# T. CHUTAUX.

## Electro-Magnetic Engine.

No. 165,064. Patented June 29, 1875.

Fig. 1.

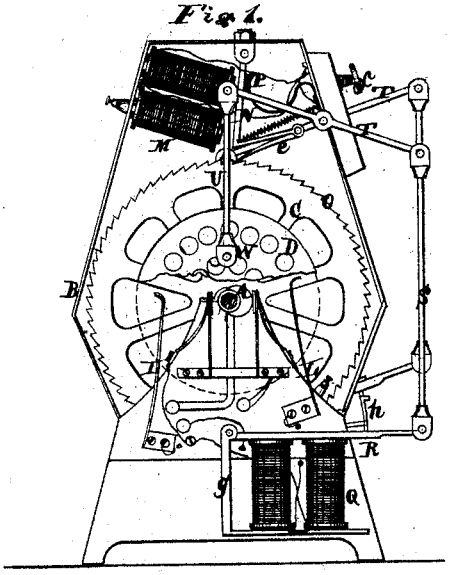


Fig. 2.

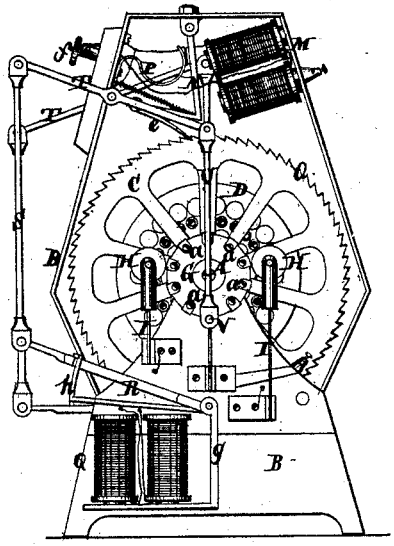


Fig. 3.

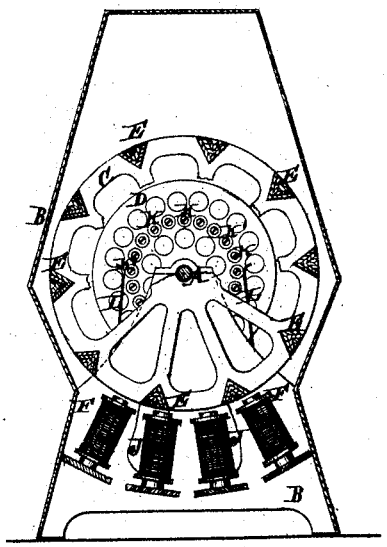
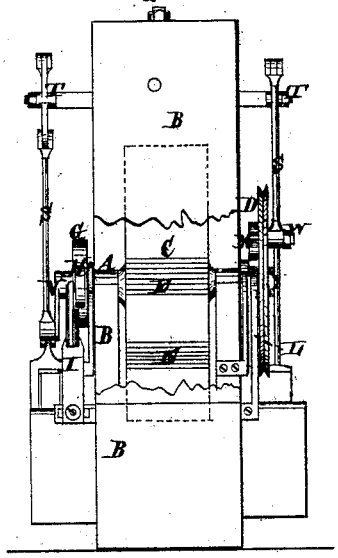


Fig. 4.



Witnesses.
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# UNITED STATES PATENT OFFICE.

THEOPHILE CHUTAUX, OF PARIS, FRANCE.

## IMPROVEMENT IN ELECTRO-MAGNETIC ENGINES.

Specification forming part of Letters Patent No. **165,064**, dated June 29, 1875; application filed May 26, 1875.

*To all whom it may concern:*

Be it known that I, THEOPHILE CHUTAUX, of Paris, France, have invented a new and Improved Electro-Magnetic Engine, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of one side of my engine. Fig. 2 is an elevation of the other side thereof. Fig. 3 is a vertical section. Fig. 4 is a front elevation.

Similar letters indicate corresponding parts.

My invention relates to certain improvements in electro magnetic motors; and my invention consists of an armature-lever, constructed in two parts, hinged at one end to the frame of the apparatus, one part of said lever being connected at its opposite end to the connecting-rod of a walking-beam, and the other end being connected with the first-mentioned part, as will more fully hereinafter appear.

In the drawing, the letter A designates the driving-shaft of my electro-magnetic engine, having its bearings in a frame-work, B; and C is a drum, which is mounted on the shaft A. On the shaft A is mounted also a pulley, D.

With these parts I have combined a series of four electro-magnetic motors, independently of each other, and which are adapted to work separately or together, in order to impart a revolving motion to the shaft A, the drum, and the pulley.

To enable others skilled in the art to make and use my invention, I will describe the several motors in detail.

*First Motor.*—This motor consists of a series of soft-iron armatures, E, affixed to the circumference of the drum C, which is constructed of two plates, between which the armatures are arranged. The armatures E are attracted successively, as the wheel revolves, by electro-magnets F, connected with a suitable battery by any suitable means. The armatures E are preferably made triangular in cross-section, in order to present a more extended surface to the magnets F, and in order to offer less resistance to the air during the rotation of the wheel. On the shaft A is mounted a "commutator," G, in the form of a disk of wood, or other non-conducting material, provided with a computed number of "points of contact," *a*. This commutator serves to open or close the circuit through the magnets F, by contact with friction-rollers H, communicating by springs I with the helices of the electro-magnets E. The pieces of metal forming the points of contact *a* are fastened by means of screws, so that they may readily be removed and replaced when worn. The commutator G is made adjustable on the shaft A through suitable adjusting-screws, or the friction-rollers H may be arranged to slide close to the shaft, in order to admit of changing the points of contact, and without the aid of special workmen.

*Second Motor.*—This motor serves to increase the power obtained by the preceding motor, and is constructed of electro-magnets J, placed in a computed position with relation to the armatures E of the drum C, and receiving a current from a different battery to the magnets F. The magnets J are combined with a commutator composed of metallic friction-rolls K, which are attached to one of the sides of the pulley D, and alternate with rolls K′, of ivory or other non-conducting material. The metallic rolls K serve to open or close the circuit by contact with springs L communicating with the helices of the magnets J.

*Third Motor.*—This motor consists of electro-magnets M, connected with a different battery from the magnets F J, and which act by direct attraction on an armature, N, which is articulated in a bracket, *d*, in the frame-work B. The loose end of the armature N carries a pawl, *e*, which engages with the teeth of a ratchet, O, arranged on the circumference of the drum C. Thus, as the armature N is attracted by the magnets M, the pawl *e* impels the teeth of the ratchet O, and by these means the speed, as well as the power, of the drum C is increased. The commutation of the electro-magnets M is controlled by means of the armature N. The interruptions of the current are produced by means of a spring, P, combined with a regulating-screw, *f*, and, by means of the armature, through its own weight.

*Fourth Motor.*—This motor has a duplicate form, the parts thereof being duplicated and arranged on opposite sides of the engine. It is constructed of electro-magnets Q, which receive an electric current from a battery, or from batteries, distinct from that of the other

motors, and which act by direct attraction on armature-levers R, articulated in brackets *g*, and which are connected by means of rods S, with one end of a walking-beam, T, the other end of which is connected by rods U with the driving-shaft A. The beams T on the respective sides of the engine are connected with the shaft by means of a crank, V, on the one side and by means of a stud, W, affixed eccentrically to the side of the pulley D on the other side. The armature-levers R are so arranged that the attraction thereof takes place when the force of the electro-magnet Q is the greatest, and at the greatest length of the lever during the revolution of the driving mechanism, in contradistinction to being produced when the lever almost has reached the dead-point. The armature-levers, furthermore, are made in two parts, which move within and are attracted independently of each other, one part being provided with a hook, *h*, by which it depends from the other part, which forms the connection with the connecting-rods S. Thus, when the armature-levers move away from the magnets Q, the hook *h* is caught by the moving part, so that the part to which the hook belongs occupies a lower position than the other part at the end of the upward movement of the levers. The hooked part is thus attracted by the magnets ahead of the other part of the levers, and the effect thereof on the power of the engine is very appreciable. The commutation and distribution of this motor may be made in any suitable manner.

I would have it understood that I do not confine myself to the precise details above enumerated, as these may obviously be modified.

What I claim as new, and desire to secure by Letters Patent, is—

In an electro-magnetic engine, the armature-lever R, constructed in two parts, hinged at one end to the frame of the apparatus, one part being connected at its opposite end to the connecting-rod S of the walking-beam, and the other provided with a hook, *h*, adapted to work within the first-mentioned part, substantially as herein specified.

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Witnesses:
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