C. O. BALLIETT.

Reversible Center Pinion for Watches.

No. 209,375. Patented Oct. 29, 1878.

*Fig. 1.*

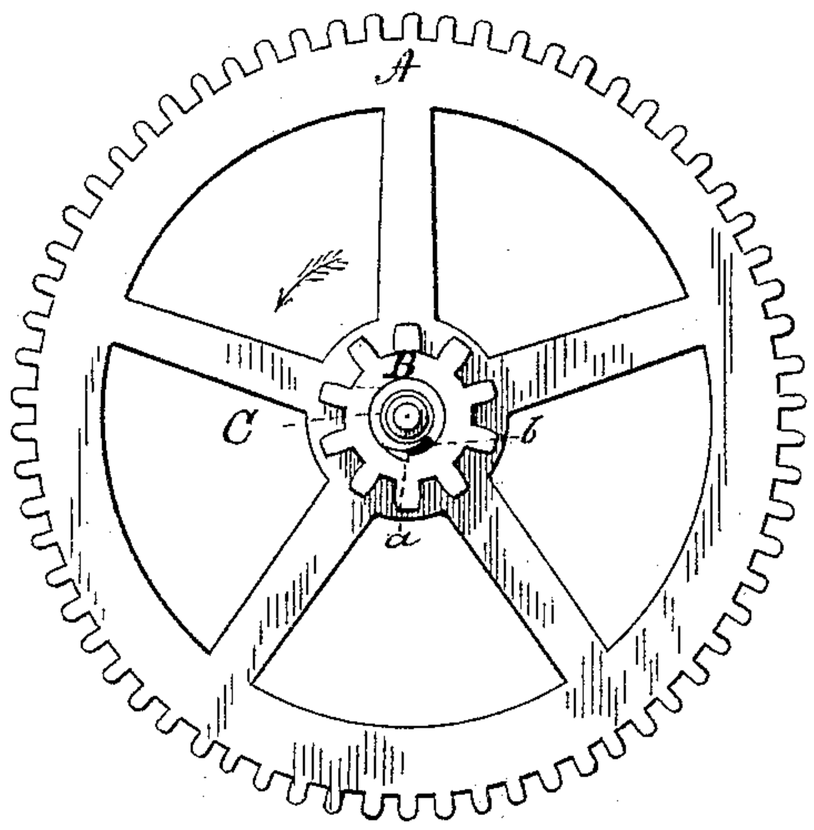
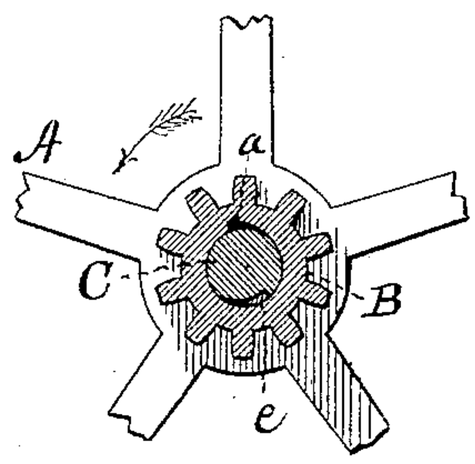



*Fig. 2.*

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# UNITED STATES PATENT OFFICE.

CHARLES O. BALLIETT, OF WATERLOO, IOWA.

## IMPROVEMENT IN REVERSIBLE CENTER-PINIONS FOR WATCHES.

Specification forming part of Letters Patent No. **209,375,** dated October 29, 1878; application filed September 9, 1878.

*To all whom it may concern:*

Be it known that I, C. O. BALLIETT, of Waterloo, in the county of Black Hawk and State of Iowa, have invented a new and Improved Reversible Center-Pinion for Watches; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of the arbor-pinion and center-wheel. Fig. 2 is a cross-section through the pinion, showing it unlocked and moving in reverse direction.

My invention relates to an improved means of attaching the center-wheel pinion of a watch to its arbor or shaft, so that in the event of the breakage of the main spring the recoil of the latter will cause the pinion to turn in the reverse direction and independently of the arbor, thus preventing all injury of the operative mechanism. Heretofore these safety-pinions have been made with a dovetail sliding key set into the arbor, and operated by means of a spring to catch an offset in the pinion. They have also been made with a semi-cylindrical key placed in a concave recess in the arbor, said key to catch in an offset in the pinion. These forms are disadvantageous, first, because the spring to operate the sliding dovetail key is necessarily very delicate, and hence will not stand wear, and enhances the cost of the watch; second, the semi-cylindrical key, when it takes a position with its flat side forming an arc of the circle of the arbor, will so remain, as there is nothing to automatically throw it into a position to catch the depression in the pinion without other agencies are used beside a convex key, a concave groove in the arbor, and an offset in the pinion, as described in the patent to Hunt, dated September 16, 1873.

My invention consists in a pinion provided with an eccentric offset in its interior surface, and an arbor provided with an eccentric recess, in combination with an inserted loose semi-concavo-convex key, as hereinafter more fully described and claimed.

In order that those skilled in the art may make and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is the center-wheel. B is the pinion, and C is the arbor.

On the side of the arbor is cut a recess, *b*, eccentric to the circumference, and on the interior surface of the pinion is cut an eccentric recess, *a*. These recesses *a b* being brought to a coincident position, I introduce between the pinion and the arbor a spline or loose key, *e*, which is a wedge of concavo-convex shape in cross-section, its thickness about corresponding with the depth of the offset *b*.

When the watch is in operation the arbor, moving in the direction of the arrow seen in Fig. 1, the wedge or spline *e* is crowded forward, and its butt rests against the straight side of the offset *a* in the pinion, and locks the pinion to the arbor. Should the mainspring break, the pinion would move in the direction indicated by the arrow in Fig. 2, and the key *e* will run back and lie snugly in offset *b* in the arbor, so as to offer no impediment to the free revolution of the pinion on the arbor, and thereby protects the train of gear from any injury.

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

The arbor C, provided with the eccentric offset *b*, in combination, with the pinion B, provided with an eccentric offset, *a*, and the concavo-convex spline or key *e*, substantially as described.

CHARLES OLIVER BALLIETT.

Witnesses:
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