(No Model.)

S. E. KOCHENDERFER.

BALANCE ESCAPEMENT FOR WATCHES.

No. 386,592. Patented July 24, 1888.

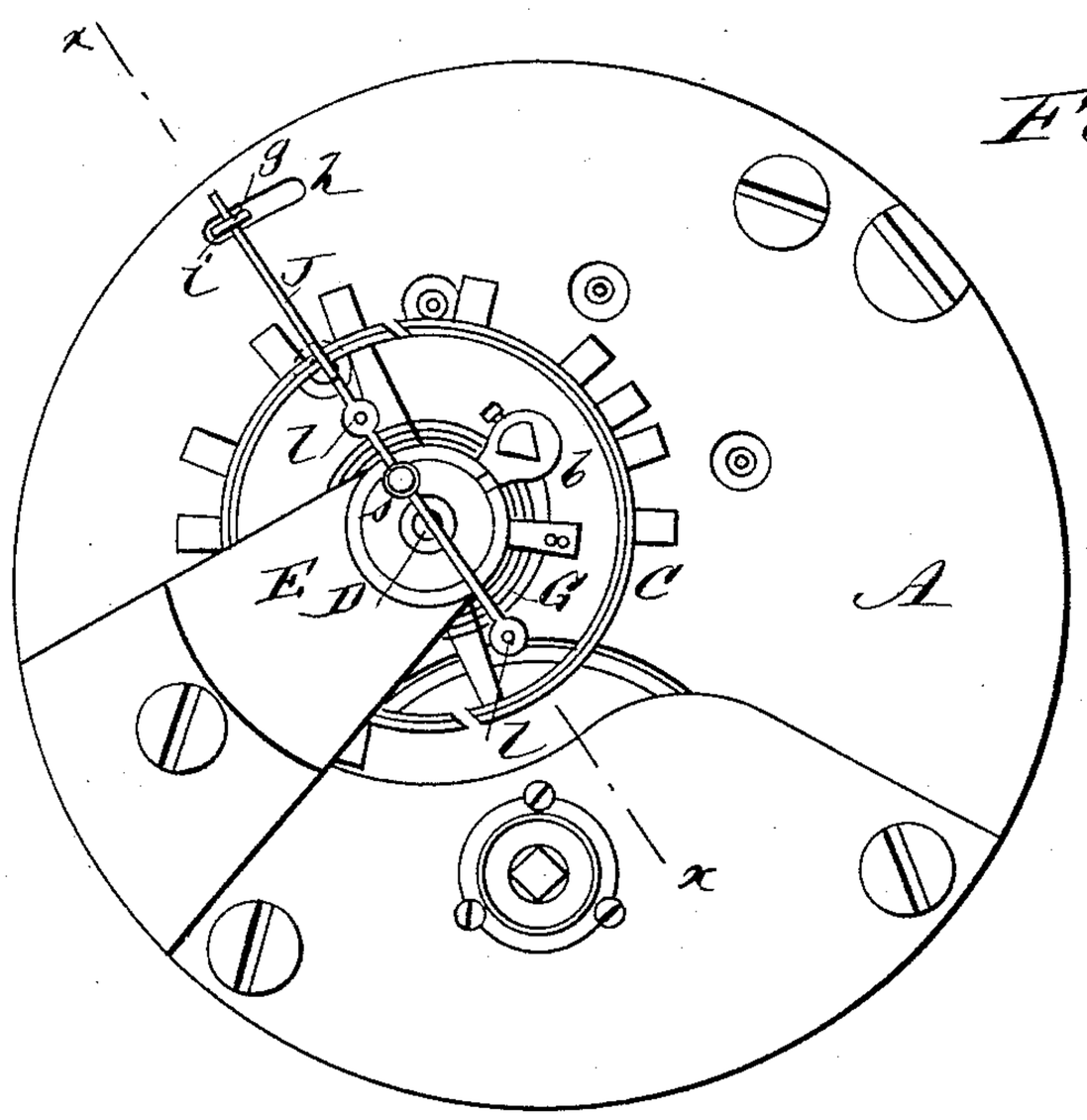


Fig. 1

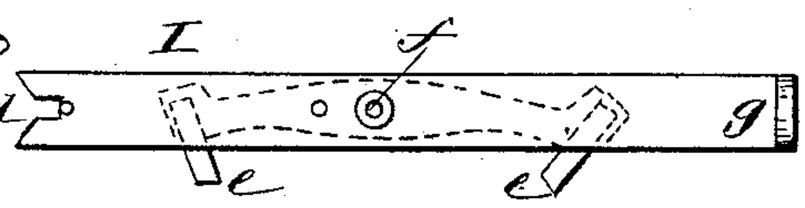
Fig. 2

Fig. 3

WITNESSES:

C. Neveux

C. Sedgwick.



INVENTOR,

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SIRUS E. KOCHENDERFER, OF HOLLIDAYSBURG, PENNSYLVANIA.

BALANCE-ESCAPEMENT FOR WATCHES.

SPECIFICATION forming part of Letters Patent No. 386,592, dated July 24, 1888.

Application filed April 24, 1888. Serial No. 271,670. (No model.)

To all whom it may concern:

Be it known that I, SIRUS E. KOCHENDERFER, of Hollidaysburg, in the county of Blair and State of Pennsylvania, have invented a new and useful Improvement in Watch-Movements, of which the following is a full, clear, and exact description.

This invention relates to watches and other time-pieces in which a hair-spring and balance-wheel are used in connection with the escapement; and it consists in the application thereto of a governor in the form of a free curb actuated by the pallet or escapement-lever and receiving freely within it the hair-spring in such manner that on exposure of the watch to jar or shock the hair-spring will be restrained from yielding thereto, which is liable to produce lost motion or irregularity in the balance, thereby causing the watch to keep incorrect time, and often causing the pin on the roller of the balance-staff to work out of timely relation with the fork of the pallet or escapement-lever, and thereby either stopping the watch or producing breakage. My invention obviates this.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a plan view of so much of a watch-movement as is necessary to illustrate my invention, which is shown applied thereto. Fig. 2 is a transverse section, upon a larger scale, of the same, taken in direction of the line *x x* in Fig. 1; and Fig. 3 is a plan view of the forked pallet or escapement-lever of the watch, and pallets which engage with the escapement-wheel.

A is the usual top plate, and B the main or bottom plate.

C is the ordinary or any suitable balance-wheel, and D its staff, supported above in a jewel in the cock E and in a lower jewel below in the usual support.

G is the hair-spring, attached, as usual, to the balance-staff at its one end and to a fixture, *b*, at its other.

H is the roller on the balance-staff, and *c* the pin on said roller, which works in the fork *d* of the pallet or escapement-lever I, carrying the pallets *e*, which engage with the escapement-wheel (not shown here) and vibrating on or with the arbor *f*.

The outer or back end of this lever I is extended and bent to form a slotted arm, *g*, which is free to work through a slot, *h*, in the top plate, A, and which projects above said plate. This arm *g* engages with a bent arm, *i*, of a vibrating rod or wire, J, having its pivot *s* a little to one side of the axial line of the balance-staff, and having inwardly-projecting curbs *l l*, that serve to receive freely but moderately closely in between them the hair-spring G, the same embracing opposite sides of the latter on reverse sides of the fixture *b*. This wire J, with its attached curbs *l l*, constitutes the governor, which is vibrated in common with the lever I, by which it is driven, and serves to equalize the motion and adjusts equal motion in any position the watch may be turned.

In case of shock or jar to the watch the balance-wheel is restrained from making lost motion by the curbs *l l* of the governor controlling any irregular vibration or yielding of the hair-spring G, and as the governor J and its actuating-pallet or escapement-lever I are synchronous in their action upon or from their respective centers the pin *c* of the roller H will always work in proper unison with the lever I to engage with the fork *d* of said lever, and will be restrained from passing the lever and striking it in coming back, and so locking the balance or producing breakage of the pin-jewel.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a watch-movement, the combination, with the hair-spring, balance-wheel, and roller-pin, of the forked pallet or escapement-lever and a vibrating governor actuated by said lever and adapted to freely embrace opposite sides of the hair-spring, substantially as specified.

2. The vibrating governor J, with its attached curbs *l l*, working upon or from an independent pivot, *s*, in combination with the hair-spring G, the balance-wheel C, balance-staff D, the roller H, with its attached pin *c*, and the pallet or escapement-lever I, having a fork, *d*, at its one end and extended and constructed at its opposite end to establish a vibrating engagement with the governor J, essentially as shown and described.

SIRUS E. KOCHENDERFER.

Witnesses:
EDWARD GARDNER,
FRANK J. OVER.