V. BOUSSET.

Escapement for Watches.

No. 217,326. Patented July 8, 1879.

Fig. 1.

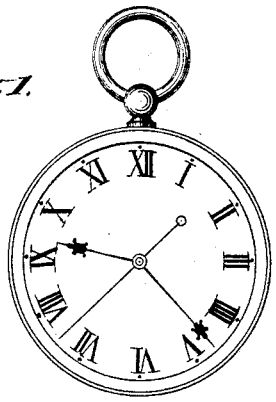


Fig. 2.

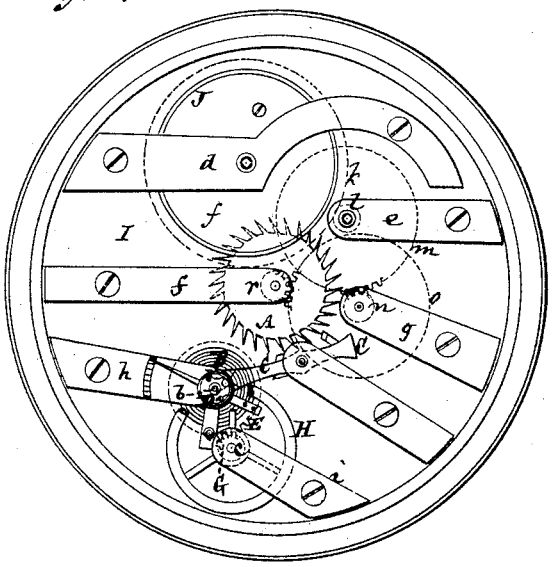
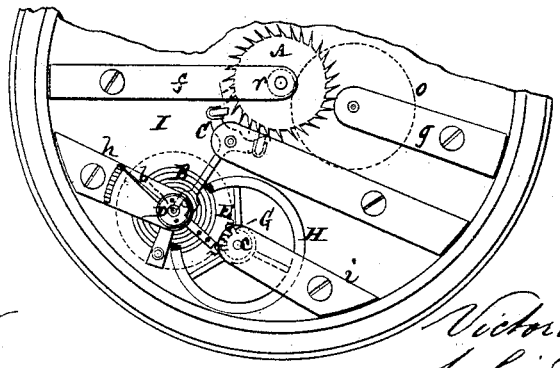


Fig. 3.



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VICTORIEN BOUSSET, OF MOREZ-DU-JURA, FRANCE.

IMPROVEMENT IN ESCAPEMENTS FOR WATCHES.

Specification forming part of Letters Patent No. **217,326**, dated July 8, 1879; application filed September 28, 1878.

To all whom it may concern:

Be it known that I, VICTORIEN BOUSSET, of Morez-du-Jura, in the Department of Jura, France, have invented a new and useful Improvement in Escapements for Watches and other Time-Pieces, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention especially relates to dead-beat escapements organized to beat seconds, and is applicable not only to watches, but to other time-pieces employing a balance or hair spring and balance-wheel.

The invention consists in an arrangement of the balance-spring upon a separate arbor to that which carries the balance-wheel, said separate arbor being provided with a toothed wheel arranged to gear with a pinion fast on the balance-wheel, that is thus rapidly moved alternately in opposite directions by the coiling and uncoiling of the balance-spring, and so far as its courses of motion are concerned is analogous to the ordinary balance. This arrangement has the effect of materially reducing the coiling and uncoiling movements of the balance-spring, so that the escapement-wheel, which is commanded by an anchor or other pallet-carrying device, marks seconds instead of the fifth or other fractional portions of seconds, as in ordinary watches, and I thus obtain direct from the escape-wheel arbor a seconds indication, and dispense with the gearing heretofore necessary in order to cause a dial-hand to beat seconds.

In the accompanying drawings, Figure 1 represents a face view of a watch having my invention applied; Fig. 2, an interior face view, upon an enlarged scale, of the works of the watch having the invention applied in connection with a lever-escapement; and Fig. 3, a like view, in part, to Fig. 2, showing the invention applied in connection with an anchor-escapement.

In said drawings, A is the escapement-wheel, which has thirty (30) teeth. B is the balance-spring, and C is the anchor or lever carrying the pallets, which engage with the escapement-wheel, and connect the latter by a pin-disk, D, with the balance-spring. Said anchor or pallet-carrying lever may be like that of the ordinary English escapements, and be constructed so that each movement of the anchor conforms to a half-tooth of the escapement-wheel, or, in other words, two impulses are given to the anchor by each movement of said wheel, whereby the latter between each of its progressive actions presents well-marked periods of rest. The arbor of this escapement-wheel C projects beyond the dial and carries the seconds-hand, which advances each second by a jerk or beat one-sixtieth part of an entire revolution.

It will be understood, then, that without materially adding to the usual mechanism of watches or clocks, I obtain a veritable chronometer action, marking dead seconds as perfectly as if such indication were furnished by a separate and more or less complicated mechanism.

The arbor *b*, which carries the balance-spring B and the pin-disk D of the escapement, also carries a toothed wheel, E, which has a vibratory motion in conformity with the action of said spring. This wheel E gears with a pinion, G, fast on the staff *c* of the balance-wheel H, and so transmits an accelerated vibratory motion to the fly or balance wheel.

The invention is not restricted to any particular arrangement of the anchor or pallet-carrying escapement-lever relatively to the escapement-wheel, nor to any particular construction of the pallets of the anchor, although it is preferred to incline them in a reverse direction to those of an ordinary anchor. Neither is the invention restricted to any particular arrangement of the bridges *d*, *e*, *f*, *g*, *h*, and *i* relatively to the main plate I for support of the mainspring-barrel J, and various wheels and pinions, including those by which motion is communicated from the mainspring-barrel to the escapement-wheel, which wheels and pinions, as here represented, are indicated by the letters *k*, *l*, *m*, *n*, *o*, and *r*, a *remontoir*, if desired, being used above the bridges when the latter do not project above the main plate.

In the arrangement represented in the drawings, the large intermediate wheel, *m*, is eccentric to the center of the watch, in order that the escapement-wheel and the seconds-hand attached to its spindle may be in the center thereof; but said intermediate wheel may be

in the center of the watch, and in such case the seconds-hand may be arranged to move over a separate small dial in or on the lower part of the large dial and in front of the hour VI.

As hereinbefore observed, the several parts of the escapement may be supported by a plate and bridges, both when the invention is applied to watches and to clocks or chronometers, and in the application of the invention to clocks or chronometers it is only necessary to make the escapement-wheel, the wheel attached to the balance-spring, the anchor, and the balance-wheel of larger dimensions than in the case of a watch. In clocks, however, the escapement may be put in place above the general movement and fitted into a groove in the top of the plates of the latter in such manner that the pinion on the escapement-wheel gears with the center-pinion, which in its turn gears in the manner common to various kinds of time-pieces. In other words, the great intermediate wheel may gear with a pinion having no large wheel on its arbor, which, passing through the dial, carries the seconds-hand. The invention, however, is not restricted to any particular system of gearing pertaining to the general movement.

Having now explained the nature and object of my invention, and the mechanism by which this object is attained, I claim—

The combination, in a watch having a dead-beat escapement, of an escape-wheel with thirty teeth and an arbor projecting in front of the watch-face to carry a seconds-hand, a pallet-lever connecting said escape-wheel with a staff carrying a balance-spring and a toothed wheel, and an arbor carrying a balance-wheel and a toothed wheel engaging with said toothed wheel on the balance-spring staff, said toothed wheels being so proportioned that the balance-wheel arbor will oscillate much more rapidly than the balance-spring staff, which, through a suitable pin, causes the escape-lever and escape-wheel to beat seconds when the watch is properly regulated, substantially as set forth.

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