PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in or relating to Electromagnetic Driving Mechanisms.

I, JOHAN DIRK CARLEY, a Dutch Subject, of Schoolstraat 41, The Hague, Province of South-Holland, The Netherlands, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electromagnetic driving mechanisms and has for its object an electromagnetic driving mechanism adapted for the drive of clocks, for the motion of advertising apparatus or for other purposes.

According to the invention I provide an electromagnetic driving mechanism characterised by a rotatable disc armature of magnetic material, located in an alternating magnetic field, and oscillating axially under the action of the said field, in combination with resilient members secured to the said disc, said members being of the nature of pieces of pile fabric or brushes, the fibres or bristles of which are inclined to the surface of the said disc and so disposed that they contact at their free ends with a fixed rough surface parallel to the said disc, thereby imparting to the disc a movement of rotation owing to the continuously varying distance between the disc and the said fixed surface.

The pieces of pile fabric or brushes can alternatively be secured to the fixed surface, their fibres or bristles contacting at their free ends with the rough surface of the disc.

Referring to the appended drawings which illustrate by way of examples, mechanisms according to this invention:—

Figs. 1 and 2 illustrate diagrammatically the principle of the invention.

Fig. 3 shows diagrammatically a form of mechanism according to the invention.

Fig. 4 shows a modified form of the mechanism according to Fig. 3.

In Fig. 1 a disc rotatable about a vertical axis, and having a rough surface, rests on a supporting surface 3 by means of an intermediate layer of resilient members secured to the surface of the disc and of the nature of pieces of pile fabric or brushes, the fibres or bristles 4 of which are inclined to the surface of the disc.

The distance 2 between the disc 1 and the surface 3 is caused to vary continuously by placing the disc, which is of magnetic material, in an alternating magnetic field. For the intermediate layer a suitable material is plush (mock-velvet), which is provided with pile-wires, which are inclined with respect to the surface of the textile material. In order to make the operation easily understood only a single brush wire or pile wire 4 is shown in figures 1 and 2.

The disc oscillates between the two positions 1 and 1^1 (Fig. 1) or 1^1 and 1^{11} (Fig. 2).

By the motion of the membrane from position 1 to position 1^1 (Fig. 1), the pile wire 4 is rotated about its lower end b with which it makes contact with the surface 3, and changes from the position 4, or $b\ a$, to the position 4^1, or $b\ a^1$, which is shown in full line in Fig. 2 and in dotted line in Fig. 1.

The result of this motion is that the membrane, as appears from Fig. 1, is rotated through an angle α. As the disc returns to its first position 1, friction prevents it from rotating back into its former angular position, but the pile wire ba resumes its former inclination to the disc so that its tip moves to b^{11} (Fig. 2). This rotation is repeated at the next reciprocating movement of the disc, the pile wire occupying the position 4^{11} or $a^{11}\ b^{11}$ Fig. 2. As a result the disc is set in rotary motion, consisting of a continuous succession of angular steps of amplitude α.

It will be understood that the resilient membrane may be secured to the rotatable disc, or to the fixed surface as may be desired.

Fig. 3 shows diagrammatically the mechanism. The winding 10—11 of a bipolar electromagnet 9 is connected to an alternating current circuit. The magnet acts on a disc 1, of magnetic material, rotatable about a spindle 12. The disc 1 is secured to the spindle 12 by means of leaf springs 13, the outer ends of which are secured to the disc 1 and the inner ends are secured to the shaft 12. The connection is so formed, that the disc 1 can perform oscillations perpendicular to

its own plane along the spindle 12, without displacing the latter. The disc 1 is supported by the intermediate resilient layer 4 on the supporting surface 3, which is formed of a textile material or of a material with pile wires (only partly illustrated in Fig. 4 with dotted lines), inclined in a direction tangential to the circumference of the disc.

The disc 1 being of magnetic material, it is put in oscillation, so that a rotation about its axis 12 is produced in the manner above described.

The form of construction shown in Fig. 4 differs from that shown in Fig. 3 only so far as, in this case, a unipolar electro magnet 14 is employed which constitutes at the same time the lower bearing 15 for the spindle 12. The disc 1 is, as in Fig. 3, secured to the spindle 12 by means of springs 13 and is supported on the surface 3 by means of the intermediate layer formed by the pile wires or brush, which in this case are ring shaped and formed on the housing 16 of the electromagnet 14.

The mechanism according to the invention is suitable for a series of purposes in which oscillations are to be converted into a uniform rotary or uniform rectilinear motion. Thus the apparatus can be employed for supplying motive power to known mechanisms such as those used in clocks, movable advertising devices, mechanical toys, and the like.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An electromagnetic driving mechanism characterised by a rotatable disc armature of magnetic material, located in an alternating magnetic field, and oscillating axially under the action of the said field, in combination with resilient members secured to the said disc, said members being of the nature of pieces of pile fabric or brushes, the fibres or bristles of which are inclined to the surface of the said disc and so disposed that they contact at their free ends with a fixed rough surface parallel to the said disc, thereby imparting to the disc a movement of rotation owing to the continuously varying distance between the disc and the said fixed surface.

2. A variation of the electro-magnetic mechanism as claimed in claim 1, in which the pieces of pile fabric or brushes are secured to the fixed surface, their fibres or bristles contacting at their free ends with the rough surface of the disc.

3. The electro-magnetic mechanism, substantially as described and as illustrated in the appended drawings.

Dated this 17th day of September, 1929.

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FIG: 1.

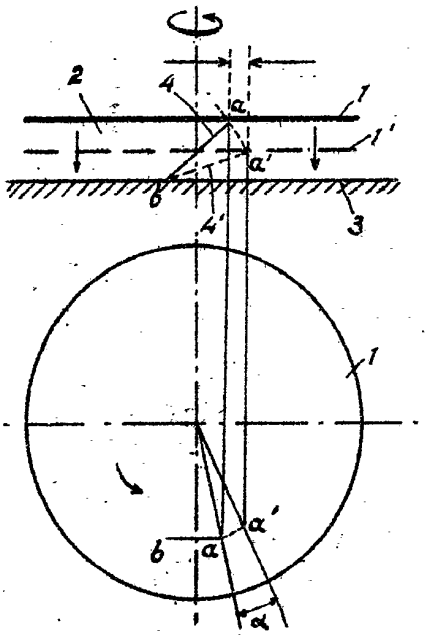


FIG: 2.

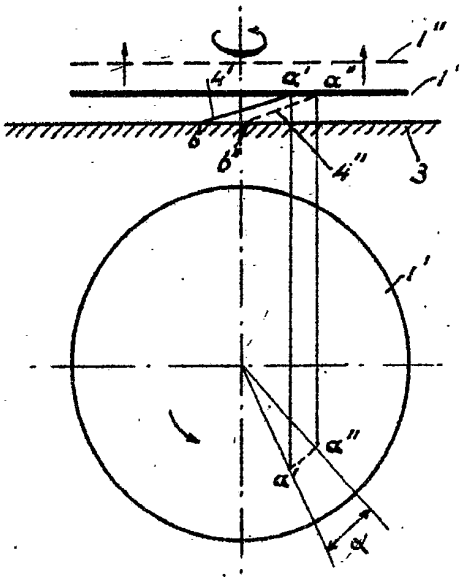


FIG: 3.

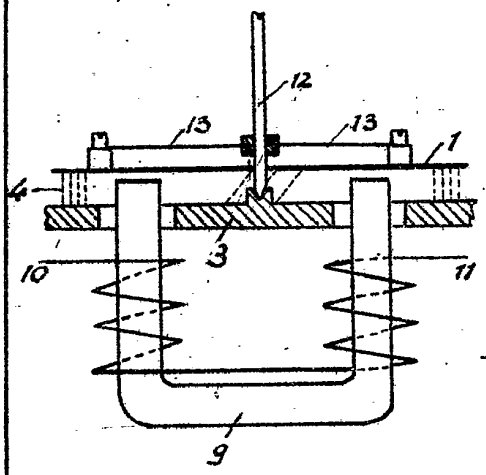
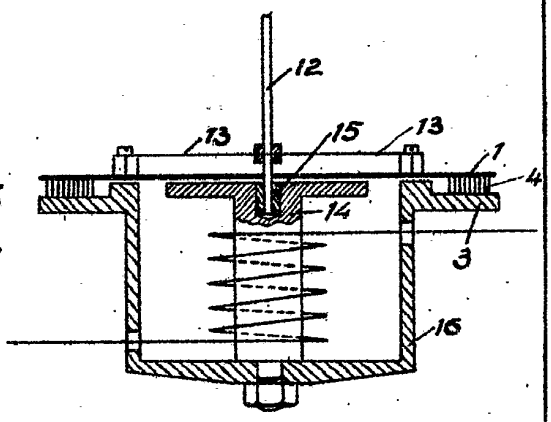


FIG: 4.



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