

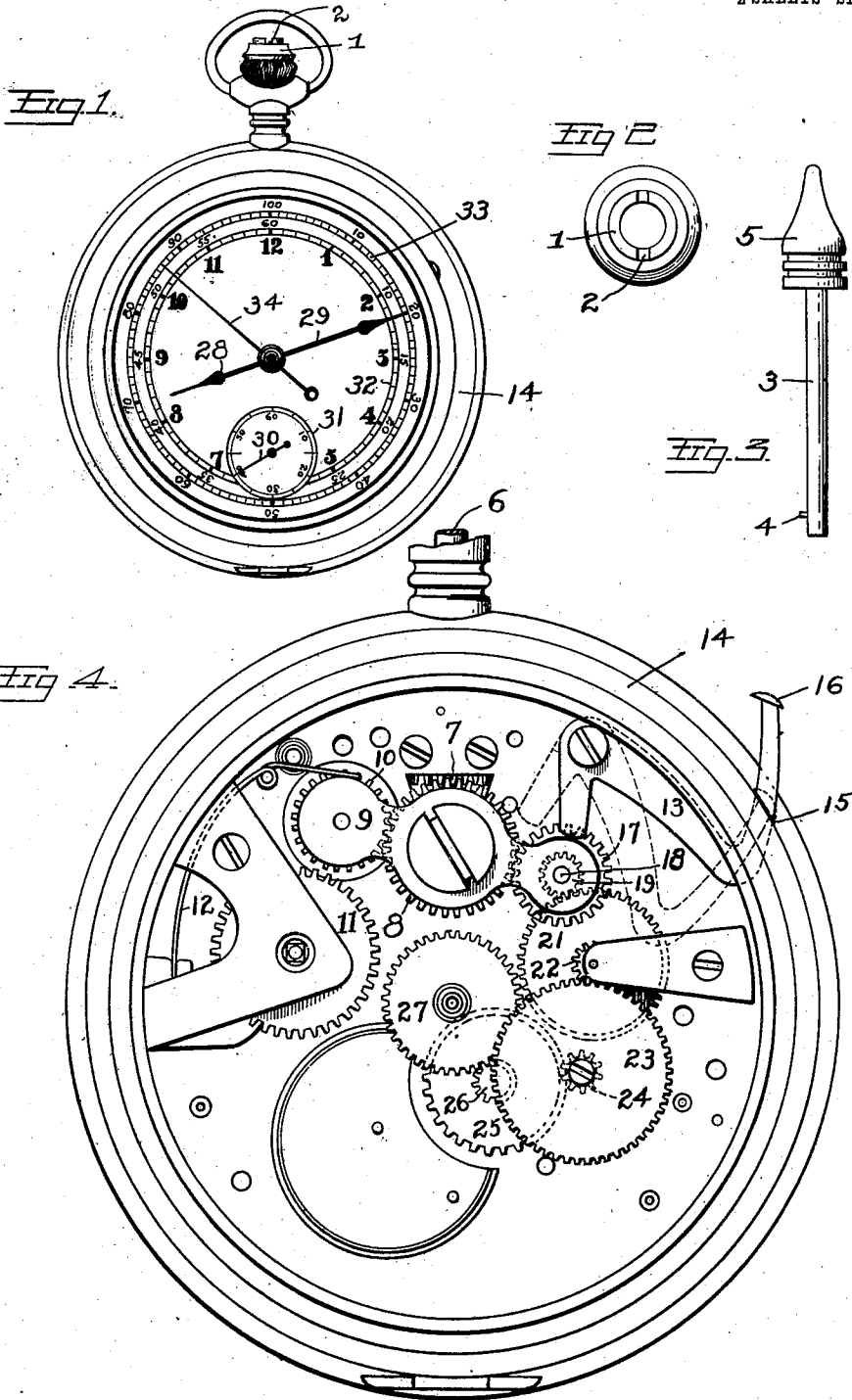
No. 847,679.

PATENTED MAR. 19, 1907.

C. J. MILLIS.
SPEED MEASURE.

APPLICATION FILED FEB. 28, 1906.

2 SHEETS—SHEET 1.



Witnesses:

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By his Attorney

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Edward N. Pagelsen.

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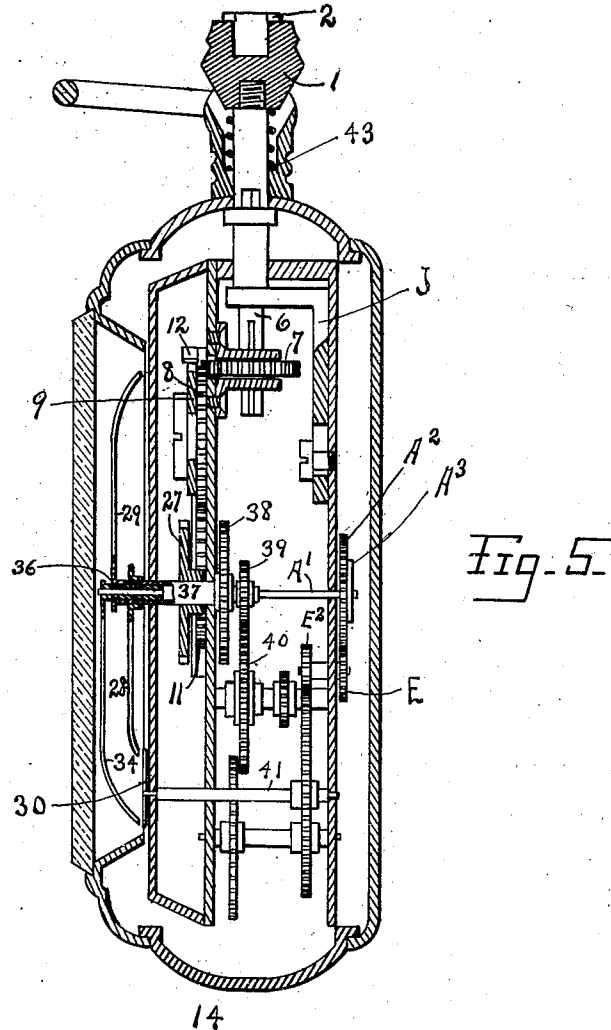
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2 SHEETS—SHEET 2.



Witnesses.
Elizabeth M. Brown.
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by

Inventor.
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UNITED STATES PATENT OFFICE.

CHARLIE J. MILLIS, OF PONTIAC, MICHIGAN, ASSIGNOR OF ONE-HALF TO
WILLIAM J. HARTWIG, OF DETROIT, MICHIGAN.

SPEED-MEASURE.

No. 847,679.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed February 28, 1906. Serial No. 303,559.

To all whom it may concern:

Be it known that I, CHARLIE J. MILLIS, a citizen of the United States, residing at Pontiac, in the county of Oakland and State of Michigan, have invented a new and useful Speed-Measure, of which the following is a specification.

My invention relates to means for determining the speed of rotating bodies; and the object of my improvement is to provide simple and accurate means by which the number of revolutions made by a moving body and the length of time during which such revolutions are made shall be indicated by moving parts of the instrument, said moving parts stopping simultaneously at the removal of the instrument from contact with the revolving body.

My invention consists in combining a time-measuring device with a revolution-counter.

It consists, further, in adding certain simple mechanism to any of the usual forms of watches, by means of which one of the hands may be made to indicate the number of revolutions made by the moving body and another hand be made to indicate the length of time consumed; and it further consists in adding an additional series of graduations to the dial of an ordinary stop-watch, whereby the minute-hand of the watch shall indicate the number of turns made by the crown of the pendant when connected thereto by appropriate gearing. I attain this object and embody the invention in the construction illustrated in the accompanying drawing, in which—

Figure 1 is a view of the face of my improved speed-measure. Fig. 2 is a plan of the crown of the pendant. Fig. 3 is a view of the removable stem, which is adapted to be inserted in an aperture in the crown to permit the same to be connected to a revolving body. Fig. 4 is a view of the gears that connect the hands of the speed-measure to the crown. Fig. 5 is a central vertical cross-section of the speed and time measure.

Similar reference characters refer to like parts throughout the several views.

In embodying my invention I can make use of many of the usual stop-watches now on the market. In the drawings I have shown my invention in connection with a stop-watch of the type illustrated and described in the patent to J. Petrillo, No.

755,313, dated March 22, 1904. The case, winding mechanism, split-second hand, and fly-back mechanism is the same as shown and described in said patent.

In my improved speed-measure the usual crown 1 of a watch is bored and slotted at 2 to receive the lower end of the stem 3, which is provided with a pin 4 and at the other end with a contact-point 5, of stiff rubber or similar substance that will form a good driving-contact with the center of a shaft or other revolving body. The crown 1 is attached to the revoluble and slidable shaft 6, which shaft is slidable in but revoluble with the gear 7, that meshes with the gear 8, mounted on the shiftable frame 9. This frame is normally held in such position that the wheel 10 meshes with the gear 11 of the winding-train, by the spring 12. The lever 13, which projects through the case 14 at 15, has a button 16 at one end. The other end, within the case, is adapted to be moved from normal position shown in dotted lines in Fig. 4, when it permits the crown and stem 6 to be in connection with the winding-train, to the position shown in solid lines, when the lever holds the shaft 6 and wheel 7 in connection with the revolution-indicating train.

The construction described, embracing the elements numbered 6 to 16, inclusive, are well known and may be replaced by any one of the similar well-known constructions.

The gear 17 meshes with the gear 8, and the shaft 18 of this gear 17 also carries the pinion 19. This pinion meshes with the gear 21, which is rigid with the pinion 22. This pinion drives the gear 23, which is rigid with the pinion 24. This pinion drives the gear 25, it the pinion 26, and it in turn the gear 27 on the sleeve that supports the hour-hand 28 shown in Fig. 1. The hour-hand and minute-hand are geared together in the usual manner through the gears 38 and 39. The proportions of these gears and pinions are such that one hundred revolutions of the crown 1 will turn the minute-hand once around the dial.

The split-seconds hand 34 is secured to the shaft A', the minute-hand 29 to the sleeve 36, and the hour-hand 28 to the sleeve 37. On the sleeve 37 are mounted the gear 27 and also the gear 38, which connects to the gear 39 on the sleeve 36 of the minute-hand in the usual manner. The gear 39 connects to the

driving mechanism of the watch proper through a frictionally-held gear, such as 40. The usual seconds-hand 30, mounted on the shaft 41, gears to the escapement-shaft 42 and connects to the shaft A' through the gears E², E, and A², which latter, together with the push member J, are the same as the corresponding construction of the Petrillo patent cited above. The seconds-hand 30 has its usual dial 31, but this is not necessary to the operation of my invention. The graduated ring 32 has the usual marks for the minutes and hours and the figures indicating the same on either side of the ring. Outside of this set of graduations is another graduated ring 33, which is divided into one hundred parts and numbered accordingly, as shown in Fig. 1. When the lever 13 is moved to the position shown in Fig. 4, the revolutions of the crown under the action of the stem 3 will be indicated by the minute-hand on the graduated ring 33.

The "split-second" hand 44 is driven by the other watch mechanism in the usual manner, as before stated. As explained in the patent above cited, whenever the hand is at 12 a pressure on the crown 1 will connect it to the driving-train, a second pressure will disconnect it, and a third pressure will permit it to move back or forward to 12 again. This will occur irrespective of the position of the lever 13, as there is no connection between the gears shown in Fig. 4 and the auxiliary seconds-hand.

The operation of the instrument is as follows: Whenever it is desired to determine the speed of a revolving body, the minute-hand 29 and hand 34 are set to 12, which may be done by pulling out the lever 13 the proper distance and turning the crown 1 in the proper direction. The end of the stem 3 is then inserted in the crown and the friction cap or point 5 pressed hard against the revolving body. This has two effects. First, it will release the hand 34, which begins to turn with the watch mechanism and to indicate the seconds, and, second, the revolving crown and shaft 6 turns the minute-hand 29 to indicate such revolutions. While the revolutions and time are being registered the usual spring 43 on the shaft 6 tends to press the crown 1 outward. When the desired number of revolutions have been registered or the instrument has been registering revolutions for the desired time, the instrument is sharply pressed against the revolving body and as quickly withdrawn. With a little practice the two movements can be performed in about one-fourth second. Pressing the cap 5 against the revolving body will stop the hand 34, and the removal of the instrument from engagement with the revolving body will stop the hand 29. The position of the hand 34 will indicate the number of seconds the contact lasted and the position of

the hands 28 and 29 will indicate the number of revolutions. Instead of using the hand 34 to indicate the length of time the revolutions have been registered, the seconds-hand 30 may be employed. This may also be done when the gearing shown in Fig. 4 is attached to a watch not provided with a split-seconds hand 34. In using an instrument thus constructed or the instrument shown in connection with the hand 30 the number of seconds the point 5 is in contact with the revolving body is ascertained by watching the hand 30. This can only be done, however, where the light at the place where the revolutions are to be counted is sufficient so the hand 30 can be distinctly seen.

Having now explained my improvements, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a combined speed-measure and watch, the combination of a case, a dial therein, a hand mounted to indicate seconds of time, watch mechanism to drive the same, a pendant on said case, a removable stem in engagement with said pendant, and a hand geared to said pendant, said dial having separate graduations for each of said hands.

2. The combination of a watchcase, a shaft or pendant and crown connected thereto, connecting means whereby a revolving body is adapted to turn said pendant, a dial having a ring graduated to hundredths, a hand, and gearing between said hand and pendant whereby one hundred revolutions of the pendant will turn the hand one revolution.

3. The combination of a watchcase, a pendant thereon, a dial on said case, a hand mounted over said dial, said dial having a series of concentric graduations, gearing between the pendant and hand, and means for controlling the operation of the hand whereby it may make one revolution at each one hundred revolutions of the pendant, and which may be disconnected from the pendant and be connected to the time-measuring mechanism, and mechanism to actuate the hand to measure time.

4. In a combined time-measure and revolution-counter, a case, a dial therefor, a hand over said dial, a clock mechanism to drive said hand to indicate the passage of time, a revoluble shaft to drive said hand, and means to connect and disconnect the hand and clock mechanism, and the hand and driving-shaft alternately, said dial having graduations to indicate the number of revolutions of the driving-shaft.

5. A combined watch and rotation-counter having ordinary hour and minute indicators, watch-graduations and supplemental rotation-graduations, and means for operating said indicators by a revolving shaft or from the watch-motor, whereby the ordinary time-indicator may be used as the indicator of a rotation-counter.

6. A combined watch and rotation-counter
having the ordinary watch-motor and hour
and minute hands, and a hand for indicating
seconds connected to said motor, the usual
5 graduations for time being supplemented by
graduations for rotations, means for operat-
ing said hour and minute hands by a revolv-
ing shaft or from the watch-motor at will,
whereby these hands may be used as the in-
10 dicators of a revolution-counter while the

seconds-hand indicates the time the revolu-
tions are being counted.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

CHARLIE J. MILLIS.

Witnesses:

EDWARD N. PAGELSEN,
WM. J. HARTING.