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L. J. LE PONTOIS & A. CLÉMENT.

MAGNETO ELECTRIC GENERATOR.

APPLICATION FILED AUG. 13, 1901.

NO MODEL.

Fig. 1

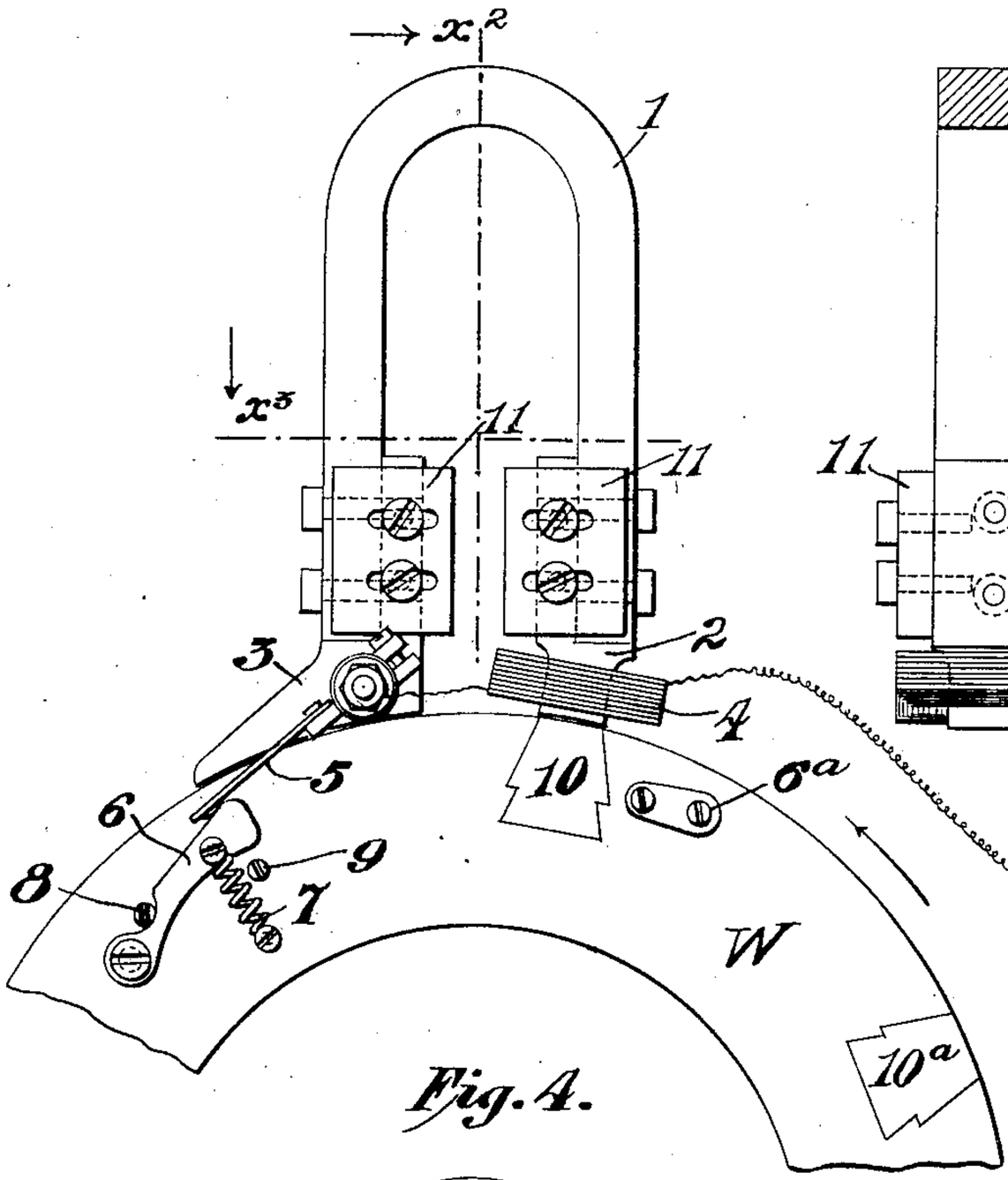


Fig. 2.

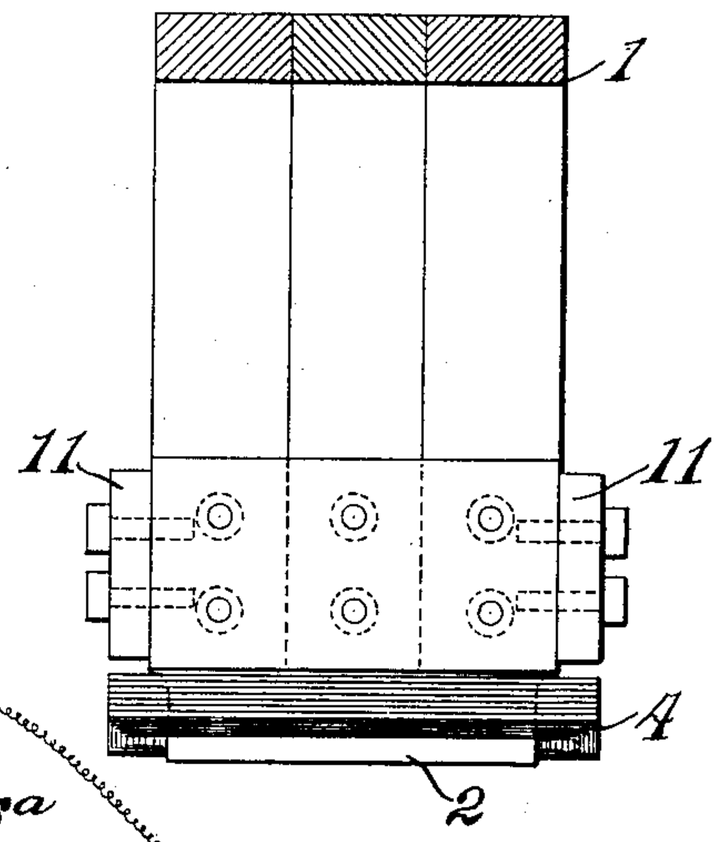


Fig. 4.

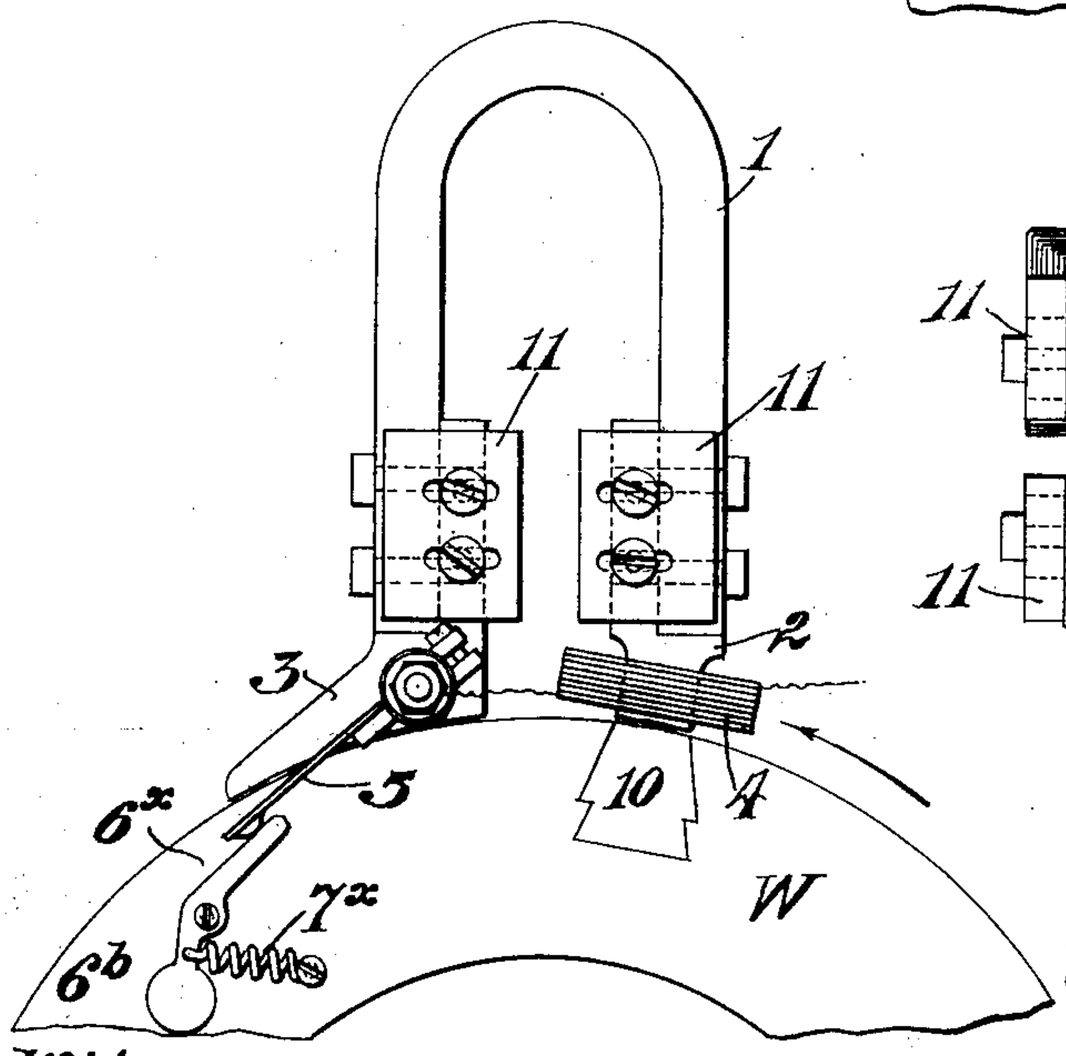
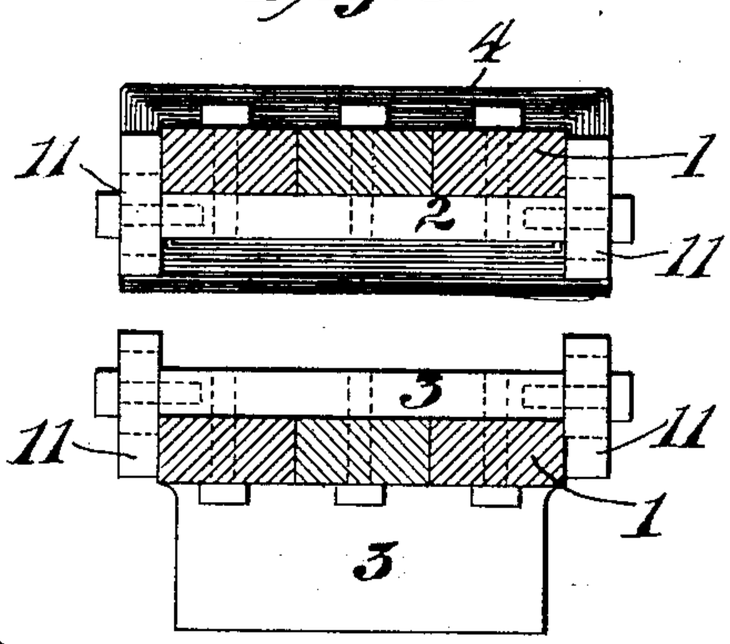


Fig. 3.



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UNITED STATES PATENT OFFICE.

LEON J. LE PONTOIS AND ADOLPHE CLÉMENT, OF LEVALLOIS-PERRET, FRANCE.

MAGNETO-ELECTRIC GENERATOR.

SPECIFICATION forming part of Letters Patent No. 744,573, dated November 17, 1903.

Application filed August 13, 1901. Serial No. 71,975. (No model.)

To all whom it may concern:

Be it known that we, LEON J. LE PONTOIS and ADOLPHE CLÉMENT, both citizens of the French Republic, and residents of Levallois-Perret, Seine, France, have jointly invented certain new and useful Improvements in Magneto-Electric Generators, of which the following is a specification.

This invention relates to magneto-electric generators for producing a current of electricity for effecting ignition of the charge in an internal-combustion engine; and the object of the invention is to produce a generator of this character which shall be especially adapted to the purpose stated.

The generator embodying this invention is an alternating-current generator, and it is well known that in this class of generators the currents are produced in the armature by a rapid modification in the number of lines of force which surround the circuit. This modification is generally produced by the movement adjacent to the pole-pieces of the field-magnet of magnetic conductors which in modifying by their position the reluctance of the magnetic circuit cause an increase in or a diminution of the lines of force surrounding the magnetic circuit. A complete alternation of the current is produced at each variation of the magnetic circuit. This principle of construction is embodied in the generator forming the object of the present invention, and by means of this generator an alternating current is produced each time that a conductor, whether magnetic or not, carried by the driving-shaft or some part fixed thereon modifies the distribution of the lines of force radiating from the magnets.

In the accompanying drawings, which illustrate embodiments of the invention, Figure 1 is a front or face view of the device. Fig. 2 is a section of the same at line x^2 in Fig. 1, and Fig. 3 is a section taken at line x^3 in Fig. 1. Fig. 4 is a view similar to Fig. 1, illustrating a slightly-modified construction.

Before proceeding to describe the construction of the device it may be stated that the required variations in the distribution of the lines of force from the field-magnet are effected by passing in front of the poles of the field-magnet one or more blocks of non-magnetic metal—as bronze, for example—fitted into the rotating iron or cast metal part, which latter rotates in close proximity to the poles of the magnet. In this case the reluctance of the magnetic circuit is increased at the movement of the passing of the block, said circuit being closed before and again closed immediately after said passage, owing to the the small air-space between the poles and the surface of the moving part. The acceleration or retardation of the ignition is attained by varying the position of the field-magnet, which will be capable of adjustment about the axis of the moving part.

Referring primarily to Figs. 1, 2, and 3, W designates the rotating part or a fragment thereof. This may be an iron fly-wheel on the shaft of the engine. 1 is a permanent field-magnet, having its pole-pieces 2 and 3 presented to the periphery of the fly-wheel W. On the pole-piece 2 is a secondary coil 4, and on the pole-piece 3 is secured a contact-arm or brush 5, which is electrically connected with one end of the wire of the coil 4. Pivotally mounted on the fly-wheel W is a contact-arm 6, provided with a spring 7, which tends to draw it inward or toward the axis of rotation, this spring being overcome by the centrifugal force tending to throw the said arm 6 outward. Two stops or detent-screws 8 and 9 limit the movements of the said arm. In the rim or peripheral face of the fly-wheel or other rotating part is set a block 10, of bronze or other non-magnetic metal. When the machine or engine is in motion and the fly-wheel rotating, the magnetic circuit is closed by the fly-wheel rim except when the block 10, of non-magnetic metal, (an insulator from a magnetic point of view,) is passing before the pole-piece 2. At this moment variations of intensity are produced in the inducing magnetic circuit, from which it results that an alternating induced current of electricity is generated in the coil 4. The contact-arm 6 under the influence of centrifugal force is thrown outward far enough to come in contact as it moves with the brush 5, and the circuit is closed at this point. In order to insure the production of a current at the mo-

ment of starting the engine, when the arm 6 is drawn in by its spring, the fly-wheel is provided with a second bronze block 10^a and with a fixed contact-piece 6^a, which also has rubbing contact with the brush 5. The production of the current by this device is slightly retarded; but this fact does not present any inconvenience. When the speed has become sufficient to throw out the contact-arm 6, this arm will effect the closing at the proper moment. The second current generated by the movement of the block 10^a in front of the pole-piece of the magnet produces no effect on the motor.

In the modification illustrated in Fig. 4 the contact-arm $6^\times$ is pivoted near its middle and has a weight 6^b at one end, which tends when acted upon by centrifugal force to draw the contact-arm inward and out of contact with the brush 5. The spring $7^\times$ counteracts the centrifugal force up to a certain speed; but if this speed should be exceeded the centrifugal force acts to draw in the contact-arm and maintain a break in the circuit. In this form of the device the block 10^a and contact 6^a are not required.

The sparking or ignition point may be situated at any point desired, and this may be arranged in the igniting-circuit in the usual way by any electrician.

In both forms of the magneto-electrical device shown there may be blocks 11 of magnetic material secured to the arms of the magnet. These blocks produce a considerable derivation of the lines of force, so that the magnetic field may be varied at will by shifting these blocks, which have a screw-and-slot connection with the arms of the magnet.

In Fig. 1 the igniter 12 is shown somewhat diagrammatically merely to indicate the circuit.

Having thus described our invention, what we claim is—

1. A device for the purpose specified, comprising a magneto-electric generator, an igniting-circuit which includes a coil about one of the pole-pieces of the field-magnet of the generator, means for producing variations in the magnetic circuit, and automatic means, influenced by centrifugal force for controlling a break in the igniting-circuit.

2. A device for the purpose set forth, comprising a magnet 1, having its pole-pieces adjacent to a moving part W composed of magnetic metal, the said moving part, provided with a block of non-magnetic metal, an igniting-circuit, and a coil 4 on one of the pole-pieces of said magnet, said coil forming a part of said igniting-circuit.

3. In a device for the purpose specified, the combination with a moving part W, of magnetic metal, a magnet 1 having its pole-pieces adjacent to said moving part, a coil 4 on one of the pole-pieces of said magnet, a block 10 of non-magnetic metal set in the face of said moving part, a contact-brush 5 connected with one end of said coil 4, and a spring contact-arm 6, mounted on said moving part, said coil, brush, contact-arm, and moving part forming parts of the igniting-circuit.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

LEON J. LE PONTOIS.
ADOLPHE CLÉMENT.

Witnesses:
JULES ARMENGAUD, Jeune,
EDWARD P. MACLEAN.