

UNITED STATES PATENT OFFICE

ALBERT WATERS, OF GLEN IRIS, AND SYLVESTER JOSEPH WATERS, OF TOORAK,
VICTORIA, AUSTRALIA

ELECTRICALLY MOVED DISPLAY APPARATUS

Application filed July 30, 1929, Serial No. 382,243, and in Australia June 26, 1929.

An object of this invention is to provide, by utilizing the vibrator of an electro-magnet, a simple, space-saving, and less expensive motor, which can be very light and silent, than has hitherto been available, so far as we are aware, to impart intermittent progressive movements to articles for advertising; display, and other purposes,—for instance to rotate a shop showcase, or table carrying wares, or to display a rotating pyramid, drum, or endless band, carrying advertisement matter—the motor being particularly suitable for persons who cannot afford the more expensive apparatus now in use for the said purposes. Another object is to combine with an electromagnet a springy vibrator to which is attached an arm which gives a pushing effect and which frictionally grips, and slidably contacts on, an article to produce progressive intermittent movements thereof.

The forward movements are extremely short, but extremely frequent, yielding a gentle and at first glance almost imperceptible effect which does not annoy or jar on an observer, no motor hitherto devised having produced such strokes which in some cases are each only a few thousandths of an inch in length. The motor and its connections will be either visible or hidden, and illuminating effects (not herein claimed) are usable in addition, for example flash lamps within the casing.

Other features of the invention are indicated hereinafter. The motor, set to drive a rotatable showcase from within, is herewith illustrated and hereinafter described, but other applications can obviously be effected. The showcase or any part of it is of any appropriate material, and degree of transparency or opacity. Details shown in the drawings can be varied while retaining matter within the scope of the claims.

Figure 1 is a perspective view of a showcase, the top of which is a table, part being broken away to show the interior.

Figure 2 is a plan of the motor ready to be clamped in working position.

Figure 3 is a perspective view of the outer end of the vibrator carrying a resilient arm;

a pusher, to fit on the arm, is shown detached.

Figure 4 is a side elevation of a part of Figure 2 in the position assumed when the pusher is in the act of advancing.

Figure 5 is a perspective view of part of the vibrator carrying an adjustable arm, the details being modified.

Figure 6 is a sectional side elevation of the said arm carrying an adjustable pusher which bears on a serrated surface, but the teeth shown are, in order to be clearly visible in the drawings, considerably exaggerated in size.

1 is the electro-magnet connectable in any suitable circuit having leads 2, 2^a; and 1^a is its core, extending from any suitable base, shown as a bar 3, and positioned to intermittently attract a vibrator 1^b, shown of blade form. The electro-magnet used is suited to the kind of current used, that shown suiting an alternating one.

At a suitable point relatively to the vibrator free end 1^b, the inner part 4^b of a stem or arm 4, is connected, the outer end 4^a being of any suitable form to act as, or to carry, a pusher shown as a member 5 of tapered block form, but made in practice of any suitable form and size.

The vibrator is suitably elongated, one end having any desired anchorage 7^b. Arm 4 extends from the vibrator at any suitable angle. Arm 4 would act if pivoted to the vibrator and allowed at its other end to bear by gravity on the surface to be pushed. In the drawings arm 4 has a bow at its end, 4^b, through which an adjusting screw 4^d carrying a nut 4^c extends, whereby to compress the bow and cause the position of arm 4 relatively to the vibrator and to surface 6 to be adjusted, so as to regulate the pressure which pusher 5 exerts on surface 6, the pusher shown in Figure 6 being also adjustable on the arm 4, which is shown with its end pushed through sleeve 5^b on the pusher, and held by a set screw 5^a. The contact of the pusher with surface 6 is advantageously adjustable and located at or near the periphery of the latter. An attendant can at any time adjust the frictional, pressing, and driving force which is exerted on surface 6.

Arm 4 is advantageously made flexible and resilient and is not necessarily straight at any time.

To allow of adjusting arm 4 along vibrator 5 1^b to vary the position of contact on surface 6 Figure 5 shows a vibrator slot 1^c housing a slide 4^c which carries arm 4 the slide being positioned suitably. It is shown positioned by a tongue and groove joint 4^f, and screws 4^g, but other ways in which the arm could be adjustably connected are obvious.

In Figure 3 a spear head 4^a on arm 4 is provided on which is forced the pusher 5 which not only propels surface 6 but also, by bearing down on it can be made to prevent its gaining momentum. Hence to alter the speed of propulsion arm 4 is made adjustable by screw 4^a to make the pressure on surface 6 lighter or heavier.

When the downward pressure as distinguished from the forward pressure on surface 6 is made light that surface can gain momentum from its intermittent propulsion, but when the pressure is relatively heavy there is not that momentum so the speed is less. The back strokes are grips, the forward strokes are impulses. The nearer periphery 6^a of surface 6 the pusher makes contact the slower the rotation. During each push, arm 4—which may flex slightly—can act without a rubber end, but a pusher with a bevelled contacting edge 5^a when made of soft rubber acts well because its tip becomes a little compressed as it grips each successive part of surface 6 at the beginning of each onward push; but a bevelled edge is not necessarily the only part which contacts with surface 6, and it is found advantageous to allow an under surface of the pusher to so contact. A fairly smooth surface 6 is usable but a finely serrated one is also serviceable.

The electro-magnet can be held in place in various ways but is shown with a frame 7, and clamp 7^a, which grips an axial spindle 8 in a showcase 10, the spindle having a support 9. The spindle carries conductors 2, 2^a, and supports in ball bearings 8^a, to enable very slight force to suffice to move surface 6.

The top 11 of the article moved may bear advertising and goods.

The motor is started by closing, and stopped by breaking, the electric circuit.

The mechanism is applicable for moving articles other than those for display purposes.

We claim:—

1. A propelling mechanism including in combination, a stationary spindle, a support rotatably mounted on the spindle, an electro-magnet fixed to the spindle and including a vibrating element, the outer end of which is provided with a longitudinal slot, a flexible spring arms, means for slidably mounting the inner end of the arm in the slot so as to vary the position of the arm on the vibrat-

ing element, the arm being extended at an angle from the vibrating element towards the support and adapted to impart intermittent movement to the support during operation of the vibrating element.

2. A propelling mechanism as claimed in claim 1, wherein means is provided to adjust the pressure of the arm on the support.

3. A propelling mechanism including in combination, a stationary spindle, a support rotatably mounted on the spindle, an electro-magnet fixed to the spindle and including a vibrating element, an arm attached to the vibrating element and extending at an angle therefrom towards the support and adapted to impart intermittent movement to the support during operation of the vibrating element, means for varying the pressure of the arm with respect to the support including a bowed portion at the inner end of the arm, and an adjustable clamping device operably connected with the bowed portion.

In witness whereof we have hereunto signed our names to this specification at Melbourne, in the State of Victoria, in Australia, this third day of July, 1929.

ALBERT WATERS.

SYLVESTER JOSEPH WATERS.