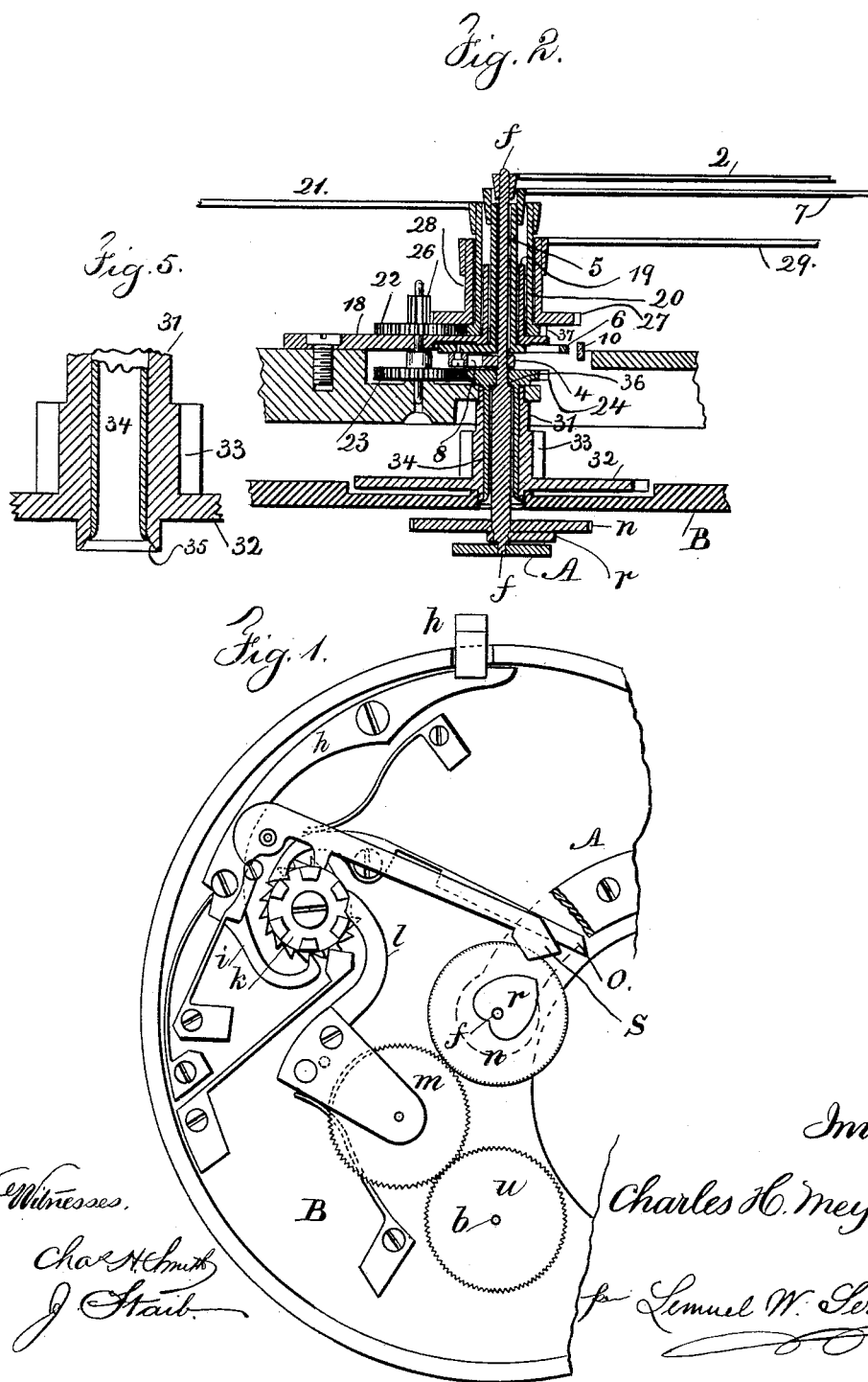


C. H. MEYLAN.  
SPLIT SECONDS STOP WATCH.

No. 383,749.

Patented May 29, 1888.



Witnesses.  
Charles H. Meylan.  
J. Straub.

Inventor.  
Charles H. Meylan.

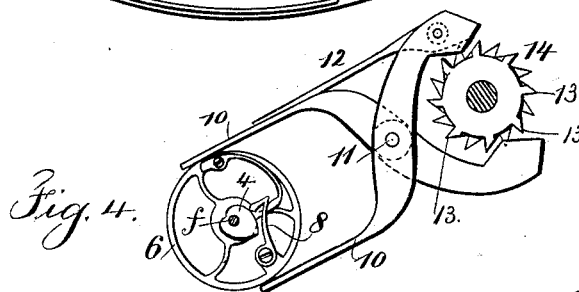
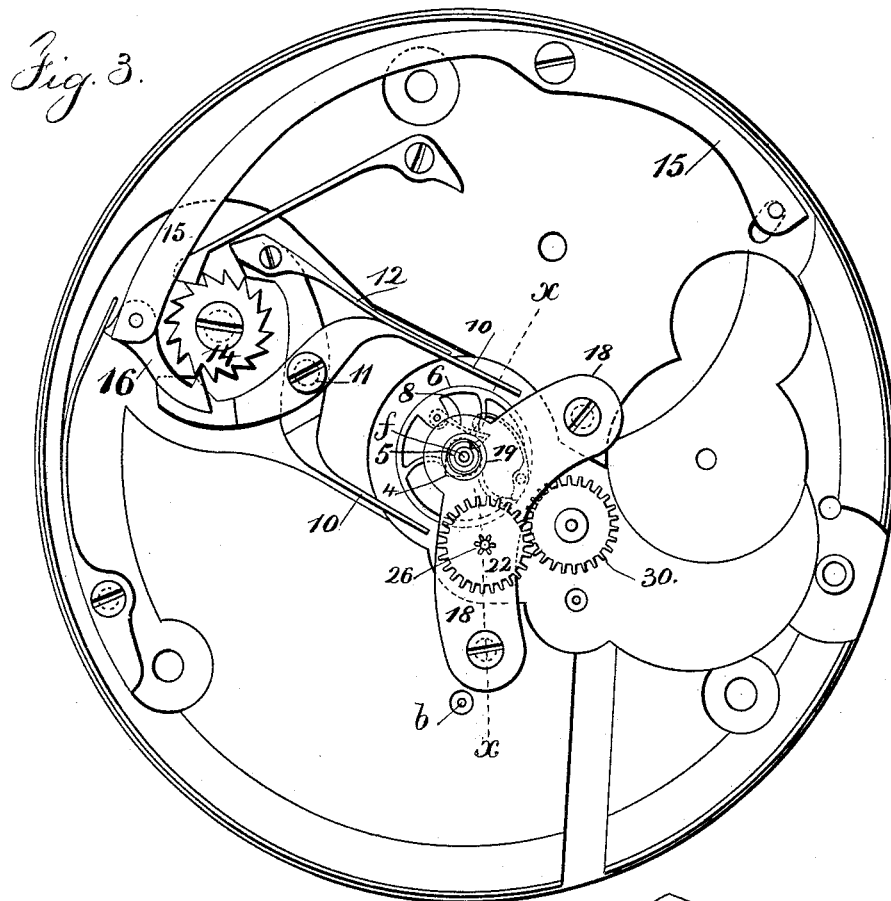
Samuel W. Serrell.  
att

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Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES H. MEYLAN, OF NEW YORK, N. Y.

## SPLIT-SECONDS STOP-WATCH.

SPECIFICATION forming part of Letters Patent No. 383,749, dated May 29, 1888.

Application filed August 31, 1887. Serial No. 248,317. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES HENRY MEYLAN, of the city and State of New York, have invented an Improvement in Split-Seconds Stop-Watches, of which the following is a specification.

Watches have heretofore been made with a mechanism that connects the wheels in the ordinary movement to an independent seconds-hand that is under the control of stop mechanism and a push-lever, so that when the push-lever is actuated the first time the independent seconds-hand is started, and it is moved by the time-gearing. The second push of the lever stops the independent seconds-hand, and the third push of the lever returns the independent seconds-hand to zero or twelve, ready to be again started. Watches of this character are usually known as "stop-watches," and a reference is hereby made to Letters Patent No. 235,794, granted to me December 21, 1880, and which shows a stop-movement with which my present improvements are especially available. Watches have also been made for taking two observations; but they have usually been provided with a second stop-movement, and have been complicated and expensive.

Efforts have been made to construct watches with two seconds-hands—one on a central arbor and the other upon a tubular arbor around it—with clamping-fingers for holding one hand while the other continues to move; but difficulty has been experienced in properly moving the ordinary hour and minute hands, because a pinion was made use of that was independent of the train of gearing and received its movement from the gear-wheel on the spring-barrel and the hands were liable to shake or swing in consequence of looseness in the teeth and from being uncontrolled by any connection in the train to the balance.

I construct the stop-watch mechanism as hereinafter described and connect the ordinary hour and minute hands to the train of gearing in such a manner that looseness is prevented and the hour and minute hand arbors are concentric with the two arbors of the split or independent seconds-hands of the stop mechanism.

In the drawings, Figure 1 shows the stop-watch movement corresponding to that shown

in my patent, No. 235,794, only it is by preference placed upon the back plate of the watch instead of beneath the face. Fig. 2 is a section at the line *xx*, Fig. 3. Fig. 3 is an elevation of the mechanism connected with the additional seconds hand, the face-hands and hour and minute gears being removed. Fig. 4 is a rear view of the skeleton wheel and the mechanism detached; and Fig. 5 is a section in greatly-magnified size of the end portions of the two tubular arbors, showing the friction device for connecting them.

A reference is hereby made to my aforesaid patent for a description of the parts shown in Fig. 1 and the mode of operation of the same, the letters of reference corresponding thereto. I, however, remark that the center arbor of the watch in this instance is supported by the bridge A upon the back plate, B, of the watch.

The center arbor, *f*, of the watch passes through the tubular arbor of the center wheel in the ordinary time-train of the watch. Upon the rear end of the arbor *f* is the heart-cam *r* and wheel *n*, (shown in my aforesaid patent,) and upon the other end of this arbor *f* is the independent seconds hand 2. The wheel *u* on the arbor *b* of the ordinary seconds-hand and the wheels *m n* are the same as in my aforesaid patent, and the swinging arm *l* and mechanism for moving the wheel *m* in starting the independent seconds hand upon the first push of the push-lever *h*, and the means for stopping the hand and for returning it to the normal or zero position, are the same as in said patent.

Upon the arbor *f* is a second heart-cam, 4, and around the arbor *f* is a tube, 5, forming the arbor of the skeleton wheel 6, and also receiving at the other end the additional seconds-hand, 7, and there is a spring-finger, 8, the end of which acts against the heart-cam 4, and when the parts are in a normal position this spring-finger causes the two seconds-hands 2 and 7 to coincide, because the spring-finger slides upon the edge of the heart-cam, turning the skeleton wheel arbor 5 and hand 7 until the end of the spring-finger reaches the inner part of the heart-cam, the hands coinciding when the parts reach this position.

To stop the independent or split seconds, I

make use of the clamping-fingers 10, pivoted at 11 and standing at opposite sides of the skeleton wheel 6. The spring 12 tends to close these fingers and clamp the skeleton wheel and the rotary spur-cams 13, acted upon by the ratchet-wheel 14, push-lever 15, and pawl 16, are employed to open the clamping-fingers and release the skeleton wheel 6 every second movement of the push-lever. A convenient way of making the spur-cams 13 is to file away the lower points of the alternating ratchet-teeth of the wheel 14, as seen in Fig. 4. It will now be understood that when the push-lever *h* is acted upon the arbor *f* will be connected to the arbor *b* of the ordinary seconds-hand of the watch, and said arbor *f* and the seconds-hand 2 will rotate in unison with the ordinary seconds-hand, and the additional seconds-hand, 7, will travel along with and be immediately below the hand 2. When an observation is to be noted, the push-lever 15 is acted upon and the skeleton wheel 6 grasped, stopping the hand 7 instantly; but the hand 2 continues its movement with but little friction except that which results from the heart-cam 4 turning in contact with the spring-finger 8. When a second observation is to be made, the push-lever *h* is acted upon, the wheels *m* and *n* are thereby separated, and the brake *o* applied to the edge of the wheel *n*, which stops the arbor *f* and hand 2. The third push on the lever *h* returns the hand 2 to its normal position, and the additional seconds-hand, 7, is made to coincide with the hand 2 by the action of the heart-cam 4 and spring-finger 8 either before or after acting upon the push-lever *h*.

In stop-watches containing a split or independent seconds-hand difficulty has heretofore been experienced, as before mentioned, in preventing looseness of the ordinary hour and minute hands when the arbors of such hands are concentric with the split or independent seconds-hands and in the center of the watch, because the pinion that moves the hands has not been in the time-train itself, and hence there was nothing to keep the teeth together at one side, and the looseness inseparable from the teeth of the wheels was manifest by the hands shaking or swinging, sometimes as much as one or two minutes. I prevent this difficulty by making the arbor 31 of the center wheel, 32, and pinion 33 in the watch-movement as a tube, and passing through the same the tubular arbor 34, that is formed with or permanently connected to the gear-wheel 24, and this tubular arbor 34 is held within the arbor 31 by friction, the end 35 of the arbor being recessed conically and receiving the slightly-flaring conical spring end of the tubular arbor 34, so that the two arbors will turn together; but the arbor 34 can be turned within the arbor 31 when setting the hands. The solid arbor *f*, before described, is within this tubular arbor 34, and is pivoted at one end in the bridge A and

supported by an inward collar, 36, within the wheel 24, that forms a bearing for the arbor *f* and prevents any end movement thereof. The heart-cam 4 is driven upon this arbor *f* outside the wheel 24, and is held firmly by friction; hence the heart-cam 4 acts with the wheel 6 and spring-finger 8, and the two independent or split-seconds hands do not prevent the connection being taken from the wheel 24 through the wheel 23 and wheel 22 to the wheel 37 on the arbor 20 of the minute-hand 21, and from the pinion 26 to the wheel 27, tubular arbor 28, and hour-hand 29. The arbor of the wheels 22 and 23 passes through the bridge 18 into the watch-plate, and the wheel 23 is below said bridge, and the intermediate wheel 30 upon the watch-plate is acted upon by the gear-wheel on the swinging plate in an ordinary stem winding and setting mechanism, so that the wheels 23 and 24 and the gearing to the hands and the hands themselves can be moved in setting the watch, as usual; but the tubular arbor 34 is turned in the tubular arbor 31 when setting the hands, and there is no risk of looseness in the hands, because the wheel 24 is entirely under the control of the time-train of the watch.

I claim as my invention—

1. The combination, in a stop-watch, of the arbor *f* for the independent seconds-hand, the tubular arbor 5 for the additional independent seconds-hand, the bridge 18, tubular arbor 19, cannon 20 for the minute-hand, wheel 27, and cannon 28 for the hour-hand, the gear-wheel 23 and pinion 24 for driving the hour and minute hands, and the gearing connecting the arbor of the wheel 24 with the train of gearing in the watch-movement, substantially as specified.

2. The combination, with the tubular center arbor, 31, in a watch-movement, of the tubular arbor 34, passing through the arbor 31 and held therein by friction, the wheel 24 on such arbor 34, the hour and minute hands and their tubular arbors, and the gearing between the wheel 24 and such hour and minute hands, and an arbor passing through the arbor 34 and carrying an independent seconds hand, substantially as set forth.

3. The combination, with the tubular central arbor, 31, in a watch-movement, of the tubular arbor 34, passing through the central arbor, 31, and held therein by friction, the gear-wheel 24 on such arbor, the hour and minute hands and their gearing, and an independent seconds-hand, 2, and central arbor, *f*, therefor within a bearing inside the tubular arbor 34, a bridge, A, for one end of said arbor *f*, and the connections for moving the said arbor *f* and hand, substantially as set forth.

Signed by me this 26th day of August, 1887.

C. H. MEYLAN.

Witnesses:

GEO. T. PINCKNEY,  
CHAS. H. SMITH.