W. L. JOHNSON.

WINDING INDICATOR FOR TIMEPIECES.

APPLICATION FILED APR. 24, 1911.

1,011,437. Patented Dec. 12, 1911.

Fig. 2.

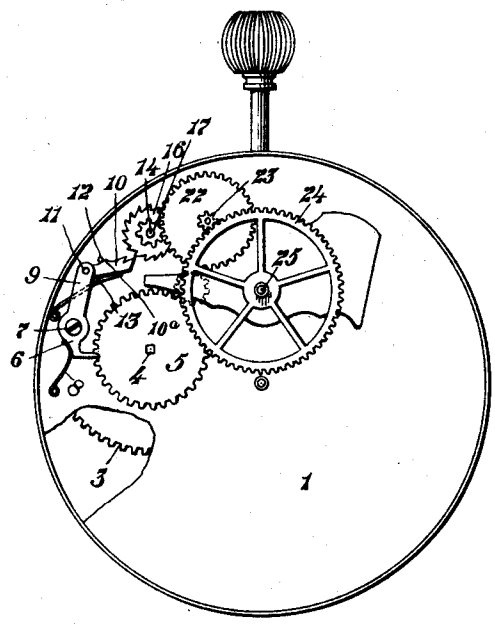


Fig. 1.

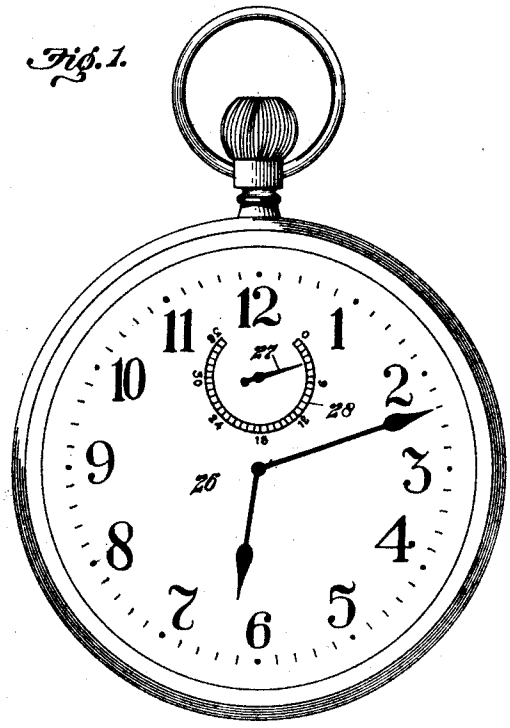
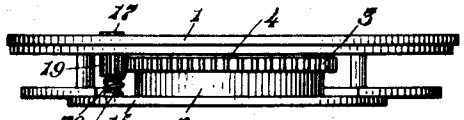


Fig. 3.



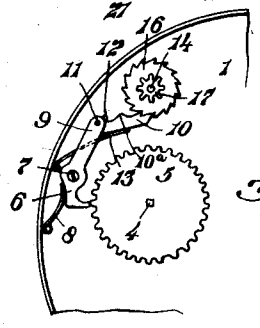


Fig. 4.

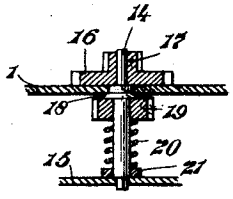


Fig. 6.

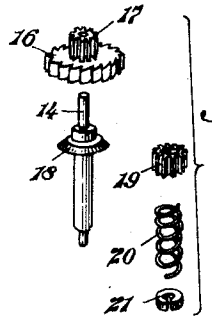


Fig. 7.

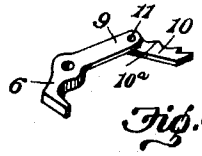


Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

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WINDING-INDICATOR FOR TIMEPIECES.

1,011,437. Specification of Letters Patent. Patented Dec. 12, 1911.

Application filed April 24, 1911. Serial No. 622,906.

To all whom it may concern:

Be it known that I, WILLIAM L. JOHNSON, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Winding-Indicator for Timepieces, of which the following is a specification.

My invention relates to improvements in indicators for spring actuated devices, especially time pieces and the like, the indicator being adapted to show the extent to which the main spring of the device is wound.

The invention is more especially adapted for use on watches and as it is a well known fact that regularity and uniformity in winding of watches has much to do with their accuracy it will be readily apparent that such an indicator is of much usefulness and importance.

The objects of my invention are to generally improve devices of the character mentioned and to provide a winding indicator for time pieces which will be simple in construction, easily and cheaply made, not liable to get out of order and thoroughly reliable at all times. These objects, together with other objects readily apparent to those skilled in the art, I attain by the construction illustrated in the accompanying drawings, although my invention may be embodied in other forms, the construction illustrated being chosen by way of example.

In the drawings Figure 1 is a face view of a watch embodying my invention. Fig. 2 is a face view of the movement of a watch with the dial and hands removed. Fig. 3 is a side elevation of the movement with some parts omitted to simplify the view. Fig. 4 is a fragmentary view of the face of the movement illustrating the parts in the position assumed during the winding of the watch. Fig. 5 is a perspective view on an enlarged scale of the click and arm. Fig. 6 is a vertical sectional view of the main indicator actuating staff and related parts. Fig. 7 is a perspective view of the said staff and related parts separated from each other.

Throughout the several views similar reference numerals indicate similar parts.

The numeral 1 indicates the front plate of the movement and it should be stated that the movement may be of any well known form or design, my invention being adapted to be used on any movement provided with a main spring and going-barrel such as is commonly in use.

2 is the going-barrel provided with the usual gear-teeth 3 adapted to transmit motion to the train of the movement.

The winding arbor 4 is provided as usual with the click wheel 5, the teeth of which are engaged by the click 6 pivotally mounted at 7 and normally held in engagement with the click wheel 5 by the spring 8. It will be understood that when the watch is wound the click wheel 5 will be permitted to advance, the click 6 riding over the individual teeth of the said click wheel, but that said click 6 will prevent any backward movement of the click wheel, as will be understood by those skilled in the art.

In so far as just described the various parts are, in general, of the usual and well known construction. It should be noted however that the click 6 is provided with an extended portion 9 which, being on the opposite side of the pivotal point 7 from that portion of the click engaging the click wheel 5, will be vibrated oppositely from the click-wheel-engaging portion when the watch is being wound.

At the end of the extended portion 9 the arm 10 is pivoted at 11. The arm 10 is limited in its pivotal movement by a stationary pin 12 preferably attached to the plate 1 and by a spring 13 which normally tends to cause the arm 10 to bear against said pin when the watch is normally running.

It should be noted that the arm 10 is provided at its free end with a plurality of teeth adapted to engage any of the various teeth of the ratchet wheel 16. The number of teeth on the arm 10 will depend upon circumstances and I have found two or three teeth to work most successfully. It is of importance that these teeth be so arranged as to accurately and positively engage the teeth of the ratchet wheel 16 to produce positive and exact rotation of said wheel upon each forward movement of the arm 10 as the click is vibrated.

The main indicator actuating staff 14 is rotatably mounted in appropriate bearings in the front plate 1 and the back plate 15. Extending frontwardly through the plate 1 the staff 14 is provided with the saw tooth ratchet wheel 16 and pinion 17, constituting a compound wheel fixedly mounted

upon said staff. Beneath the plate 1 the staff 14 is provided with the friction disk 18 formed integrally with said staff or fixedly mounted thereon as may be desired. Rotatably mounted upon the staff 14 below the friction disk 18 and in contact therewith is the pinion 19 which is held in frictional engagement with the disk 18 by the spring 20 which bears upon the collet 21 fixedly mounted upon the lower end of the staff 14 on the inner side of the back plate 15. It will be obvious that by appropriate adjustment of the spring 20 the pinion 19 may be caused to frictionally engage the disk 18 with the degree of intensity desired. While such adjustment, when once accomplished, will usually be found sufficient for the ordinary life of the device, yet in any case where it may be desirable to change the intensity of frictional engagement, such change can be readily made by opening out or closing the spring, or moving the collet 21 on the staff 14, as will be readily understood by those skilled in the art. The pinion 19 meshes with the gear teeth 3 on the going-barrel and the pinion 17 meshes with the teeth of the wheel 22 which is mounted upon the same rotatable arbor with the pinion 23 which pinion meshes with the teeth of the wheel 24, which is fixedly mounted upon the rotatable arbor 25 which extends through the face 26 and is provided with the indicator hand 27 adapted to sweep the graduated scale 28 on the face 26.

When the watch is normally running the parts are in the relative positions illustrated in Fig. 2 where it will be noted that the click 6 is in positive engagement with one of the teeth of the click wheel 5, the extended portion 9 of said click being in the outermost position whereby the arm 10 is drawn outwardly and away from the ratchet wheel 16. As before mentioned the arm 10 is normally pressed outwardly against the pin 12 by the spring 13 and it will be noted that the arm 10 on the side bearing against said pin is provided with a curved face extending outwardly to the point 10^a. As the arm is retracted from the wheel 16 the extended portion 10^a will be brought into engagement with the pin 12 so as to throw the arm 10 not only backwardly but outwardly and away from the wheel 16, as will be readily understood from an inspection and comparison of the Figs. 2 and 4. During the process of winding, however, the click 6 will be vibrated upon its pivotal connection at 7, thus vibrating the extended portion 9, and as the click rides up over each of the individual teeth of the click wheel 5 the arm 10 will be thrown inwardly into engagement with one of the teeth of the ratchet wheel 16, causing said ratchet wheel to be rotated slightly forwardly. The rotation of the click wheel 5 will thus cause a great number of vibratory movements of the click and a corresponding number of forward movements of the arm 10, whereby the ratchet wheel 16 and the staff 14 to which it is connected will be forwardly rotated. It will be understood that the arm 10, having a plurality of teeth at its free end to engage the ratchet wheel 16, will not be liable to be thrown out away from said ratchet wheel when moving said ratchet wheel forward, as would be the case if said arm were provided with but one tooth. With the plurality of teeth, as the arm moves the ratchet wheel forward and as the first tooth of the arm engages the teeth of the ratchet wheel less securely the other tooth or teeth, as the case may be, will come into positive engagement with other teeth of the ratchet wheel, thus assuring positive action at all times and preventing said arm kicking away from the ratchet wheel, and permitting the use of a light spring to hold said arm in engagement with said ratchet wheel, thus producing freedom as well as certainty of action. The pinion 17, as the staff 14 rotates, will transmit movement through the wheel 22, pinion 23 and wheel 24 to the arbor 25, thus moving the indicator hand 27 over the graduated scale 28 and bringing said hand ultimately back to the zero mark on said scale when the main spring of the watch is fully wound.

It should be noted that as the main spring is being wound and the staff 14 is rotated forwardly the pinion 19, being in engagement with the gear teeth 3, will be held against rotation and the disk 18 will be caused to frictionally rotate with reference to said pinion 19. When the watch has been wound, however, and the arm 10 withdrawn from contact with the ratchet wheel 16 the movement of the gear teeth 3 in actuating the mechanism of the watch will rotate the pinion 19 which, being frictionally engaged by the disk 18, will rotate the staff 14 and the wheel 16 and pinion 17 connected thereto. As before movement will be transmitted through the wheel 22, pinion 23 and wheel 24 to the arbor 25, and as the mechanism of the watch is operated and the main spring gradually is unwound the indicator hand 27 will be caused to move over the graduated scale 28 from the zero mark on through the various graduations to the other end of the scale, at which point the main spring will have been sufficiently unwound to require that the same be rewound in order to maintain the accuracy of the time piece. The main springs of ordinary watches being adapted to satisfactorily operate the movement for a period of thirty-six hours I have indicated on the scale 28 thirty-six divisions and have supplied numerals at various points on said scale so that upon glancing at the indicator it may be instantly ascertained

how many hours the watch has been running since it was last fully wound.

It will of course be understood that in the making of my invented device the ratio of the various gears and the operation of the different parts should be such that the hand 27 will travel as far backwardly toward the zero mark when the main spring is being wound as it will subsequently travel forwardly while the main spring is unwinding in driving the movement. This feature must be kept clearly in mind and accurately worked out in a device of my invented construction in order that the same may be entirely accurate and adapted to successfully accomplish its purpose.

While that form of construction illustrated in the drawings and hereinabove described is at present the best form in which I have contemplated embodying my invention it will be understood that I do not wish to be limited to the exact form herein disclosed as various modifications of form, size and design may readily be adopted without departing from the spirit of the invention.

I claim:

1. A winding indicator comprising, in combination with a spring actuated device provided with a main spring, a going-barrel having gear teeth thereon, and a click wheel; a pivotally operable click engaging said click wheel, said click provided with a portion extended beyond the point of pivotal mounting thereof, an arm pivotally connected at one end to said extended portion, said arm provided at the other end with a plurality of teeth and provided intermediate its ends with a curved face, a ratchet wheel, a stationary pin, said arm normally adapted to bear with its curved face against said pin and adapted, when moved forwardly, by the oscillation of the click, to operatively engage said ratchet wheel with said plurality of teeth, said stationary pin and curved face being adapted, when the oscillation of the click retracts said arm from said ratchet wheel, to throw said arm out of engagement with said ratchet wheel, and indicator mechanism operatively connected with said ratchet wheel and adapted to be actuated thereby.

2. A winding indicator comprising, in combination with a spring actuated device provided with a main spring, a going-barrel having gear teeth thereon and a click wheel; a pivotally operable click engaging the teeth of said click wheel, an arm connected to said click, a main rotatable indicator actuating staff provided at one end with a compound wheel comprising a saw tooth ratchet wheel and a pinion, said staff also provided with a friction disk, a pinion rotatably mounted upon said staff and in frictional engagement with said friction disk, a spring adapted to hold said pinion in said frictional engagement with said disk and adapted for adjustment to vary the degree of frictional contact between said pinion and said disk, said frictionally mounted pinion constantly meshing with the gear teeth on the going barrel, an indicator hand, a train operatively connected to said indicator hand, said train operatively connected with the pinion of said compound wheel, and said arm adapted for operative engagement with said ratchet wheel when the going barrel is rotated in the operation of winding the main spring.

3. A winding indicator comprising, in combination with a spring actuated device provided with a main spring, a going-barrel having gear teeth thereon, and a click wheel; a pivotally operable click engaging the teeth of said click wheel, an arm pivotally connected to said click, a main indicator actuating staff, a ratchet wheel fixedly mounted on said staff, said arm normally held out of engagement with said ratchet wheel but adapted for operative engagement with said ratchet wheel when said click is pivotally moved by the rotation of said click wheel, a fixedly mounted pinion, and a fixedly mounted friction disk also upon said staff, a second pinion rotatably mounted upon said staff, a spring holding said second pinion in frictional engagement with said friction disk, said second pinion meshing with the gear teeth on said going-barrel, a graduated scale, an indicator hand adapted to sweep said graduated scale, and a train of gears constituting means operatively connecting said indicator hand and said fixedly mounted pinion.

4. A winding indicator comprising, in combination with a spring actuated device provided with a main spring, a going-barrel having gear teeth thereon, and a click wheel; a pivotally operable click engaging the teeth of said click wheel, an arm pivotally connected to said click, a main indicator actuating staff, a ratchet wheel fixedly mounted on said staff, said arm provided at its free end with a plurality of teeth adapted for engagement with the teeth of said ratchet wheel, said arm also provided on its outer side with a curved face extending outwardly to an extended portion, a fixed pin, said arm adapted to bear with its curved face against said pin, said arm normally held out of engagement with said ratchet wheel and with said extended portion of said arm bearing against said fixed pin, said arm adapted for movement into operative engagement with said ratchet wheel when said click is pivotally moved by the rotation of said click wheel, said arm in moving into said operative engagement adapted for sliding movement with reference to said fixed pin, a fixedly mounted pinion and a fixedly mounted friction disk upon said staff, a second pinion rotatably mounted upon said staff, said

pinion in frictional engagement with said friction disk, said second pinion meshing with the gear teeth on said going-barrel, a graduated scale, an indicator hand adapted to sweep said graduated scale, and a train of gears constituting means operatively connecting said indicator hand and said fixedly mounted pinion.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM L. JOHNSON.

Witnesses:
WILLIAM A. COLES,
WILLIAM H. MILLER.