No. 687,723. Patented Dec. 3, 1901.

D. P. BURDON.

ELECTRIC MOTOR.

(Application filed July 26, 1901.)

(No Model.)

2 Sheets—Sheet 1.

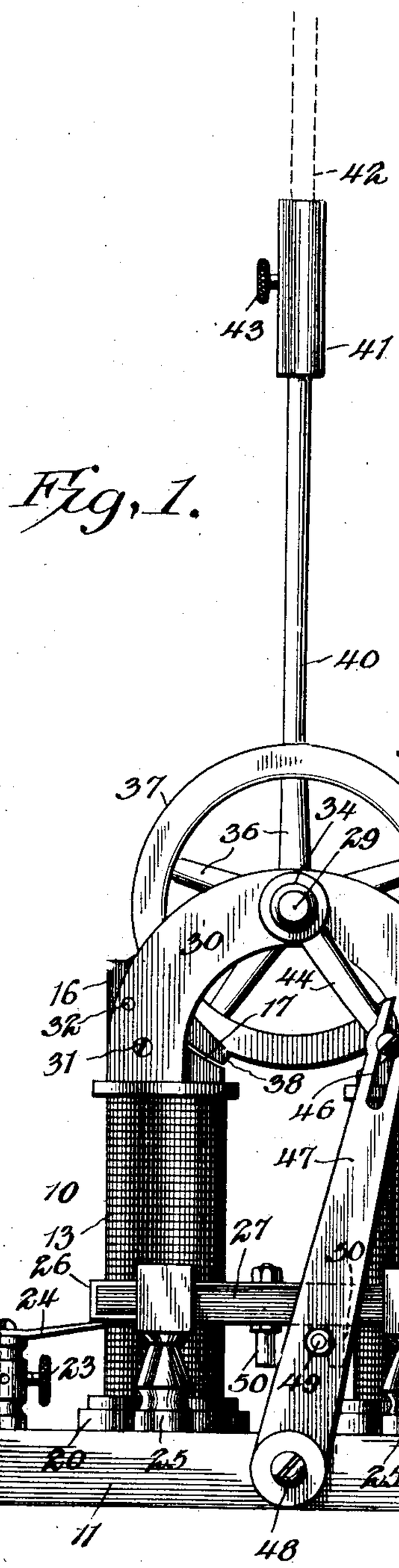


Fig. 1.

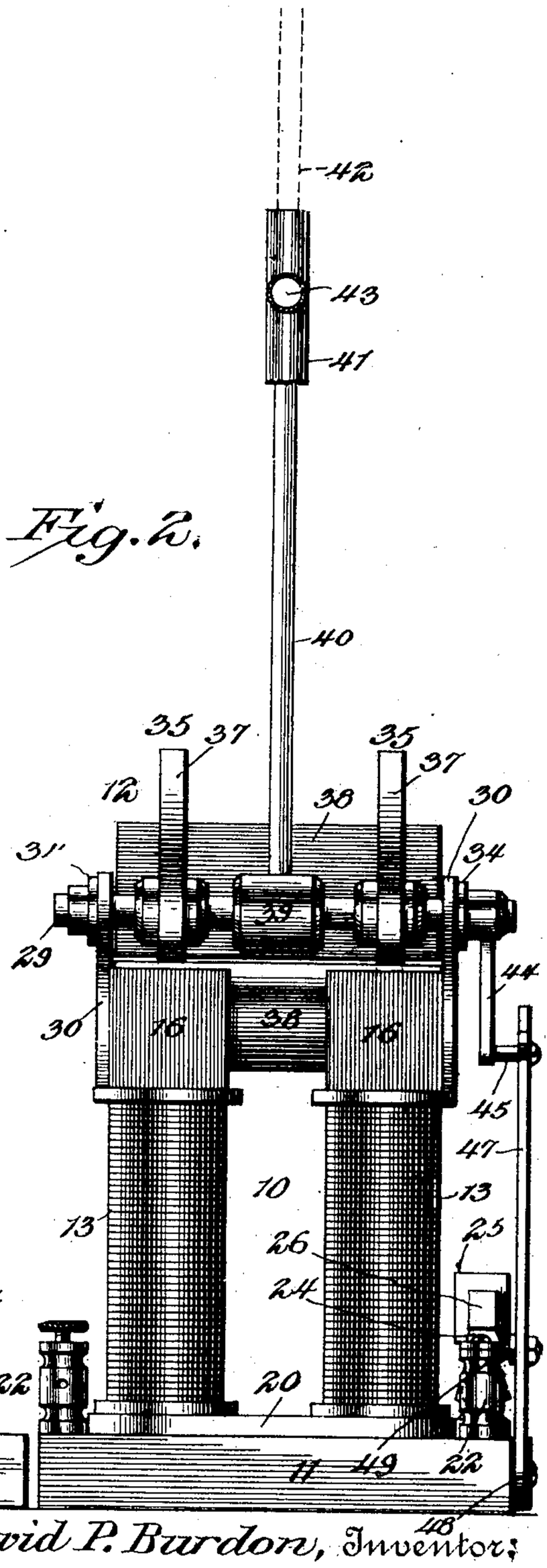


Fig. 2.

Witnesses
Howard W. Orr.
B. G. Foster

David P. Burdon, Inventor;

By E. G. Siggers.

Attorney

No. 687,723. Patented Dec. 3, 1901.

D. P. BURDON.

ELECTRIC MOTOR.

(Application filed July 26, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

Fig. 5.

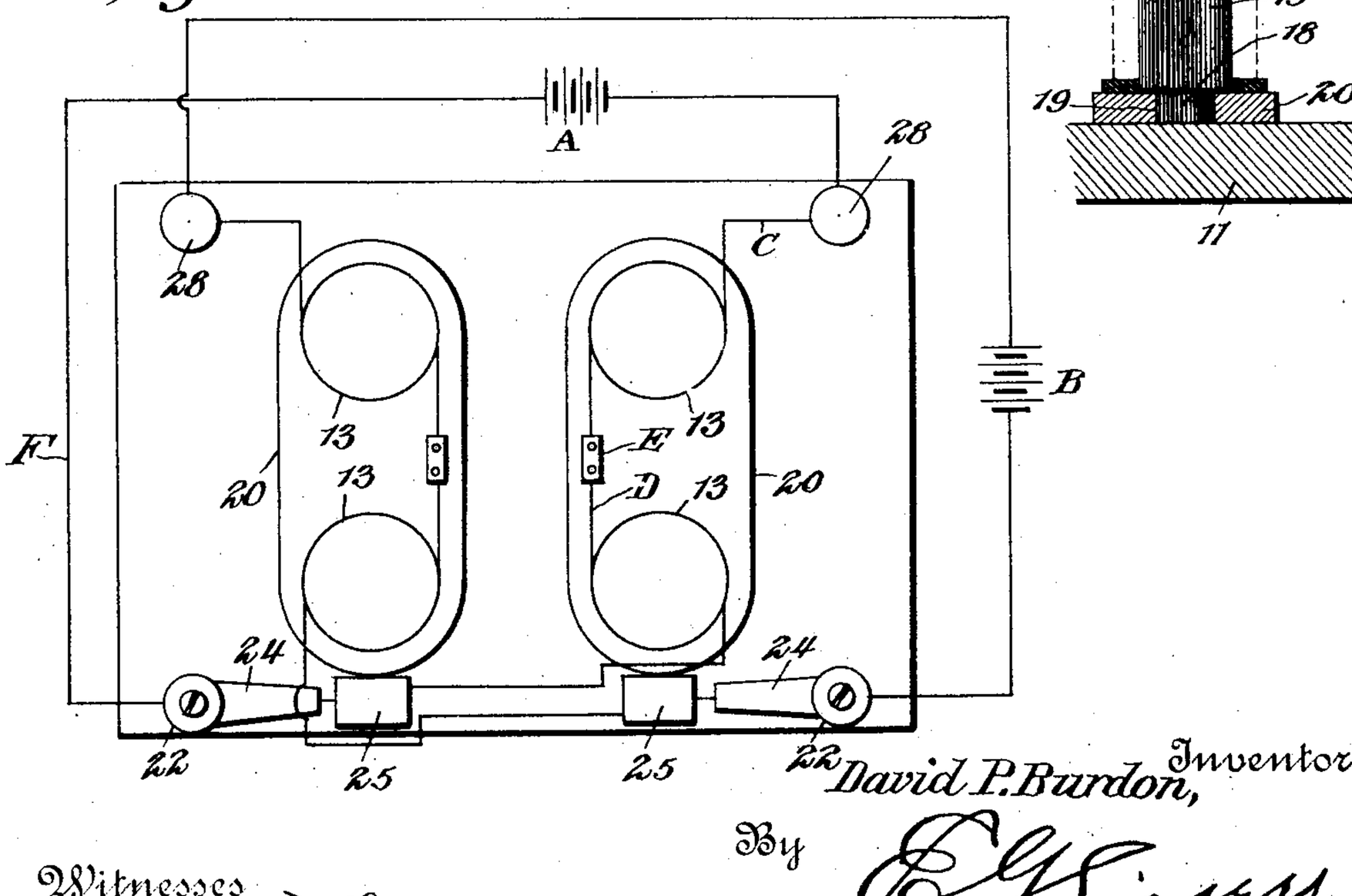
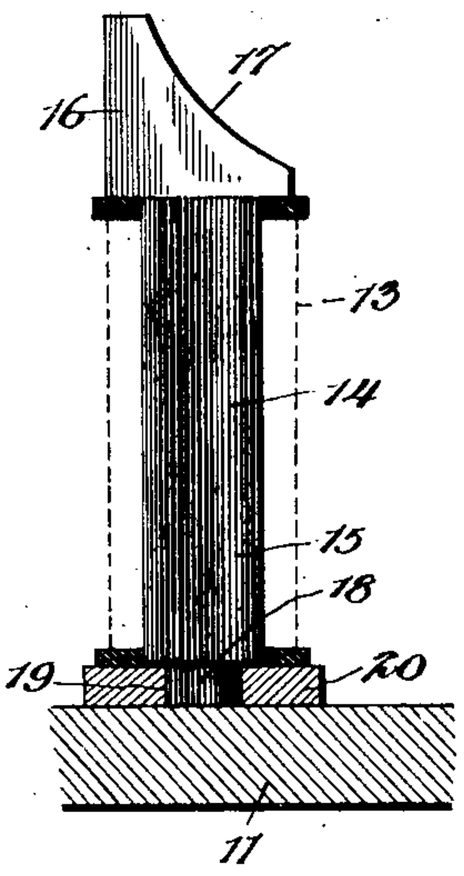


Fig. 4.



Witnesses
Howard D. Orr.
B. H. Foster

Inventor:
David P. Burdon,
By E. G. Siggers
Attorney

UNITED STATES PATENT OFFICE.

DAVID PATTON BURDON, OF JACKSONVILLE, FLORIDA.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 687,723, dated December 3, 1901.

Application filed July 26, 1901. Serial No. 69,834. (No model.)

To all whom it may concern:

Be it known that I, DAVID PATTON BURDON, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented a new and useful Electric Motor, of which the following is a specification.

The present invention relates to oscillating motors, and while particularly intended for use in operating fans it will be readily understood that the invention may be employed for various other purposes.

One of the features of the invention resides in employing a plurality of alternately-energized magnets acted upon by separate sources of electrical energy, whereby one source is at rest while the other is in action, thus providing a machine especially applicable for use in connection with that class of batteries which soon wear out if in continuous use.

Another feature resides in novel means of a simple character for alternately making and breaking the circuits of the magnets, said means being positively actuated by the armature. Other features reside in the combination of the several elements hereinafter pointed out, whereby a simple and compact machine is provided that is not liable to derangement, but can be readily repaired if from any cause it becomes necessary.

In the following specification the preferred embodiment of the invention is fully described, and said embodiment is also illustrated in the accompanying drawings. Such modifications may be made from the construction shown and described, however, as are within the scope of the appended claims without departing from the invention.

Figure 1 is a side elevation of the motor. Fig. 2 is an end elevation of the same. Fig. 3 is a top plan view. Fig. 4 is a vertical sectional view more clearly showing the construction of the field-magnet cores. Fig. 5 is a diagrammatic view showing the circuits employed.

In the drawings similar reference characters designate similar parts throughout the several figures.

The motor consists, broadly, of field-magnets 10, mounted upon a base 11, an armature (designated as a whole by 12) coacting with the field-magnets, and switches operated by the armature to alternately throw the field-magnets into and out of their respective electrical circuits. Two field-magnets are preferably employed, each comprising a plurality of vertical solenoids 13, wrapped about central cores 14. The construction of these cores is clearly shown in Fig. 4, each comprising a main shank 15, having an enlarged head 16 at its upper end, which head is provided with an inclined curved face 17. The lower end of the core is cut away to form a plug 18, that fits in an opening 19, arranged in a plate 20, that connects the solenoids of each magnet, and is secured to the base by means of bolts 21 or other suitable fastening devices. The corresponding solenoids of each magnet are disposed opposite each other, with their inclined faces arranged in opposing relation, as clearly shown.

A pair of switches are secured to the base 11 contiguous to the magnets, each of these switches comprising a binding-post 22, having the usual set-screw 23 secured thereto and carrying at its upper end a contact-spring 24, said spring preferably inclining upwardly from its connection with the post. A conductor-post 25 is mounted upon the base contiguous to the free end of each spring, and a bridge-piece 26 is mounted to move across the space between said spring and the post and electrically connect the same. The bridge-pieces of both switches are secured to the opposite ends of an insulator carrier-bar 27, which bar is slidably mounted in alined openings made for the purpose in the upper ends of the posts 25, said bridges being in the form of substantially U-shaped clips that embrace the ends of the bar.

The electrical circuits for the motor are illustrated in Fig. 5, and as the machine is primarily intended to be run by batteries a separate one is shown for each field-magnet, one being designated A and the other B. The battery A has an electrical connection with a binding-post 28, located at one corner of the base, said binding-post being in turn connected with the solenoids through the wire C, the two solenoids being in connection through the wire D, said wire having a coupler, as E, located therein. The solenoids are furthermore in connection with one of the conductor-

posts 25, while the other pole of the battery connects to the binding-post 22 through the medium of the wire F. In like manner the battery B has one pole in connection with the other binding-post 22 and its other pole in connection with the binding-post 28, which latter post is associated with the solenoids of the other field-magnet, said solenoids being connected to the other conductor-post 25. By this means it will be seen that when the carrier-bar 27 is shifted in one direction, so that the space between the contact-spring and the conductor-post is bridged, an electrical current will pass through the field-magnet, which will thereby be energized. On the other hand, the bridge at the other end of the carrier-bar will be moved to its inoperative position and the circuit of the other field-magnet will be broken.

The armature 12 is constructed in the following manner: A rock-shaft 29 is journaled in arches or yokes 30, secured to and connecting the opposite sides of the field-magnets, said yokes being held in place by screws 31 and pins 32. Bushings 34 are preferably secured to the outer faces of these arches about the shaft, said bushings thus affording a more stable bearing for said shaft. Mounted upon the shaft are spaced disks or wheels 35, preferably consisting of spokes 36 and rims 37, to the peripheries of which are attached the armature-magnets 38. These magnets are in the form of bars that extend across and connect the disks 35 and have their outer faces curved to conform to the curvature of the core-heads 17 of the solenoids, said magnets, however, being located at a greater distance apart than the distance between the heads of the field-magnets, whereby when one of the armature-magnets is directly adjacent to the field-magnet the other will be located above the same, as clearly shown in Fig. 1. Secured to the shaft 29 between the disks 35 is a hub 39, from which projects a stem 40, having a socket 41 at its upper end designed to receive the handle of a fan, (indicated at 42,) a set-screw 43 being employed to hold said handle in place.

In order to operate the carrier-bar, a crank-arm 44 is fastened to the projecting end of the shaft 29 directly above said carrier-bar and has at its free end a wrist-pin 45, that engages in the slot 46 of the forked upper end of a shift-lever 47, which lever is pivoted at its lower end by means of a suitable screw 48 to the base. A stud 49 projects from the inner face of the shift-lever and is located between the depending ends of pins 50, secured to the carrier-bar 27 between the conductor-posts 25.

The operation of the device will be readily apparent to those skilled in this art. Electrical connections having been made in the manner above described and the armature being in the position shown in Fig. 1, the field-magnet above which is located the armature-magnet will be energized, while the other field-magnet will be out of action. As a result the armature-magnet will be attracted downwardly, while the other will be raised, thus moving the armature, and consequently the crank-arm carried thereby. As the armature-magnet approaches the field-magnet, however, the carrier-bar will be shifted because of the movement of the shift-lever, and as a result the other bridge will be brought into action, while the energized magnet will be thrown out of circuit. A reversal of the movement above described will thereupon take place, and the armature will be oscillated continuously as long as the sources of electrical energy are connected with the machine. As a result a fan secured in the socket 43 of the stem 40 will be oscillated continuously.

By the above construction it will be seen that a simple machine has been devised which is especially applicable in connection with ordinary batteries, for the reason that a separate battery is employed for each field-magnet, so that while one magnet is in action the other magnet is inoperative, and the battery therefor being at rest will have time to recuperate. In certain aspects, however, this invention is not limited to the use of separate batteries, and a machine having novel elements is provided which can be operated from any direct current. The sliding construction of the switches between the elements of the bridge affords an easy but positive action which is simple and is not liable to derangement.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In an oscillatory motor, the combination with a field-magnet, of an oscillatory armature-magnet coacting with the field-magnet, one of said magnets being an electromagnet, a switch having electrical connection with the field-magnet and comprising a contact element, a support and a reciprocatory element slidably mounted upon the support and movable into and out of engagement with the contact device, and means operated by the armature for reciprocating the sliding element.

2. In an oscillatory motor, the combination with a field-magnet, of an oscillatory armature-magnet coacting with the field-magnet, a switch having electrical connections with one of the magnets and comprising a contact-spring, a conductor-post spaced from said spring, a bridge slidably mounted on the post and movable across the space between the

spring and post, and means operated by the armature to reciprocate said bridge.

3. In an oscillatory motor, the combination with a field-magnet, of an oscillatory armature-magnet coacting with the field-magnet, a switch having electrical connections with one of the magnets and comprising a contact-spring, a conductor-post spaced from said spring, an insulator carrier-bar slidably mounted on the post and carrying a conductor-bridge movable across the space between the spring and post, and means operated by the armature to reciprocate said carrier-bar.

4. In an oscillatory motor, the combination with a pair of field-magnets, of an oscillatory armature coacting with the field-magnets, switches having electrical connections with the field-magnets, each switch comprising a contact device, a conductor-post spaced therefrom, and a bridge movable across the space between the contact device and the post, a carrier-bar slidably mounted upon the posts and connected to the switches, and means connected to the armature for reciprocating the carrier-bar.

5. In an oscillatory motor, the combination with a pair of field-magnets, of an oscillatory armature coacting with the field-magnets, switches having electrical connections with the field-magnets, each switch comprising a contact-spring, a conductor-post spaced therefrom, and a bridge movable across the space between the contact device and the post, a carrier-bar slidably mounted upon the posts of the switches and having said bridges secured to its opposite ends, and means connected to the armature for reciprocating the bar.

6. In an oscillatory motor, the combination with a pair of field-magnets, of an oscillatory armature coacting with the field-magnets, switches having electrical connections with the field-magnets, each switch comprising a contact-spring, a conductor-post spaced therefrom, and a bridge movable across the space between the contact device and the post, a carrier-bar slidably mounted upon the posts of the switches and having said bridges secured to its opposite ends, a crank-arm secured to the armature, a shift-lever having an engagement with the crank-arm, and connections between the shift-levers and the carrier-bar.

7. In an oscillatory motor, the combination with a pair of field-magnets, of an oscillatory armature coacting with the field-magnets, switches having electrical connections with the field-magnets, each switch comprising a contact-spring, a conductor-post spaced therefrom, and a bridge movable across the space between the contact device and the post, a carrier-bar slidably mounted upon the posts of the switches and having said switches secured to its opposite ends, a crank-arm secured to the armature, a shift-lever having an engagement with the crank-arm and provided with an offset stud, and a pair of spaced pins secured to the carrier-bar and located on opposite sides of the lever-stud.

8. In an oscillatory motor, the combination with a field-magnet, of an oscillatory armature coacting with the field-magnet and comprising a rock-shaft, a plurality of spaced supporting-disks secured to the rock-shaft, and a magnet fastened to the peripheries of the supporting-disks.

9. In an oscillatory motor, the combination with a field-magnet, of an oscillatory armature coacting with the field-magnet and comprising a rock-shaft, a plurality of spaced supporting-disks secured to the rock-shaft, a magnet fastened to the peripheries of the supporting-disks, and a fan-supporting stem secured to the rock-shaft between the disks and having means at its outer end for attaching a fan.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

DAVID PATTON BURDON.

Witnesses:
FRED T. BARNETT,
W. J. BRYAN.