A. AUNE.

WINDING INDICATOR.

APPLICATION FILED JULY 13, 1911.

**1,143,567.**

Patented June 15, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

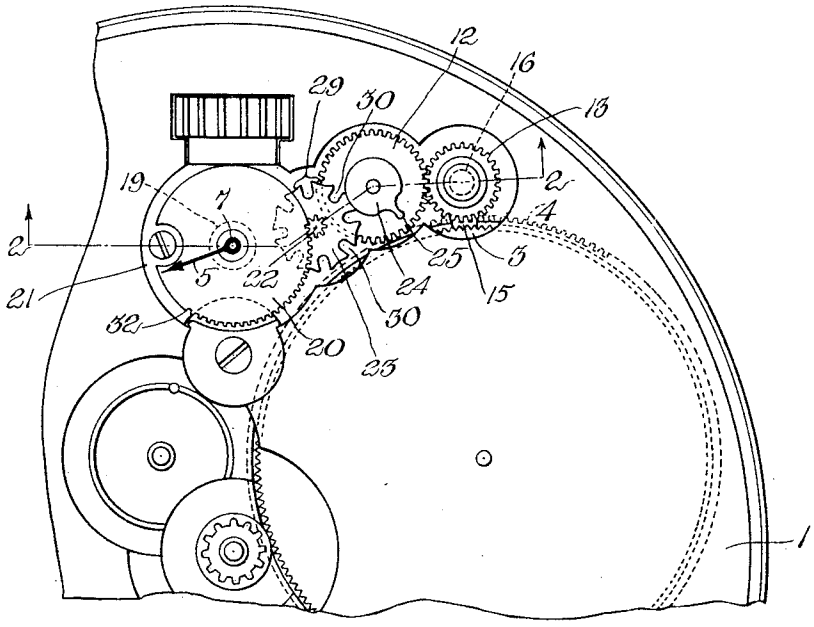
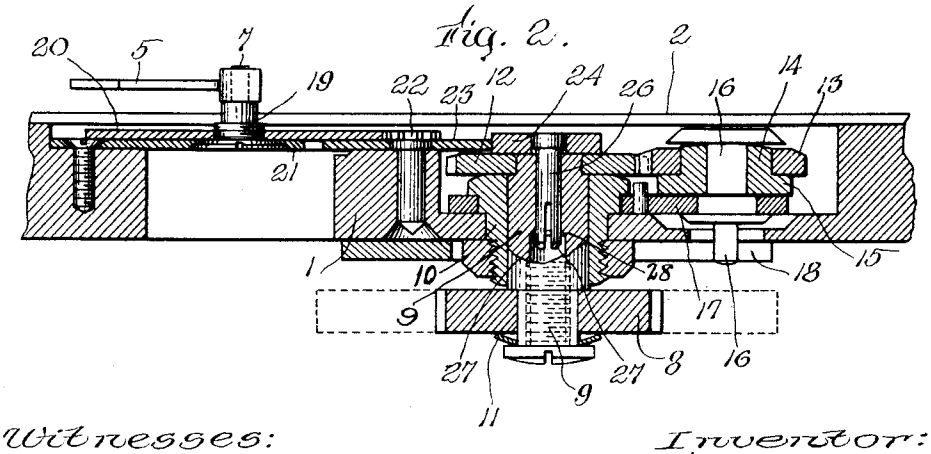



Fig. 2.




Witnesses:
F. W. Pezzetti
Harry L. Allen

Inventor:
A. Aune
by Wright Brown Quinby & May
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

A. AUNE.

WINDING INDICATOR.

APPLICATION FILED JULY 13, 1911.

**1,143,567.**

Patented June 15, 1915.

2 SHEETS—SHEET 2.

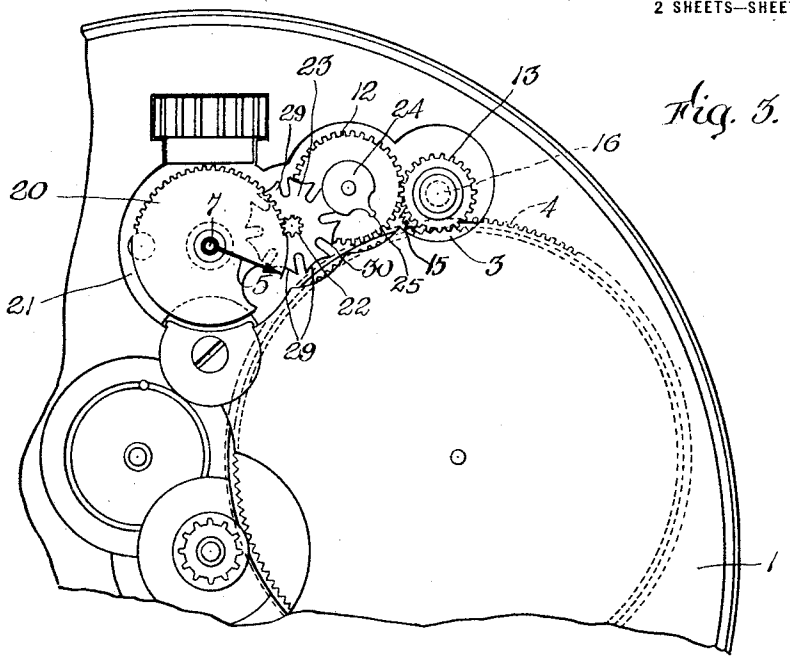



Fig. 3.

Fig. 4

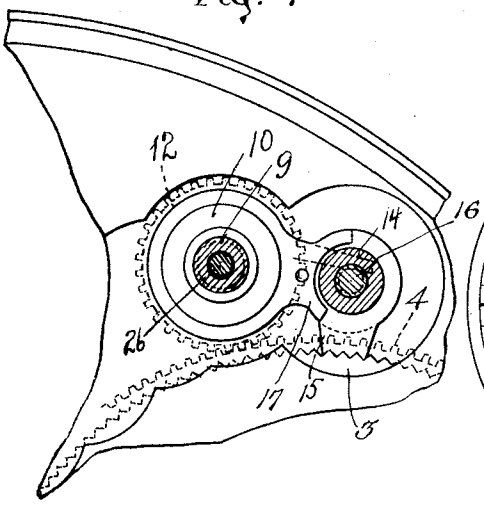
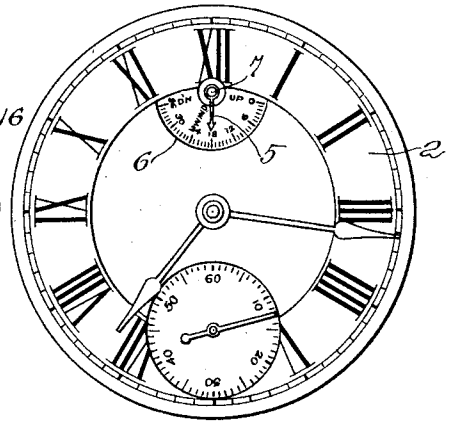



Fig. 5.




Witnesses:
C. W. Pizzetti
Harry L. Allen

Inventor:
A. Aune

by Wright Brown Quinby & May
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

ANDERS AUNE, OF WALTHAM, MASSACHUSETTS, ASSIGNOR TO WALTHAM WATCH COMPANY, A CORPORATION OF MASSACHUSETTS.

## WINDING-INDICATOR.

1,143,567. Specification of Letters Patent. Patented June 15, 1915.

Application filed July 13, 1911. Serial No. 638,372.

*To all whom it may concern:*

Be it known that I, ANDERS AUNE, of Waltham, 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.

The present invention relates to indicators applicable to watches and other time pieces for indicating when the watch is wound up or run down, and also the degrees of winding up and running down.

In many of its features this invention is similar to the winding indicator shown in the patent to Olof Ohlson, No. 942,659, granted December 7, 1909, and includes certain improvements over such indicator.

The object of these improvements is to maintain continued and positive meshing between the members of the gearing which drive the indicator, to enable the movement to run and the winding operation to continue after the indicating member or pointer has reached the limits of its travel in opposite directions, respectively, without causing the driving gear frame to get out of mesh, and to cause the indicating member or pointer to adjust itself automatically at the zero position when the spring is completely wound up. The manner in which I accomplish this object is described in the following specification, and illustrated in the drawings forming a part thereof, which represent a watch movement containing a winding indicator embodying my invention.

In the drawings,—Figure 1 represents a part of the pillar plate of a watch movement having my improved winding indicator applied thereto. Fig. 2 is a sectional view represented as taken on the line 2—2 of Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing the position of the indicating mechanism when the main spring is fully wound up. Fig. 4 is a fragmentary elevation showing details of the mechanism not shown in Figs. 1 and 3. Fig. 5 is an elevation of the dial showing the position in which the visible part of the indicator is applied thereto.

In the following description I will refer to the time piece to which the indicator is applied as a watch, for the purpose of brevity, without, however, intending to limit the application of the invention to any particular class or type of time piece.

So much of the mechanism of the indicator as is similar to the combination shown in the Ohlson patent above referred to, may be described briefly as follows:—1 represents the pillar plate of a watch movement frame, 2, the dial which is detachably fastened to the pillar plate on the outer face thereof, 3, the barrel in which the main spring of the watch is contained and of which the periphery is provided with teeth, (or its equivalent, for the purposes of this invention, a winding wheel secured to the barrel), and 4 the main wheel which is driven by the main spring and drives the entire watch movement.

5 is the indicating member which is preferably a pointer and is visible on the outer face of the dial, being arranged to swing over a scale 6 on the face of the dial which bears symbols indicating in connection with the pointer whether the watch is wound up or run down, and the degree of winding up or running down.

The pointer is driven from the main wheel when the watch is running by a pinion 8, meshing with the main wheel and mounted loosely upon a stud 9 which turns in a bushing or bearing 10 secured to the pillar plate. A spring 11 between the head or a shoulder on the stud and the pinion, provides friction sufficient to turn the stud and the parts associated with and driven thereby.

12 represents a pinion secured upon the stud 9 which meshes with a pinion 13 rotatably mounted upon the hub 14 of a yoke lifter 15 which in turn is adapted to swing about a pin or stud 16, carried by a yoke or swinging plate 17 which has a bearing on the bushing 10 and is adapted to swing about the same. The pinion 13 is adapted to swing into and out of mesh with the teeth of the main spring barrel and is pressed toward the latter by a spring tongue 18, bearing on an end of the stud 16, and mounted upon the pillar plate as described in the patent referred to. The yoke lifter 15 is longer than the radius of the pinion 13 and has one or more teeth on its end adapted to engage the teeth of the barrel, when the latter recoils after the main spring is wound, and lift the pinion 13 out of engagement

with the barrel teeth by swinging the yoke 17 about the bushing 10 is described in the patent referred to.

The arbor 7 which carries the pointer 5 above referred to is formed upon a screw 19, held in a disk 20 and having a bearing in a bridge 21 secured to the pillar plate. As thus far described, the mechanism of the winding indicator is substantially the same as in the patent referred to. The differences which constitute my present improvement consists of the following:—The disk 20, which is provided with teeth extending through a part only of its circumference, is driven not directly by the stud 9 or its equivalent as in the patent before mentioned, but by intermediate mechanism consisting of a pinion 22, a star wheel 23, and a disk 24, having a tooth or finger 25. Such disk is provided with a stem 26 adapted to slip into a central bore in the stud 9, which is notched and spread apart at its lower end, to make spring jaws 27 which press against the walls of the bore which contain them and produce friction which causes the disk to turn when the stud is turned. The ends of these jaws extend past a shoulder 28 into an enlargement of the bore of the stud, whereby they are able to spread beyond such shoulder and hold the stem 26 and disk 24 firmly to the stud.

The star wheel has a number of projections 29 and notches 30, preferably equal to the number of teeth of the pinion 22, in this case eight. The outer ends of the projections 29 are concave and so curved as to fit the circumference of the disk 24, so that the star wheel is prevented from turning except when the tooth 25 causes it to turn. Recesses are provided in the disk on each side of the tooth to admit the corners of the projection 29 when the star wheel turns.

As a result of the construction described, the star wheel and pinion 22 turn one tooth space for each revolution of the disk 24, and as the gear ratio of the pinion 22 to the disk 20 is very small, the latter and the pointer turn through a very minute angle. The ratio in fact is such that the extreme movement of the pointer is less than a semi-rotation whereby the indicator scale can be placed upon the dial, close to the figures of the latter. In the construction illustrated, the pointer makes its complete swing in 36 hours, and the scale 6 is accordingly provided with that number of divisions between its extremes.

When the pointer reaches either limit, the rotation of the disk and pinion is stopped by engagement of a tooth of the pinion, with the untoothed rim of the disk at the end of the series of teeth on the latter. The disk thus constitutes in effect a gear segment having shoulders or abutments at its ends to interlock with the driving pinion 22 and prevent further movement without allowing the pinion to get out of mesh with the segment. This may be said to be the main object of my present invention.

As some watches will run more than 36 hours before stopping I have provided the friction between the disk 24 and the pinion 12 which drives it in order to permit further running of the watch movement after the pointer has reached the position where it indicates running down of the watch. This friction allows the stud 9 to slip around the stem 26 without injuring any of the parts of the movement. It also permits slipping in winding up of the watch after the pointer has arrived at the zero position on the scale. In order to insure that the pointer will always come to its zero position before the spring is completely wound up, I have made the gear ratio between the barrel and the pinion 12 greater than that between the main wheel and the pinion 8, so that the stud 9 and finger 25 are turned more rapidly and farther in the winding up than in the running down of the watch. Then, when the pointer is at the zero position, it stops by interlocking of the pinion 22 with the shoulder 32 at the end of the toothed segment and the mechanism continues to run, the stud 9 slipping around the friction jaws 27. In this way the pointer automatically adjusts itself to the zero position when the main spring is fully wound whether the movement has continued to run after stoppage of the pointer at the run down position or not.

Owing to the fact that none of the members of the gearing, including pinions 8 and 12, 13 and 12, disk 24 and its tooth 25, star wheel 29, pinion 22, and segment 20, ever get out of mesh, the indicator is always started properly when the winding up is commenced or when the watch commences to run. There is never any possibility of a tooth or any of the members named striking another tooth improperly or failing to enter freely the spaces between the teeth or projections with which it coöperates.

I claim,—

1. In a time piece the combination with a toothed winding wheel for the main spring and a movement wheel driven by the main spring, a rotatably mounted stud, a pinion frictionally engaged with said stud and in mesh with said movement wheel, a second pinion secured to said stud, a yoke pivoted coaxially with said stud, a pinion carried by said yoke, and meshing with the second named pinion, means for moving the third named pinion into mesh with the winding wheel when the main spring is being wound, and out of mesh with said winding wheel at all other times, a disk or wheel frictionally connected with said stud, a train of gearing including a segment driven by said disk

and having stop shoulders at each end of its line of teeth, whereby its movement in either direction is positively limited, and an indicator connected with and operated by said segment.

2. In a winding indicator for time pieces a rotatably mounted stud, a pinion frictionally engaged with said stud adapted to drive the same and to slip relatively thereto when resistance to rotation of the stud becomes excessive, a second pinion positively secured to the stud, a toothed disk having a shank or stem contained coaxially in said stud and being split to form spring jaws forming a frictional connection with the stud, the first named pinion being driven by a movement wheel of the time piece, and a second named pinion being driven in the opposite direction by the winding wheel of the time piece when the main spring is being wound, and a train of gearing carrying an indicator arranged to be driven by said toothed disk.

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

ANDERS AUNE.

Witnesses:

ARTHUR H. BROWN,

P. W. PEZZETTI.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."**