2 Sheets—Sheet 1.

J. J. JOHNSTON.

Escapement for Time-Keepers.

No. 220,763. **Patented Oct. 21, 1879.**

Fig. 1.

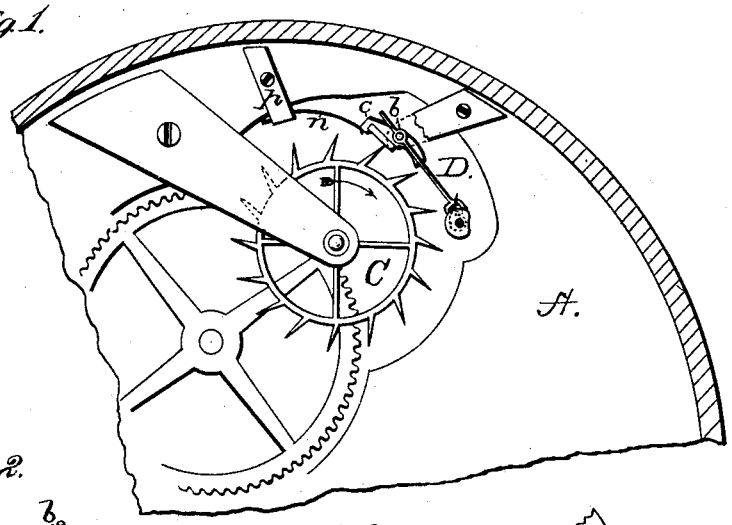


Fig. 2.

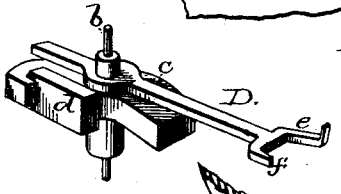
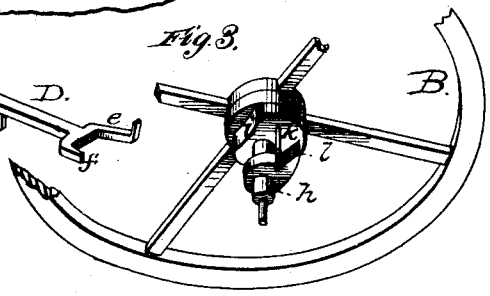


Fig. 3.



WITNESSES

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Fig. 4.

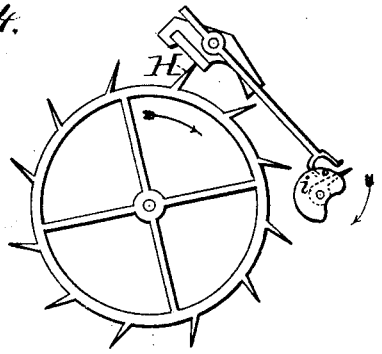


Fig. 5.

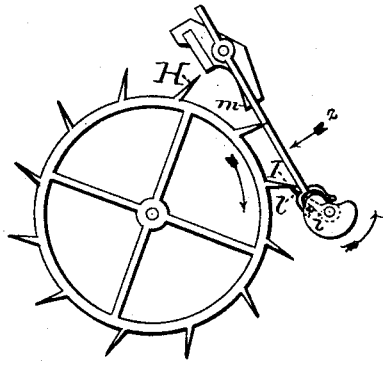


Fig. 6

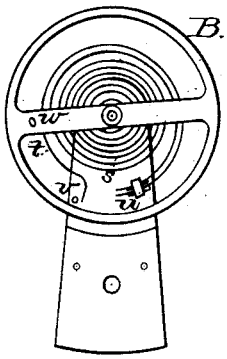
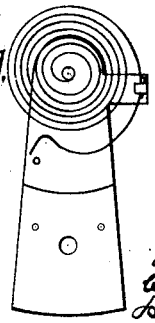


Fig. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN JAY JOHNSTON, OF PITTSFIELD, ILLINOIS.

IMPROVEMENT IN ESCAPEMENTS FOR TIME-KEEPERS.

Specification forming part of Letters Patent No. **220,763**, dated October 21, 1879; application filed April 24, 1879.

To all whom it may concern:

Be it known that I, JOHN JAY JOHNSTON, of Pittsfield, in the county of Pike and State of Illinois, have invented new and valuable Improvements in Time-Keepers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a plan view of my improved escapement, showing the parts in position. Fig. 2 is a perspective view of the detent-pallet and detent-lever. Fig. 3 is a part perspective view of the balance-wheel, showing the operating attachments. Figs. 4 and 5 are plan views of the escapement, showing the parts in different position. Figs. 6 and 7 are views of the banking device.

This invention relates to certain improvements in time-keepers; and the object is to provide improved means for regulating the motion of the escapement-wheel of the watch, and a banking device to prevent the balance-wheel under certain circumstances from vibrating beyond a certain point to destroy the regularity of motion to the movements.

My improvements consist in the novel construction of the oscillating pallet, the forked lever, and the attachments secured to the balance-wheel.

My invention further consists in attaching an auxiliary spring to the balance-wheel-support frame, or in a continuation of the hair-spring, in combination with a pin, forming a banking device, so arranged that as the hair-spring uncoils it forces itself against the auxiliary spring, which prevents the balance-wheel from vibrating too far.

In the annexed drawings, forming a part of this specification, the letter A represents a portion of one of the supporting-plates of a watch; B, the balance-wheel, and C the scape or escapement wheel, of the usual construction substantially.

The letter D indicates the detent-lever, working on the pivot *b*, located at an angle above the scape-wheel. To this lever is journaled, near its upper end, a device, *c*, known as the "detent-pallet," carrying a ruby, *d*, or other hard substance. This detent-pallet is so journaled to the detent-lever as to have a slight oscillatory movement, as shown by full lines in Figs. 4 and 5 of the drawings.

The rear or lower end of the detent-lever D is bifurcated or forked—that is to say, it has two arms, *e f*, of different lengths. The arm *e* has its outer end turned upward at right angles, as shown, to engage with the peripherical surface of the cam *i*, and the short arm *f* engages with the pin *k*, attached to the face of the cam *i*, and is moved by it far enough to disengage the detent-pallet from a tooth of scape-wheel.

The balance-wheel B is mounted upon the staff or shaft *h*, and has on its surface, in contact with the hub, a cam, *i*, with pin *k*, and an impulse-arm, *l*, of the construction substantially as shown in Fig. 3 of the drawings.

The peripherical face of the cam *i* engages with the long arm *e* of the detent-lever, and secures the perfect locking of the escapement, and at the same time, owing to its construction, prevents the said lever from unlocking the scape-wheel.

The pin *k* engages with the short arm *f* of the detent-lever, and moves it far enough to unlock the escapement, as shown in Fig. 5.

The impulse-arm *l* receives a tooth of the scape-wheel whenever the detent-pallet is released above, thereby causing the impulse stroke or movement to the balance-wheel. (See Fig. 5.) The balance-wheel in turning to the left, as shown by the arrow in Fig. 4, will bring the pin *k* in contact with the short arm *f* of the detent-lever, which will cause the parts to assume the position as indicated by dotted lines, and as soon as the pin *k* clears the said short arm the parts will resume their normal position. It will be seen that in this movement the balance-wheel has received no impulse-stroke; but on its returning to the right, as indicated by arrow in Fig. 5, the pin *k* will come in contact with the short arm of lever again, and carry it around with it far enough to cause the parts to assume the position as seen in Fig. 5, which will unlock the tooth H of the scape-wheel. Now, as the scape-wheel is free the tooth I will encounter the impulse-arm *l*, and force it around with it,

thereby causing the balance-wheel to vibrate. The tooth H in advancing will encounter the lift *m* of the detent-pallet, and set the pallet in position to receive the following tooth of the scape-wheel. The spring *n*, secured to post *p*, controls the fall of the detent-lever, and retains it at the proper inclination to receive the pin in the cam *i*.

The escapement can only be unlocked by the detent-lever being moved in the direction of the arrow 2, and the lever is prevented from moving in this direction at the wrong time by the long arm *e*, guarded by the cam *i*. When the proper time arrives for unlocking, the notch in the cam *i* presents itself in front of the long arm *e* just as the pin *k* encounters the short arm, the bent portion of the arm passing into the notch, and is thus thrown back into position by the tooth of scape-wheel coming in contact with the lift.

The letter R represents the balance-wheel of the time-piece, and is actuated by the escapement-wheel and the hair-spring *s*.

The auxiliary or outer spring, *t*, forming a part of the banking device, is pinned to the hair-spring stud *u*, and the other or free end is bent as shown, to engage with the pin *v*, fixed to the balance-bridge. One of the arms of the balance-wheel is provided with a pin, *w*, near its rim, for the purpose hereinafter stated.

The balance-wheel in turning in the direction as indicated by the arrow causes the hair-spring to expand, which in return forces the spring *t* outwardly and the bent end in front of the pin *v*. The pin *w* then comes in contact with the outer surface of the said spring *t*, at which point the vibration of the balance is stopped in that direction, thereby preventing the escapement from being unlocked out of regular order. Fig. 7 is a modification of the banking device, and works substantially in the same manner.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A detent-lever, D, having at its lower or rear end the bifurcated arms *e f*, the outer end of the arm *e* being bent at right angles to its body, substantially as shown and described.

2. The detent-lever D, having at its lower or rear end the arms *e f*, of the construction substantially as described, in combination with the cam *i* and the pin *k*, attached to the face of the cam, substantially as described, and for the purpose set forth.

3. The combination, with the scape-wheel, of the balance-wheel provided with the operating devices, the detent-lever, the oscillating detent-pallet, and the spring *n*, substantially as and for the purposes set forth.

4. A balance-wheel having a pin to engage with the expanded portion of the spring to limit the vibration of the balance, substantially as described.

5. In combination with the balance-wheel having the pin *w*, the auxiliary spring *t*, for limiting the vibration of the balance-wheel, substantially as described.

In testimony whereof I have hereunto subscribed my name.

JOHN JAY JOHNSTON.

Witnesses:
T. I. COULTAS,
JNO. L. FIELD.