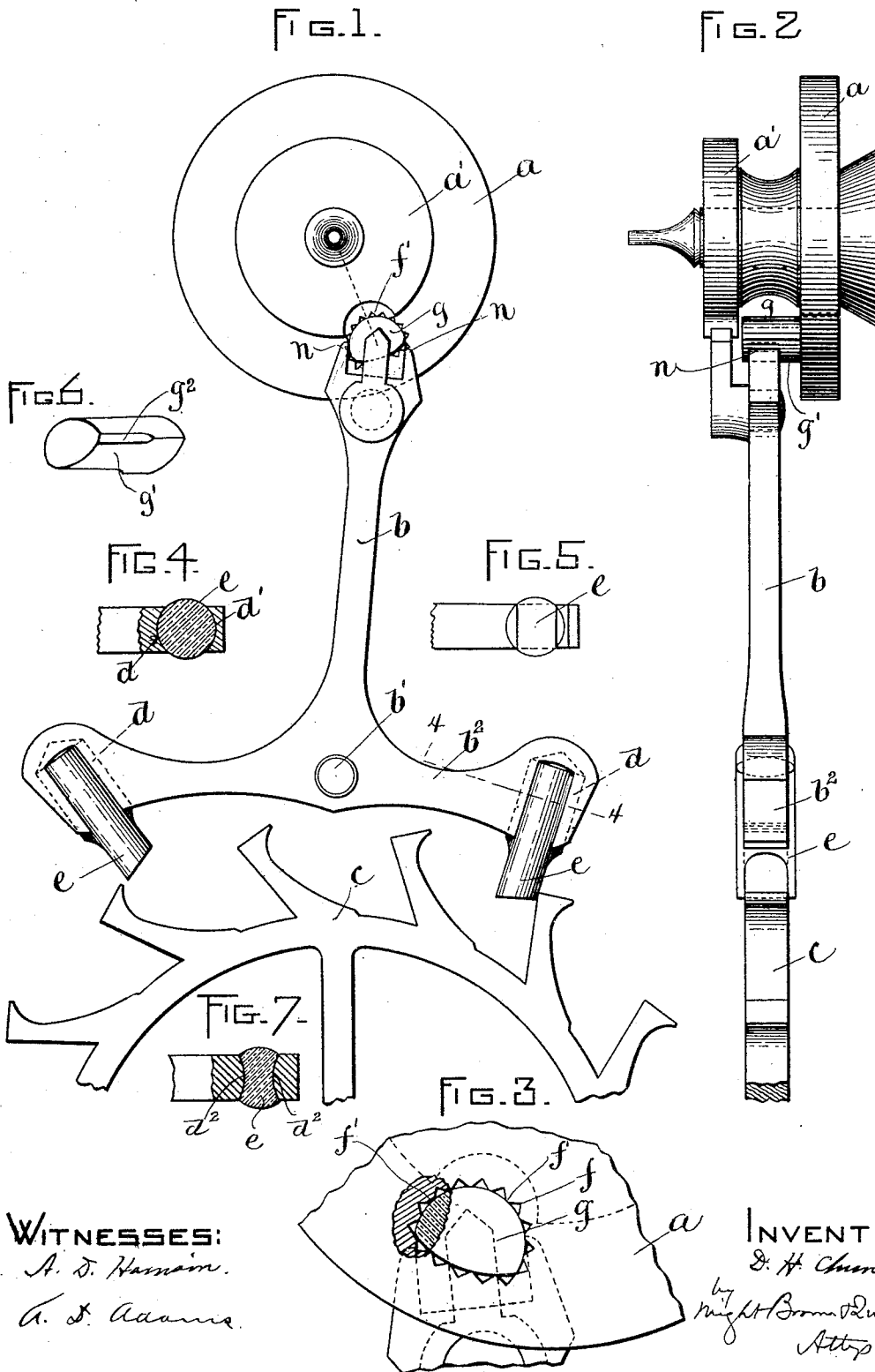


(No Model.)

D. H. CHURCH.
BALANCE ESCAPEMENT.

No. 581,535.

Patented Apr. 27, 1897.



WITNESSES:

A. D. Hammon.

A. S. Adams.

INVENTOR:

D. H. Church

by *Wm. H. Brown & Co.*
Attys.

UNITED STATES PATENT OFFICE.

DUANE H. CHURCH, OF NEWTON, MASSACHUSETTS.

BALANCE-ESCAPEMENT.

SPECIFICATION forming part of Letters Patent No. 581,535, dated April 27, 1897.

Application filed February 6, 1896. Serial No. 578,177. (No model.)

To all whom it may concern:

Be it known that I, DUANE H. CHURCH, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Escapements for Watch or Clock Movements, of which the following is a specification.

This invention relates to escapements for watch or clock movements, and has in view, for one thing, an improvement in the construction of the pallet and the jewel or stone carried thereby, by which improvement the latter may be securely held in place without the use of shellac, as now commonly practiced, but by the resiliency of the metal of the pallet.

Another object of the invention is to provide an improved construction whereby the jewel may be secured in the balance-roller without requiring the close fitting heretofore considered necessary.

With the above ends in view the invention consists in a number of novel constructions and combinations of parts recited in the claims appended hereto.

The drawings which accompany and form part of this specification illustrate an embodiment of the invention.

Figure 1 shows a face or plan view of my improved escapement. Fig. 2 shows an edge view of the same. Fig. 3 shows a fragmentary view looking from the side opposite that seen in Fig. 1 with some parts broken out and in section. Fig. 4 shows a section on the line 4 4 of Fig. 1. Fig. 5 shows an end view of one of the pallet-stones, together with a part of the pallet. Fig. 6 shows a perspective view of the roller-jewel detached. Fig. 7 represents a modification.

In the drawings the letter *a* designates the jewel-holding roller carried by the balance-wheel, and *a'* the usual safety-collar on the same arbor.

The letter *b* designates the escapement-lever, which is pivoted at *b'*.

b² designates the pallet, and *c* the escapement-wheel.

In carrying out the first object above stated I form the stone-receiving holes *d* in the pallet with a circular cross-section, so as to give its sides reëntrant curves, as shown at *d'* in Fig. 4. I correspondingly form the stone *e* with a circular cross-section, except where it

is flattened for contact with the escapement-wheel. Before hardening and tempering the pallet it is bent together around the holes *d*, so as to slightly contract the same and provide for embracing the stones with spring-pressure. The same result may be secured by forming the stone-receiving holes in the pallet with salient curves *d²*, which enter correspondingly-formed recesses in the stone.

It will be seen that by the construction described provision is made for holding the stone securely in place without the use of shellac, the stone-receiving opening having a resilient outer side, which presses inwardly on the stone, while the peculiar formation of the pallet and stone prevents the latter from becoming displaced laterally.

The next object above stated—namely, that of holding the roller-jewel without a close fit—I accomplish by cutting the hole *f* in the roller with corrugations *f'* around its walls. This formation providing a number of small projections allows the metal to yield when the jewel *g* is forced into the hole and causes said jewel to become securely set or wedged into the hole without requiring the close fit of a smooth-bored hole.

What I claim as my invention is as follows:

1. In a balance-escapement for watch or clock movements, a pallet having an opening with a resilient side, and a stone or jewel formed to fit said opening, the opening and stone having interlocking projections and recesses, whereby the stone may be confined in the opening wholly by the resiliency of the metal of the pallet.

2. In a balance-escapement for watch or clock movements, a balance-roller having a jewel-receiving hole with corrugations in its sides, said corrugations forming a series of projections adapted to yield to the balance-roller, whereby said roller may be securely set or wedged in the said hole without closely fitting the same.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 13th day of December, A. D. 1896.

DUANE H. CHURCH.

Witnesses:

C. F. BROWN,

A. D. HARRISON.