

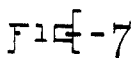
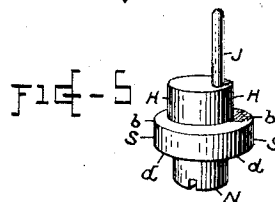
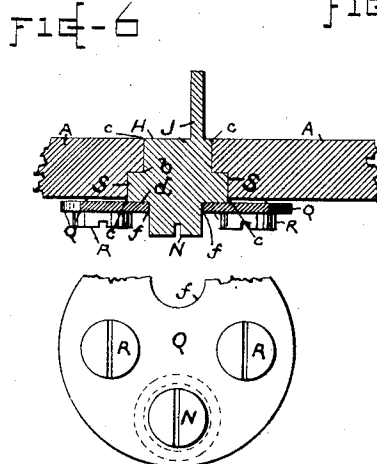
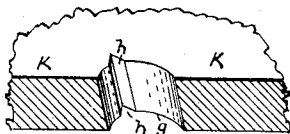
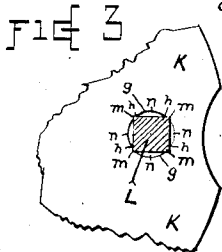
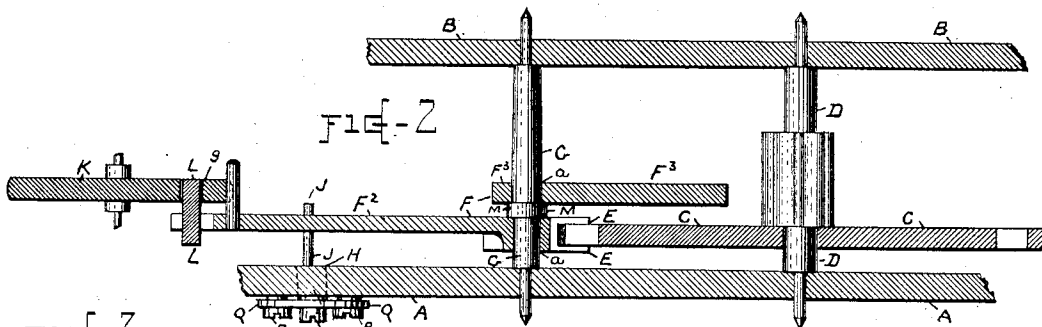
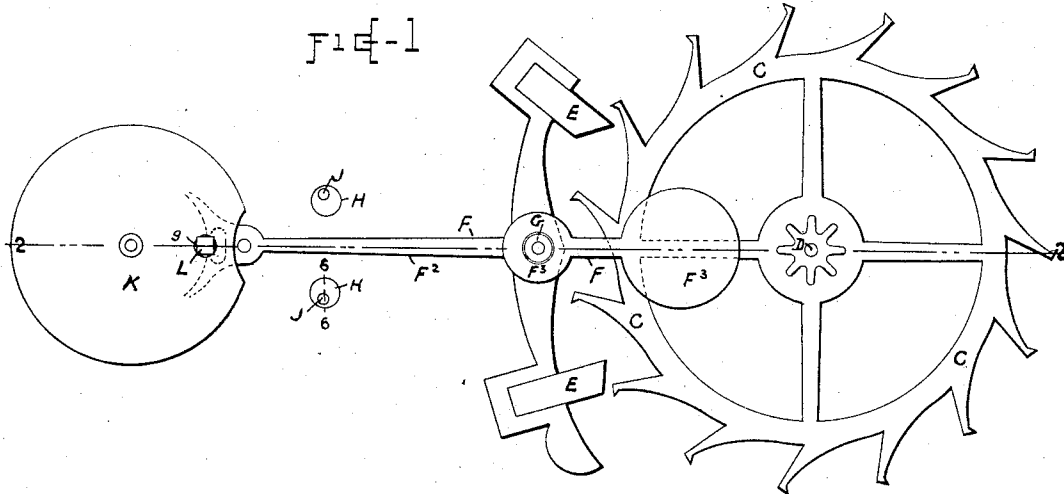
(No Model.)

C. V. WOERD.

ESCAPEMENT FOR TIME PIECES.

No. 372,003.

Patented Oct. 25, 1887.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES V. WOERD, OF WALTHAM, MASSACHUSETTS.

ESCAPEMENT FOR TIME-PIECES.

SPECIFICATION forming part of Letters Patent No. 372,003, dated October 25, 1887.

Application filed March 23, 1887. Serial No. 232,179. (No model.)

To all whom it may concern:

Be it known that I, CHARLES V. WOERD, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Watch-Escapements, of which the following is a full, clear, and exact description.

These improvements in watch-escapements relate particularly to the attachment of the roller-pin to the balance-wheel roller, to the construction of the pallet-fork and the banking-pins, and to their attachment and adjustment.

Under this invention the roller-pin is square sided, and is secured in a round opening of the balance-wheel roller, which is slightly greater in diameter than the diagonal dimension of the square pin, and is notched at four equidistant points to receive and confine the four corners of the roller-pin, leaving four segmental spaces about the pin to be filled with cement of any suitable kind. Again, the pallet-fork is made in two separate parts, one constituting the longer arm and the other the shorter arm of the fork, and each of which parts is adapted for separate and independent attachment and adjustment upon the arbor of the fork; and again, the stud of the banking pin has a peripheral shoulder intermediate of its length, and this shoulder, with the remaining length of the stud, fits closely within, but so as to be free to be turned in, a correspondingly-shaped bearing or seat of the support therefor of the watch-movement, and so fitted the stud is secured by means separate from it and which are attached to the said support, and all in a manner to exert a pressure endwise of the stud.

In the accompanying plate of drawings, forming part of this specification, the present improvements in watch-escapements are illustrated on an enlarged scale.

Figure 1 is a face view of the escape-wheel, the pallets and their fork, the banking-pins, and balance-wheel roller and its roller-pin, all in accordance with said improvements. Fig. 2 is a section on line 2 2, Fig. 1, and also in part of the top and pillar plates of the watch-movement. Figs. 3 and 4 are detail views of the roller-pin and the notched opening of the balance-wheel roller to receive and hold it. Fig. 5 is a perspective view of a banking-pin

and its stud detached. Fig. 6 is a detail section on line 6 6, Fig. 1, and Fig. 7 is a face view in detail of the under side of the parts as they are shown in Fig. 6.

In the drawings, B and A represent the top and pillar plates of a watch-movement. C is the escape-wheel, and D is its arbor. E E are the pallets. F is their fork, having long and short arms F² F³, and G is the arbor of fork F. J J are the banking-pins and H H are their studs, and K is the balance-wheel roller, and L is the roller-pin, all, except as to the features of this invention, and which hereinafter appear, constructed, arranged, and operating together and separately as ordinarily, and therefore in such particulars needing no particular description herein.

The long and short arms F² F³ of the pallet-fork F are made separate from each other, and each has a round hole, *a*, for the placing of the arms upon the arbor G of the pallet-fork, and which arbor, preferably, is provided with a collar, M, to hold them separated from and from bearing upon each other, each arm fitting the arbor friction-tight. This two-part construction and independent attachment of each part of the pallet-fork upon the arbor renders each part capable of independent and separate adjustment as to its position for the best and most even operation of the fork with its pallets, and as a whole in its working as to its opposite ends and to the other parts of the escapement, in conjunction with which it works, as is well known.

The stud H of each banking-pin J is cylindrical, and it has a peripheral shoulder, *b*, between its two ends and at one side of a collar, S, having at the other side thereof another shoulder, *d*, and a nicked head, N, for convenience in turning the stud to adjust its banking-pin, which, as usual, is eccentric to its axis of rotation.

c is the seat for the stud H of a banking-pin, and formed in and through the thickness of the top plate, B. This seat *c* is shaped to make a bearing for the shoulder *b* and to receive the remaining portions of the stud H, so that the stud may be turned or rotated therein. The stud H at its shoulder *d*, opposite to its shoulder *b*, has a plate or washer, Q, at a bearing upon it, and which is secured by headed screws

R, passing loosely through it to the top plate, B. This plate or washer Q has holes *f* for the projection of the nicked heads N of the stud H of the banking-pin J, two banking-pins being used, one on each of the opposite sides of the pallet-fork, and both attached, as stated, to the top plate, B. Said plate Q is pressed against the outer shoulder, *d*, of the collar S of both studs, and thus the studs and banking-pins are made fast against accidental rotation; but, as is plain, they can be readily released for adjustment or change, when so desired, by simply loosening said binding or fastening screws R.

It is obvious the banking-pins are held against movement by a pressure or bind exerted on their studs in a direction from end to end, and the binding-plate may be of a disk shape, as shown, or of an annular or ring shape; or a separate plate for each stud may be used; or, again, the binding-screws R may be arranged to bear directly on the collar of the stud, instead of through an intervening plate, Q, as shown, and still secure the desired end-wise pressure on the stud to confine it.

The roller-pin L of the balance-wheel roller K is square sided, as it well known, and it is received in a round hole, *g*, of the roller. This hole *g* has a diameter slightly less than the diagonal of the square-sided roller-pin, and it is provided with four equidistant notches, *h*, of suitable size to receive and to make close fit with the square corners *m* of the roller. These notches are situated so as to definitely determine and fix the position of the corners and flat faces of the roller-pin upon the roller and to insure the position necessary therefor in the operation of the roller-pin in connection with the fork of the pallets, as well known.

With the roller-pin inserted in roller, segmental spaces *n* are left at the several square sides of the pin, and these spaces are to be filled with cement, as is well known, thus completing the attachment of the roller-pin to the balance-wheel roller.

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

1. In a watch-escapement, a pallet-fork having its opposite arms *F*² *F*³ made separate and independently attached to the arbor of said fork, substantially as described, for the purposes specified.

2. In a watch-escapement, a pallet-fork having its opposite arms *F*² *F*³ made separate and independently attached to an arbor, G, of said fork, having a separating-collar, M, substantially as described, for the purposes specified.

3. In a watch-escapement, a banking-pin, J, having a shouldered stud, H, in combination with a correspondingly-shaped seat for said stud in the support therefor of the watch-movement, and means separate from and applied to said stud to confine it endwise in its said support, substantially as described, for the purposes specified.

4. In a watch-escapement, a banking-pin, J, having a shouldered stud, H, in combination with a correspondingly-shaped seat for said stud in the support therefor of the watch-movement, and means separate from and applied to said stud, consisting of a plate, Q, and binding-screw R, to confine said stud endwise in its said support, substantially as described, for the purposes specified.

5. In a watch-escapement, a square-sided roller-pin, L, in combination with a round opening, *f*, of the balance-wheel roller, having notches *h*, to receive the corners of said pin, and leaving segmental spaces *n*, to be filled with cement, substantially as described, for the purposes specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHAS. V. WOERD.

Witnesses:

ALBERT W. BROWN,
FRANCES M. BROWN.