W. A. WALES.
Escapement.

No. 204,400. Patented May 28, 1878.

Fig. 1.

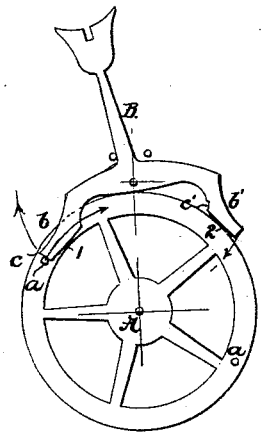
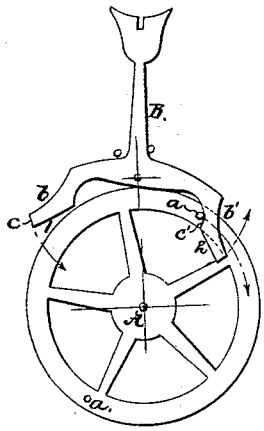


Fig. 2.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN ESCAPEMENTS.

Specification forming part of Letters Patent No. **204,400**, dated May 28, 1878; application filed April 15, 1878.

To all whom it may concern:

Be it known that I, WILLIAM A. WALES, of the city of Newton, county of Middlesex, and State of Massachusetts, have invented a new and useful Improvement in Escapements; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figures 1 and 2 represent plan views of a device embodying my invention and showing the relative positions of the parts at each beat.

This invention relates to mechanism for measuring time by a division of seconds, generally applied to scientific and racing purposes, and ordinarily known as "timers."

The invention consists of an improved construction of escapement, whereby a positive and accurate division of seconds in even parts, such as halves, quarters, eighths, &c., is accomplished; and in order that others may understand and use my invention, I will first proceed to describe its construction, operation, and advantages, and to subsequently point out in the claim its novel characteristics.

In the drawing, A represents the escape-wheel, and B the escapement, connecting with the balance-wheel (not shown) in the usual manner.

The horizontal escape-wheel A is provided with vertical pins or crown-teeth *a*, arranged in opposite pairs upon the face of the rim of the wheel; and any number of pairs of such pins may be employed, according to the division of a second of time required. In the present instance two pairs of pins are used to denote quarter-seconds.

The escapement B is arranged to vibrate between the escape-wheel A and the balance-wheel in the usual manner.

The pallets *b b'* are each constructed of such form as to receive an impulse from the pins or teeth of the escape-wheel and to present alternately a positive stop to each of said pins, and with a given length or given vibration of the escapement the length of the pallets may be changed to accommodate a more or less number of pairs of pins upon the escape-wheel.

In the position of the escapement shown in in Fig. 1, the end *c* of the pallet *b* forms the positive stop, while in the opposite position of the escapement, as shown in Fig. 2, the pin is arrested at the inner end *c'* of the pallet *b'*. In each position a positive beat or "dead-action" is secured.

The inner faces 1 2 of each pallet are arranged at such an angle to the axis of the escapement that each pin when released from either stop will impart an impulse to the pallet in contact.

This action is radically different from the ordinary anchor-escapement, in which, by a direct action, both the lock and impulse will pass beyond or fall short of a positive beat, and an independent or double train is necessary to prevent it.

By my invention I am enabled to denote accurately eight divisions of a second of time, making the number of beats 28,800 in an hour, and which by the ordinary escapement cannot be accomplished, owing to the excessive friction.

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

In a mechanism for denoting divisions of a second of time, a vibrating escapement, B, having each of its pallets *b b'* constructed with positive stops *c c'* and impulse-faces 1 2, in combination with an escape-wheel, A, provided with one or more pairs of pins or crown-teeth, substantially as and for the purpose set forth.

WILLIAM A. WALES.

Witnesses:
EDWIN O. CHILDS,
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