

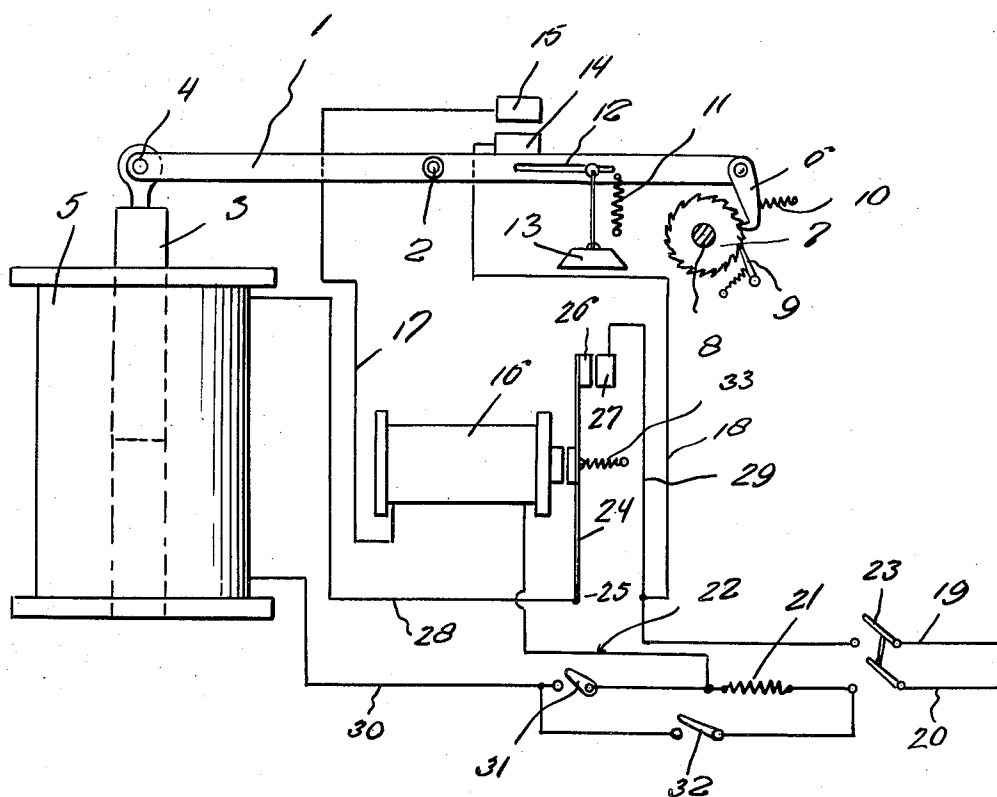
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ELECTRIC MAGNETIC MOTOR

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ELECTRIC MAGNETIC MOTOR.

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To all whom it may concern:

Be it known that I, ABILIO FRANCA, a citizen of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in an Electric Magnetic Motor, of which the following is a specification.

This invention relates to improvements in motors, and particularly motors operated electro-magnetically and designed for use where an oscillating or intermittent rotary motion is adaptable for producing desired results.

An object of the invention resides in providing a motor mechanism of the character above mentioned wherein any oscillating member is provided with a suitable contact mechanism for controlling the energization of the solenoid, which solenoid is provided for controlling a second contact mechanism in order that the periodic operation of the solenoid will periodically operate the contact mechanism controlled thereby for periodically energizing an electromagnet adapted to operate the oscillatable member in the periodic energization thereof so that suitable means may be operated by or from said member in the operation thereof so as to produce desired movements of mechanism for controlling signs, advertising matter, or producing mechanical movements of a desired character.

The invention further comprehends the provision of an oscillating member operable by the periodic energization of an electromagnet which is controlled through the operation of the solenoid which is periodically energized by the operation of the member, which oscillating member is adapted to have suitable connection for producing a periodic rotation of the shaft which may be used to operate any suitable mechanical mechanism.

The invention also comprehends other objects and improvements in the details of construction and arrangement of the parts which are more particularly pointed out in the following description and claims directed to a preferred form of the invention, being understood however that various changes in the size, shape, and arrangement of parts as well as the electrical connections between the same may be made without departing from the spirit or scope of the invention as herein set forth.

In the drawing forming part of this application,

The figure illustrates diagrammatically the relation of the parts for the control and operation of the oscillating member and other connected mechanism.

An oscillating member is indicated at 1, mounted at its central portion 2 for pivotal movement. An armature 3 is pivotally mounted at 4 on one end of the oscillating member 1 and slidable fits within the core of an electromagnet 5 which forms the operating magnet for the oscillating member. At the opposite end of the oscillating member 1 is a pawl 6 pivotally connected with the end of the oscillating member adapted for cooperation with the ratchet wheel 7 mounted on the rotary shaft 8, and which is prevented from reverse rotation by the spring operated pawl 9. A coil spring 10 normally under compression retains the pawl 6 in operative engagement with the ratchet wheel 7 at all times. A coil spring 11 is anchored at one end to the oscillating member 1, and at the opposite end to a suitable stationary support and normally tends to move the pawl 6 downwardly on the ratchet wheel 7 so that the energization of the electromagnet 5 will operate the oscillating member in the opposite direction. The oscillating member is slotted at 12 longitudinally thereof, and adjustably supports the weight 13 which is adapted to cooperate with the spring 11 when both a weight and spring are used for producing a downward movement of the end of the oscillating member carrying the pawl 6. The slidable adjustment of the weight 13 is adapted to change the distance from the pivot 2 so that the period of operation of the oscillating member can be changed in order that it may be caused to operate faster or slower, if desired.

It is to be understood however that either a weight or a spring may be used independently if desired.

The oscillating member 1 operates a contact mechanism which includes a movable contact 14 mounted on the oscillating member, and a stationary contact 15 mounted for cooperation with the movable contact 14. The operation of this contact mechanism is such that at the end of the stroke the oscillating member actuated by the electromagnet 5 will cause the contact 14 to engage the contact 15 for operating the herein-

after described structure for deenergizing the electromagnet in order that the weight and spring may operate to move the same through the opposite stroke of movement for a subsequent operation by the electromagnet. This contact mechanism including the movable and stationary contact 14 and 15 respectively controls the solenoid 16, which has a wire connection 17 with the stationary contacts, while the movable contact is connected by the wire 18 to one side of the source of energy supplied through the wires 19 and 20 respectively. The wire 18 is connected to the wire 19 from the source of energy while the wire 20 is connected to a suitable resistance 21 which in turn has the connection 22 with the other terminal of the solenoid 16. The circuit with the source of energy through the wires 19 and 20 is controlled by the switch mechanism 23. In this way it will be seen that the oscillation of the member 1 alternately closes and opens the circuit to the solenoid 16.

The solenoid 16 is adapted to operate the armature 24 having a pivotal mounting at 25, and at the opposite free end provided with the movable contact 26 adapted to engage the stationary contact 27 of a contact mechanism for controlling the energization of the electromagnet 5. One terminal of the electromagnet 5 is connected by the wire 28 to the armature 24 while the stationary contact 27 is provided with the wire connection 29 to the wire 19 from the source of energy. The opposite terminal of the electromagnet 5 is provided with a wire connection 30 which may be connected to the wire 20 from the source of energy through either the switch 31 or switch 32. The circuit through the electromagnet 5 will include the resistance 21 when the switch 31 is closed, and the switch 32 is open, so that an electromagnet of relatively small resistance can be protected by using the circuit through the resistance 21. A coil spring 33 connected with the armature 24 normally tends to move the same to engage the contact 26 with the contact 27 for closing the circuit to the electromagnet 5.

Upon the closing of the main control switch 23 for connecting the circuits of the apparatus with the wires 19 and 20 from a source of power it will be seen that the electromagnet 5 will be first energized which will operate the armature 3, and draw the same within the magnet, and thereby move the member 1 on the pivot 2 so as to lower the adjacent end of the member, and raise the end carrying the pawl 6 for producing a partial rotation of the shaft 8. At the end of the stroke of the movement of the member 1, the contact 14 will engage the stationary contact 15 and close the circuit to the solenoid 16 which will draw the arma-

ture toward the core of said solenoid, and move the contact 26 out of engagement with contact 27, and thereby break the circuit to the electromagnet 5. This deenergization of the electromagnet 5 will permit the weight 13 and the spring 11 to move the member about the pivot 2 in the opposite direction so as to break the circuit to the solenoid 16 which will immediately permit the contact 26 to again engage the contact 27. This will close the circuit to the electromagnet 5, and produce a subsequent operation of the oscillating member. In this way a continued reciprocating movement of the oscillating member 1 on the pivot 2 will be provided which will produce a periodic rotation of the shaft 8. In this way electric energy is converted into mechanical motion through the cooperation of the solenoid and the electromagnet under the control of the oscillating member 1. With a device of this character suitable mechanism may be operated, such as advertising signs or other mechanically operated devices in which a step by step motion is required or desirable.

Having thus described the invention, what I claim as new is:—

1. An electromagnetic motor comprising on oscillating member, an electromagnet for operating said oscillating member, a contact mechanism operated by said oscillating member, a solenoid having electrical connection with said contact mechanism for control and periodic energization through operation of said contact mechanism by the oscillation of said member, and a contact mechanism operated and controlled by said solenoid for controlling circuits with said electromagnet for periodically energizing said magnet alternately with the energization of said solenoid, whereby said member may be continuously operated.

2. An electromagnetic motor comprising an oscillating member, an electromagnet for operating said oscillating member, a solenoid having an armature, connections between said solenoid and said electromagnet and a source of power, means operated by said electromagnet for controlling the energization of the solenoid, and means operated by the solenoid for controlling the energization of the electromagnet, said means both cooperating to permit energization of the electromagnet and solenoid, whereby oscillation of the member is produced.

3. An electromagnetic motor comprising a member pivotally mounted at its central portion for oscillating movement on said pivot, an electromagnet having a movable armature pivotally connected with one end of said member, a movable contact member carried by the opposite end of said member, a stationary contact cooperating with said movable contact, means engaging the member for moving it on the pivot to disengage

said contacts, a solenoid having an armature, a movable contact carried by the armature of the solenoid, a stationary contact mounted for cooperation with the movable contact on said armature, means for normally holding said armature contacts in engagement, and connections between said electromagnet, solenoid and a source of power, the stationary and movable contacts associated with said member being included in the circuit to the solenoid, and the stationary and movable contacts associated with said armature being included in the circuit to the electromagnet, whereby alternate energization of the electromagnet and solenoid is effected for producing an oscillating movement of said member on its pivot. 15

In testimony whereof I affix my signature.

ABILIO FRANCA.