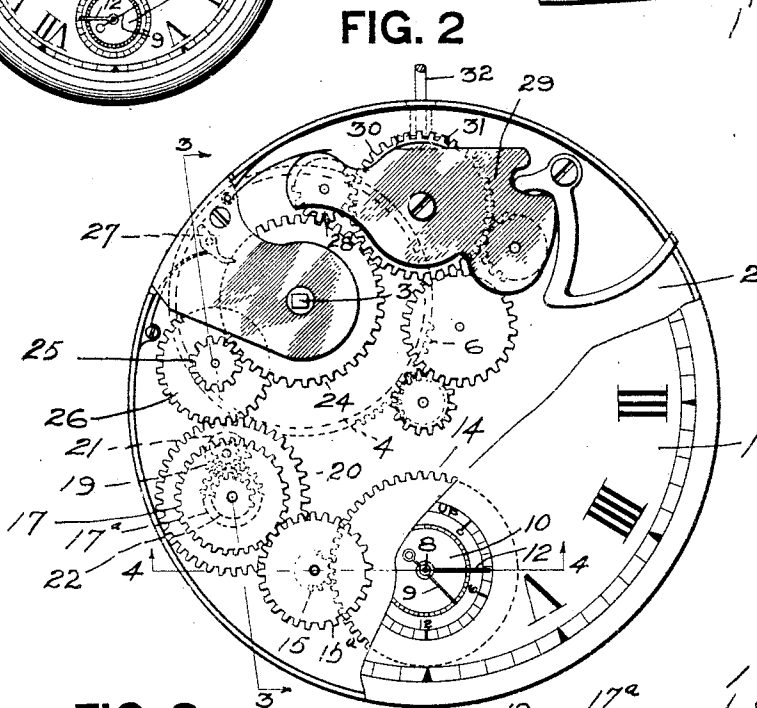
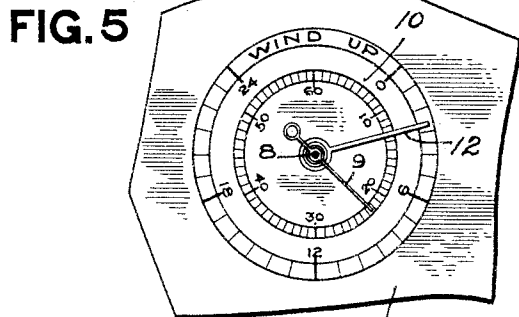
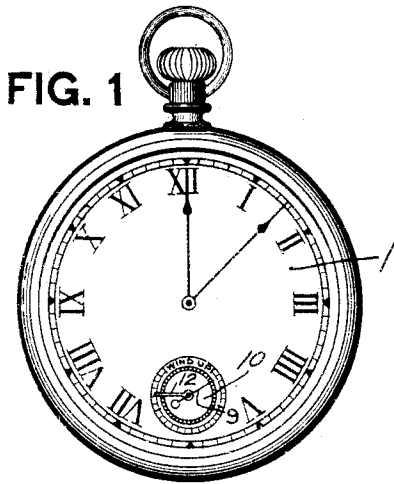


J. MAZER.
WATCH WINDING INDICATOR.
APPLICATION FILED AUG. 17, 1904.

2 SHEETS—SHEET 1.



WITNESSES.

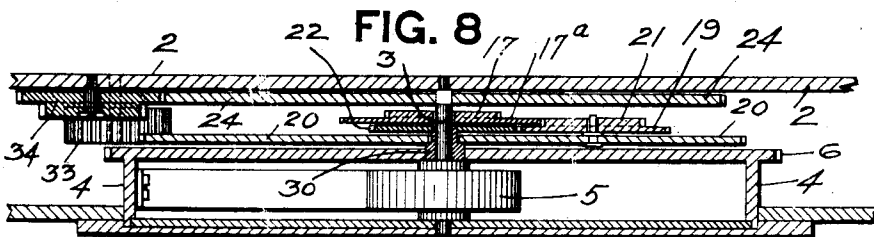
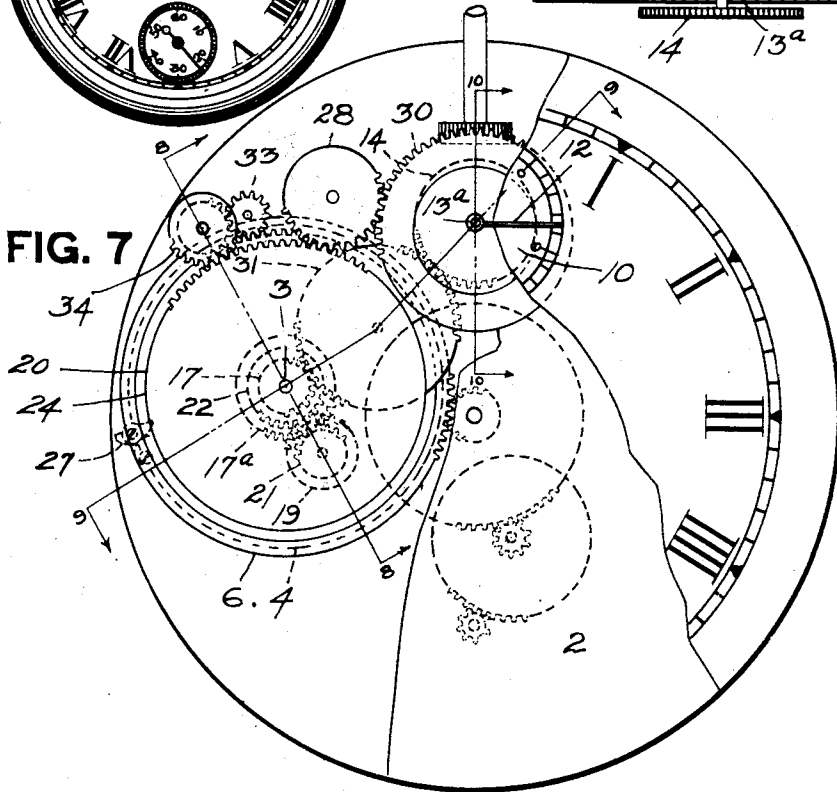
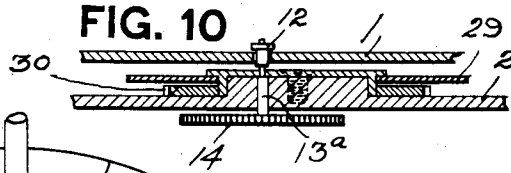
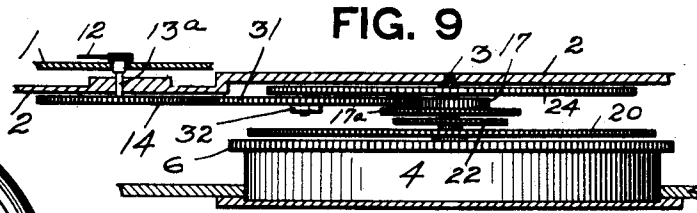
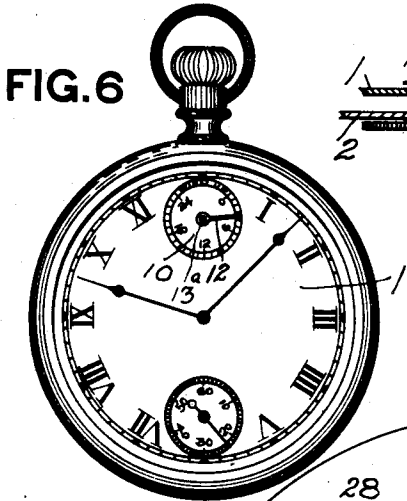
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2 SHEETS—SHEET 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

JOSEPH MAZER, OF SOUTH McALESTER, INDIAN TERRITORY.

WATCH-WINDING INDICATOR.

SPECIFICATION forming part of Letters Patent No. 790,511, dated May 23, 1905.

Application filed August 17, 1904. Serial No. 221,130.

To all whom it may concern:

Be it known that I, JOSEPH MAZER, a resident of South McAlester, 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 which is designed to indicate the extent to which the mainspring is wound, so that the observer may know not only when the spring 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 will slip when the watch is being wound, or said train included means whereby it could be connected to and disengaged from the winding-arbor and going-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 perfect contact. 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 were 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 going or safety barrel in which the foregoing defects are overcome and in which a simple train of 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 going-barrel and winding-arbor on the one hand and the indicator on the other, which train is positive and non-yielding, is constantly in connection and never disengaged, and which will insure the indicator being moved to 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 applied thereto. Fig. 2 is a face view of a watch with a portion of the dial and bottom plate removed. Fig. 3 is a section of the same on the line 3 3, Fig. 2. Fig. 4 is a similar view on the line 4 4, Fig. 2. Fig. 5 is an enlarged face view of the indicator and seconds-dial. Fig. 6 is a face view of a watch, showing a modification. Fig. 7 is a face view of the mechanism of the same with the dial and bottom plate partly removed; and Figs. 8, 9, and 10 are sectional views on the lines 8 8, 9 9, and 10 10 of Fig. 2.

In the drawings, 1 indicates the dial of the watch; 2, the bottom plate of the movement; 3, the winding-arbor, and 4 the going-barrel, in which the mainspring 5 is inclosed with its inner end secured to the winding-arbor and its outer end to the going-barrel. The going-barrel is provided on its periphery with the gear-teeth 6, which engage with the usual

train of the watch and drive the same in the ordinary manner. A portion of the gearing of the usual watch-train is shown in the drawings, and it operates in the usual way. Detail description will not be given of it, as it will be readily understood. Suffice it to say that from the gear 6 motion is communicated to the minute and hour hands and to a small pinion 7 on an arbor 8, carrying the seconds-hand 9, which moves over the usual dial 10 for this purpose.

Around the dial 10 are marked suitable designations—as, for instance, from zero (“0”) to “24” and the words “Wind up” and over which travels the winding indicator-hand 12. This indicator-hand is connected to the front end of a sleeve 13, which surrounds the seconds-arbor 8 and projects down through the dial. To the inner end of the sleeve 13 is secured a gear 14, which meshes with a pinion 15, loose on an arbor 16. Secured to or formed integral with the pinion 15 is the gear 15^a, which is engaged by an intermediate gear 17, journaled loosely on the arbor 18. Secured to or formed integral with the gear 17 is a smaller gear 17^a, which is engaged by a small pinion 19, journaled on a larger gear-wheel 20, which in turn is loosely mounted on a hollow boss or stub-shaft 20^a, secured to the plate 2 and through which passes the arbor 18. Secured to or formed integral with the pinion 19 is a larger gear 21, which meshes with a pinion 22, fast on the arbor 18. The arbor 18 has also secured thereto a gear 23, which meshes with the gear-teeth 6 of the going-barrel and through which rotary movement is imparted by the going-barrel to the arbor 18 and pinion 22.

The gear-wheel 20, carrying the planetary gears 19 and 21, will be connected by any suitable intermediate gearing to the winding mechanism of the watch. As shown in the drawings, the winding-arbor 3 has secured thereon a large wheel 24, which is connected to the wheel 20 through the intermediate wheels 25 and 26, integral with each other. This large wheel 24 may be a wheel in addition to the ones usually found in watches, or it may be the usual ratchet-wheel found in stem-winding watches and is so shown. It is engaged by a spring-pressed pawl 27 to prevent it from rotating backwardly and is also engaged by the intermediate winding-wheel 28, mounted in an oscillating frame 29 and engaging the crown-pinion 30, which in turn is engaged by the winding-gear 31 on the winding-stem 32.

The gearing described constitutes the entire train of mechanism for operating the winding-indicator 12. It will be observed that this train is positive throughout and that no part thereof is yielding, nor is said train of gearing ever disconnected in the operation of the watch.

The operation is as follows: We will as-

sume that the watch has run down and that it is to be wound up. In this condition the indicator-hand 12 will be pointing toward the words “Wind up” on the small dial 10. In winding the watch the going-barrel 4 becomes the relatively stationary part, while the winding-arbor 3 is rotated by the winding mechanism to wind up the mainspring. Inasmuch as the arbor 18 is geared directly through the gear 23 to the mainspring-barrel, it, together with the connected pinion 22, will remain relatively stationary during the winding operation. The large gear 20, however, will be rotated with the winding-arbor, because it is geared to the ratchet-wheel 24. It will, however, be rotated in the opposite direction and at a different speed from said arbor, depending upon the relative sizes of the intermediate wheels 25 and 26. The wheel 20 in its rotation will carry with it the planetary gears 19 and 21. The latter will be given a rotary movement which will be imparted to the loose gears 17^a and 17, mounted on the arbor 18, and the gear 17 in turn will communicate its rotary movement to the gears 15^a and 15 and the latter to the gear 14 on the lower end of the sleeve carrying the indicator-hand. The size and number of the various gears and pinions are so arranged and proportioned that the indicator-hand 12 will be turned backward over the dial 10 and at just such a rate that all the time the mainspring is fully wound up the hand will point toward the zero on said dial. When the watch is running, the winding-arbor 3 becomes the relatively stationary part, while the going-barrel becomes the rotary part. This through the intermeshing gear 23 will impart a rotary movement to the arbor 18 and connected pinion 22. The wheel 20 being geared to the winding-arbor will be stationary, and as a consequence the rotation of the pinion 22 will impart a slow rotary movement to the planet-gears 21 and 19, and the latter meshing with the gears 17^a and 17 will slowly rotate said gears and the train connected therewith, thus rotating the gear 14, secured to the inner end of the sleeve carrying the indicator-hand. These various gears and indicator will therefore be turned during the running of the watch at a slow speed and in the opposite direction from that given thereto when winding, so that the hand will be moved slowly over the dial 10 from “24” to “0,” and if the watch is not then wound up over the words “Wind up” then it will indicate to the observer that the watch must be wound. By means of this indicator, therefore, it is possible at all times to determine to what extent the mainspring is still wound up and at what time the piece must again be wound. Inasmuch as the train of gearing is never disconnected nor as it does not embody any slip or friction device, the action of the indicator is always positive and accurate, so that it will be brought

back to zero whenever the watch is wound. Furthermore, the planetary gearing being on a disk or wheel which is independent of the going-barrel will not have its position affected by the movement of the going-barrel during the running of the watch, and as a consequence by the simple gearing shown the indicator-hand will in winding up be always moved through the same distance as it is while the watch is running.

The indicator-hand is shown mounted on a sleeve surrounding the seconds-hands, thus utilizing a single small dial to show both the seconds and the condition of the mainspring.

This indicator, however, may be placed in other positions on the watch-dial, if desired. It might with only slightly changing the positions of the trains of gearing described be placed directly under the minute and hour hands, the indicator-hand in this case being upon a short sleeve carrying the hour-hand. So, too, it may be placed diametrically opposite the usual position of the second-hands. This last position is shown in the modification illustrated in Figs.

6 to 10. In this modification also the gearing for driving the indicator is shown as located directly underneath the going-barrel instead of at one side thereof, as in the preferred form.

All of the parts of the mechanisms of Figs. 6 to 10, which are identical with those in Figs.

1 to 5, are marked with the same reference-numerals. In this modification the pinion 22 instead of being on a separate arbor and geared directly to the going-barrel is secured to a bushing 30, projecting from said going-barrel, so as to rotate with the going-barrel precisely as in the main modification.

The large gear 20 is loosely mounted on the bushing 30 and carries the planet-gears 19 and 21, the former meshing with the pinion 22 and the latter with the gear 17^a, to which is connected the pinion 17, both loosely mounted on the winding-arbor 3.

The pinion 17 in this modification is connected by an intermediate idler 31, journaled on a projection 32 of the plate 2 with the gear 14 on an arbor 13^a, carrying the indicating-hand 12.

The gear 20, being mounted concentric with the ratchet-wheel 24, cannot be geared directly thereto, nor can it be secured thereto for the reason that it is required to rotate at a different speed.

It is connected to the same through the intervention of intermediate gears 33 and 34, suitably journaled on the plate 2 of the watch-movement.

In this modification the operation is precisely the same as in the preferred form just described.

When winding motion is communicated from the ratchet-wheel 24, through the intermediate gears 33 and 34, to the large wheel 20, thus carrying the planetary wheels 19 and 21 around with it, and as the former meshes with the relatively stationary pinion 22, which is secured directly to the going-barrel, motion will be communicated to the gears 17^a and 17 and from the same to the

indicator-hand. When the watch is running, the winding-arbor becomes the relatively stationary part, and as a result the wheel 20, carrying the planetary gears 19 and 21, is held against rotary movement.

The barrel, however, becomes the movable part and carries with it the pinion 22, which will impart a slow rotary movement to the planetary gears 19 and 21, and these through the train of gearing described will move the indicator-hand slowly over the dial, but in the direction opposite to that in which it was moved when winding up.

Instead of using a going-barrel such as illustrated, in which the entire barrel rotates during the running of the watch, my invention can be applied equally as well to what is known as a "safety-barrel," wherein the barrel itself does not rotate, but only the head thereof, to which head the inner end of the mainspring 5 is connected.

I intend, therefore, by the term "going-barrel" as used in my claims to include not only the going-barrel illustrated, but also a safety-barrel.

My invention can be applied to any spring-driven mechanism as well as to watches and clocks.

What I claim is—

1. In a watch or the like, the combination of the mainspring, a barrel and an arbor connected to the opposite ends thereof, a winding-train connected to one of said parts, an indicator to show the condition of the mainspring, a pinion, a gear, said pinion and gear being concentric and rotatable the one from the barrel and the other from the arbor, the connecting-gearing being separate from and not including any part of the winding-train, planetary gearing mounted on and carried by said gear and engaging said pinion, and gearing connecting said planetary gearing with the indicator.

2. In a watch or the like, the combination of the mainspring, a going-barrel and winding-arbor connected to the opposite ends thereof, a winding-train connected to the winding-arbor, an indicator to show the condition of the mainspring, a pinion connected to rotate with the barrel, a wheel driven from the winding-arbor but at a different speed and by connecting-gearing separate from and not including any part of the winding-train, planetary gears mounted on and carried by the last-named gear and engaging the pinion, and gearing connecting said planetary gears with the indicator.

3. In a watch or the like, the combination with the mainspring, and a barrel and arbor connected to the opposite ends thereof, of an indicator to show the condition of the mainspring, a winding-train connected to the arbor, a pinion connected to rotate with the barrel, a wheel mounted concentric with said pinion and rotated from the arbor but at a different speed and by connecting-gearing separate from and not including any part of the wind-

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ing-train, planetary gears mounted on and carried by said last-named gear and engaging the pinion, a gear also concentric with the pinion and driven by said planetary gears, and connections between said last-named gear and the indicator.

4. In a watch or the like, the combination of the mainspring, a barrel and arbor connected to the opposite ends thereof, a winding-train connected to one of said barrel and arbor, of an indicator to show the condition of the mainspring, an arbor, a pinion fast thereon, a gear loose thereon, said pinion and gear being connected to be rotated by connecting-gearing separate from and not including any part of the winding-train and the one from the mainspring-arbor and the other from the barrel, planetary gears mounted on and carried by said last-named gear and engaging said pinion, and gearing connecting said planetary gears with the indicator.

5. In a watch or the like, the combination with the mainspring, and a going-barrel and winding-arbor connected to the opposite ends thereof, of an indicator to show the condition of the watch, a winding-train connected to the arbor, a pinion connected to rotate with the barrel, a gear concentric with said pinion and connected to the winding-arbor by gearing separate from and not including any part of the winding-train, planetary gears mounted on and carried by said last-named gear and engaging said pinion, and gearing connecting said planetary gears with the indicator.

6. In a watch or the like, the combination with the mainspring, and a going-barrel and winding-arbor connected to the opposite ends thereof, of an indicator to show the condition of the mainspring, a winding-train connected to the arbor, a pinion geared to the going-barrel, a gear concentric therewith and connected to be rotated from the winding-arbor by gearing separate from and not including any part of the winding-train, planetary gears mounted on and carried by said last-named gear and engaging said pinion, and gearing connecting the planetary gears with the indicator.

7. In a watch or the like, the combination of the mainspring, a going-barrel and winding-arbor connected to the opposite ends thereof, an indicator to show the condition of the mainspring, a winding-train connected to the arbor, a ratchet-wheel on the winding-arbor, a pinion geared to the going-barrel, a gear concentric with said pinion and geared to the ratchet-wheel by means separate from and not including any part of the winding-train, planetary gears mounted on and carried

by said last-named gear and engaging said pinion, and gearing connecting said planetary gears with the indicator.

8. In a watch or the like, the combination with the mainspring, and a barrel and arbor connected to the opposite ends thereof, of a winding-train connected to one thereof, an indicator to show the condition of the mainspring, a pinion and gear disconnected from, and mounted concentric with, each other and at one side of the barrel and arbor, and one being driven from the barrel and the other from the arbor and by connecting-gearing separate from and not including any part of the winding-train, planetary gearing mounted on and carried by said gear and engaging said pinion, and gearing connecting said planetary gearing with the indicator.

9. In a watch or the like, the combination with the mainspring, and a going-barrel and winding-arbor connected to the opposite ends thereof, of an indicator to show the condition of the mainspring, a winding-train connected to said arbor, a ratchet-wheel on the winding-arbor, an arbor mounted at one side of the going-barrel and geared thereto, a pinion fixed to said arbor, a gear-wheel connected to the ratchet-wheel by gearing separate from and not including any part of the winding-train, planetary gears mounted on and carried by said gear-wheel and one of which engages said pinion, a loose gear mounted on said arbor and engaging the other planetary gear, and gearing connecting the same with the indicator.

10. In a watch or the like, the combination of the mainspring, a barrel and an arbor connected to the opposite ends thereof, a winding-train connected to one of said parts, a time-indicating hand, gearing connecting the same with the barrel, an indicator to show the condition of the mainspring and mounted concentric with said time-indicating hand, a pinion, a gear, said pinion and gear being concentric and rotatable the one from the barrel and the other from the arbor by connecting-gearing which is separate from and does not include any part of the winding-train, planetary gears mounted on and carried by said gear and engaging said pinion, and gearing connecting said planetary gears with the indicator.

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

JOSEPH MAZER.

Witnesses:

P. D. CHASTAIN,
ALBERT W. JONES.