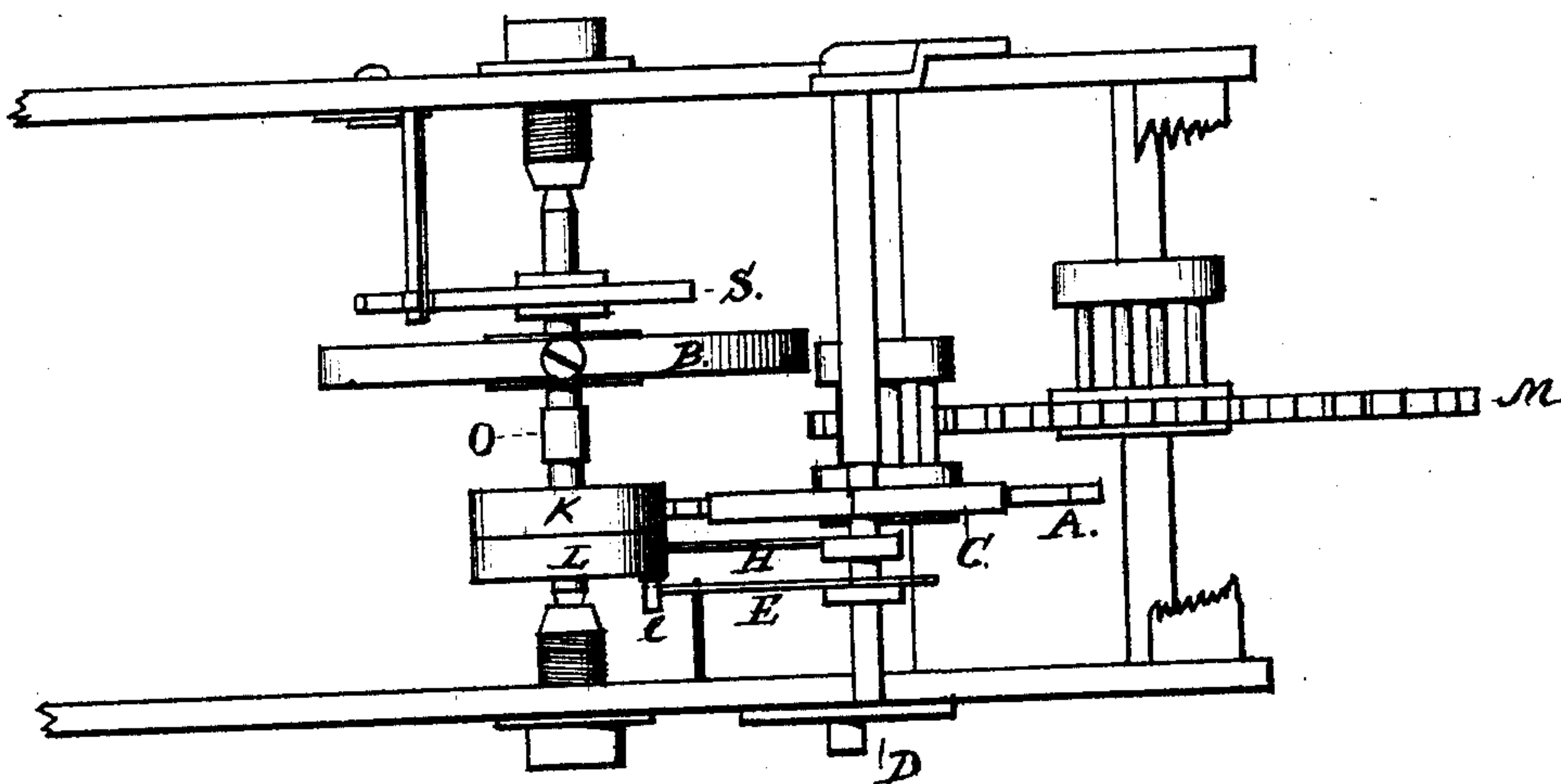
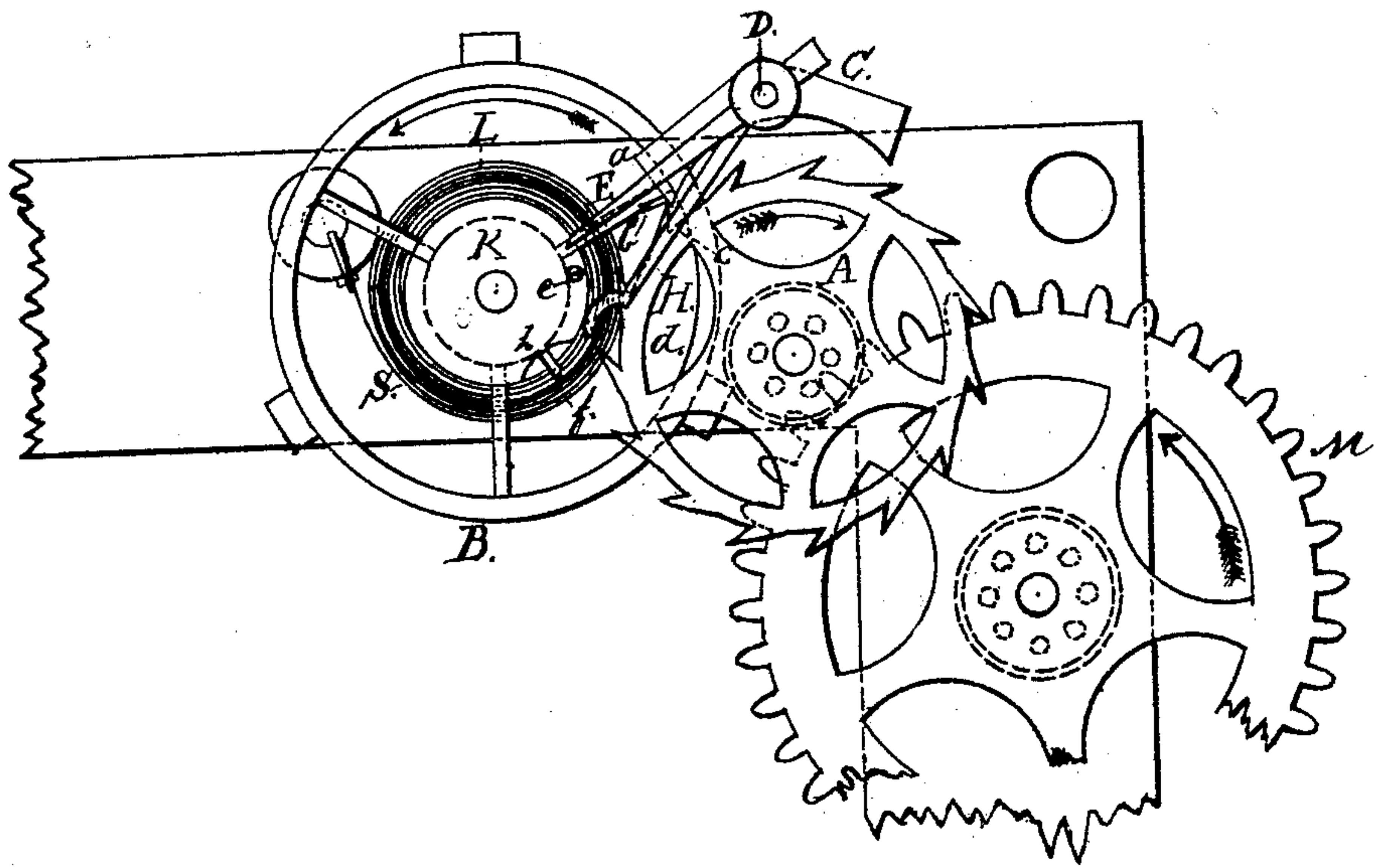


J. F. WATSON.

ESCAPEMENT FOR TIME-PIECES.

No. 172,285.

Patented Jan. 18, 1876.



Witnesses:

BBBram.
J. Mills.

Inventor;

John Forest-Watson
by his attorney
Alex. L. Hayes.

UNITED STATES PATENT OFFICE.

JOHN F. WATSON, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ESCAPEMENTS FOR TIME-PIECES.

Specification forming part of Letters Patent No. **172,285**, dated January 18, 1876; application filed May 26, 1875.

To all whom it may concern:

Be it known that I, JOHN F. WATSON, of Boston, in the county of Suffolk, State of Massachusetts, have invented a new and useful Improvement in Escapements for Time-Keepers, of which the following is a full, clear, and exact description, reference being had to the drawings accompanying and forming part of this specification.

In the drawing, Figure 1 is a view of the escapement in elevation from the back of the movement, a part of the plate having been removed, and Fig. 2 is a view of the same in plan.

In these figures similar letters refer to similar parts.

This invention relates to an improvement in that class of escapements known as the detached chronometer-escapement; and it consists in constructing the locking-pallet in such a form that it is prevented from entering beyond a certain depth in the escape-wheel, and in constructing the lifting or unlocking arm of a single piece without the usual lifting-spring. It also consists in the use of a guard upon the balance-staff, in combination with an arm upon the arbor of the detent, by means of which device the tooth of the escape-wheel is prevented from being dislodged from the locking-pallet by any accidental jar of the movement.

The advantage which this form of escapement possesses is that, by doing away with the usual spring upon the lifting or unlocking arm, which spring is difficult to construct, I obtain an escapement which has the accuracy of the chronometer-escapement of the usual form, but is so simple and cheap that it can be used advantageously in cheap clock-movements.

In the accompanying drawings, M represents the train. A is the escape-wheel. C is the detent, constructed so as to embrace two or three teeth of the escape-wheel. D is the arbor of the detent. *a* is the locking-pallet. *b* is a pin on the same at a reverse angle to the pallet, and *c* is a tooth of the escape-wheel in contact with the locking-pallet. B is the balance-wheel; O, the balance-staff; S, the spring on the balance-wheel; E, the lifting-arm upon the arbor of the detent, which arm is brought to a fine point, and stands in

a direct line to the balance-staff when the wheel is locked. *e* is the unlocking-pin upon the balance-staff, which pin comes in contact with the lifting or unlocking arm. *f* is the impulse-pallet upon the balance-staff. K is a cylindrical guard upon the balance-staff, having a recess, *h*, in the same, formed by cutting out a segmental piece, and H is an arm attached to the arbor of the detent, having a bent extremity, *d*, which bears against the face of the guard K, and falls into the recess *h* when the detent is unlocked. Instead of bending the end of the arm H, it may be made straight, and a pin be placed at the end.

As shown at Fig. 1, the tooth of the escape-wheel engages with the locking-pallet *a* of the detent C, but is prevented from moving up its face by the pin *b*, which is placed at a reverse angle to the face of the detent, so that the tooth just touches the pallet and is ready to be released by the slightest movement of the same. This release is given by the unlocking-pin *e*, which, as the balance-wheel rotates in the direction shown by the arrow in the figure, before the impulse-pallet strikes the teeth of the escape-wheel, comes into contact with the end of the arm E and lifts the same, thereby raising the detent and permitting the escape of one tooth of the escape-wheel; but before the impulse is completed the locking-pallet is forced by the inner pallet of the detent to its original position, and the escape-wheel is locked on the next tooth. On the return of the balance, the unlocking-pin slides over the rounded end of the arm E, and the tooth of the escape-wheel moves on the incline plane or reverse angle of the locking-pallet, but is restored to its original position by the force of the train. Instead of a pin in the detent, for holding the tooth of the escape-wheel, the pallet may be made in such a shape that the same result is accomplished as if a pin were used.

In order to prevent the tooth of the escape-wheel from being dislodged from the pallet by any accidental jar of the movement, I provide a guard upon the balance-staff, upon which the end of an arm, H, attached to the arbor of the detent, bears so as to keep the tooth in contact with the locking-pallet, until the unlocking-arm is lifted, when the end of

the arm H falls into the recess in the guard K, and permits the escape of the pallet.

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

1. In an escapement for time-keepers, a detent, having a pin or its equivalent upon the locking-pallet at a reverse angle to the same, in combination with a lifting-arm upon the arbor of the detent, which is constructed in a single piece, without a spring, substantially as and for the purpose set forth.

2. The combination of the escape-wheel A,

detent C, locking-pallet *a*, having the pin *b*, or its equivalent, the balance-staff O, the lifting-arm E, and unlocking-pin *e*, substantially as and for the purpose set forth.

3. The combination of the guard-piece K upon the balance-staff having the recess *h* therein, and the arm H on the detent-arbor D, substantially as and for the purpose set forth.

JOHN FORREST WATSON.

Witnesses:

CLARENCE S. LIECE,
F. M. DARRACOTT.