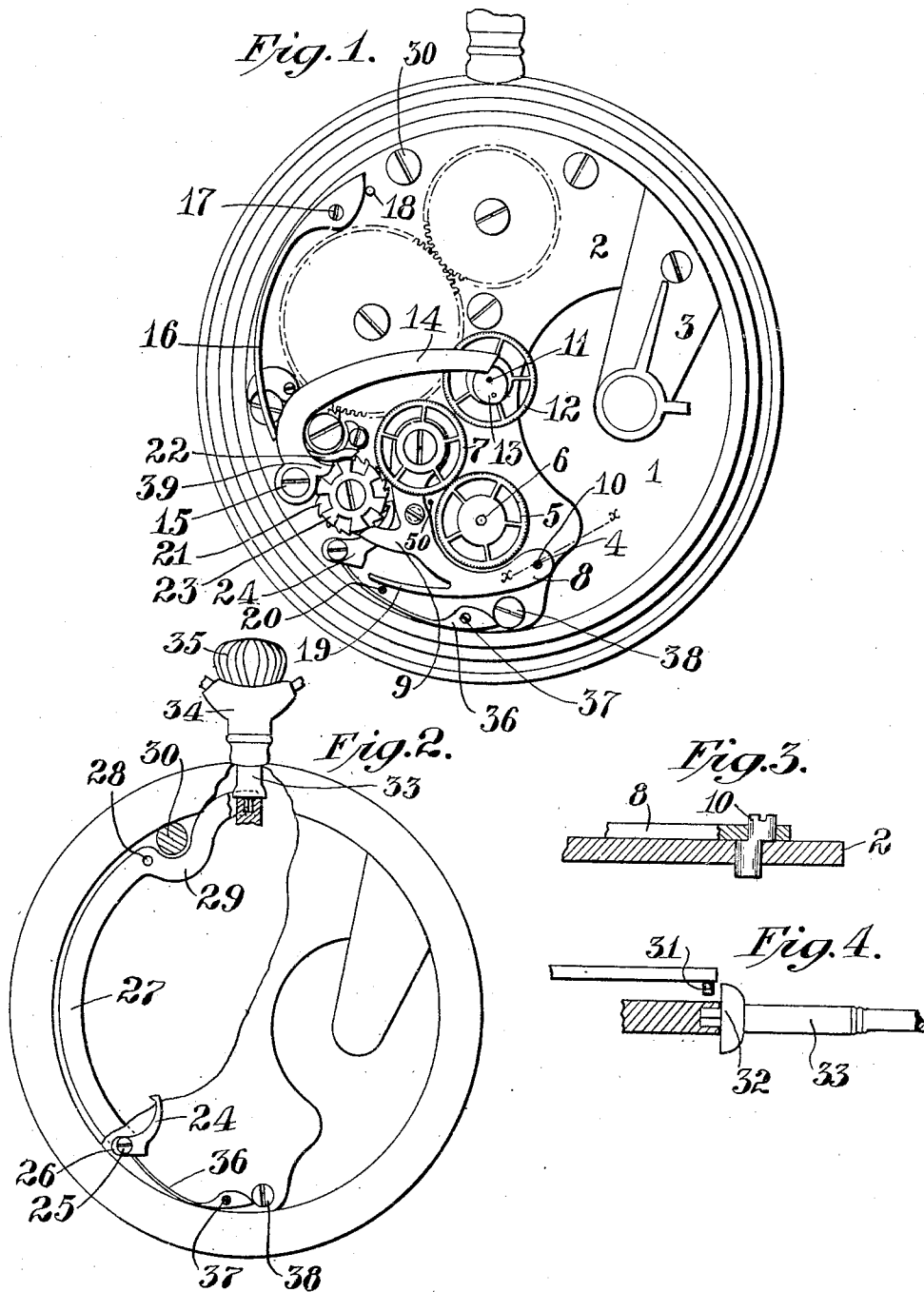


E. A. DUPUIS.  
STOP WATCH.  
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972,520.

Patented Oct. 11, 1910.



Attest:  
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by *Osbert F. Gung* his Atty.

# UNITED STATES PATENT OFFICE.

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STOP-WATCH.

972,520.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed July 3, 1909. Serial No. 505,816.

*To all whom it may concern:*

Be it known that I, EUGENE A. DUPUIS, a citizen of Switzerland, and resident of the city of New York, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Stop-Watches, of which the following is a specification.

This invention relates to improvements in stop watches and the object of my invention is to provide a new and improved stop watch which is simple in construction effective and reliable in use, and does not increase the thickness of the movement to any appreciable extent.

In the accompanying drawings in which like letters of reference indicate like parts in all the figures, Figure 1 is a rear view of my improved stop watch, in a case, parts being broken away, others omitted and the back cap of the case removed. Fig. 2 is a similar view, parts of the three quarter plate being broken away and others shown in section. Fig. 3 is an enlarged detail sectional view on the line *xx* of Fig. 1. Fig. 4 is an enlarged detail sectional view showing the combined winding arbor and push pin and its relation to the lever for starting and stopping the stop watch mechanism.

The movement which I have shown for illustrating my invention is provided with the usual main plate 1, three quarter plate 2, balance bridge 3 and other conventional parts of a watch movement that need not be described.

From the so-called fourth wheel of the movement the finely toothed wheel 5 is driven, and is located directly over the three quarter plate and is attached to the upper end of the arbor 6 of the fourth wheel. The toothed wheel 5 is maintained in constant engagement with a toothed wheel 7 of the same size and same size of teeth, which wheel 7 is mounted on the free end of a curved lever 8 having a laterally projecting arm 9. The lever 8 is mounted on an eccentric pivot 10, passing through the lever 8 at that end opposite the one carrying the wheel 7, said pivot being mounted to turn in the three quarter plate as shown in Fig. 3. The fractional seconds hand, which is not shown, is mounted on the front or dial end of an arbor 11 passing entirely through the movement and carrying at its inner end the toothed wheel 12, of the same size and size

of teeth as the wheel 7, said arbor 11 also carrying the heart cam 13 of conventional construction, which can be engaged by a lever 14, pivoted on the outer face of the three quarter plate at 15 and pressed toward the heart cam by a spring 16 secured in place by a screw 17 and bearing against the stud 18 projecting from the three quarter plate. A spring 19 made integral with the lever 8 bears at its free end and against a screw 20 and this spring presses the lever 8 upward.

A ratchet wheel 21 is mounted upon the outer face of the three quarter plate and is engaged by a click spring 22. United with this ratchet wheel 21 is a star wheel 23 having alternate teeth and recesses in the conventional manner and the end of the arm 9 of the lever 8 rests against the rim of this star wheel. The ratchet wheel 21 is also engaged by a hook pawl 24 located on the outer surface of the three quarter plate and pivoted by a pivot 25, passing through the slot 26 in the three quarter plate, to the lower end of the curved lever 27 pivoted at 28. It will be seen that this lever 27 is curved in conformity with the contour of the movement and is located along the circumference of the movement and in space not occupied by wheels or other working parts of the movement. The lever 27 at 29 is curved around the screw 30 that holds the three quarter plate on the main plate and at its upper end the lever 27 has a laterally projecting pin 31 which can be shifted or moved by the shoulder 32 on the combined winding arbor and push pin 33 mounted in the pendant 34 in a conventional manner and connected at its upper end with the crown 35.

By turning the crown the main spring can be wound and when the crown is pulled out the hands can be set in conventional manner. This crown and push pin are capable of a limited lengthwise movement and when the crown and push pin are in normal position, that is when the parts are in such positions that by means of the crown and push pin the main spring can be wound, the shoulder 32 is a short distance from the pin 31 on the upper end of the lever 27. If the crown and push pin are pushed inward the shoulder 32 encounters the push pin 31 and the upper end of the lever 27 is moved toward the center of the movement a very short distance and the opposite end of the lever

27, carrying the hook pawl 24 is moved in the direction from the center of the movement a correspondingly increased distance and rotates the ratchet wheel 21 the distance of one tooth. When the push pin is released the spring 36 bearing on the hook pawl 24 presses the lower end of the lever 27 inward. This spring 36 is secured by a screw 37 and rests against the screw 38 which serves to connect the three quarter plate with the main plate.

When the parts are in the position shown in Fig. 1 and the crown is pressed inward the hook pawl 24 turns the ratchet wheel 21 the distance of one tooth whereby the star wheel 23 is moved correspondingly and the arm 9 of the lever 8 slips off one tooth of the star wheel and into the recess between two teeth permitting the spring 19 to throw the lever 8 upward sufficiently to cause the wheel 7 to engage the wheel 12 without disengaging the wheel 7 from the wheel 5 and at the same time another tooth of the star wheel acts on the cam projection 39 of the lever 14, which is thrown up so as to be disengaged from the heart cam thereby releasing the wheel 12 which is now rotated from the wheel 7 and the fractional seconds hand is moved and continues to move until the crown is again pushed inward. If now the push pin is again pressed inward the arm 9 of the lever 8 rides upon one of the teeth of the star wheel 23, whereby the lever 8 is moved downward against the tension of the spring 19 sufficiently to disengage the wheel 7 from the wheel 12 and at the same time the toe or cam 39 of the lever 14 continues to ride upon that tooth or projection of the star wheel 23 upon which it rested and no motion of the lever 14 takes place. If the push pin is now again pushed inward the star wheel is again turned the distance of one tooth and the arm 9 of the lever 8 continues to ride on that tooth of the star wheel upon which it rested and the position of the lever 8 is not changed but the toe or cam 39 of the lever 14 slides off that tooth of the star wheel upon which it rested and under the action of the spring 16 the lever 14 is thrown against the heart cam and the wheel 12 and the fractional seconds hand are brought back into the initial position as shown in Fig. 1. It will be observed that there are no bridges or similar structures on the three quarter plate to form bearings for any of the parts of my stop watch mechanism which is thus extremely flat and does not increase the thickness of the movement to any appreciable extent.

In order to get the proper engagement between the walls 7 and 12 and to permit of adjusting them so that they will engage properly when they are to be engaged and when disengaged are completely separated so that motion cannot be transmitted from

the wall 7 of the wheel 5, the eccentric pivot 10 for the lever 8 is provided. By turning said eccentric pivot the lever 8 can be nicely adjusted so as to give the wheels 7 and 5 the proper relative positions for proper engagement or disengagement. It will also be observed that the several springs have but a single fastening screw which are devoid of the extra fixed pin usually secured in the springs and passing into separate holes in the three quarter plate. The construction of the stop watch is thus greatly simplified and the costs are greatly reduced.

50 represents a pin for limiting the engagement of the teeth of the wheels 7 and 12.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. The combination with a watch movement, of a fractional seconds wheel, means for throwing the watch movement into and out of engagement with the wheel of the fractional second wheel and returning the parts to their initial positions, all mounted above the outer surface of the three quarter plate of the movement, a motion transmitting lever extending along the rim part of the movement and between the plates thereof from the winding arbor to the said mechanism for throwing the fractional seconds wheel into and out of engagement with the movement and a connecting member extending from said lever through the three quarter plate to the mechanism above the top of the three quarter plate, substantially as set forth.

2. The combination with a watch movement, of a fractional seconds wheel mounted above the outer face of the three quarter plate, a wheel driven from the fourth wheel of the watch movement and also mounted above the outer face of the three quarter plate, an idler wheel interposed between the wheel driven from the fourth wheel and the fractional seconds wheel and permanently engaged with the wheel driven from the fourth wheel, a lever pivoted on the outer face of the three quarter plate and carrying said idler wheel, a star wheel mounted on the outer face of the three quarter plate, and engaging the said lever, a ratchet wheel united with the star wheel, a lever pivoted between the plates of the movement and extending along the rim of the movement from the crown to said ratchet wheel, a hook pawl on the outer face of the three quarter plate, a pin extending from the said hook pawl through a slot in the three quarter plate to the end of the lever pivoted between the plates, a heart cam on the fractional seconds wheel, and a spring pressed lever for throwing said heart cam and engaging the star wheel, substantially as set forth.

3. In a stop watch, the combination with

a watch movement, of a wheel driven from  
the fourth wheel of the movement and a  
fractional seconds wheel both of said wheels  
being mounted above the outer surface of the  
5 three quarter plate, an intermediate idler  
wheel permanently engaging the wheel  
driven from the fourth wheel of the move-  
ment and capable of engagement with the  
fractional seconds wheel a spring pressed  
10 lever pivoted by an eccentric pivot upon the  
outer surface of the three quarter plate at  
one end of said lever and carrying said idler

wheel at the opposite end, and a star wheel  
for shifting said lever and engaging the  
lever, and means for operating the star 15  
wheel, substantially as set forth.

Signed at New York city in the county of  
New York and State of New York this 30th  
day of June, A. D. 1909.

EUGENE AMI DUPUIS.

Witnesses:

FRANK E. RAFFMAN,  
OSCAR F. GUNZ.