May 22, 1945. R. STRAUMANN 2,376,461

MAGNETIC ESCAPEMENT

Filed Nov. 24, 1943

Fig. 1

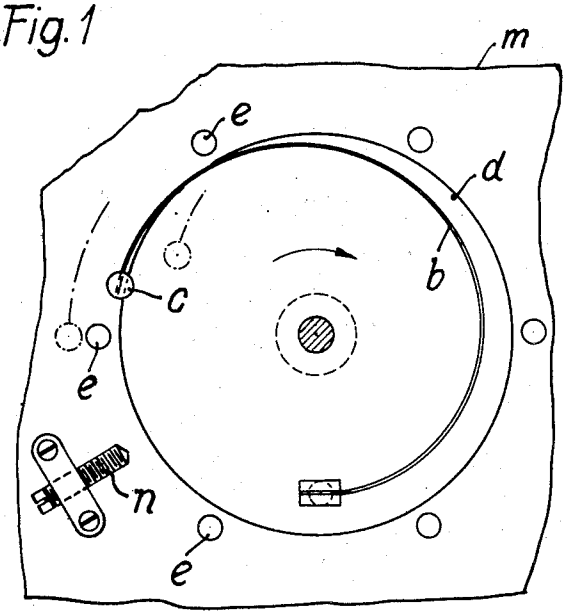


Fig. 2

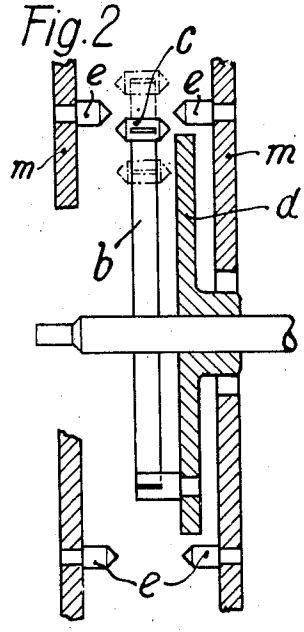


Fig. 3

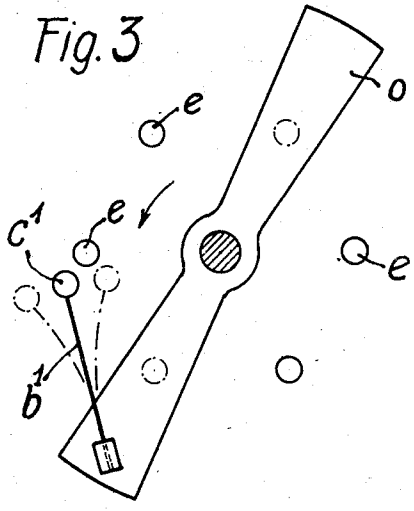
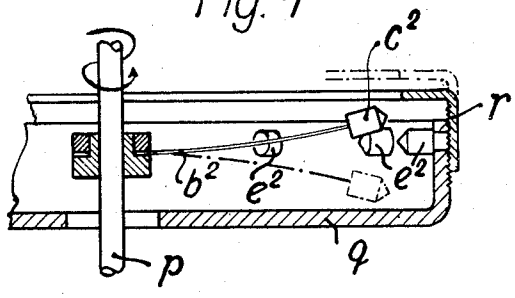


Fig. 4



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MAGNETIC ESCAPEMENT

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Application November 24, 1943, Serial No. 511,584
In Switzerland February 16, 1943

6 Claims. (Cl. 58—116)

In copending patent application Ser. No. 474,734, filed on February 4, 1943, there is disclosed a frictionless magnetic run controller for watch movements and the like, comprising an oscillating spring, fixed at one end, a magnetic mass arranged at the free end thereof and an escapement wheel bearing magnetic projections in such position to said magnetic mass as to cooperate therewith in order to energise said spring to successive oscillations and to simultaneously act on the magnetic mass swinging with constant frequency so as to control the rotational speed of the escapement wheel.

The present invention relates to an escapement regulator of a similar kind with which, however, as opposed to the device according to the above mentioned patent application, the magnet poles are immovably disposed (with a clock, for example, in the form of magnetic pins set in the clock plate) while the oscillating system consisting of oscillating spring and magnetic oscillating mass rotates with the shaft of the rotating member.

Three examples of application are shown by the drawing herewith.

Figures 1 and 2 show a top view and section, respectively, of the escapement regulator according to the first form of application and,

Figures 3 and 4 show a top view and section, respectively, of the escapement regulator according to the second and third forms of applications.

In the form of application according to Figures 1 and 2 d is the escapement wheel on which a bent-over oscillating tongue b is fixed carrying on its free end a magnetic oscillating mass c. On both sides of the escapement wheel d bearer plates m are provided carrying on their inner faces magnetic pins e which are equidistant in circles concentric to the shaft of the escapement wheel d. Regulation of the motion of the wheel d is effected, as stated in the above said patent application by magnetic reciprocal action between the oscillating mass c and the magnet pins e. Here again the speed of rotation of the escapement wheel d is maintained in constant correspondence with the frequency of oscillation of the oscillating mass c by the reciprocal influence of the mass c displaced in oscillation and the pins e. With the rotating escapement wheel d the oscillating mass c describes a closed sinusoid. On one bearer plate is provided a pin n radially disposed relative to the escapement wheel, around the forward end of which the oscillating mass c normally oscillates. Should the regulating system, possibly by external influence, fall "out of step" the oscillating mass c strikes against the pin n until the normal ratio of oscillation is again restored.

In the example of application according to Figure 3 the escapement wheel is replaced by a double-armed rotating member which, on one of its arms carries an oscillating spring b^1 with a magnetic oscillating mass c^1. e again designates immovably fixed magnet poles. Whilst in the two examples of application according to Figures 1 and 2 and Figure 3, the oscillating spring with oscillating mass oscillates in a plane vertical to the axis of rotating member d or o, an example of application is shown in Figure 4 in which this oscillating motion takes place in a plane taken through the axis of rotation of the system. The oscillating spring b^2 is here radially disposed on the rotating shaft p. The oscillating mass c^2 on the free end of this spring works with radially disposed magnet pins e^2 which are correspondingly disposed on a pole carrier q made of non-magnetic material.

On the pole-carrier q is screwed a ring r of magnetic material which by greater or lesser shunt effect permits of the magnetic ratios of the regulating system to be influenced and consequently also the frequency of the oscillating mass. The ring r thus forms a simple means of timing regulation.

What I claim is:

1. An escapement regulator for maintaining constant the speed of escapement of a driven rotary member, comprising an oscillating spring fixed at one end on said rotary member, a magnetic mass carried on the free end of said oscillating spring, and means carrying magnetic poles immovably arranged about said rotary member so as to energise said spring to successive oscillations and to simultaneously act on said magnetic mass to control the rotational speed of said rotary member.

2. An escapement regulator according to claim 1, the oscillating mass consisting of the oscillating spring and of the magnetic mass at the free end thereof being arranged to oscillate in a plane normal to the axis of rotation of said rotating member and parallel to the plane of the latter.

3. An escapement regulator according to claim 1, the oscillating mass consisting of the oscillating spring and of the magnetic mass at the free end thereof being arranged to oscillate in a direction at an angle to the general plane of rotation of the rotating member.

4. An escapement regulator according to claim 1, and further comprising a member which is disposed in relation to said magnetic mass to pre-

vent the regulating system from falling out of step.

5. An escapement regulator according to claim 1, the oscillating mass consisting of the oscillating spring and of the magnetic mass at the free end thereof being arranged to oscillate in a direction at an angle to the general plane of rotation of the rotating member, and timing regulating means for varying the frequency of the oscillating mass.

6. An escapement regulator according to claim 1, the oscillating mass consisting of the oscillating spring and of the magnetic mass at the free end thereof being arranged to oscillate in a direction at an angle to the general plane of rotation of the rotating member, and means for providing a variable shunt effect for varying the frequency of the oscillating mass.

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