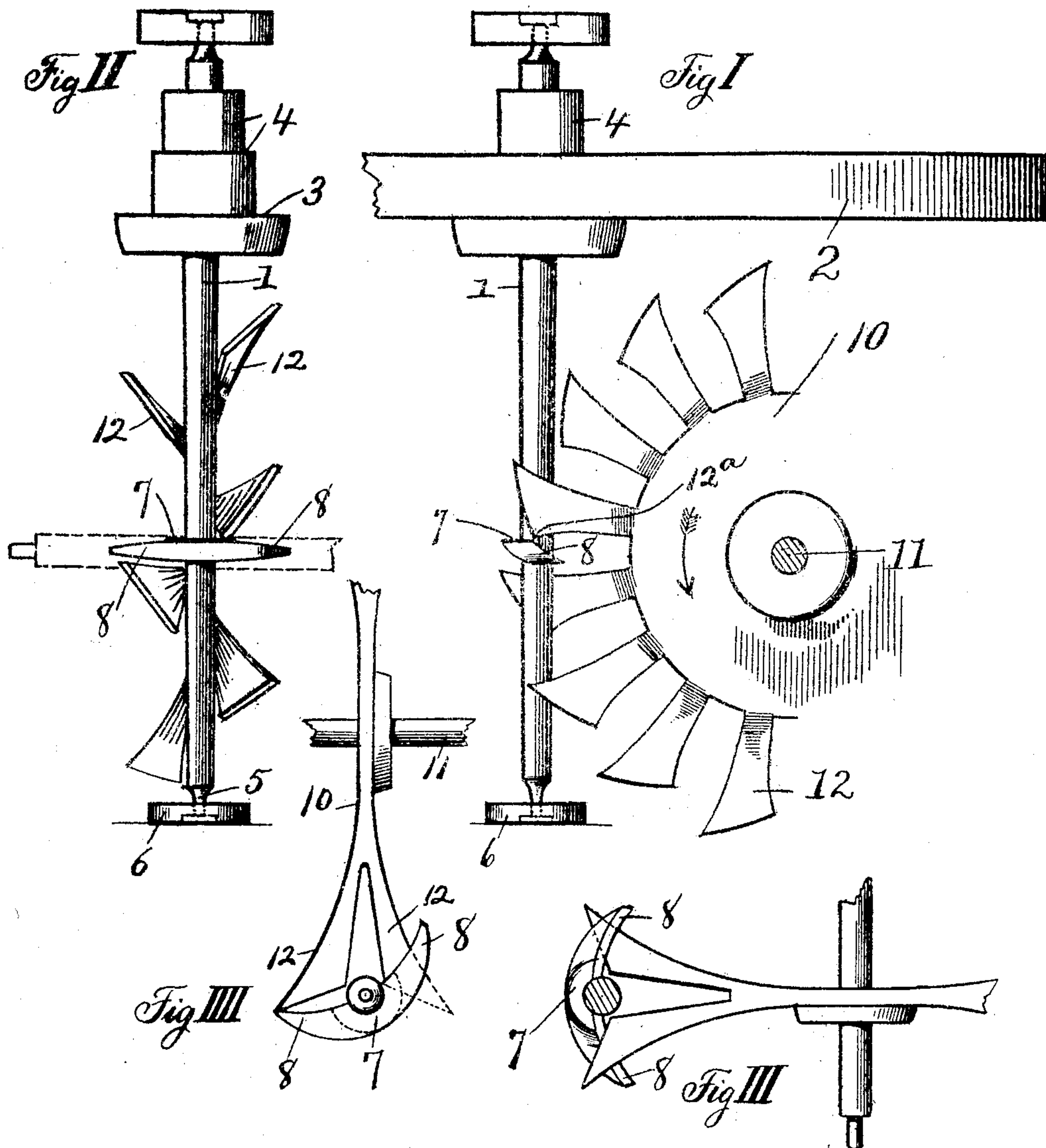


No. 797,730.

PATENTED AUG, 22, 1905.

F. GUNDORPH.
BALANCE ESCAPEMENT.
APPLICATION FILED APR. 9, 1904.



Ferdinand Gundorph
INVENTOR

WITNESSES:

George Paterson
DePauw

UNITED STATES PATENT OFFICE.

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BALANCE-ESCAPEMENT.

No. 797,730.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed April 9, 1904. Serial No. 202,302.

To all whom it may concern:

Be it known that I, FERDINAND GUNDORPH, a citizen of the United States of America, and a resident of San Francisco, San Francisco county, California, have invented certain new and useful Improvements in Balance-Escapements, of which the following is a specification.

This invention relates to certain new and useful improvements in escapements for clocks and timepieces; and my object is to produce an escapement with the fewest number of pieces and which will run with a comparatively small power and will give a more even rate of time from the beginning to the end of the winding. This I accomplish by means of a crescent-shaped device of preferably flat shape and by the peculiar bend of the escape-wheel teeth.

With the aforesaid object in view my invention consists in the peculiar arrangement and combination of parts hereinafter more particularly described and then definitely claimed at the end hereof.

In the accompanying drawings, which represent my invention as I now prefer to make it, Figure 1 is a side elevation of the escapement. Fig. 2 is a view of the escapement, taken at right angles to Fig. 1, but with the balance-wheel left off. Fig. 3 is a top plan with the parts above the crescent-shaped disk omitted, showing only two teeth of the wheel, with the balance-staff and its parts in a position of rest. Fig. 4 is a view similar to Fig. 3, but with the balance-staff and its parts rotated by the pressure of a tooth until one of its flanged horns passes out of the path of one of the teeth of the escape-wheel, so as to permit the latter to rotate one tooth's distance.

Referring now to the details of the drawings by numerals, 1 indicates the balance-staff, which is made of steel and carries a fly-wheel or balance 2, (see Fig. 1,) and for which a seat is provided, as seen at 3 in Fig. 2. A seat 4 is also provided for the hair-spring, which latter is omitted from the drawings. The balance-staff is also provided with the ordinary fine pivots resting in bearings 6, which of course permit the usual free and easy rotation. Preferably about one-third from the lower end of the staff there is formed a crescent-shaped disk 7, whose upper surface is flat and polished, so as to reduce friction to a minimum. From this disk

there project two impulse levers or horns 8, whose working edges are curved and also beveled, as seen best in Figs. 1 and 3.

The escape-wheel 10 is represented in side elevation in Fig. 1 and of course is fixed on the usual shaft or spindle 11, and this escape-wheel is provided with teeth 12, which are formed of the peculiar shape shown in Figs. 1 and 2 and so that the teeth alternate on opposite sides of the vertical plane of the wheel and so that when viewed from the edge of the escape-wheel (see Fig. 2) the teeth slant at an angle of about forty degrees alternately in opposite directions, with the staff 1 between the two rows of teeth.

As shown in Fig. 1, the parts are at rest and no influence of power is exerted on the escape-wheel 10; but it will be obvious that when power is exerted on said wheel it is caused to move in the direction of the arrow and the tooth 12 just above the beveled edge 8 of one of the impulse levers or horns will bear on said beveled and curved edge and on account of the leverage of the tooth and the shape of the lever or horn the latter will be shoved or displaced, and thereby caused to rotate. The disk and its levers or horns are rotated about twenty-four degrees when the parts reach the position shown in Fig. 4; but owing to the impetus given to the balance it continues to rotate about sixty-six degrees more. Of course as soon as the disk is moved by one tooth the first twenty-four degrees said tooth is free to slip past the impulse lever or horn 8 and the next tooth is now caught and rests on the polished flat surface of the disk 7, where it rests during the remainder of the movement of the disk. Owing to the fact that there is only a point of the tooth contacting with this polished portion 7 and as said portion is perfectly flat, the disk can easily rotate till about ninety degrees, when the force of the impulse is spent. Then the hair-spring will of course cause its return movement. During this return movement the point 12^a of the tooth is still in contact with the polished flat portion 7, and hence the disk can glide freely under the tooth; but just as soon as the point 12^a of the tooth reaches the end of the flat portion 7 said tooth is again in a similar position to that shown in Fig. 1, but on the other side of the staff, so that the power which is exerted on the escape-wheel 10 causes the inclined or angular tooth to now contact with the curved or beveled edge on the opposite

impulse lever or horn 8, and thus once more impel the disk and its balance in a reverse direction, as previously described.

From the foregoing description and the accompanying drawings it will be seen that I have invented a very simple escapement with practically only two working pieces (the escape-wheel 10 and the disk 7 with its impulse-levers) and that owing to the structure of these parts there is a minimum of friction, and an escapement of great delicacy is produced.

What I claim as new is—

1. In an escapement, an escape-wheel having teeth slanting alternately in opposite directions, in combination with a crescent-shaped "disk" having its working edges beveled, the said alternating teeth bearing as levers on said working edges, substantially as described.

2. In an escapement, the combination of an escape-wheel having its teeth slanting alternately in opposite directions; of a "disk" ar-

ranged to coact with said teeth, said "disk" having a polished flat portion or bearing on which said teeth ride, substantially as described.

3. In an escapement, an escape-wheel having its teeth slanting alternately in opposite directions, in combination with a crescent-shaped "disk" provided with impulse-levers having the working edges curved, the edges of the teeth of said escape-wheel bearing at an angle on the beveled and curved edges of said crescent-shaped levers, and said "disk" having a flat polished portion or bearing on which said teeth are supported during a portion of each rotary movement of said "disk," substantially as described.

Signed by me at San Francisco, California, this 18th day of March, 1904.

FERDINAND GUNDORPH.

Witnesses:

E. E. KIRK,
GEORGE PATTISON.