

B. P. & F. I. REMY.
MAGNETO ELECTRIC GENERATOR.

APPLICATION FILED MAR. 14, 1903.

NO MODEL.

Fig. 1.

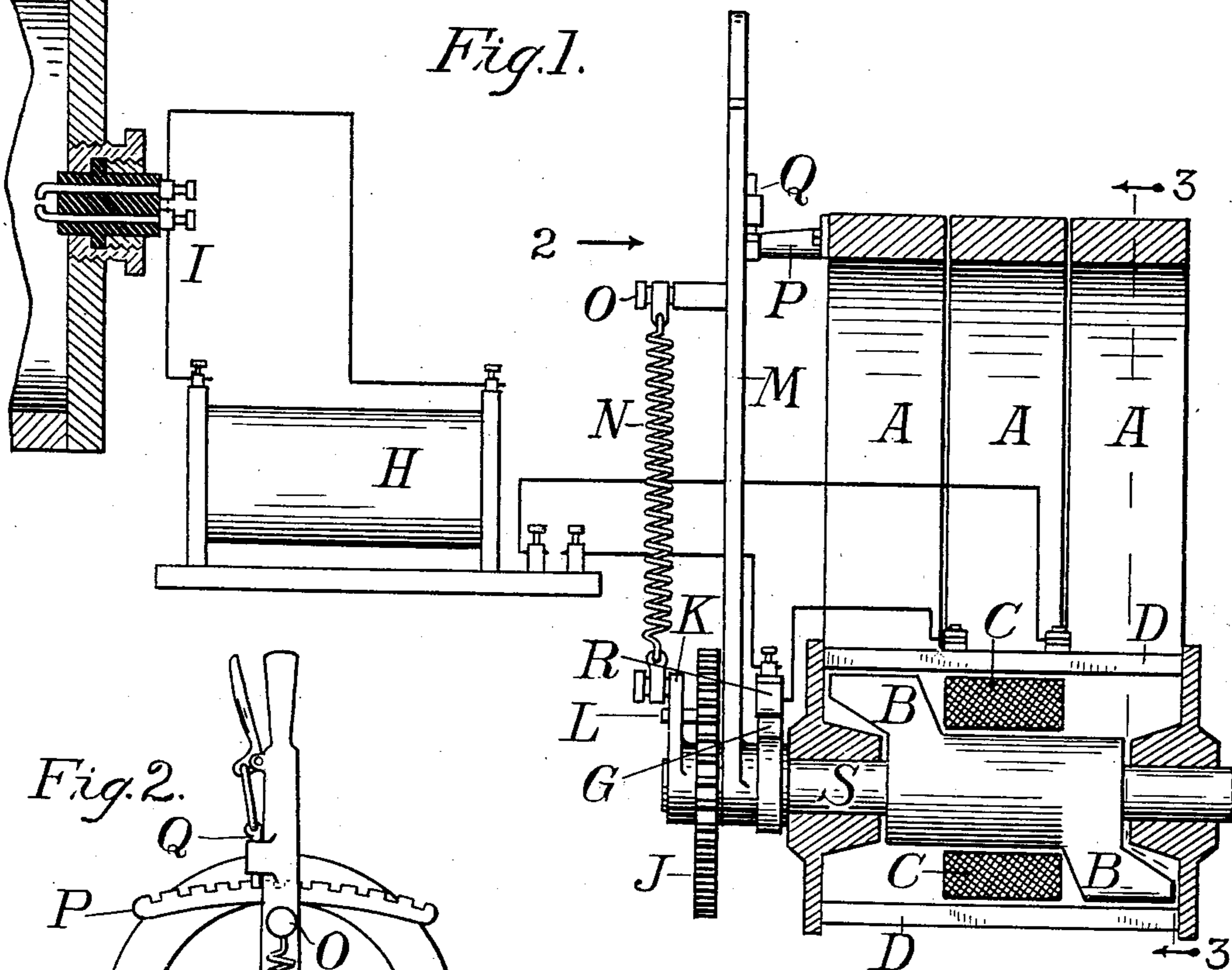


Fig. 2.

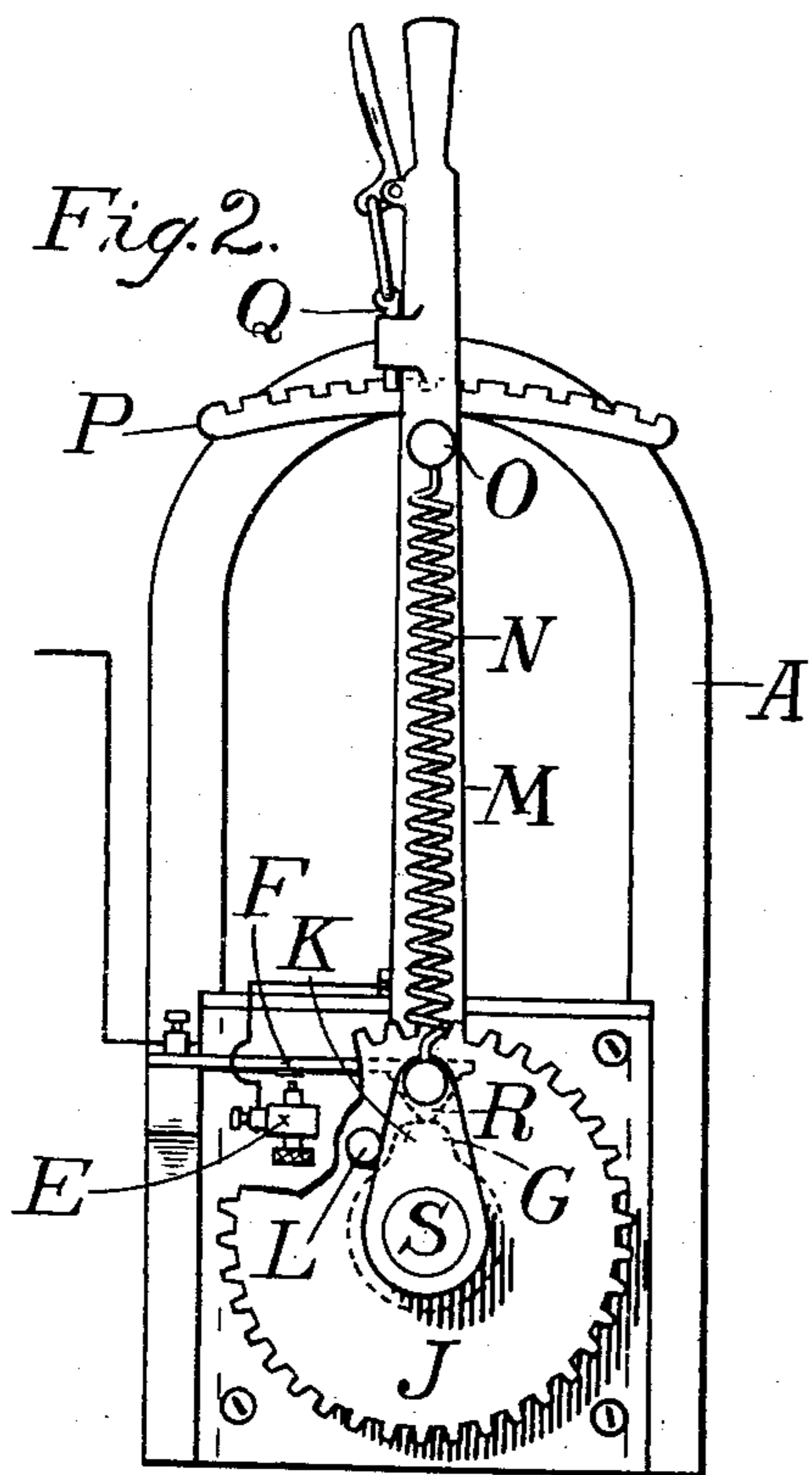
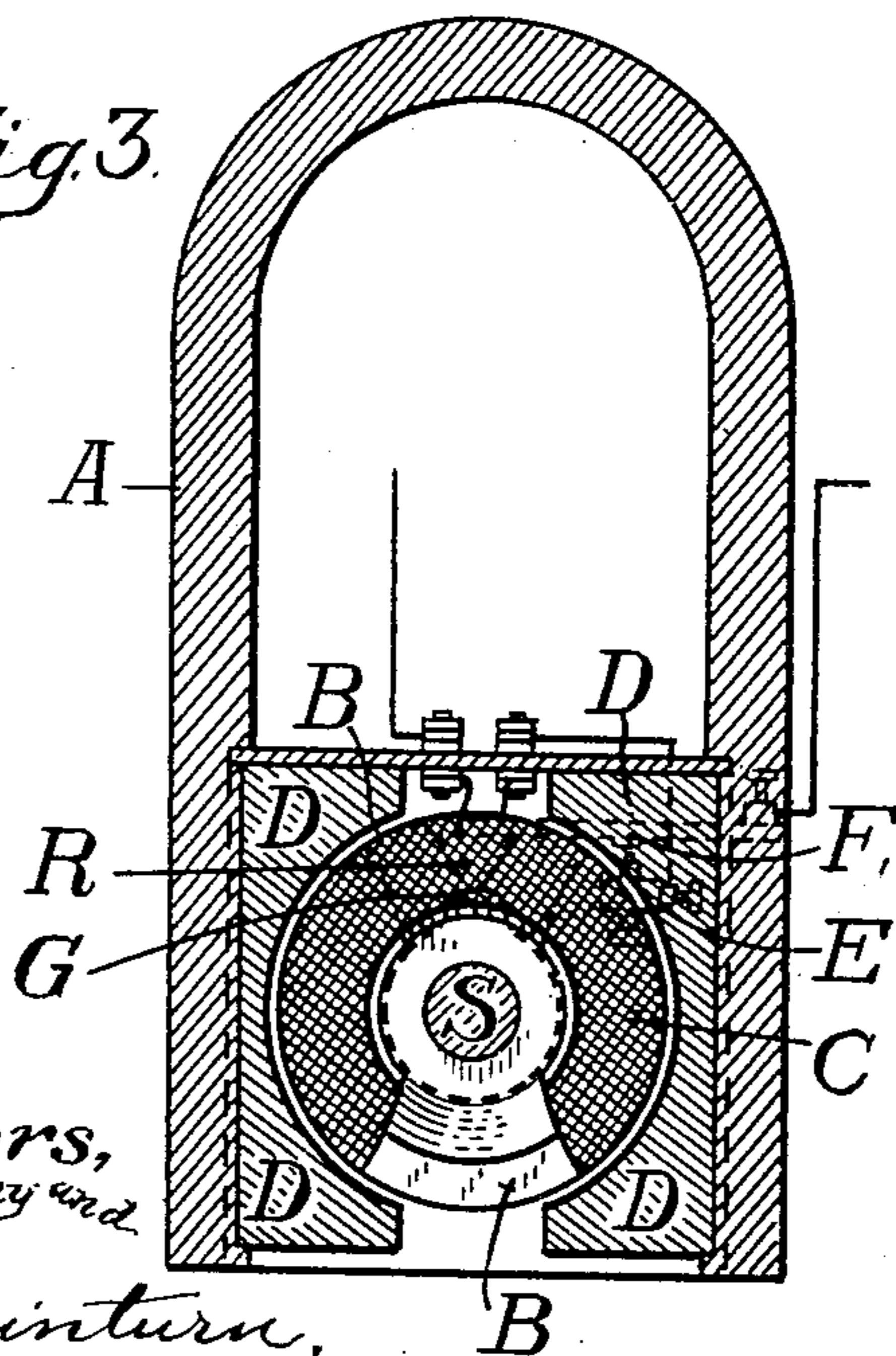


Fig. 3.



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UNITED STATES PATENT OFFICE.

BENJAMIN PERRY REMY AND FRANK IRWIN REMY, OF ANDERSON,
INDIANA.

MAGNETO-ELECTRIC GENERATOR.

SPECIFICATION forming part of Letters Patent No. 763,510, dated June 28, 1904.

Application filed March 14, 1903. Serial No. 147,701. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN PERRY REMY and FRANK IRWIN REMY, citizens of the United States, residing at Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Magneto-Electric Generators, of which the following is a specification.

This invention relates to improvements in magneto-electric generators for gas-engine ignition or other purposes in which a rotative mechanical movement generates an electric current, which may be used either directly or through an induction-coil for gas-engine ignition or for other purposes for which such current is suitable.

The object of the invention is to provide a generator in which the winding is stationary and permanently connected in the circuit, thereby avoiding the necessity of conducting the current through either bearings or brushes, which are more or less liable to fail to properly conduct said current, due partly to the necessity for lubricants, and to provide an inductor which will be rotated within the stationary winding, so as to avoid the jar and strain incident to the changes of an oscillatory inductor in a rapidly-running machine.

The object where the generator is used for gas-engine ignition is to change the time of movement of the inductor with relation to the movement of the engine-shaft for changing the time of ignition.

The object, further, is to give the generator a quick motion regardless of the engine speed.

The object also is to simplify the construction of the generator so it can be safely operated by uneducated or inexperienced persons, which will be durable and of low cost to manufacture.

We accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical central section of our improved generator, a detail in section of the end of a gas-engine cylinder with a sparking plug in section, the sparking plug being connected electrically with the gen-

erator and having an induction or Ruhmkorff coil in the circuit; Fig. 2, an end elevation of the generator looking in the direction of the arrow 2 shown in Fig. 1, and Fig. 3 a vertical section on the line 3 3 of Fig. 1.

Like letters of reference indicate like parts throughout the several views of the drawings.

The reference-letters A A A indicate powerful permanent magnets; B B, the moving part or inductor, which is rotated to reverse the magnetic lines of force; C C, the armature or winding of insulated wire, and D D D D the pole-pieces of magnets A. If the inductor B B be rotated, the magnetic flux furnished by the magnets A will be reversed in winding C C twice during each revolution, and an electric current will be generated in winding C C at each reversal of said magnetic flux.

Fig. 1 shows the invention in connection with an induction or Ruhmkorff coil H and ignition-plug I, both of usual and well-known construction. The ordinary electromagnetic vibrator may be used on the coil H; but we prefer to use an interrupter in the primary circuit of coil H, located on the generator-body for more convenient regulation, such as we will now describe. The inductor B is mounted in a fixed manner on the shaft S, and mounted outside of the machine in a fixed manner on said shaft S is a wheel having the cam G. When the shaft S is rotated, this cam contacts with a lug R on the free end of a spring-bar F. E is a terminal for one of the conducting-wires. E and F when actuated by the cam G constitute the interrupter in the primary circuit of the coil H. The time of ignition at the plug I is when the circuit is broken at the interrupter by the contact of cam G with the lug R. In gas-engines it is often desirable to vary this time with relation to the travel of the piston and the rotation of the engine-shaft. As the shaft S is driven by some suitable connection, whether direct or indirect, with the engine-shaft, the time of ignition may be varied by disconnecting the shaft S and turning the inductor to the desired position before connecting the shafts up again, or it may be done more conveniently while the engine is running, if desired, by the mechan-

ism shown in Figs. 1 and 2, in which M is a hand-lever, having a sleeve at its lower end mounted loosely on shaft S. Adjustment of its upper end is held by rack P and pawl Q.
 5 Mounted loosely on shaft S outside of lever M is cog-wheel J, which is connected with the engine-shaft in any suitable manner. (Not shown.) Mounted in a fixed manner on shaft S outside of wheel J is the crank K, having a
 10 pin at its outer end connected by spiral spring N with the pin O on lever M. The wheel J has the stud-pin L, which contacts with the crank K by the rotation of wheel J and compels said crank, its shaft S, and the inductor
 15 B, mounted on the shaft, to move with it; but as soon as the pin on the end of the crank passes the dead-center at the bottom of the wheel J (which dead-center will fall on the continuation of the line drawn through the
 20 centers of pin O and shaft S) the spring N will bring the crank quickly back past the position shown in the drawings, causing the cam to break the circuit at the interrupter. This time of release of the crank at dead-center may be delayed or hastened by shifting
 25 the lever M in the proper direction along the rack P. It is evident that if the gas-engine by which the magneto is operated runs fast enough the spring will not be required and
 30 that our invention would be operative if connected to rapidly-moving gas-engines by gears only.

The ordinary electromagnetic vibrator may be used on the coil H without the cam-interrupter, the ignition occurring when the current has attained sufficient strength to operate the vibrator.

It is evident that the machine would operate with so-called "primary" method of ignition, wherein the electrodes within the engine are separated at the proper instant.

We are aware that prior to our invention magneto-electric generators have been used rotative and oscillative in which the electric
 45 current is generated by motion of the armature or winding, that same have also been used oscillatively in which the winding is stationary and within a movable inductor, said inductor moving between said armature or
 50 winding and the pole-pieces. In our invention the inductor is movable within a stationary armature.

In the following claims the word "synchronously" is used to express the condition
 55 in which the magneto and the engine are connected so that the generator will furnish one pulsation of an electric current at the time that the engine requires an ignition-spark, rather than an equal number of revolutions
 60 with the same or no cyclic variations.

Having thus fully described our invention, what we claim as new, and wish to secure by Letters Patent, is—

1. In a magneto-electric ignition apparatus,
 65 one or more magnets, a stationary armature

or winding, an inductor mounted in a fixed manner on a revoluble shaft, said inductor rotating within the winding, sparking electrodes, a circuit-breaking interrupter, a cam mounted in a fixed manner on the inductor-shaft to contact with a movable member of the interrupter and break the circuit. 70

2. In a magneto-electric ignition apparatus, one or more magnets, a stationary armature or winding, an inductor mounted in a fixed
 75 manner on a revoluble shaft said inductor rotating within the winding, sparking electrodes, a circuit-breaking interrupter, a cam mounted in a fixed manner on the inductor-shaft to contact with a movable member of the interrupter
 80 and break the circuit, and means for imparting a controlled variable speed to the said shaft whereby the sparking is timed, said means comprising a part adapted to move along a line approximating an arc concentric
 85 to the shaft, a crank mounted in a fixed manner on said shaft having its outer end elastically connected with said movable part, and a revoluble wheel loosely mounted on the shaft, having a pin to contact with and move
 90 the crank during half of the travel of the pin.

3. In a magneto-electric ignition apparatus, one or more magnets, a stationary armature or winding, an inductor mounted in a fixed
 95 manner on a revoluble shaft said inductor rotating within the winding, sparking electrodes, and means for imparting a controlled variable speed to the said shaft whereby the sparking is timed, said means comprising a part adapted to move along a line approximating an arc concentric to the shaft, a crank mounted in a fixed
 100 manner on said shaft having its outer end elastically connected with said movable part, and a revoluble wheel loosely mounted on the shaft, having a pin to contact with and move the
 105 crank during half of the travel of the pin.

4. In a magneto-electric ignition apparatus, one or more magnets, a stationary armature or winding, an inductor mounted in a fixed
 110 manner on a revoluble shaft said inductor rotating within the winding, sparking electrodes, and means for imparting a controlled, variable speed to the said shaft whereby the sparking is timed, said means comprising a lever pivoted to the shaft having lateral controlled
 115 adjustment, a crank mounted in a fixed manner on the shaft having its outer end elastically connected with the lever, and a revoluble wheel loosely mounted on the shaft, having a pin to contact with and move the crank during half
 120 of the travel of the pin.

5. In a magneto-electric ignition apparatus, one or more magnets, a stationary armature or winding, an inductor mounted in a fixed
 125 manner on a revoluble shaft said inductor rotating within the winding, sparking electrodes, a circuit-breaking interrupter, a cam mounted in a fixed manner on the inductor-shaft to contact with a movable member of the interrupter and break the circuit and means for impart- 130

ing a controlled variable speed to the said shaft whereby the sparking is timed.

6. In a magneto-electric ignition apparatus, one or more magnets, a stationary armature
5 or winding, an inductor mounted in a fixed manner on a revoluble shaft said inductor rotating within the winding, sparking electrodes, a circuit-breaking interrupter, a cam mounted
10 in a fixed manner on the inductor-shaft to contact with a movable member of the interrupter and break the circuit, and means for imparting a controlled, variable speed to the said shaft whereby the sparking is timed, said means comprising a lever pivoted to the shaft having
15 lateral controlled adjustment, a crank mounted in a fixed manner on the shaft having its outer end elastically connected with the lever, and a revoluble wheel loosely mounted on the shaft, having a pin to contact with and move
20 the crank during half of the travel of the pin.

7. In a magneto-electric ignition apparatus, one or more magnets, a stationary armature

or winding, an inductor mounted in a fixed manner on a revoluble shaft, said inductor rotating within the winding, sparking electrodes, 25 a circuit-breaking interrupter, a cam mounted in a fixed manner on the inductor-shaft to contact with a movable member of the interrupter and break the circuit, a crank mounted fixedly on the inductor-shaft, an elastic tie attached 30 at one end to the outer end of the crank and to a fixed point at the other, and a revoluble wheel mounted loosely on the inductor-shaft having a pin to engage the crank and move the latter during half of the travel of the pin. 35

In witness whereof we have hereunto set our hands and seals, at Anderson, Indiana, this 9th day of March, A. D. 1903.

BENJAMIN PERRY REMY. [L. s.]

FRANK IRWIN REMY. [L. s.]

Witnesses:

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