A. HORVATH.

ESCAPEMENT MECHANISM.

APPLICATION FILED DEC. 6, 1919.

1,372,024. Patented Mar. 22, 1921.

FIG. 8

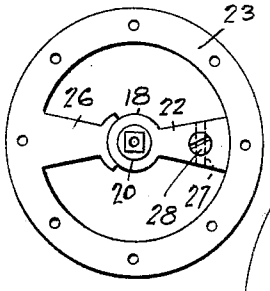


FIG. 1

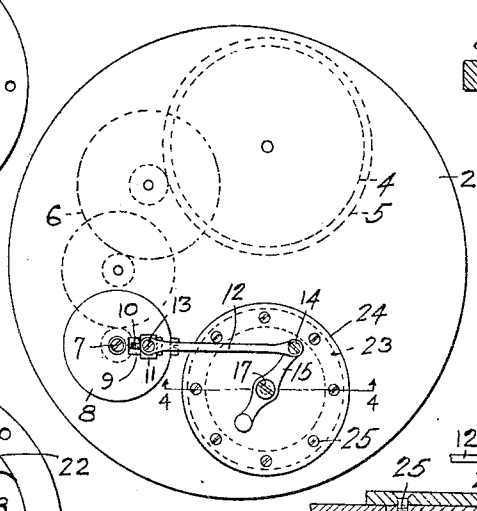


FIG. 5

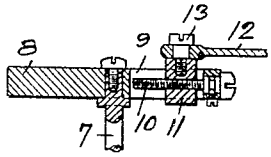


FIG. 9

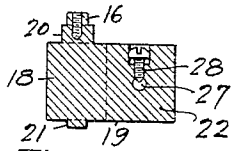


FIG. 3

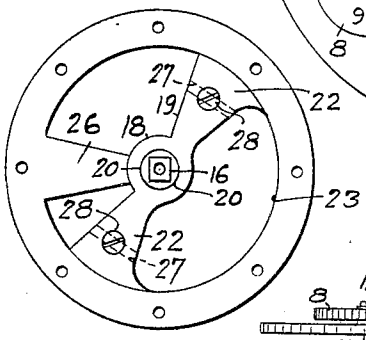


FIG. 4

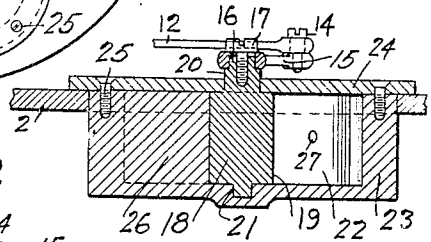


FIG. 2

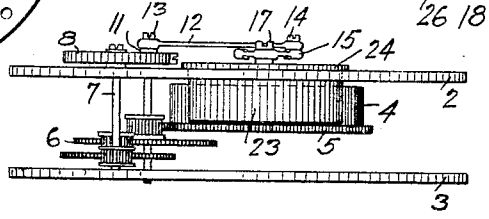


FIG. 6

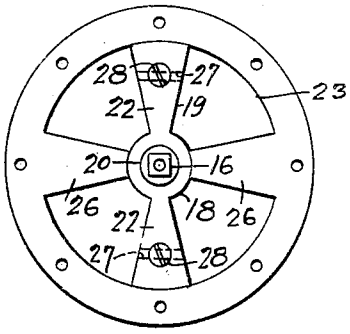
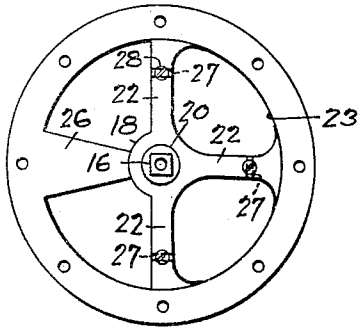


FIG. 7



INVENTOR

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Attys

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ESCAPEMENT MECHANISM.

1,372,024. Specification of Letters Patent. Patented Mar. 22, 1921.

Application filed December 6, 1919. Serial No. 343,063.

To all whom it may concern:

Be it known that I, ALEXANDER HORVATH, a citizen of the United States, and resident of Farrell, in the county of Mercer and State of Pennsylvania, have invented a new and useful Improvement in Escapement Mechanism; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to escapement mechanism for watches, and clocks, and it has for its object to provide an escapement device operating upon a novel and effective principle, whereby the time-controlled device shall operate correctly and which shall be able to withstand long and continuous service.

My invention generally stated, comprises the use of an oscillating member inclosed within a body of oil, mercury or other suitable liquid and provided with means for permitting the liquid to pass through one or more members of the oscillator at a definite and restricted rate, together with means for connecting the oscillator to the usual main spring through the usual gear trains of the watch or clock.

In the accompanying drawing, which shows one embodiment of my invention, Figure 1 is an enlarged and somewhat diagrammatic plan view of a watch movement provided with an escapement mechanism constructed in accordance with my invention; Fig. 2 in a side elevational view of the structure shown in Fig. 1; Fig. 3 is a plan view of one form of oscillator; Fig. 4 is a transverse vertical sectional view of the escapement mechanism; the section being taken substantially along the line 4—4, Fig. 1; Fig. 5 is a longitudinal sectional view of an adjusting device forming part of the escapement mechanism; Figs. 6, 7 and 8 are plan views of modified forms in which the oscillator may be constructed, and Fig. 9 is a vertical sectional view through one of the oscillator vanes, showing one form of screw adjustment.

The watch shown in Figs. 1 and 2 consists of parallel circular plates 2 and 3 having the usual main-spring casing 4 that carries the driving gear 5 which, through a train of gears and pinions designated generally by the numeral 6, drives a spindle 7. The spindle 7, which may be the second-hand spinde of the watch, extends through the side plate 2 and carries at its outer end a crank disk 8. The disk 8 is provided with a radial slot 9 in which is rotatably mounted a screw 10 which carries a screw-threaded stud 11. A pitman 12 is pivotally secured at one end to the stud 11 by means of a pivot-screw 13 and is connected at its other end, by means of the pivot-screw 14, to a crank 15. The crank 15 is mounted upon the squared portion 16 of the hub of an oscillator 19. A screw 17 holds the crank from rising.

The oscillator 19 consists of a central hub 18 having oppositely disposed bearing portions 20 and 21 and provided with one or more radial vanes 22 that fit closely within a circular casing 23 provided with a cover 24 which is secured in place by means of screws 25. The casing 23 is also provided with a radial abutment or barrier 26 which extends inwardly to a point adjacent to the hub 18 of the oscillator and serves to restrict the movement of the liquid within the casing during the operation of the device. Each of the vanes 22 is provided with a transverse perforation 27 of small diameter, the size of these perforations being exaggerated on the drawing for the sake of clearness, and the interior of the casing, after the oscillator is placed in position, is completely filled with a liquid of substantially constant viscosity, high-grade watchmaker's oil being conveniently used for this purpose. Adjusting screws 28, or the like, are preferably provided for regulating the effective diameter of the perforations 27.

The form of oscillator in the escapement shown in Fig. 3 is provided with two vanes 22 while the casing has one abutment 26. The escapement shown in Fig. 6 differs from that of Fig. 3 in that the casing is provided with two opposed abutments, so that each of the vanes 22 operates in a separate compartment of its own. In the modification of Fig. 7, three of the vanes 22 are provided and the casing, as in the form of device shown in Fig. 3 is provided with a single abutment 26. The modification of Fig. 8 is provided with only one of the vanes 22.

In the operation of my escapement device, the main-spring of the watch transmits

power through the gear train 6 and rotates the shaft 7. On account of the connection between the shaft 7 and the oscillator 19, the disk 8 and the shaft 7 make one rotation for each complete oscillation of the escapement oscillator, and the time required for such oscillation is controlled by the flow of oil through the apertures 27 in the vanes 22 of the oscillator. Since the apertures 27 are of definite and fixed diameter when their size is once regulated, and since the casing of the escapement is entirely filled with oil, it will be evident that the oscillation period will remain constant indefinitely. In the device shown herein, the disk and the shaft 7 make a complete rotation once each minute, and the oscillator will therefore swing for half a minute in one direction and for half a minute in the opposite direction. The oscillation period will of course be selected, in any device, in accordance with its special requirements.

In order to effect minor adjustments of the time piece the radial screw 10 in the disk 8 may be turned to bring the stud 11 nearer to or farther from the center of the disk 8, thereby producing a corresponding change in the period of oscillation of the oscillator 19.

It is to be understood that the structural details which I have shown and described are merely illustrative and that the principles of my invention may be applied to various other arrangements and to various kinds of time-pieces. I therefore desire that no limitations be imposed on my invention except such as are indicated in the appended claims.

What I claim as my invention is:

An escapement mechanism for watches and clocks comprising a circular oil-filled casing, a stationary abutment extending into the said casing, an oscillator disposed within the said casing and provided with an opening for the passage of oil, means for varying the effective size of the said opening, a pivot for the said oscillator, a crank secured to the said pivot, a pitman for connecting the said crank to a rotary portion of the said time-piece, and means for varying the effective length of the said pitman.

In testimony whereof, I the said ALEXANDER HORVATH, have hereunto set my hand.

ALEXANDER HORVATH.

Witnesses:
R. D. BROWN,
JOHN F. WILL.