

W. H. THOMPSON.
MOTOR FOR ADVERTISEMENT DISPLAY APPARATUS.
APPLICATION FILED JUNE 5, 1911.

1,022,898.

Patented Apr. 9, 1912.

2 SHEETS-SHEET 1.

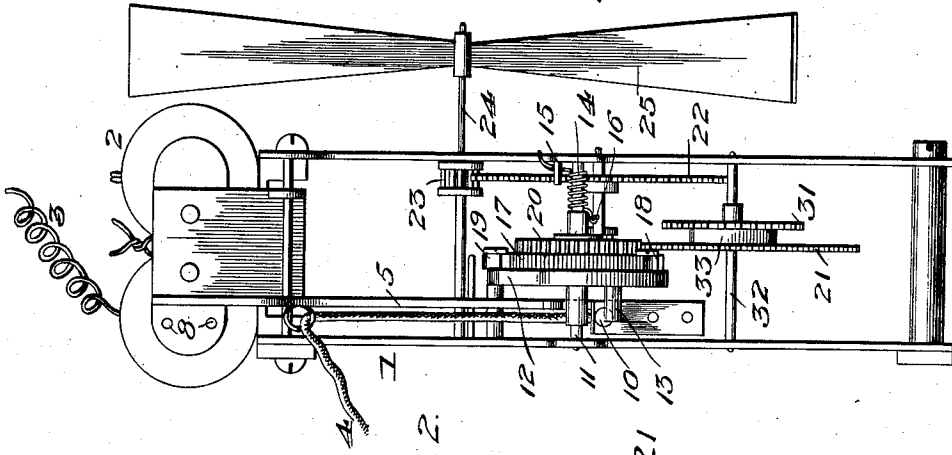


Fig. 2.

Fig. 8.

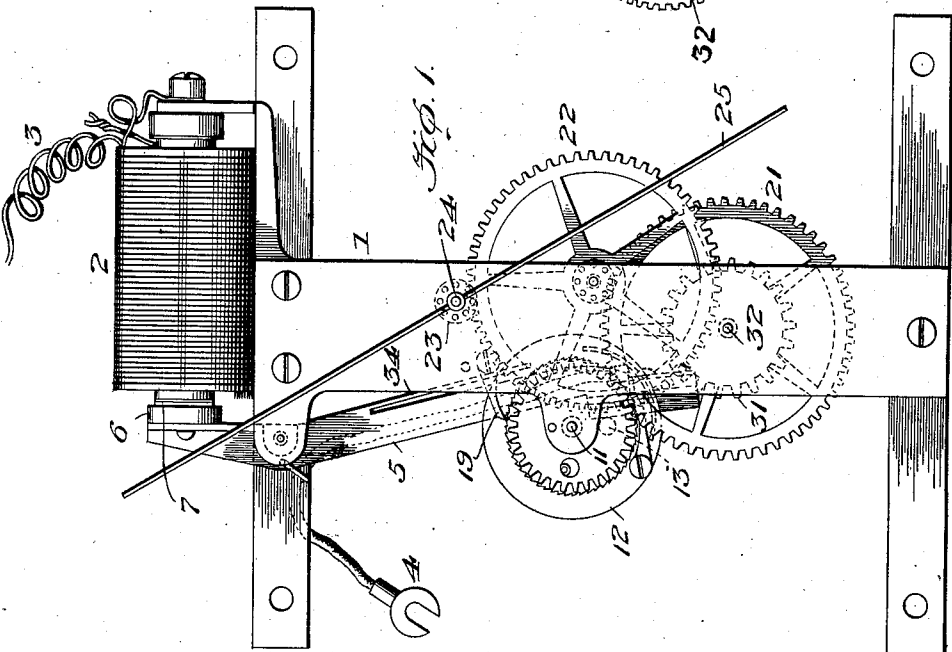
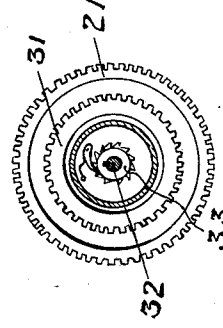


Fig. 1.

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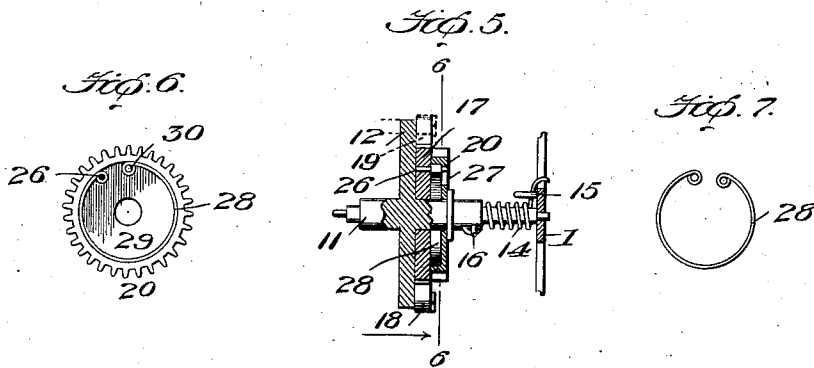
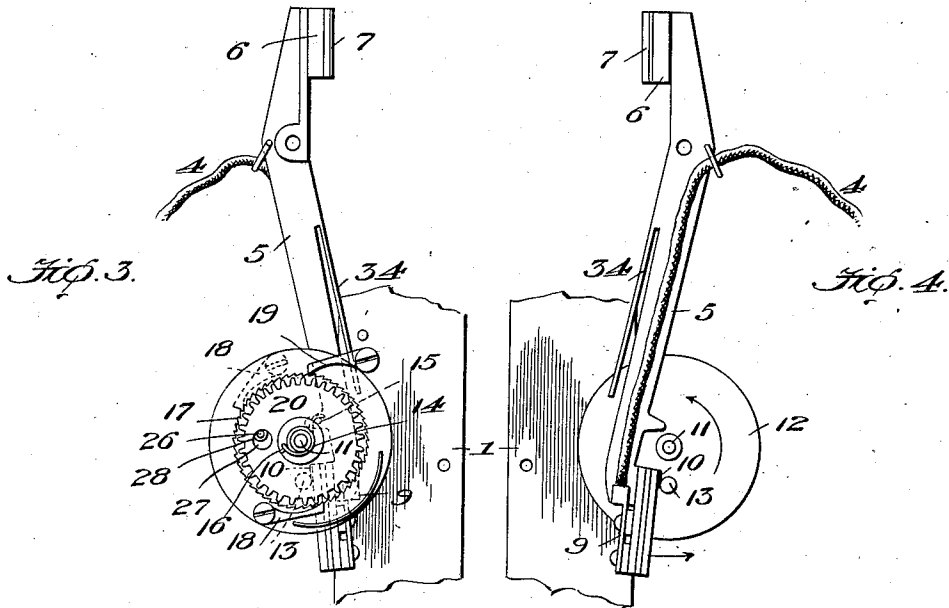
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UNITED STATES PATENT OFFICE.

WILLIAM HENDERSON THOMPSON, OF MEMPHIS, TENNESSEE.

MOTOR FOR ADVERTISEMENT-DISPLAY APPARATUS.

1,022,898.

Specification of Letters Patent.

Patented Apr. 9, 1912.

Application filed June 5, 1911. Serial No. 631,450.

To all whom it may concern:

Be it known that I, WILLIAM H. THOMPSON, a citizen of the United States, residing at Memphis, county of Shelby, and State of Tennessee, have invented certain new and useful Improvements in Motors for Advertisement-Display Apparatus, of which the following is a specification.

This invention relates to motors for advertisement display apparatus.

The present invention has for its object the provision of a simple, inexpensive, and reliable electro-magnetically rewound spring operated motor, particularly adapted for operating advertisement display apparatus which will operate with great regularity and will require only intermittent electrical energization of minimum periodicity so that it will be very economical in the use of electric current, and will be adapted for operation by a small battery for a relatively long period of time.

In carrying out the invention, I provide a spring motor which is periodically wound by an electro-magnet and its armature through the medium of certain novel instrumentalities, and in connection therewith employ novel spring power-retaining means adapted to retain the power of the spring motor in the brief period during which the electro-magnetic means operates to re-wind the spring motor and thereby preserve the continuity and regularity of operation of the spring motor when the latter is unwound.

The present invention differs in certain particulars from that set forth in my application on electric automobile clock, Serial No. 631,637, filed June 6, 1911 in respect to the construction and arrangement of the spring motor and power-retaining means.

In the present invention there may be employed a new form of power transmitting gear which constitutes a part of the subject-matter of another application on compressed air operated advertisement display apparatus set forth in my application filed June 5, 1911, Serial No. 631,449; and this invention utilizes the electro-magnet, armature and armature lever, contacts and pin, set forth in my application on advertisement display apparatus, filed November 19, 1910, Serial No. 593,185.

In the accompanying drawings:—Figure 1 is a side elevation; Fig. 2, an end elevation; Figs. 3 and 4, views looking toward

opposite sides of the armature lever and the spring motor; Fig. 5, a detail section, partly in elevation, through the spring motor; Fig. 6, a view looking toward the interior of the transmitting gear having the power-retaining spring; Fig. 7, a detail of the power-retaining spring and Fig. 8, a detail of the pawl, ratchet, and wheel connection, for driving the advertisement display apparatus.

The parts are carried by a frame 1, surmounted by an electro-magnet 2, having a shunt to absorb the spark at the contacts when the electro-magnet is energized. One terminal of the circuit including the electro-magnet appears at 3, and the other terminal at 4. The terminals 3 and 4 may be connected to any electric or battery circuit. As the device requires very little current, and that only for a fraction of a second at a time, a dry battery of but few cells may be conveniently employed for operating the device.

5 designates an armature lever pivoted to the frame 1 and provided with an armature 6, which preferably has on its inner face a light leaf-spring 7 secured at one end by fastenings 8, and free at its other end, which prevents the armature from sticking to the poles of the contact by residual magnetism, and also serves as a spring to maintain the armature and armature lever in normal position and to quickly snap them to such position on the breaking of the circuit, as will presently appear. The armature lever is provided with an insulated contact plate 9 which is connected to the circuit terminal 4. Preferably, there is an insert 10 of German silver (Fig. 2) in the contact plate where the contact is made, thus compensating for the rubbing action which ensues and insuring a bright contact at all times, which in turn insures the uninterrupted operation of the device throughout long periods of time; in fact, as long as the source of electric current retains its integrity. Sparking does not cause blackening and imperfect contacts with this contact structure.

Journalled in the frame 1 is a shaft with which is integrally formed or which has connected to it, an actuating wheel or disk 12. Projecting from the disk 12 is a contact pin 13 (Figs. 2, 3, and 4) which is adapted to engage the contact 10. The spring which constitutes the driving power for the motor is shown at 14, Fig. 5, one end

thereof being engaged with a pin 15 on frame 1, and the other end with a pin 16 on shaft 11, the spring being coiled around said shaft and serving to actuate it and being adapted to be wound when the disk or wheel 12 is turned on the actuation of the armature. Referring to Fig. 4, it will be observed that the contact pin 13 is touching the contact 10 on the armature lever. When this occurs the circuit to the electro-magnet 2 is completed and the armature is thereupon attracted with the result that the lower end of the armature lever is instantaneously moved in the direction of the arrow (Fig. 4) whereupon the disk or wheel 12 is impactively turned, as indicated by the arrow thereon, Fig. 4, resulting in re-winding the spring 14, thus restoring the operating power to said spring for the purpose of driving the gears, as will presently appear.

During the re-winding of the spring by the operation just set forth, there would be a cessation of the turning of the gears. To compensate for this and to enable the gears to continuously operate even during the almost instantaneous turning of the wheel 12 induced by the kicking of the armature lever when the contact is energized, I provide a power-retaining device illustrated more in detail in Figs. 3, 5, 6 and 7. Loose on the shaft 11 is a ratchet wheel 17 whose teeth are engaged by a pawl 18 carried by the wheel 12. Preferably there is provided on the frame 1 a pawl 19 also adapted to engage the ratchet wheel 17 to prevent backward turning thereof. When the wheel 12 is kicked backwardly, as heretofore described, the pawl 18 drags idly on the ratchet wheel 17 but the uncoiling tendency of the spring 14 after it has been wound, acting through the shaft 11 and the wheel 12, causes the pawl 18 to then positively engage the said ratchet wheel 17 and to positively drive it during the unwinding of the spring 14.

Loosely journaled on the shaft 11 is a power-retaining driving gear 20 which is in mesh with the train of accelerating gears 21 and 22, the latter driving a pinion 23 on a spindle 24 which carries a regulator or governor fan 25 which insures the regularity of the action of the train. Secured to the ratchet wheel 17 is a pin 26 which projects into an enlarged opening or slot 27 in the power-retaining gear 20. Secured to the pin 26 is a helical spring 28 which lies within a concavity 29 in the ratchet wheel 20, the other end of the spring being secured at 30 to the ratchet wheel 20. Assuming that the spring 14 has been wound, the pawl 18 would be put in the position shown by dotted lines in Fig. 3. The unwinding of the spring, through the pawl 18 would cause the ratchet wheel 17 to be turned with the wheel 12 and the pin 26 would be shifted to

the lower side of the opening 27, as shown in Fig. 3, so that the ratchet wheel 17 would drive power gear 20 which in turn drives the gears 21 and 22 as the tension of spring 14 is greater than that of spring 28, and hence spring 28 is thus put under tension. Now, when the turning of the wheel 12 causes the contact pin 13 to engage the contact 10, the circuit of the electro-magnet 2 is completed and the armature being energized, the wheel 12 is kicked back to again bring the pawl 18 to the position shown in dotted lines in Fig. 3, during which operation the spring 14 is re-wound but this re-winding, it will be observed, would interrupt or check the continuous turning of the gears 21 and 22, unless the retaining power consisting of the spring 28 and gear 20 were employed. When the wheel 12 is thus kicked backwardly, the spring 28 expands, which is permitted by the play of the pin 26 in the opening 27, and hence the gear 20 is impelled by said spring 28 and there is a continuous application of spring power to the wheel 21 without any backward turning thereof. The operation of kicking back the wheel 12 is practically instantaneous and immediately the pawl 18 reaches the dotted line position shown in Fig. 3, the spring 14, having been re-wound, again acts on the gear 20 through the pawl 18, ratchet wheel 17, and pin 26.

The power for operating any device such, for instance, as an advertisement display apparatus, is transmitted through a chain wheel 31 on the shaft 32 which carries the gear 21. Preferably, the wheel 31 has a pawl and ratchet connection 33 with the shaft 32 or the gears 21 so that while said wheel 31 is positively driven in one direction, it may be idly turned in the same direction to enable the advertisement display devices to be rapidly turned or moved by hand when desired. This part of the invention is set forth and claimed in my application on compressed air motor operated advertisement display apparatus filed June 5, 1911, Serial No. 631,449.

The armature lever is preferably provided with a spring member 34 adapted to bear against a part of the frame 1 and to insure a rubbing engagement of the contacts 10 and 13 before the contact 13 and the wheel are kicked by the armature lever.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a motor for advertisement display apparatus, the combination with gears adapted to operate the advertisement display apparatus, of a fan wheel adapted to act as a governor therefor, a spring-actuated driving wheel, spring-operated power-retaining means interposed between the driving wheel and the gears aforesaid adapt-

ed for imparting motion to the gears during the re-winding of the spring-actuated wheel, an electro-magnet, an armature therefor, and contacts carried by the armature and the driving wheel which are adapted for engagement, said contacts being in the circuit of the electro-magnet, whereby the electro-magnet is adapted to periodically cause backward turning of the driving wheel to re-wind the spring thereof.

2. In a motor for advertisement display apparatus, the combination with gears adapted to operate the advertisement display apparatus, of a shaft, a driving wheel secured thereto, a spring cooperating with the driving wheel aforesaid, a ratchet wheel loose in relation to the driving wheel, a spring connection between the ratchet wheel and the gear last named whereby the two are adapted to move together but have a limited relative movement, permitting the spring connection to drive the gear independently of the ratchet wheel, a pawl carried by the driving wheel and adapted to engage the ratchet wheel, and means for periodically turning the driving gear back to re-wind its spring.

3. In a motor for advertisement display apparatus, the combination with gears

adapted to operate the advertisement display apparatus, of a shaft, a driving wheel secured thereto, a spring cooperating with the driving wheel aforesaid, a ratchet wheel loose in relation to the driving wheel and in relation to the ratchet wheel, a spring connection between the ratchet wheel and the gear last named whereby the two are adapted to move together but have a limited relative movement, permitting the spring connection to drive the gear independently of the ratchet wheel, a pawl carried by the driving wheel and adapted to engage the ratchet wheel, an electro-magnet, an armature therefor, a contact carried by the armature, a contact carried by the driving wheel, said contacts being in the circuit of the electro-magnet, whereby said contacts are adapted to engage with the unwinding of the main spring to thereby complete the circuit of the electro-magnet and cause the armature to kick back the driving wheel and thus re-wind the spring.

In testimony whereof, I hereunto affix my signature in presence of two witnesses.

WILLIAM HENDERSON THOMPSON.

Witnesses:

J. A. GOODMAN,

S. P. JOHNSON.