(No Model.)

P. SANDOZ-BARBIER.

STOP WATCH.

No. 455,026. Patented June 30, 1891.

Fig. 3.

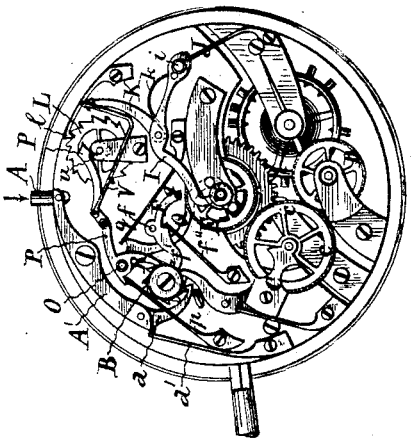


Fig. 6.

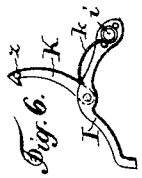


Fig. 2.

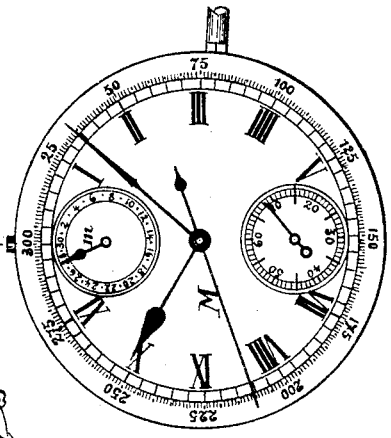


Fig. 4.

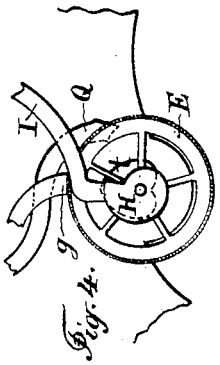


Fig. 5.

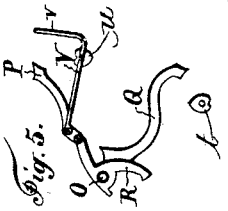
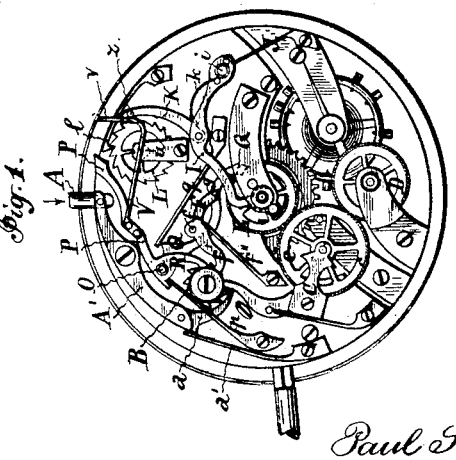


Fig. 1.



Witnesses

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atty

UNITED STATES PATENT OFFICE.

PAUL SANDOZ-BARBIER, OF CHAUX-DE-FONDS, SWITZERLAND, ASSIGNOR TO MARCHAND & SANDOZ, OF SAME PLACE.

STOP-WATCH.

SPECIFICATION forming part of Letters Patent No. 455,026, dated June 30, 1891.

Application filed February 26, 1891. Serial No. 382,939. (No model.) Patented in Switzerland August 14, 1890, No. 2,440.

To all whom it may concern:

Be it known that I, PAUL SANDOZ-BARBIER, watch-manufacturer, of Chaux-de-Fonds, in Switzerland, have invented certain new and useful Improvements in Stop-Watches, more particularly applicable in combination with repeating-watches, (for which I have obtained a patent in Switzerland, No. 2,440, dated August 14, 1890,) of which the following is a specification.

The invention relates to stop-watches having a seconds-hand and a minute-hand.

This improvement may be combined with different mechanism of stop-watches with or without sounding mechanism; but in the accompanying drawings said improvements are shown as they are applied to a sounding watch, said mechanism being for that purpose placed upon the top of the watch-movement and not between plate and dial, as usual.

The improvements relate especially to the transmission of motion from the seconds-hand to the minute-hand.

In the drawings, Figure 1 is a plan view of the improved mechanism. Fig. 2 is a plan view of the dial. Fig. 3 shows the stop mechanism for the hands at rest at zero. Fig. 4 shows on an enlarged scale the pieces operating the transmission of movement from the seconds-hand to the minute-hand. Fig. 5 shows separately the form of lever P, and Fig. 6 shows separately the form of lever I.

The starting and the stopping of the seconds-hand M is effected by an oscillating bridge C, carrying an intermediate wheel *c* to transmit the rotation of a wheel D, which is affixed upon the axis of one of the wheels of the watch-movement to a wheel E, the axis of which carries the hand *m*. The fulcrum of the oscillating bridge C is placed so as to have the wheel *c* remaining always in gear with wheel D. The arm of the bridge C projects toward the cam B, and when it rests upon a full part or falls into a notch of said cam the wheel *c* is in or out of gear with the central wheel E to move the seconds-hand M to allow it to stop. The cam B is moved by a pusher A, acting upon one end of a double-armed lever A′, which has on its other end a click or hook *a*, acted upon by a spring *a′*. At each depression of the pusher A the click or hook *a* turns the cam B one tooth, and when the pusher is released the spring *a′* restores the pusher to its normal position and the hook *a* to be hooked to the next tooth of the cam B. To stop the seconds-hand accurately, there is a brake-lever F, having its fulcrum in *f*, and the one arm *f′* of which is pressed by the spring *f″* against the cam B. The end *g* of said lever *f* bears against the circumference of the wheel E, acting like a brake when the arm *f′* rests upon an elevated portion of the cam B, and it is thrown out of contact with said wheel E when the arm *f′* falls into a notch of the cam B.

The axis of wheel E is provided with a cam H, against which rests one end of a lever I, having its fulcrum in *i*. A spring J maintains the same in the said position. The lever I carries a hook K, acted upon by a small spring *k*, so as to gear with the teeth of the wheel L. The latter may at will directly carry the hand that indicates the minutes, or, as in the mechanism shown in the drawings, transmit its motion to the said hand *m* by suitable intermediate wheels placed beneath the dial. (Not shown.) When the stop-movement is in action, the cam H, turning with the wheel E, lifts the lever I once at each of its revolutions. This causes the hook K to turn the wheel L one tooth at each revolution of the wheel E, when the lever I falls from the top of the cam H upon the lowest part of the latter. *l* is a retaining-spring preventing the jumping of the wheel L more than one tooth at a time. To set the hands M and *m* to zero, there are provided two levers or hammers P and Q, having a common fulcrum O and a similar arm R, bearing against the cam B under the action of the springs *p* and *q*. When the arm R falls into a notch of the cam B, the hammers P and Q are caused to strike upon the heart-piece *t* and *u*, which bear the hands M and *m*, respectively. The heart-piece *u* being affixed to the wheel L, it is necessary to disengage the hook K from said wheel L when the hand *m* is to be set to zero. To effect this the lever P has an arm V, the part *v* of which bears against a pin *z* of the hook K. The arm V causes the hook K to be disengaged, as seen in Fig. 3, somewhat before the lever P is striking toward the heart-piece *u*.

The action of the whole mechanism is as follows: The mechanism being connected with the train, Fig. 1, if the pusher A is depressed the cam B will act simultaneously upon the bridge C to disengage wheel *c* from wheel E and upon the lever F to cause the same to act as a brake upon the wheel E. If the pusher is depressed again, the cam B will maintain the bridge C in its previous position, but lift the brake-lever F out of contact with E, and the cam will simultaneously cause the lever Q to strike upon the heart-piece *t* and the lever P to strike upon the heart-piece *u*, and the lever P disengages the hook K from wheel L. At a third depression of the pusher A the cam B causes the bridge C to replace the wheel *c* into gear with wheel E. The lever F remains in its previous lifted position and the lever P with its arm V and lever Q are lifted out of reach of the heart-pieces *u* and *t*. Thereby the hook K falls again into gear with wheel L, and the cam H causes the said hook K to turn the wheel L, as above specified, once at each revolution of the wheel E.

Having thus described my invention, I claim—

In a stop-watch, the combination, with the wheel L, heart-cam, and hand *m*, of the cam B, a lever P, having an arm R, bearing against cam B under the action of a spring *p*, the lever I, and hook K, and an arm V for lifting the hook K out of reach of the teeth of the wheel L before the lever P strikes upon the heart-cam, substantially as shown and described, and for the purpose specified.

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

PAUL SANDOZ-BARBIER. [L. S.]

Witnesses:

ADOLPHE BROSSARD,

ETIE MONNIERE.