

(No Model.)

F. BOURQUIN.
STOP WATCH.

No. 458,348.

Patented Aug. 25, 1891.

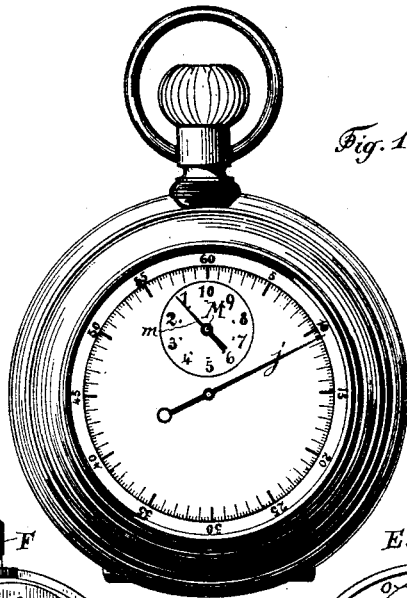


Fig. 1.

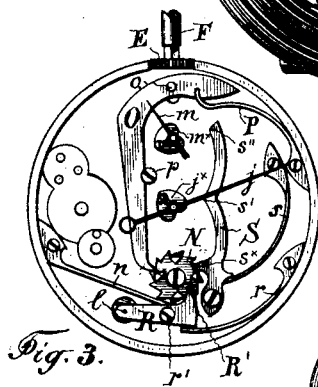


Fig. 3.

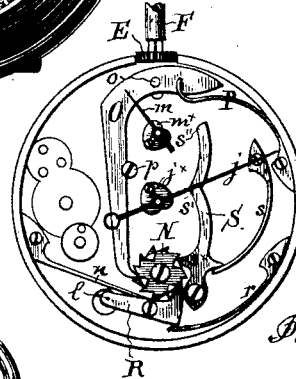


Fig. 4.

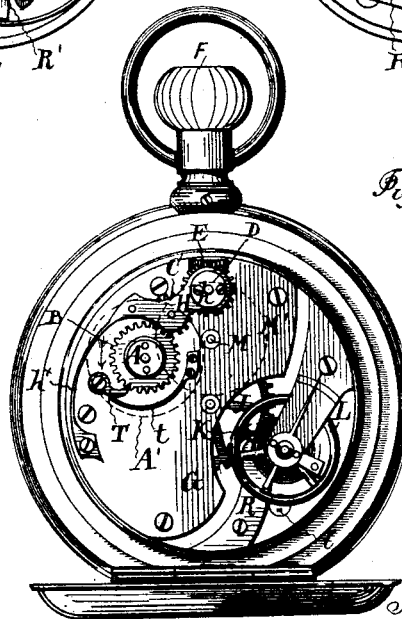


Fig. 2.

Witnesses

Charles H. Smith
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Inventor

Ferdinand Bourquin
per Lemuel W. Serrell
[Signature]

UNITED STATES PATENT OFFICE.

FERDINAND BOURQUIN, OF ST. IMIER, SWITZERLAND.

STOP-WATCH.

SPECIFICATION forming part of Letters Patent No. 458,348, dated August 25, 1891.

Application filed March 10, 1891. Serial No. 384,397. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND BOURQUIN, watch-manufacturer, of St. Imier, Switzerland, have invented an Improved Stop-Watch, of which the following is a specification.

The improved stop-watch mechanism of the present invention is characterized by the peculiar shape and arrangement of the levers and the hand-actuating mechanism.

In the accompanying drawings, Figure 1 is a plan of the dial. Fig. 2 is a plan view of the movement as it is to be seen at the side opposite the dial when the watch-case is open. Figs. 3 and 4 are plan views of the stop-watch levers as they are seen when the dial is removed. In Fig. 3 the parts are represented as if hands are in motion, and in Fig. 4 as if stopped and ready to be set at zero.

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

The motor of the stop-watch is composed of a mainspring-barrel A', having its axis A provided with a gear-wheel B, which may be revolved by means of the wheels E, D, and C, when the stem F is turned from left to right. A suitable click T with spring *t*, engaging the teeth of said wheel B, prevents the back rotation of the axis A of the mainspring. The wheel D is pivoted to the bridge G by means of a disk *h*, which is, moreover, the fulcrum of the oscillating bridge H, bearing the wheel C. A spring *h*^x causes the wheel C to remain in gear with wheel B, but allowing the same to be lifted out of gear when the stem F is turned to the left, as the wheel B cannot be turned in a direction opposite to that indicated by an arrow in Fig. 2. If such left rotation of the stem takes place, then the wheel C jumps from tooth to tooth in and out of gear with the wheel B, the latter being motionless. The stem F is adapted to slide axially with its squared portion in a square hole of the crown-wheel or pinion E. The gear-wheel of the spring-barrel A' acts upon the pinion of a wheel M', the axis M of which bears a heart-piece *m*^x, to which is affixed the minutes-hand *m*. The said wheel M' gears with the pinion of a third wheel J, having its axis in the center of the movement, and said axis carries a heart-piece *j*^x, to which is affixed the seconds-hand *j*. The wheel J is in gear with the escapement-wheel K.

L is the balance-wheel, which is alternately free to oscillate or stopped by means of a fine spring *l*, bearing against the circumference of the balance-wheel L when the latter is to be stopped, as will be shown below. The heart-pieces *j*^x and *m*^x are not affixed to their respective axes. They are provided with suitable friction-springs upon those heart-pieces and bearing against the axes of the wheels J and M', respectively.

N is the usual cam with brake-spring *n*. Said cam is turned one tooth at each depression of a lever O, which has a projection *o*, upon which the end of the stem F bears, and is acted upon by a spring P, which lifts the same after each depression of the stem F and also moves the lever laterally against a guiding-screw *p*.

R is the stopping-lever bearing the fine spring *l* mentioned above and having its fulcrum at *r*'. The spring *r* causes the point R' of lever R to bear against the cam N, and according to the position of the latter the fine spring *l* is moved from the balance L when the point R' passes into a notch of the cam N, Fig. 3, or the said spring is pressed against the balance L when the point R' is lifted by an elevated portion of the cam N, Fig. 4.

S is a hammer-lever, the points *s*' and *s*² of which act upon the heart-pieces *j*^x and *m*^x, respectively. The projection *s*^x of said lever S is pressed by means of a spring *s* upon the cam N, and when said projection *s*^x falls into a notch of the cam N the lever S falls toward the heart-pieces *j*^x and *m*^x, and thereby causes the hands *j* and *m* to be set to zero.

If the mechanism is in the position shown in Fig. 3, the hands are in motion. Now if one depresses the stem F the lever O will cause the cam N to be turned one tooth and to take the position shown in Fig. 4. The point R' of lever R has been lifted and the hair-spring *l* pressed toward the circumference of the balance L. Hence the watch is stopped. The position of the lever S has not been changed by this function. Now if one depresses the stem F again the lever O causes the cam N to be turned one tooth, and then the point *s*^x of the lever S falls into a notch of the cam N, and the points *s*' and *s*² act simultaneously upon the heart-pieces *j*^x and *m*^x. Thereby the lever R remains in its

foregoing position until a new depression of the stem F causes the point R' to fall again into a notch of the cam N, causing the hands to move by throwing the hair-spring l out of reach of the balance L.

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I claim as my invention—

The combination, in a stop-watch, with the arbors, hands, and the actuating mechanism, of the push-stem F, the pawl-lever O, actuated thereby, and its spring P, the toothed cam N, 10 operated by the lever O, the lever R, and its

hair-spring l, operated by the cam N to engage and stop the balance-wheel, substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 15

FERDINAND BOURQUIN.

Witnesses:

F. CHAPNY,

E. HIRSEHY.