

942,659.

O. OHLSON.  
WINDING INDICATOR.  
APPLICATION FILED APR. 10, 1908.

Patented Dec. 7, 1909.  
2 SHEETS—SHEET 1.

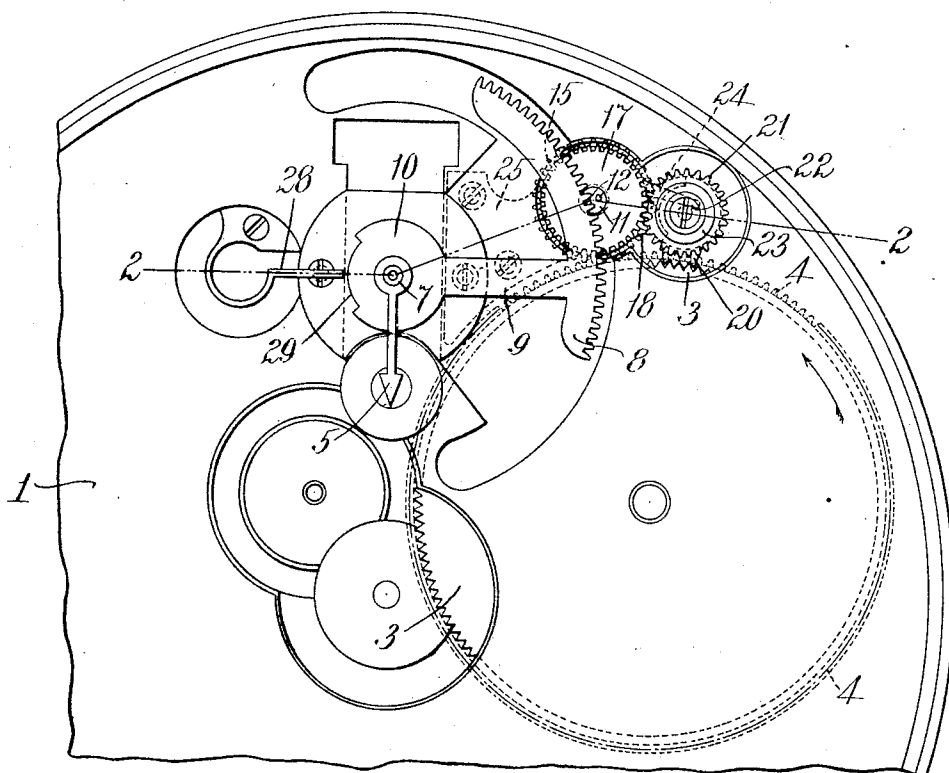


Fig. 1.

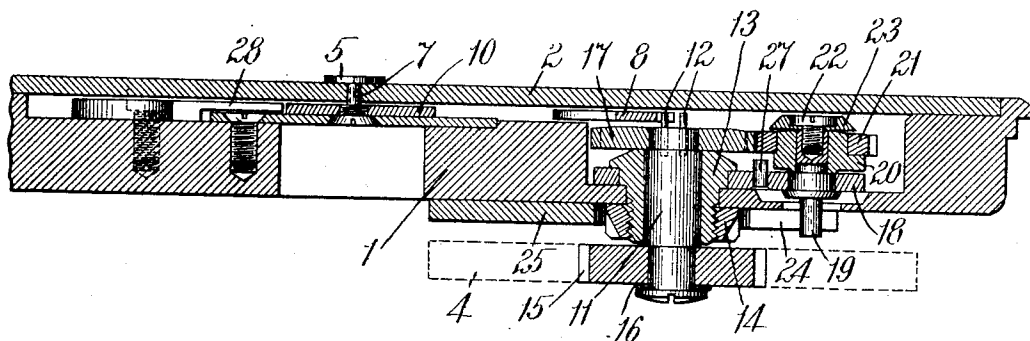


Fig. 2.

Witnesses.

P. H. Leggett  
F. R. Rowlett

Inventor.

O. Ohlson

by Wright, Brown, Quincy & May  
Attys

O. OHLSON.  
WINDING INDICATOR.  
APPLICATION FILED APR. 10, 1908.

942,659.

Patented Dec. 7, 1909.  
2 SHEETS—SHEET 2.

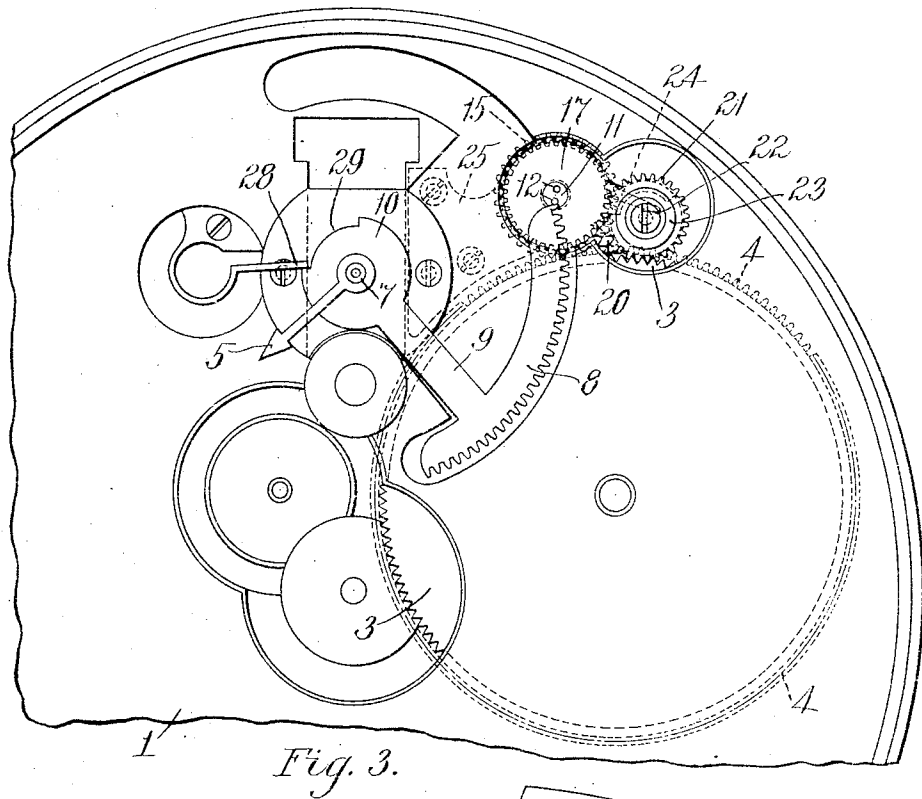


Fig. 3.

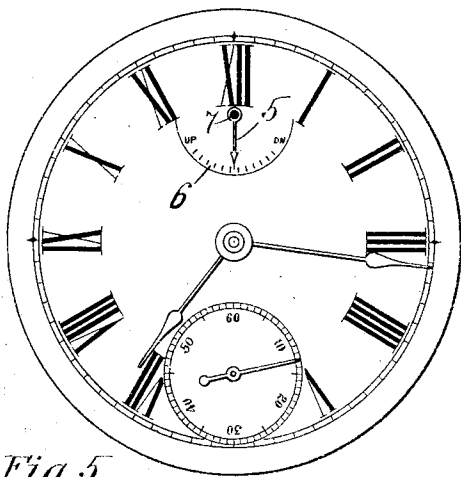


Fig. 5.

Witnesses:

P. H. Terzetti  
F. R. Rollstone

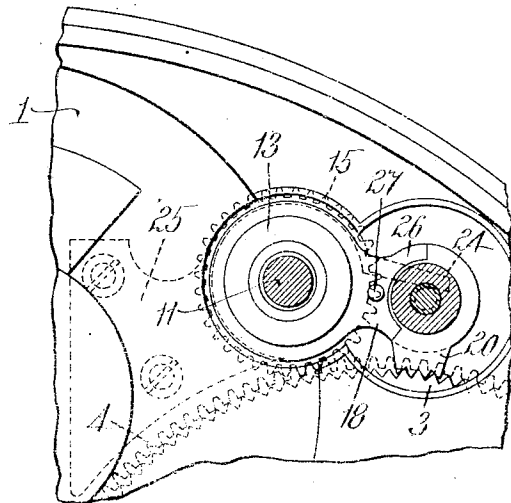


Fig. 4.

Inventor:  
O. Ohlson

by Wright, Brown, Quincy & May  
Attys

# UNITED STATES PATENT OFFICE.

OLOF OHLSON, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO WALTHAM WATCH COMPANY, OF WALTHAM, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

WINDING-INDICATOR.

942,659.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed April 10, 1908. Serial No. 426,222.

*To all whom it may concern:*

Be it known that I, OLOF OHLSON, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Winding-Indicators, of which the following is a specification.

This invention has for its object to provide an indicator for time-pieces adapted to show plainly and readily the condition of a main spring, that is, whether it is wound up or unwound, and the amount by which it has run down at any period of the day.

The indicator is particularly designed for specially accurate watches, in order to remove the disturbing influence which a re-winding of the watch at odd times would exert. In order to get the greatest possible accuracy of running from a watch, it is desirable that the main spring should be wound only once in every twenty-four hours, and at as near the same hour each day as practicable. It sometimes happens that the user of the watch forgets to wind it, or forgets whether it has been wound at the proper time or not, and the indicator which forms the subject-matter of this invention enables one to determine at once approximately at what time the watch was last wound up, and avoids the necessity of re-winding at an unusual time, to give assurance on this point.

The present form of indicator is particularly adapted to that style of watch in which the main spring is contained in a barrel, which is rotated in winding, and which then turns in the same direction that the main wheel turns when the watch is running.

Accordingly, the invention consists in the combination with an indicating pointer operating in connection with a scale on the watch dial, of driving mechanism operated alternately by the barrel during the winding, and by the main wheel in the running of the watch movement, to move the pointer in opposite directions to show when the spring is wound up, and whether and to what extent the watch has run down.

The invention further consists in details of construction enabling a considerable range of movement in the barrel and main wheel to swing the pointer through only a short arc, and in the means by which either the barrel or main wheel may turn without

causing the other to injure the indicator-operating mechanism.

Of the accompanying drawings,—Figure 1 represents an elevation of part of the top plate of a watch or other time-piece with the dial removed, showing the winding indicator and the mechanism by which the same is operated. Fig. 2 represents a sectional view of the same on line 2—2 of Fig. 1. Fig. 3 represents a view similar to Fig. 1, showing the indicating mechanism in the position occupied when the main spring is fully wound up. Fig. 4 represents a fragmentary elevation, illustrating more clearly the details of construction. Fig. 5 represents an elevation of the dial of a watch, showing the winding indicator applied thereto.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, 1 represents the top plate of a watch on which is mounted the metal dial 2.

3 represents the main-spring barrel which is provided with teeth upon its periphery, and 4 represents the main wheel. These parts are of the usual construction employed in certain grades of watch movements.

On the face of the dial, as illustrated in Fig. 5, there is a pointer 5 which swings over a scale 6 having the words "Up" and "Down," or symbols to express the same meaning, at opposite extremes, and intermediate graduation marks to indicate the degree of winding up or running down. The pointer 5 is mounted upon a staff 7 journaled in the plate, and has fastened to it a gear segment 8, through an arm 9 and a disk 10 which is attached to the staff 7. The segment 8 is moved back and forth by the rotation of a stud 11 which has on its end eccentric pins 12 spaced similarly to the teeth of the segment 8 and arranged so as to move into and out of the spaces between them as the stud is rotated. This stud is contained in a bushing 13 screwed into the watch plate 1, and retained by a lock-nut 14. On the stud is a pinion 15 which has a frictional engagement through a dished spring 16 pressing against the pinion and the head of the stud. This pinion meshes with the main wheel 4 and when the watch movement is running, is turned by the latter. This rotary movement is transmitted

through the friction 16 to the stud 11, and by the latter through the pins 12 to the segment 8. On the stud is mounted also a pinion 17 which is secured so that when rotated, it will turn the stud and the pins 12. Loosely mounted on the bushing 13, so that it can swing thereon, is a yoke or holder 18 which carries a stud 19 in its swinging end. The stud has journaled upon it a yoke lifter or separator 20, and journaled upon the hub portion of the latter is a second pinion 21 which meshes with the pinion 17. The yoke lifter 20 and pinion 21 are held upon the stud by a screw 22 and washer 23. The yoke lifter projects beyond the periphery of the pinion 21 and has teeth, as shown most clearly in Fig. 4, which are adapted to engage the teeth of the main-spring barrel 3. The pinion 21 is also adapted to mesh with the teeth of the barrel, but when the latter are engaged by the yoke lifter, the greater amount of projection of this lifter or separator swings the yoke 18 away from the barrel and holds the pinion 21 out of mesh therewith. There is a spring 24 which bears against the end of the stud 19 and tends to throw the pinion 21 into mesh with the barrel, accomplishing this result whenever the yoke lifter or separator is swung out of the way. The spring 24 is formed as a tongue extending from a plate 25, which plate is attached to the under side of the watch plate 1, and is carried around the lock-nut 14. The flange of the yoke lifter 20 is recessed, as shown at 26 in Fig. 4, and into this recess extends a pin 27 which is adapted to engage shoulders at opposite ends of the recess and prevent the yoke lifter being completely rotated.

In the type of watch movement to which this attachment is applied the main wheel and barrel both turn in the same direction, which is that indicated by the arrow in Fig. 1. During the winding of the spring the barrel is turned, and after moving through the space of three or four teeth, swings the yoke lifter 20 out of the way so that the spring 24 is enabled to carry the pinion 21 into mesh with the teeth of the barrel. Continued movement of the latter then rotates the pinion 21, driving the pinion 17 and pins 12, causing the segment 8 to be moved from the position of Fig. 1 to that of Fig. 3, and swinging the pointer to the left, where it approaches the point on the scale at which the word "Up" appears. This rotation thus given to the pinion 17 is of course contrary to that given to the main wheel by the pinion 15, for the reason that the main wheel gears directly with this pinion, while the barrel gears indirectly with pinion 17 through the intermediate pinion 21. The frictional connection 16 then allows the stud 11 to slip within the pinion 15 so that the parts are not locked, and none of the

pinion teeth are broken. When the main spring is completely wound it is allowed to relax slightly, carrying the barrel backward by the space of a few teeth, thus causing the yoke lifter again to mesh with the barrel teeth, and crowding the yoke away from the barrel, thus separating the pinion 21 therefrom. Sufficient backward movement of the barrel for this purpose may be given by the use of the re-coiling click described in my patent numbered 835,710, and dated November 13, 1906. This pinion is then free to rotate oppositely when driven by the pinions 15 and 17, through the action of the main wheel, as the movement and spring run down. This motion of course rotates the stud 11 oppositely to the rotation given by the barrel, causing the segment 8 to be moved upward and the pointer to be moved to the right, showing the amount of unwinding of the spring.

The gear segment 8 is adapted to be carried past the pins 12, as shown in Fig. 3, this carrying past being permitted in either direction, but in either position it is held against the pins ready to mesh with them when they rotate in the opposite direction, by a spring 28 which projects into a recess 29 in the disk 10 of the segment, and engages either one of the limiting shoulders of this recess when the segment is in either of its extreme positions.

It will be seen that by the driving mechanism as above described, I have provided for movement of the indicator in each direction to show accurately the condition as to the winding of the main spring, and without danger of any of the parts being broken, and that by the employment of the pins with a fine pitch gear segment, I am enabled to confine the movement of the pointer within practical limits, while allowing full scope to the movement of the barrel and main wheel.

Although this device has been described as applied to a watch movement, it is to be understood that I do not intend to limit it to such use, but desire it to be understood that it is applicable to any type of time-piece in which the winding mechanism is turned in the same direction in winding the spring as that in which the wheel which actuates the indicator oppositely is turned when the watch is running. Conceivably this wheel may be another one than the main wheel.

I claim:—

1. In a watch or clock movement, in combination with a main-spring barrel and a main wheel, an indicator for showing the degree to which the main-spring is wound, a pinion having a driving engagement with said indicator and driven by the main wheel in the unwinding of the spring, a pinion carrier pivoted concentrically with said pinion, an intermediate pinion mounted on said

carrier in mesh with the first pinion and adapted to be brought into mesh with teeth on the main-spring barrel, and a separator pivoted to said carrier arranged to mesh with the teeth on the barrel and remove the second pinion from engagement therewith.

2. In a watch or clock movement, in combination with a main-spring barrel and a main wheel, an indicator for showing the degree to which the main-spring is wound, a pinion having a driving engagement with said indicator and driven by the main wheel in the unwinding of the spring, a pinion carrier pivoted concentrically with said pinion, an intermediate pinion mounted on said carrier in mesh with the first pinion and adapted to be brought into mesh with teeth on the main-spring barrel, a spring acting on said carrier, tending to swing the same toward the barrel to engage the teeth of said intermediate pinion with the barrel teeth, and a separator pivoted to said carrier arranged to mesh with the teeth on the barrel and remove the second pinion from engagement therewith, said separator being swung into inoperative position by the movement of the barrel during winding to permit engagement of the intermediate pinion, and being returned to operative, or disabling, position by recoil of the barrel.

3. In combination with the main wheel and toothed main-spring barrel of a watch or clock movement, both of which turn in the same direction, an indicator, intermeshing pinions, one of which is adapted to be driven by the main wheel and the other by the barrel, in the same direction, driving connections between said pinions and indicator whereby the latter is moved in opposite directions according as one or the other of the pinions is driven, means constantly active, tending to carry the barrel-driven pinion into mesh with the teeth of said barrel, and a separator for holding said pinion out of mesh.

4. In combination with the main wheel and main-spring barrel of a watch or clock movement, both of which are adapted to turn in the same direction, and the latter having peripheral teeth, an indicator, a toothed segment attached thereto, a shaft having projections adapted when rotated to engage and actuate said toothed segment and indicator, a gear operatively engaged with said shaft, a swinging holder by which said gear is carried, and whereby the latter is adapted to be brought into and out of mesh with the teeth of the barrel, and a positively acting separator for disconnecting said gear from the barrel and holding the same out of mesh while the barrel is stationary.

5. In combination with the main wheel and main-spring barrel of a watch or clock movement, both of which are adapted to turn in the same direction, and the latter having peripheral teeth, an indicator, a

toothed element attached thereto, a shaft having projections adapted when rotated to engage and actuate said toothed element and indicator, a gear operatively engaged with said shaft, a swinging holder by which said gear is carried, and whereby the latter is adapted to be brought into and out of mesh with the teeth of the barrel, and a separator independent of the main-spring holding click mounted swivelly on said holder beside the said gear and projecting beyond the latter to engage the barrel and hold the gear out of mesh therewith, said separator being displaced when the barrel is turned to wind up the main spring.

6. In combination with the main wheel and main-spring barrel of a watch or clock movement, both of which are adapted to turn in the same direction, and the latter having peripheral teeth, an indicator, a toothed element attached thereto, a shaft having projections adapted when rotated to engage and actuate said toothed element and indicator, a gear operatively engaged with said shaft, a swinging holder by which said gear is carried, and whereby the latter is adapted to be brought into and out of mesh with the teeth of the barrel, a separator independent of the main-spring holding click mounted swivelly on said holder beside the said gear and projecting beyond the latter to engage the barrel and hold the gear out of mesh therewith, said separator being displaced when the barrel is turned to wind up the main spring, and a spring for moving the gear into mesh with the barrel teeth when the separator is so displaced.

7. In combination with the main wheel and main-spring barrel of a watch or clock movement, both of which are adapted to turn in the same direction, and the latter having peripheral teeth, an indicator, a toothed element attached thereto, a shaft having projections adapted when rotated to engage and actuate said toothed element and indicator, a gear operatively engaged with said shaft, a swinging holder by which said gear is carried, and whereby the latter is adapted to be brought into and out of mesh with the teeth of the barrel, a separator for holding the same out of mesh while the barrel is stationary, said separator being pivotally attached to said swinging holder and arranged to be shifted by the barrel, being displaced so as to allow said gear to engage the barrel when the latter is turned in winding the spring, and being crowded between the barrel and holder to put the gear out of mesh when the barrel recoils, and a pinion carried by said shaft and meshing with the main wheel, whereby the indicator may be moved while the main spring unwinds.

8. In combination with the main wheel and main-spring barrel of a watch or clock movement, both of which are adapted to

turn in the same direction, and the latter  
having peripheral teeth, an indicator, a  
toothed element attached thereto, a shaft  
having projections adapted when rotated to  
5 engage and actuate said toothed element and  
indicator, a gear operatively engaged with  
said shaft, a swinging holder by which said  
gear is carried, and whereby the latter is  
adapted to be brought into and out of mesh  
10 with the teeth of the barrel, a separator for  
holding the same out of mesh while the bar-  
rel is stationary, and a pinion carried by

said shaft and meshing with the main wheel,  
whereby the indicator may be moved while  
the main spring unwinds, said pinion being 15  
frictionally engaged with the shaft to trans-  
mit rotation thereto but being enabled to slip  
while the shaft is turned by the barrel.

In testimony whereof I have affixed my  
signature, in presence of two witnesses.

OLOF OHLSON.

Witnesses:

L. C. LANE,  
A. AUNE.