

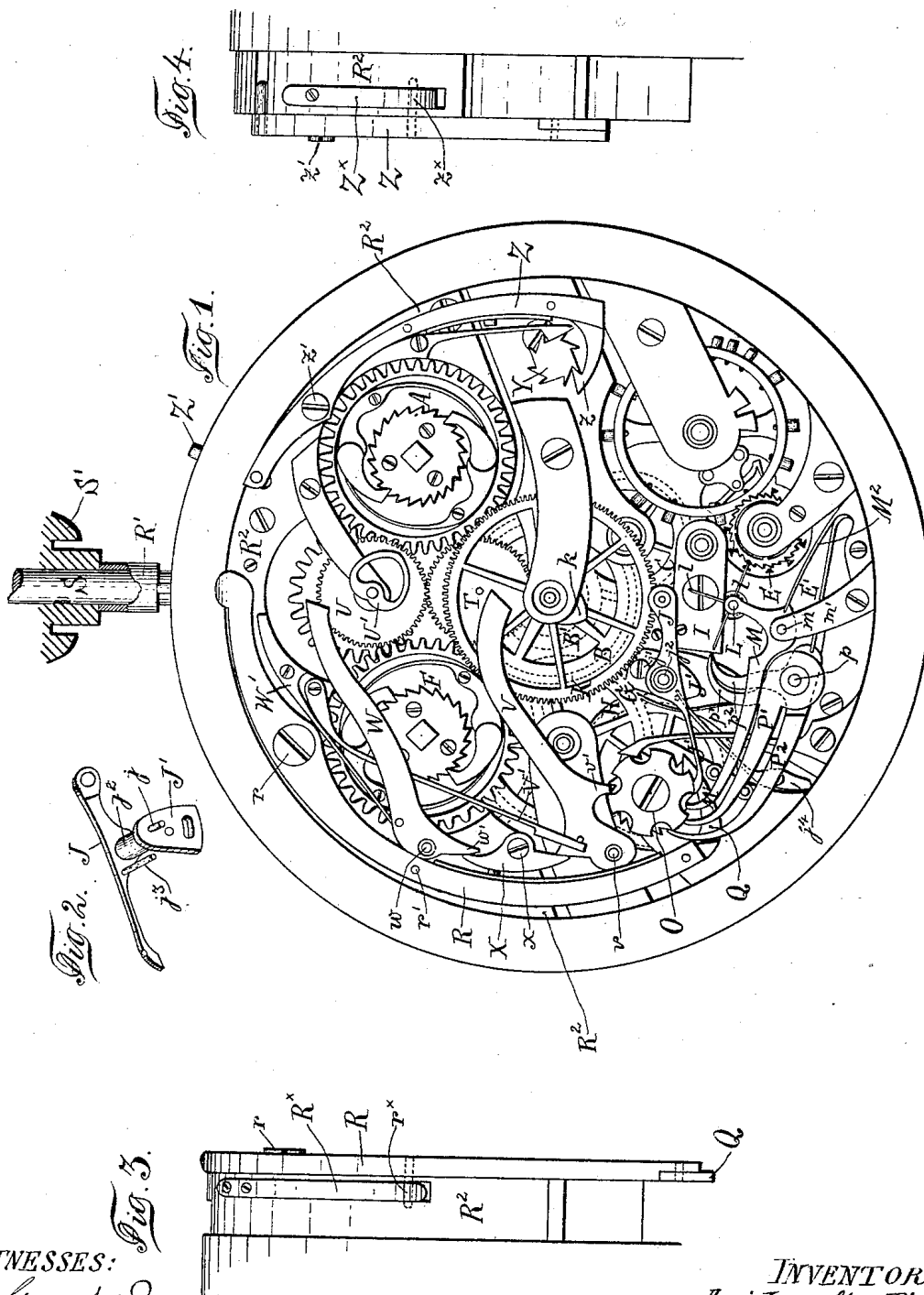
(No Model.)

5 Sheets—Sheet 1.

A. LECOULTRE-PIGUET.
STOP WATCH.

No. 550,182.

Patented Nov. 19, 1895.



WITNESSES:

Georg W. Jauch
Geo. S. Wheelock

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Fig. 1^a.

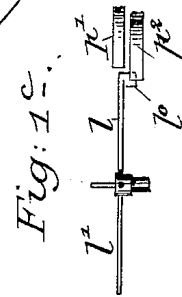
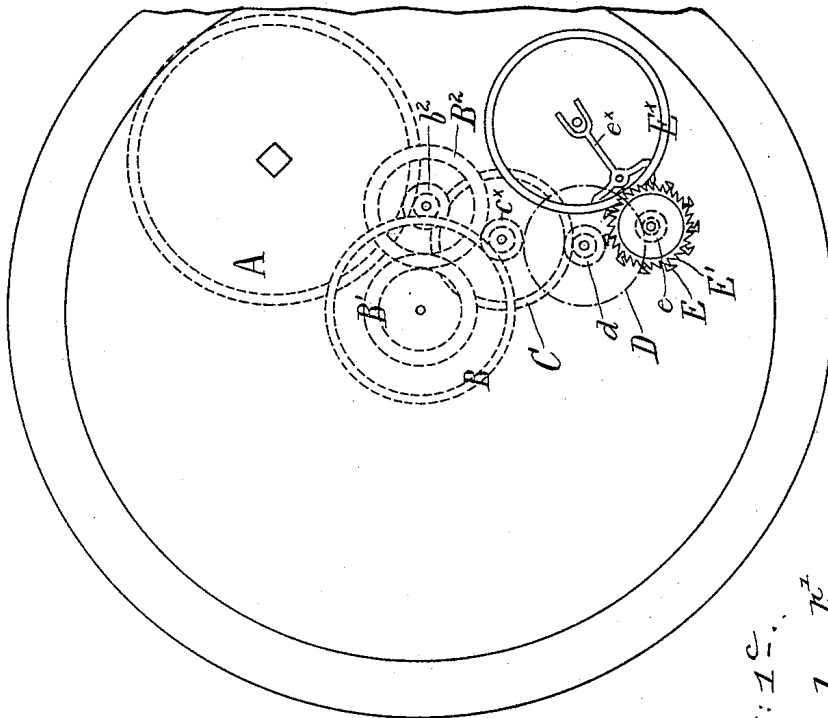
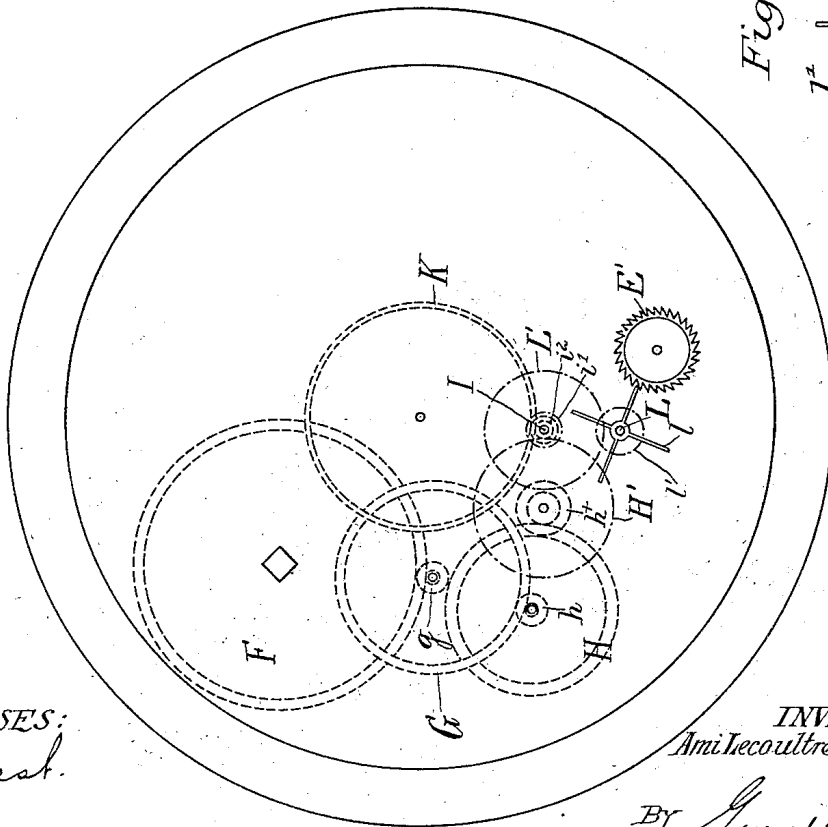


Fig. 1^b.



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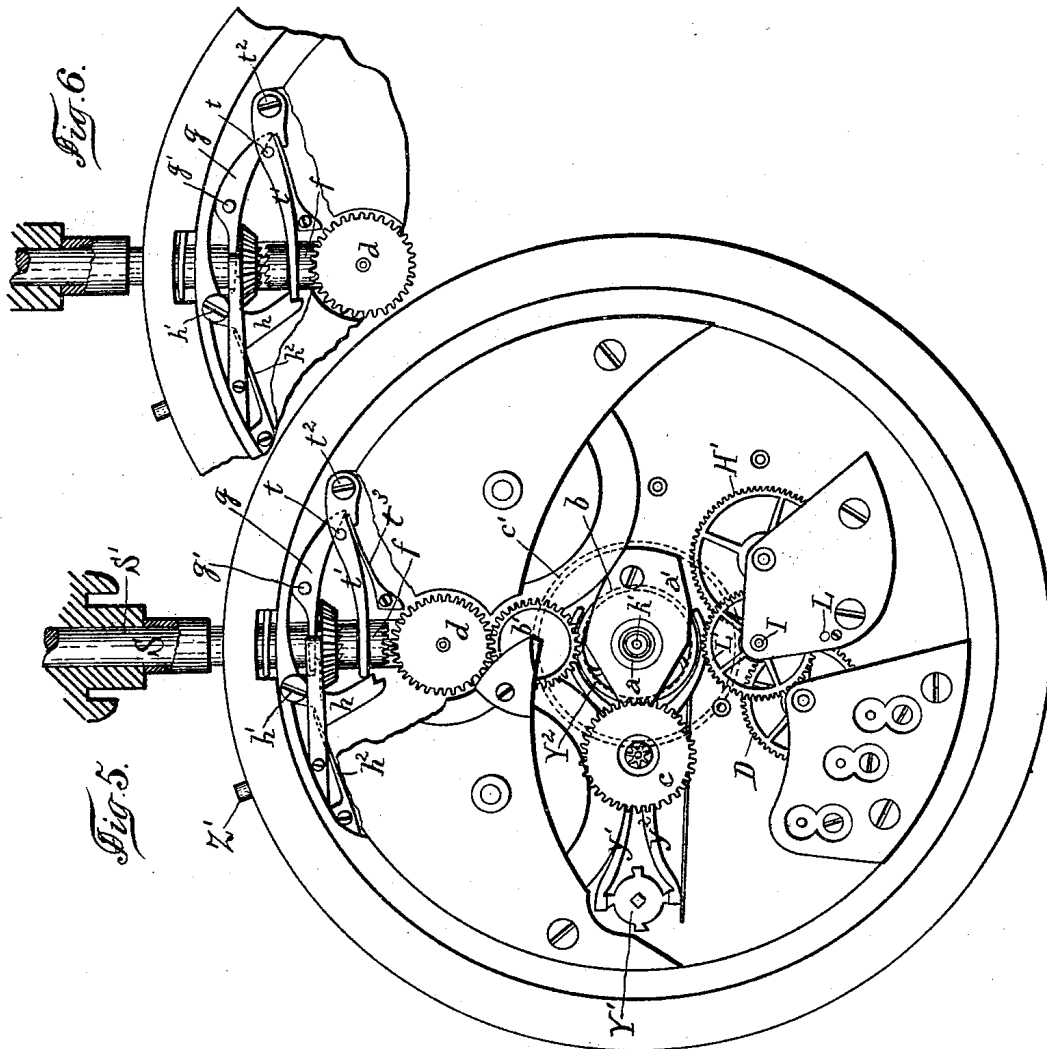
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5 Sheets—Sheet 3.

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Patented Nov. 19, 1895.



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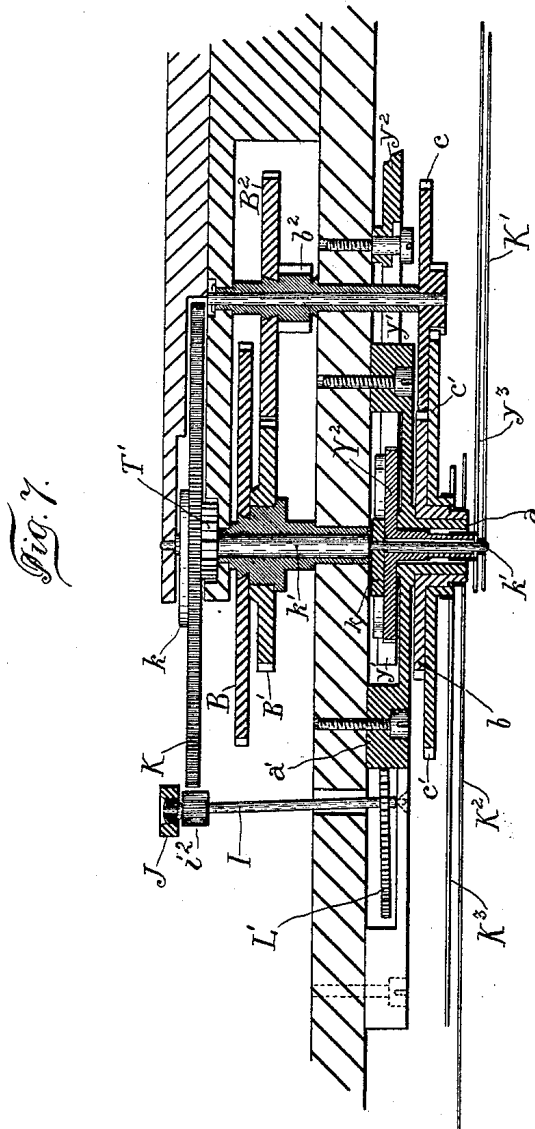
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A. LECOULTRE-PIGUET.
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No. 550,182.

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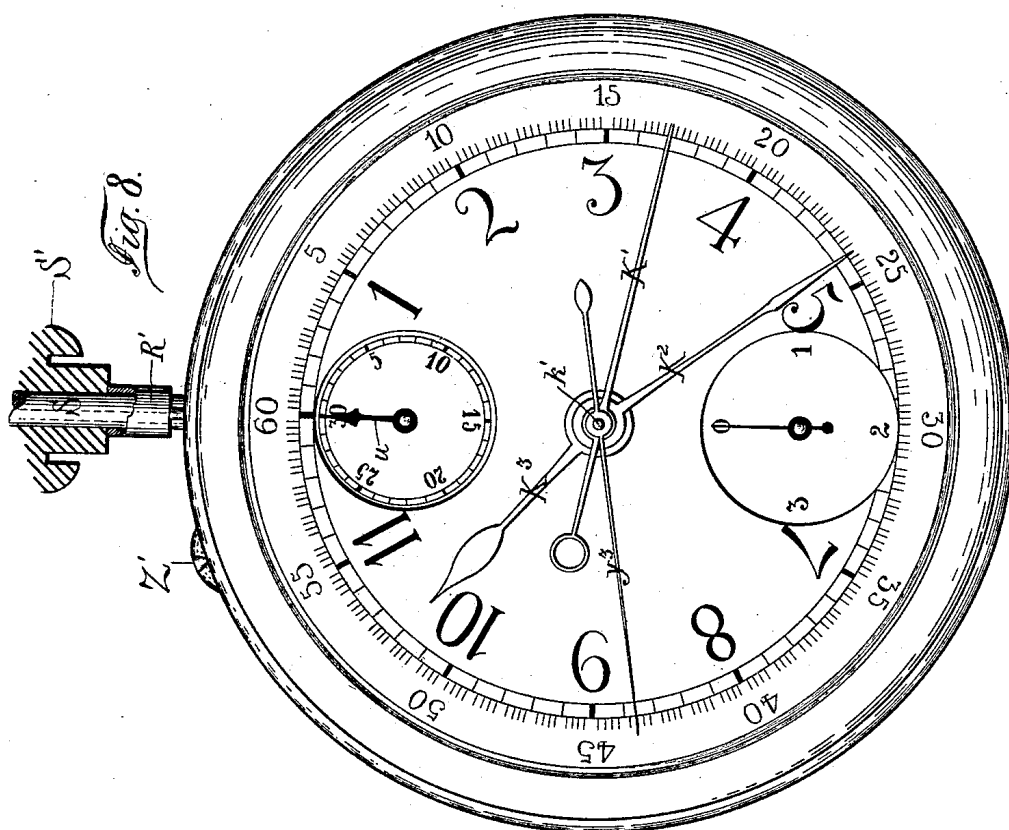
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STOP WATCH.

No. 550,182.

Patented Nov. 19, 1895.



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UNITED STATES PATENT OFFICE.

AMI LECOULTRE-PIGUET, OF BRASSUS, SWITZERLAND.

STOP-WATCH.

SPECIFICATION forming part of Letters Patent No. 550,182, dated November 19, 1895.

• Application filed November 22, 1894. Serial No. 529,581. (No model.)

To all whom it may concern:

Be it known that I, AMI LECOULTRE-PIGUET, watchmaker, of Brassus, Switzerland, have invented some new and useful Improvements in Stop-Watches, of which the following is a specification.

The present invention may be applied as well to those watches which are provided with only one mainspring as to those having one mainspring operating the ordinary watch mechanism and another mainspring operating the stop-watch mechanism.

In the accompanying drawings my said invention is shown as applied to a watch having two separate mainsprings, and the split-seconds hand is adapted to indicate the quarters of seconds; but I do not limit myself to that special form of execution of the mechanism, as it may be adapted to record other fractions of seconds.

Figure 1 is a plan view of those parts of the mechanism which are at the back of the movement-plate. Fig. 1^a is a diagram of the train of gears connecting the one mainspring-barrel with the escapement. Fig. 1^b is a diagram of the train of gears connecting the other mainspring-barrel with the split-seconds-hand wheel and with the wings engaging a bevel-toothed wheel fixed on the axis of the escapement-wheel axis. Fig. 1^c is a detail view of the two detents and one of the wings of the arbor of the quarter-seconds hand. Fig. 2 shows separately and in perspective view the adjustable bridge J' and the rocking lever J. Fig. 3 is a side view of the rocking lever R and of the bridge upon which the same is pivoted, showing the arrangement of the spring R^x of said rocking lever. Fig. 4 is a side view of the rocking lever Z and of the bridge upon which the same is pivoted, showing the arrangement of the spring Z^x of the said rocking lever. Fig. 5 is a plan view of those parts of the mechanism which are located under the works—that is to say, beneath the dial-plate—as they are to be seen after the latter has been removed, the hand-setting mechanism being at rest. Fig. 6 shows the said hand-setting mechanism in activity. Fig. 7 is a partial section showing the train of gears situated in the central part of the watch and the oscillating shaft I. Fig. 8 is a face view of the watch.

In all the figures the same letters refer to the same parts.

A is the usual mainspring-barrel acting upon the hour-hands and the minute-hands by means of the usual train of wheels. Said barrel gears into the pinion b^2 of a wheel B², (shown in Figs. 1^a and 7,) which acts upon a wheel B', fixed upon the axis of the center-wheel B. The latter engages the pinion c^x of a wheel C, which is in gear with the pinion d of a cog-wheel D, located beneath the plate, as seen in Fig. 5, and acting upon the pinion e of an escapement-wheel E, the axis of which bears on its upper end a toothed wheel E', substantially as in my patent numbered 355,403. The escapement-wheel E acts, as usual, upon an anchor e^x , engaging the axis of a balance-wheel E^x.

F is the stop-spring barrel acting upon the pinion g of a wheel G, which gears into the pinion h of another wheel H, the rotation of said wheel H being transmitted by means of a pinion h^x and of an intermediate wheel H', placed beneath the plate, as shown in Fig. 5, to the lower pinion i' of the shaft I, the upper end of which bears in a jewel bearing fixed to the one end of a rocking lever J, pivoted to an adjustable bridge J'. The upper end of said shaft I bears an upper pinion i^2 , intended to act upon the stop-wheel K.

The adjustable bridge J', Fig. 2, is pivoted to the movement-plate by means of its pivot j and kept in its place by means of a screw j' , passing through an elongated hole in said bridge. The lever J is loose upon a stem j^2 , secured to the bridge J', and said lever J bears a downwardly-projecting pin j^3 , against which acts a spring j^4 . Said spring presses the rear end of lever J against the cam-wheel O, and when one of the cam teeth or projections of the latter raises or acts on the lever J the pinion i^2 of the shaft I is brought into gear with the wheel K. When the mechanism has been taken to pieces and is to be re-assembled, the adjustable bridge J is allowed to be rocked on its pivot j , so that the teeth of the pinion i^2 of the shaft I may take very exactly into the spaces between the teeth of wheel K, and thus it is understood that after the adjustable bridge has been fixed again by means of its screw j' , and when the upper end of the shaft I is again oscillated by

means of the lever J, as already specified, the said pinion will be put into or out of gear with wheel K without any jump of the stop-hand either forward or backward.

5 The lower end of the shaft I bears under the dial-plate a wheel L', which gears into the pinion l', fixed to the lower end of a shaft L, bearing near its upper end small radiating wings l, meshing with the toothed wheel E',
 10 above mentioned. (See Figs. 7, 1^b, and 1 in succession.) The upper end of the shaft L is journaled in the shorter part of a rocking lever M, pivoted at m to a bridge m' and the longer part M' of which bears, under the action of a spring M³, against the cam-wheel O.
 15 Two superposed levers P' and P², both pivoted at p to the plate, bear under the action of a spring against the cam-wheel O and are provided with hook-shaped detents p' and p², respectively. The detent p' of the lever P' is intended to stop any one of the radiating wings l when the end of said lever P' engages into a notch of the cam-wheel O, while the detent p² of the lower lever P² is intended to
 25 engage a lower projection l' on the end of one of the said wings, whereby such wing is stopped. The said detent p² of the lever P² and the lower projection of one of the wings l are so combined as to have the quarter-seconds hand of the fractions of seconds stopped upon the zero of the dial when the other end of said lever P² engages a notch of the cam-wheel O. Therefore when the said quarter-seconds hand is to be stopped
 35 the cam-wheel is rocked into a position in which the lever P' engages a notch of said cam-wheel, so as to have its detent p' stop either of the wings l—for instance, upon the number 1, 2, or 3 of the seconds-dial, Fig. 8; and then,
 40 when the said number is recorded and the device is to be set to zero for a new record, the cam-wheel is rocked one tooth and the lever P' is lifted, so as to move its detent p' out of the path of the wings l; but at same
 45 time the lever P² engages a notch of the cam-wheel, and its detent p² stops the projection of one of the wings l and sets the quarter-seconds hand to zero.

The wheel O is provided with a lower
 50 ratchet-wheel which may be acted upon by means of a click Q, carried by a lever R, pivoted at r to a bridge R². The free end of lever R may be operated by means of a tubular sleeve R', surrounding the stem S, and upon which acts the pendant S', when the same is depressed. The rocking lever R is brought back to its normal position by means of a spring R^x, Fig. 3, which is arranged in a suitable recess provided on the edge of the
 60 bridge R² to which the said rocking lever is pivoted, said spring bearing against a pin r projecting from the lower side of the lever R into a suitable opening in said bridge R².

The arbor of the stop-wheel K bears the
 65 stop-hand K', a heart-cam k, and a pinion T', (shown in Fig. 7 of the drawings,) with which gears an intermediate wheel T, acting upon

the wheel U, the arbor of which bears a heart-cam U' and the minute-hand u. The heart-cam U' is carved or hollowed out in order to
 70 have its mass reduced, and the minute-hand u, fixed to the same arbor, is on the contrary made somewhat massive or heavy, so as to counterbalance the weight of said heart-cam. In this way the minute-hand u is perfectly
 75 poised and works quite uniformly.

In order to bring the stop-hand K' back to zero, and at same time the minute-hand u of the stop-watch, the mechanism is provided with a hammer-lever V, pivoted at v and
 80 bearing by its nose v', under the action of a spring V', against the cam-wheel O and arranged to act upon the heart-cam k, and also with a hammer-lever W, pivoted at w and arranged to act upon the heart-cam U'. The
 85 nose w' of the hammer-lever W bears under the action of a spring W' against a rocking-lever X, pivoted at x, and arranged so as to transmit to the said hammer-lever W every motion of the hammer-lever V.

Y is a click-wheel which may be actuated
 90 by means of the click z of a lever Z, pivoted at z' to a bridge R² and combined with a pusher Z', by which the short part of the lever is depressed and the click z caused to
 95 rotate click-wheel Y the distance of one tooth.

The rocking lever Z is brought back to its normal position by means of a spring, Fig. 4, arranged in a suitable recess provided in the edge of the bridge R², to which the said
 100 lever is pivoted, and acting upon a pin z^x, projecting from the lower face of the rocking lever Z into a suitable outcut or opening of the bridge R². The arbor of said wheel Y traverses the whole work, and bears beneath the
 105 dial-plate a cam-wheel Y', upon which bear the two arms y' and y² of the usual fork, intended to alternately seize or release the wheel Y², the sleeve of which bears the fly-back hand y³. The arbor k' of the seconds stop-wheel
 110 K passes through the sleeve of the wheel Y². The sleeve of wheel Y² is surrounded by a dead-sleeve a, carried by a bridge a', and around which rotates a minute-wheel b, the sleeve of which bears the minute-hand K², and
 115 upon which is sleeved the usual hour-wheel c', bearing the hour-hand K³. The minute-wheel b gears at same time into a wheel b' and into the intermediate wheel c, the pinion of which acts as usual upon the hour-wheel c'.
 120 d is a wheel rotating upon a sleeve, through which passes the axis of the wheel U' of the minutes meter-hand, and the rotation of which is then transmitted to the minute-wheel b through the wheel b'.

The hand-setting mechanism consists of a
 125 rocking lever g, pivoted at g', and having one of its ends engaging in a circular groove of the stem S, while its other end bears against a pin t of another rocking lever t', pivoted at
 130 t² and engaged in the circular groove of the usual sliding pinion f. A lever h, pivoted at h', is acted upon by means of a spring h², so as to catch the end of lever t' when the same

brings the sliding pinion f into gear with wheel d —that is to say, when the stem S is drawn out, Fig. 6. On the contrary, when the latter is pressed inwardly the lever h is brought back by the end of the lever g into the position shown in Fig. 5 of the drawings, in which it releases the end of lever t' , which is then raised by the spring t^3 , so as to release the sliding pinion f from the wheel d .

Having thus described my invention, I claim—

1. In a stop-watch with independent split-seconds hand, quarter-seconds-hand indicating the fraction of seconds, and fly-back hand, a fifth mover of the train actuating the stop, consisting in a rocking-shaft I traversing the watch-work, a wheel L' on the lower end of the shaft, near the dial-plate, and the pinion of which is acted upon by the usual train of wheels, a pinion on the upper end of the shaft placed near the stop-wheel K located at the top of the watch-work, a rocking-lever J , one of the ends of said shaft I which is near the dial, being journaled in a jewel bearing, and the other end of said shaft I being journaled in a bearing of the said rocking-lever J , a rocking-bridge J' having its pivot j located in the plate of the work and provided with a pin j^2 on which rocking-lever J is pivoted, and a screw j' traversing a slot of bridge J' , substantially as described and for the purpose specified.

2. In a stop-watch with independent split-seconds hand, quarter-seconds-hand and fly-back hand, a sixth mover formed of a long shaft L , a pinion on one end of the shaft, near the dial, actuated by means of the wheel L' of the fifth mover of the wheel-work acting upon the stop and wings l , on the other end of the shaft one of which is provided with a projection, a lever M on which is pivoted the upper end of shaft L , in combination with a cam-wheel O upon which the rear end of the lever M bears, a wheel E upon the arbor of the escapement-wheel and rocking-levers P' and P^2 having detents p' and p^2 and bearing upon a cam-wheel O , substantially as and for the purpose specified.

3. In a stop-watch with independent split-seconds hand, quarter-seconds-hand indicating the fractions of seconds and fly-back-hand, a minute-hand formed of a toothed wheel, a pinion placed on the arbor of the

stop-wheel and a train of gears between the pinion and toothed wheel the arbor of said wheel bearing on one of its ends a carved or hollowed out heart-cam counterbalanced by means of the hand secured on the other end of said axis, substantially as described.

4. In a stop-watch with independent split-seconds hand, quarter-seconds-hand indicating the fractions of seconds, and fly-back hand, the combination of the hammer-lever V , the hammer-lever W , with a rocking-lever X adapted to transmit to the lever W the motions of the lever V , substantially as described.

5. In a stop-watch with independent split-seconds hand, quarter-seconds-hand and fly-back hand, the lever R provided with a pin r^x , a click on the lever, and spring R^x located in a suitable recess of the bridge R^2 and acting against the pin r combined with a sleeve R' surrounding the crown stem S , said click being adapted to engage and to act upon the cam-wheel O , substantially as described.

6. In a stop-watch with independent split-seconds hand, quarter-seconds-hand and fly-back hand, a lever Z pivoted to a bridge of the watch-works, and provided with a click z , a toothed-wheel Y engaged by the latter, means for actuating the lever, a spring Z^x engaging a pin on said lever, a cam-wheel rotated by said wheel, and the usual fly-back fork y' , y^2 , acted on by the cam-wheel, substantially as set forth.

7. In a watch-work having independent split-seconds hand and fly-back hand, a hand-setting mechanism consisting of the combination of the grooved crown-stem S and the sliding-pinion f , with a spring-actuated lever t' pivoted at one side of the pinion, a lever g pivoted at the same side, engaging in the groove, and engaged by a portion of lever t' , and a spring-actuated lever h pivoted at the opposite side of the pinion and engaged by the ends of the levers t' and g , substantially as set forth.

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

AMI LECOULTRE-PIGUET.

Witnesses:

ELMER SCHNEIDER,
BENJ. H. RIDGELEY.