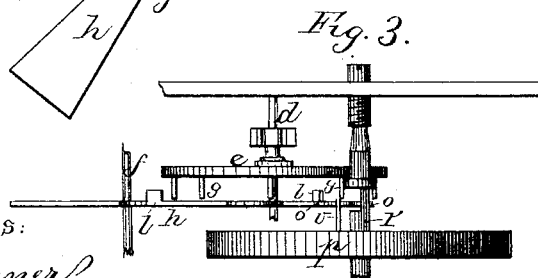
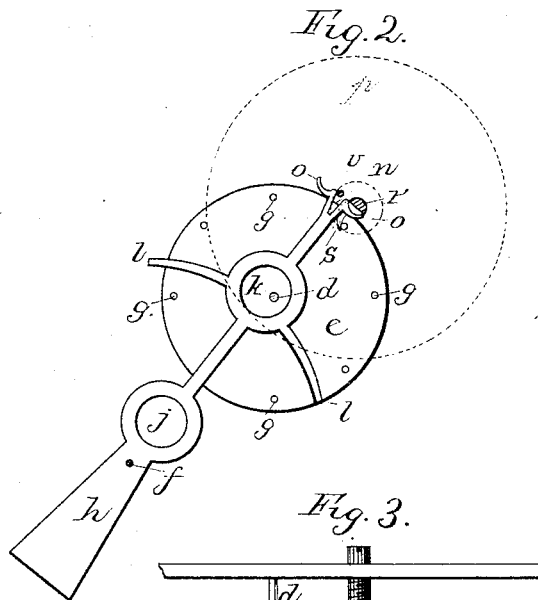
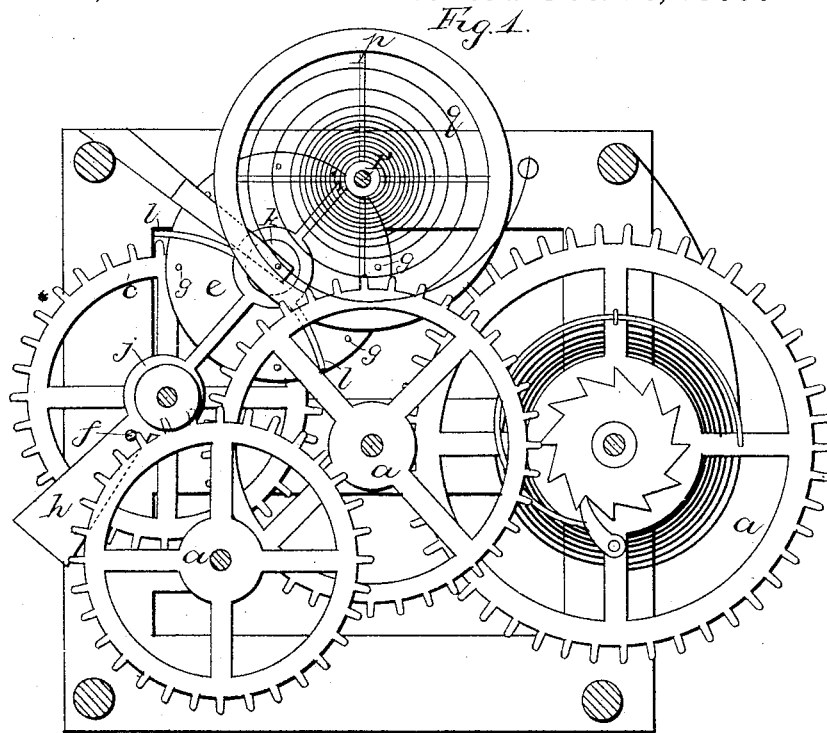


A. G. LAUGHLIN.
Escapement for Timepiece.

No. 220,849.

Patented Oct. 21, 1879.



Witnesses:

J. W. Garner
H. S. D. Barnes

Inventor:
A. G. Laughlin,
per
F. A. Lehmann,
att'y.

UNITED STATES PATENT OFFICE.

ABNER G. LAUGHLIN, OF PARIS, TEXAS, ASSIGNOR OF ONE-HALF OF HIS
RIGHT TO STEPHEN G. HUDDLE.

IMPROVEMENT IN ESCAPEMENTS FOR TIME-PIECES.

Specification forming part of Letters Patent No. **220,849**, dated October 21, 1879; application filed
July 12, 1879.

To all whom it may concern:

Be it known that I, ABNER G. LAUGHLIN, of Paris, in the county of Lamar and State of Texas, have invented certain new and useful Improvements in Escapements for Time-Pieces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in escapements for time-pieces.

It consists in the arrangement and combination of parts whereby the lever and duplex escapements are combined together, as will be more fully described hereinafter.

Figure 1 is a front view of my invention, a portion of the frame-work being removed so as to show the operating parts. Figs. 2, 3, 4 are detail views of the same.

a represents a common train of wheels such as are used in time-pieces, and which may be of any desired construction.

The last one, *e*, of the large wheels meshes with a pinion on the shaft *d*, which shaft has secured to it the disk or scape-wheel *e*, which has a number of studs, *g*, projecting from its side, as shown. This scape-wheel may be modified to suit any train of wheels.

Secured to a special shaft, *f*, which is mounted in special bearings, is a lever, *h*, which is made heavy at its lower end and light all the way beyond its shaft to the other end. Through the lighter and longer end are made the two holes *j k*, so that the shaft on which the wheel *e* is placed and the shaft *d* can pass through the openings, and thus allow the lever to vibrate freely back and forth without interfering with them in any manner.

Projecting from opposite sides of the hole *k* are the two curved arms *l*, which have their points or ends on the side next to the disk or scape-wheel *e* thickened for a short distance, so as to form lever-pallets of any desired angle, and thus give any desired degree of impulse from one or both pallets of the lever, and alternately act as stops to the studs *g* as the disk revolves around. Just as one end releases one

stud the other end catches another, and brings the disk to a momentary stop while the lever *h* makes one of its vibrations.

The small end of the lever has a recess, *n*, in it, and on each side of this recess there projects outward an arm, *o*, which is made concave on its outer side.

The lever may be made in any other form to suit the special train of wheels it is designed for, so that it has the two lever-pallets described.

The shaft *r*, to which the balance-wheel *p* and spring *q* are fastened, has a curved arm, *s*, against which the studs *g* on the disk or scape-wheel *e* alternately strike, and thus give the shaft an impetus in one direction, which the spring instantly counteracts as soon as the arm is released, and moves the shaft backward in the opposite direction, receiving a lever-impulse in that direction, and the opposite arm again catches another stud on the scape-wheel.

Projecting from the side of the hub of the balance-wheel *p* is an arm, *v*, which, as the curved arm *s* is moving backward to be caught by another stud, enters the recess *n* in the end of the lever, and thus causes it to move as far in one direction as the shaft *r* turns; and then, as the shaft moves backward, this arm *v* forces the lever to move backward again. Thus the arm on the shaft operates the escapement-lever, and gives it its vibratory motion.

The shaft *r* is cut squarely away through one-half of its thickness, just over the recess *n* in the end of the lever, so that as the shaft rocks back and forth this square portion will always catch the two corners of the lever, and the round portion of the shaft will roll in each of the concave portions of the arm *o*.

Where the shaft *r* is not cut away any sudden impulse will cause the lever *h* to move with such force at its longest end as to become entirely detached from the shaft, and thus cause the stoppage if not the breakage of the works. Where the shaft is cut away and made just broad enough to span across the concave portions *o*, as shown in Fig. 2, the shaft forms a dead stop to any further movement of the lever in that direction. With such a positive stop to the movement of the lever at the end of

each throw or movement, it will be readily seen that the most violent jar or shake cannot displace the lever.

By means of the construction above described the duplex and lever escapements are combined together, whereby the mainspring can be reduced fully one-half in power. A double impulse is obtained and the escapement moves with more force and regularity, and hence is not so liable to stop. This escapement is applicable to the finest and smallest watch, and is especially intended for all time-pieces that have to be carried or moved about and are subjected to jarring and shaking.

Having thus described my invention, I claim—

The combination of the shaft *r*, provided with the arm *s*, balance-wheel *p*, having an arm, *v*, for moving the lever, the shaft being cut away, as shown, and the lever provided with a recess, *n*, and concave arms *o*, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 7th day of July, 1879.

ABNER G. LAUGHLIN. [L. s.]

Witnesses:

JNO. C. EASTON,
E. S. CONNOR.