No. 812,949. PATENTED FEB. 20, 1906.

J. L. POTTER.

ELECTROMAGNETIC POWER GENERATOR.

APPLICATION FILED MAY 26, 1906.

Fig. 1.

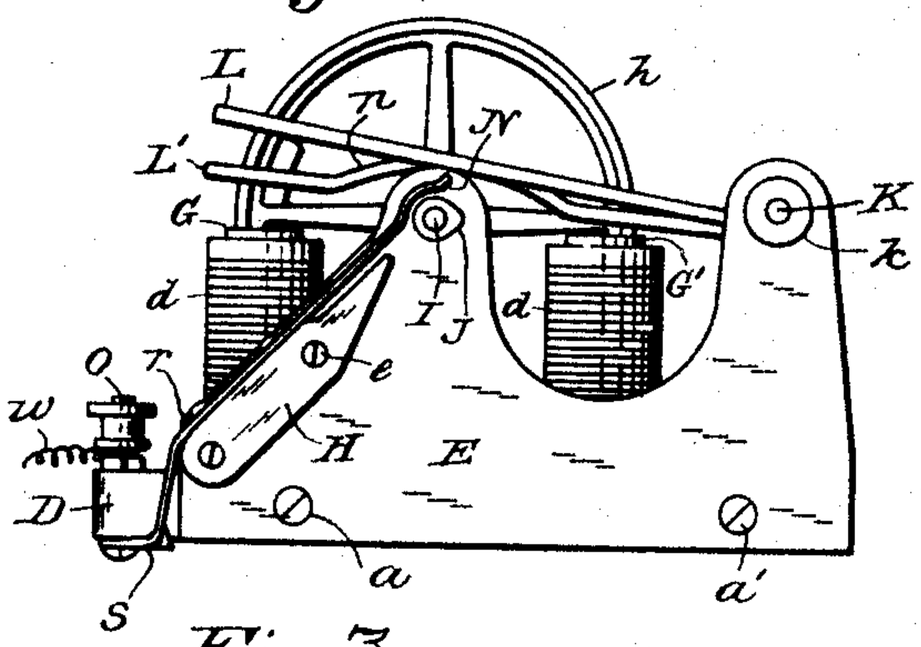


Fig. 2.

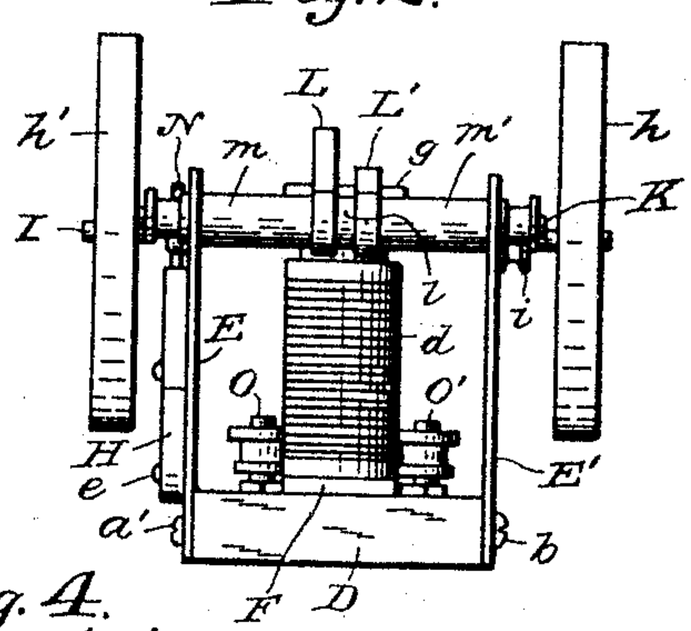


Fig. 3.

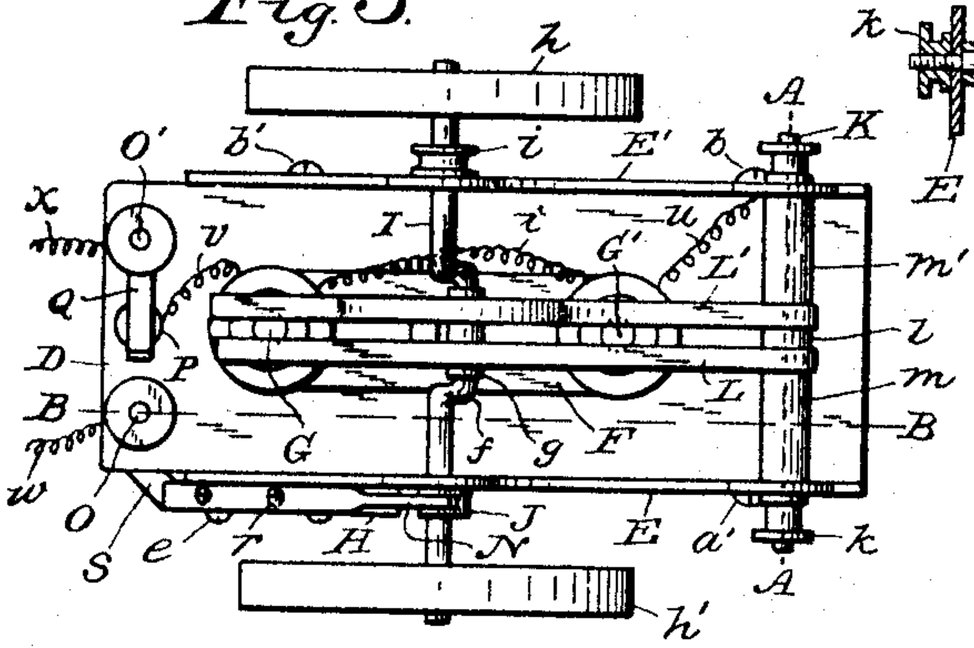


Fig. 4.

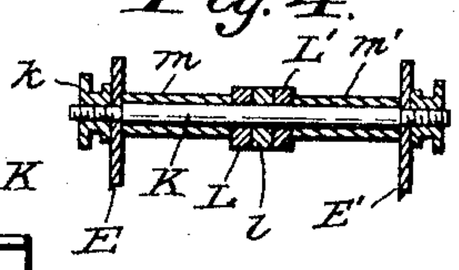
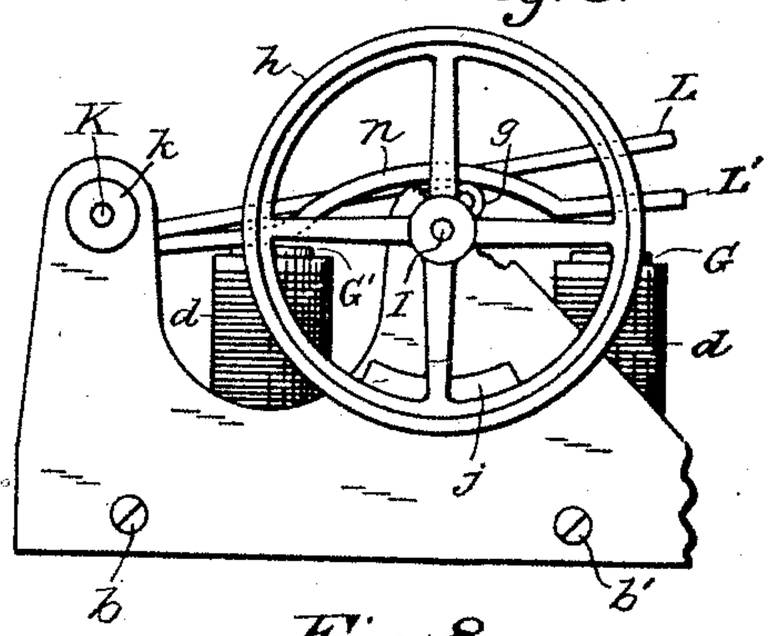


Fig. 5.



L^2 Fig. 6.

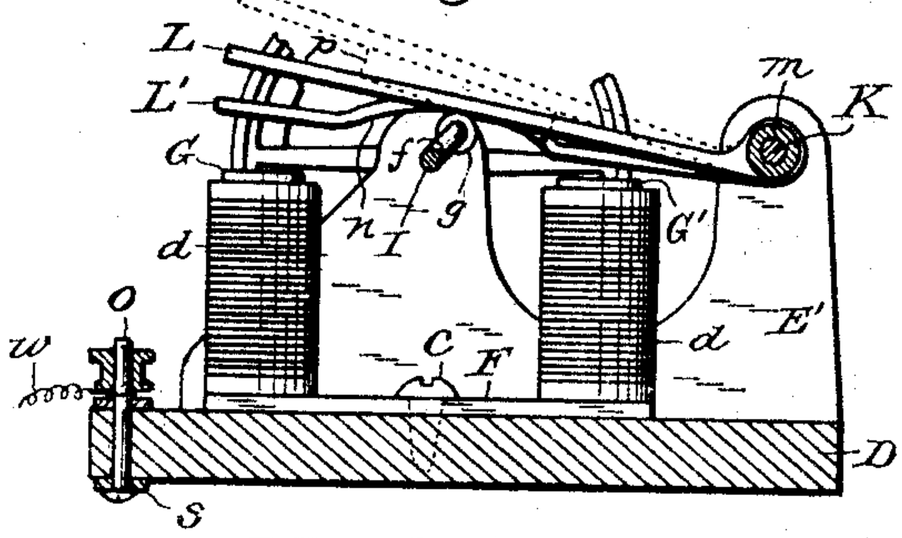


Fig. 7.

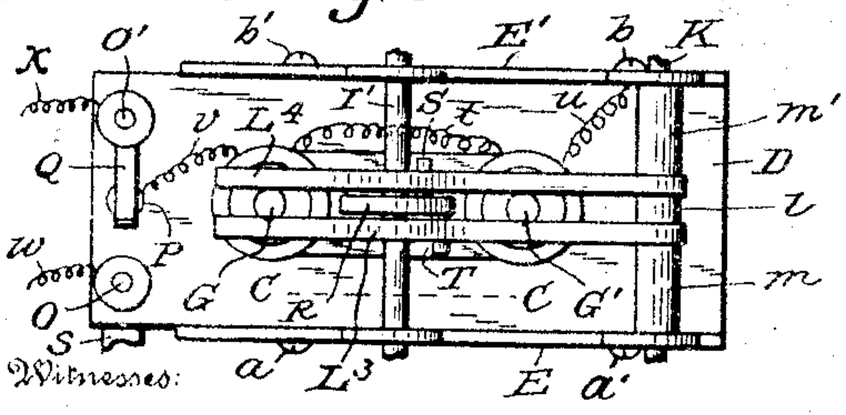


Fig. 8.

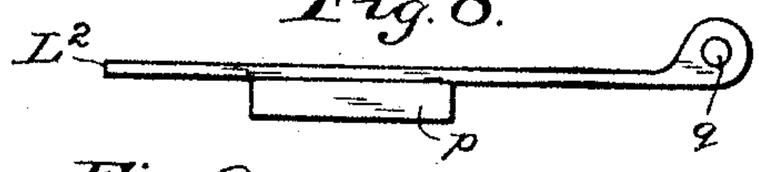


Fig. 9.

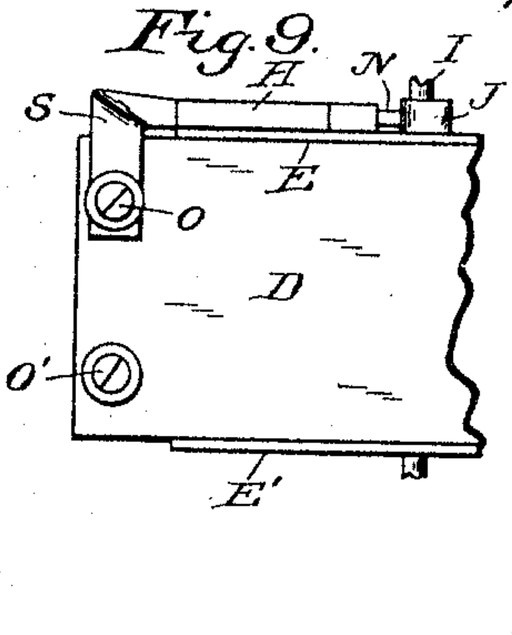
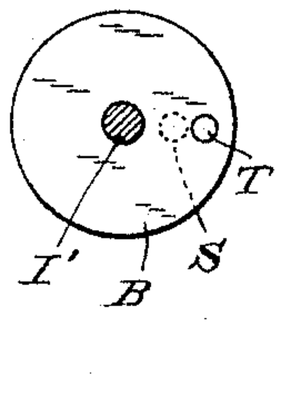


Fig. 10.



Witnesses:

Dow W. Vorhies.

Stella Snider.

Inventor

Joseph L. Potter,

by

E. T. Silvius.

Attorney.

UNITED STATES PATENT OFFICE.

JOSEPH L. POTTER, OF INDIANAPOLIS, INDIANA.

ELECTROMAGNETIC POWER-GENERATOR.

No. 812,949. Specification of Letters Patent. Patented Feb. 20, 1906.

Application filed May 26, 1905. Serial No. 262,349.

To all whom it may concern:

Be it known that I, JOSEPH L. POTTER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Electromagnetic Power-Generators; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to power-generators of the class in which the power is generated by means of electromagnets that attract movable armatures by which the power is transmitted to rotative shafts, the invention having reference more particularly to the armatures and the rotative shafts and to the elements associated therewith.

A prime object of the invention is to provide simple, compact, and strong mechanism whereby power may be generated and transmitted by means of electromotive force acting through stationary electromagnets and movable armatures or vibratory arms to the end that the cost of manufacture of such mechanism may be reduced to the minimum and that the mechanism be durable and economical in use.

A further object is to provide simple and relatively inexpensive yet interesting and instructive toys of the above-mentioned type of structure.

The invention consists, broadly, in a power-generator embracing vibratory arms, means for actuating the arms, movable means engaged intermittently by the arms and actuated thereby without having constant connection therewith, and means connected with the movable means for continuing the motion thereof that may be transmitted thereto intermittently by the arms, and more specifically the invention consists of certain novel forms and arrangements of parts of the power-generator and in the combinations of elements, as hereinafter particularly described and claimed.

Referring to the drawings, Figure 1 is a side elevation of the power-generator constructed substantially in accordance with the invention; Fig. 2, an end elevation thereof; Fig. 3, a top plan thereof; Fig. 4, a fragmentary sectional view on the line A A in Fig. 3; Fig. 5, a side elevation opposite to that shown in Fig. 1 and having parts of the frame broken away; Fig. 6, a vertical longitudinal sectional view on the line B B in Fig. 3; Fig. 7, a fragmentary top plan showing modifications in the vibratory arms and in the means adapted to be engaged intermittently by the arms for transmitting motion and power; Fig. 8, a side elevation of a modified form of armature, shown in broken lines in Fig. 6; Fig. 9, a fragmentary bottom plan of the generator; and Fig. 10 a fragmentary sectional view on the line C C in Fig. 7, showing in elevation the modified means for transmitting motion from the arms.

Similar reference characters in the drawings designate corresponding elements or features.

In construction various kinds of materials may be suitably employed, and the invention obviously is not limited entirely to the kinds that may be herein mentioned for the purposes of description. A frame is provided that comprises a rectangular base D, preferably of wood, and two identically-formed upright or side members E and E′, of suitable metal, that are secured to opposite sides of the base parallel one to the other by securing devices *a a′ b b′*, such as screws or nails. A yoke-plate F is secured by a screw *c* or similar device on the central portion of the top of the base D of the frame between the upright members thereof, and a pair of identical cores G and G′ are suitably secured on the end portions of the yoke-plate, each core having suitable windings *d* for producing an electromagnet structure, the upper or free ends of the cores being somewhat broadened, as by collars or by upsetting the metal of the cores. A brush-holder H, preferably composed of vulcanized fiber, is attached by screws *e* or the like to the outer side of one of the upright members of the frame. A rotative metallic shaft I is mounted in suitable bearings in the upper portions of the upright members E and E′ of the frame or in a plane between the cores and beyond the plane of the free ends thereof, the shaft having a crank *f*, on which is a roller *g*, preferably composed of brass. A cam J is secured to the shaft I, as are also balance-wheels *h* and *h′* and a pulley *i*, the balance-wheels having weights *j* attached thereto for properly setting the crank *f* by the force of gravity when the motor is stopped, so as to be in position suitable to be actuated by the vibrating arms

or armatures when the motor is to be started in operation.

A shouldered pivot-rod K, preferably of brass, is mounted in suitable perforations in the upright or side members E E′ of the frame, so as to be parallel to the shaft I and beyond either core therefrom, the rod being secured to the members, as by screw-nuts *k* or other suitable means.

A plurality of vibratory arms, which essentially perform the functions of armatures and are constructed as such, are mounted pivotally on the rod K and extend across the ends of the cores G and G′ and through the path of the roller *g* of the cranked shaft I, and so that the arms may intermittently draw the crank toward the base D and so that the crank may intermittently push the arms away from the cores G and G′. Any suitable number of armature-arms may be employed, there being two arms L and L′ shown for the sake of brevity, and in Fig. 6 a third arm L^2 is indicated in broken lines, illustrating the relative position it would have when practically applied, this arm being shown detached in Fig. 8. The two arms are spaced on the rod K by an insulating-collar *l* and sleeves *m* and *m′*. The various armature-arms may be made in various shapes, so as to make the desired contacts with the roller *g* or with the bare crank *f*, if preferred, or with the equivalents thereof, hereinafter to be described. As shown, the arm L is straight and is carried beyond the magnetic influence. The arm L′ has a curved part *n*, which while moving as far from the axis of the shaft I as the contact portion of the other arm leaves its body portion within the magnetic influence of the cores when farthest removed therefrom. When additional arms, as L^2, are provided, they may have each a block *p* attached thereto or the equivalent thereof for carrying the armature thereof farther away than the arm L from the cores, the essential requirement being that the different armatures move different distances from the axis of the crank-shaft that they are to drive and also move different distances from the magnets. Each armature-arm has a pivot-hole *q* to receive the pivot-rod which supports it.

A brush N is attached by screws *r* or the like to the holder H and with the cam J comprises make-and-break devices for connecting and breaking the electric circuit through the frame and the rotative shaft; the brush having a terminal *s*, connected to a post O, that is secured to the base D. A wire *t* connects the windings of the two cores, and the outer end of the winding of the core G′ is connected by a wire *u* to the frame member E′, preferably by means of the screw *b*, the outer end of the winding of the core G being connected by a wire *v* to a contact-piece P, that is secured to the base D. A post O′ is attached to the base and supports a switch-finger Q, that may be moved into and out of contact with the contact-piece P. A circuit-wire *w* is connected to the post O, and a similar wire *x* is connected to the post O′ to be connected to any suitable battery or electric generator.

The modifications shown in Figs. 7 and 10 mentioned herein may in some cases be preferred to the structures above described and comprise a straight rotative shaft I′, mounted in place of the shaft I, a disk R, secured to the shaft I′ and having a suitable number of lateral projections S and T at opposite sides thereof and at different distances from the shaft I′ in lieu of the crank *f* of the shaft I, and a plurality of armature-arms, as L^3 and L^4, mounted pivotally in the places of those above described, and all of identical form, either straight or curved, as may be required by the proportions of coöperating elements, the arms coöperating with the projections of the disk.

Various devices may obviously be adopted for preventing the armatures from moving too far for practical purposes away from the magnets, particularly in case the cores are arranged horizontally and the armatures vertically, as pendulums. One balance-wheel may be sufficient in some cases. It will be observed that the portions of the armatures nearer the pivot thereof may be attracted by the core G′, while the end portions thereof may be beyond the influence of the core G. Hence the cores successively attract the armatures when in operation, permitting of economical construction and operation with the minimum number of constituent elements.

In practical use, having established an electric circuit and the rotative shaft having been turned until the crank (or the projections S and T) and the armatures are in proper positions, the armature nearer to the cores will first be drawn thereto and will transmit motion directly to the crank or its equivalent, as the case may be, the other armatures being successively drawn to the cores by the electromagnetic force, imparting momentum intermittently to the balance wheel or wheels through the rotative shaft. When the shaft has made a portion of a revolution—for instance, one-fourth or one-third thereof, as may be designed—the armature-arms will be stopped on the cores, while the rotation of the shaft continues until the "dead-center" has been passed, when the armature-arms will be engaged successively by the crank or projections and pushed away from the now demagnetized cores until the other dead-center has been passed, the above-described operations being repeated, as will be obvious.

Having thus described the invention, what is claimed as new is—

1. A power-generator including a plurality of vibrating arms, means for actuating the

arms, and a rotative shaft having a device carried thereby intermittently engaged by the arms and actuated directly thereby.

2. An electromagnetic power-generator including a rotative shaft having a crank or lever device attached thereto, an electromagnetic core, and a movable armature mounted opposite to the core and also opposite to the crank or lever device and intermittently engaging the crank or lever device.

3. An electromagnetic power-generator including a rotative shaft having a crank or lever device attached thereto, an electromagnet, and a plurality of armatures mounted movably oppositely to the electromagnet and having intermittent contact with the crank or lever device and also intermittently disconnected therefrom.

4. An electromagnetic power-generator including an electromagnet, a plurality of armatures mounted movably at the electromagnet, and a rotative shaft having a crank or lever device attached thereto and movable into and out of contact with the armatures and coöperating therewith.

5. An electromagnetic power-generator including an electromagnet, a plurality of pivoted armature-arms opposite to the electromagnet, one or more thereof having lateral deflections formed therein, and a rotative shaft having a crank or lever device attached thereto and movable into and out of contact with the deflections of the armature-arms and coöperating therewith.

6. An electromagnetic power-generator including an electromagnet, a plurality of pivoted armature-arms opposite to the electromagnet, one or more thereof having lateral projections attached thereto, and a rotative shaft having a crank or lever device attached thereto and movable into and out of contact with the projections of the armature-arms and coöperating therewith.

7. An electromagnetic power-generator including an electromagnet having a pair of cores, a plurality of pivoted armature-arms extending periodically parallel to the ends of the magnet-cores and periodically moving with parts thereof toward one of the cores in advance of other parts thereof toward the other core, and a rotative shaft having a crank or lever device attached thereto and periodically directly contacting and moving the armature-arms successively away from the cores.

8. An electromagnetic power-generator including a frame, an electromagnet attached to the frame, a brush-holder mounted on the frame, a pivot-rod mounted on the frame, a plurality of armature-arms pivotally mounted on the pivot-rod and extending opposite to the electromagnet, a rotative shaft mounted on the frame and having a crank or lever device attached thereto and directly coöperating intermittently with the plurality of armature-arms, a cam attached to the rotative shaft, a brush mounted on the brush-holder and having intermittent contact with the cam, a circuit-wire connected with the winding-wire of the electromagnet and also with the frame, a battery-wire connected with the winding-wire of the electromagnet, and a battery-wire connected with the brush.

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

JOSEPH L. POTTER.

Witnesses:
WM. H. PAYNE,
E. T. SILVIUS.