H. N. MOTSINGER.

MAGNETO ELECTRIC DEVICE.

APPLICATION FILED OCT. 18, 1910.

**1,021,001.**

Patented Mar. 26, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

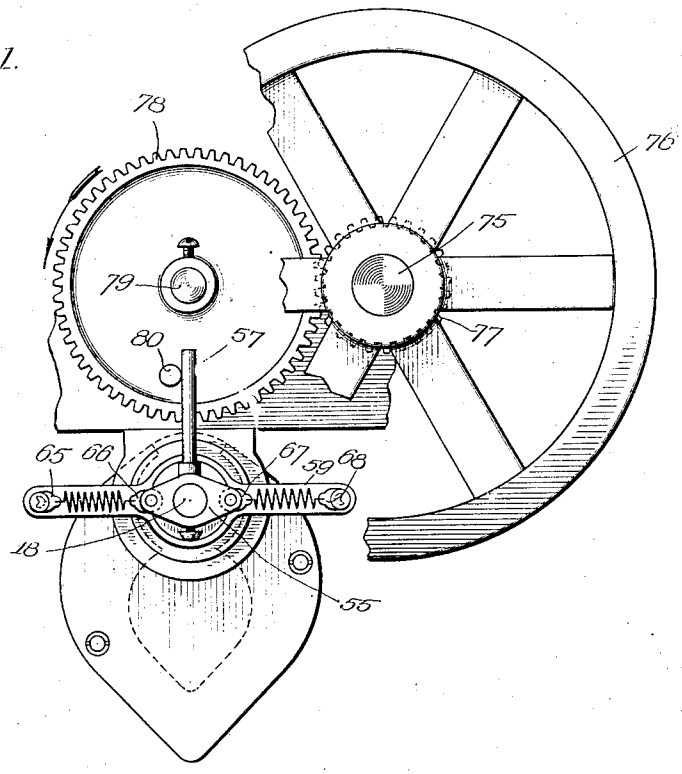



Fig. 2.

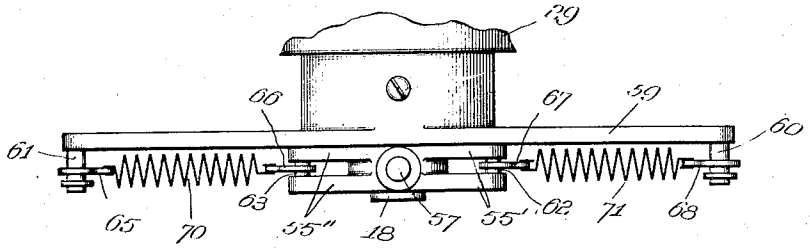
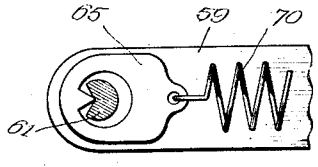



Fig. 3.

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2 SHEETS—SHEET 2.

Fig. 6.

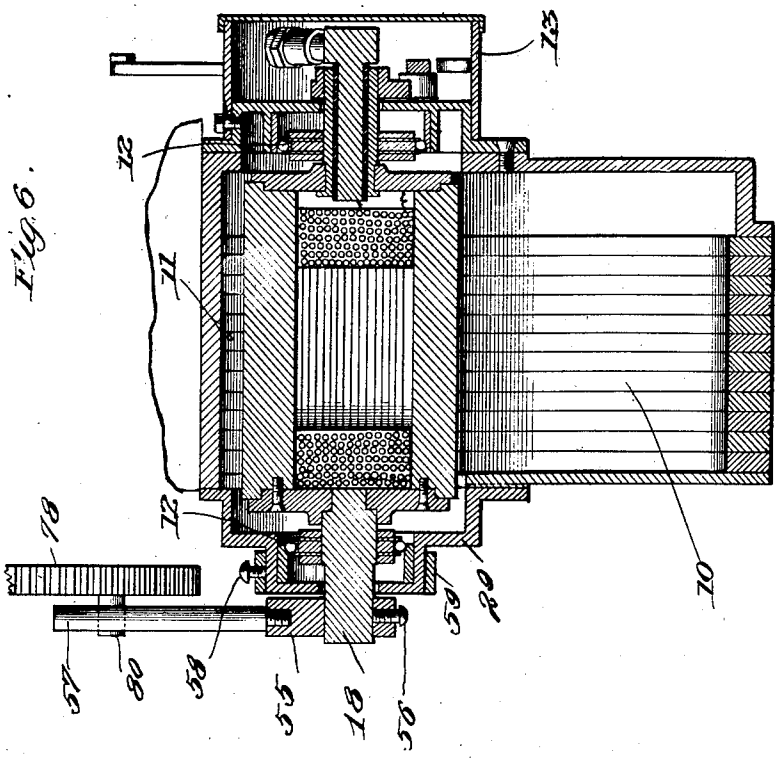



Fig. 4.

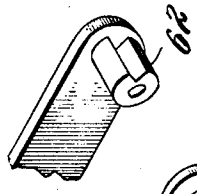
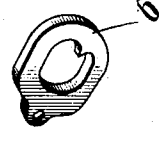



Fig. 5.

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# UNITED STATES PATENT OFFICE.

HOMER N. MOTSINGER, OF PENDLETON, INDIANA, ASSIGNOR TO MOTSINGER DEVICE MANUFACTURING COMPANY, OF PENDLETON, INDIANA, A CORPORATION OF INDIANA.

## MAGNETO-ELECTRIC DEVICE

1,021,001. Specification of Letters Patent. Patented Mar. 26, 1912.

Application filed October 18, 1910. Serial No. 587,706.

*To all whom it may concern:*

Be it known that I, HOMER N. MOTSINGER, a citizen of the United States, residing at Pendleton, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Magneto-Electric Devices, of which the following is a specification.

My invention relates to improvements in magno-electric machines, and has for its salient object to improve the structure and relation of parts, and cheapen the cost of production of magneto-electric machines having a vibrating part normally spring-maintained in a given position and adapted to be displaced therefrom and subsequently released for spring-return to said normal position.

Another object of my invention is to provide a structure of the character described wherein the friction and wear is reduced to a minimum and in which the certainty of operation is enhanced and its reliability increased.

Other and further objects of my invention will become readily apparent to persons skilled in the art from a consideration of the specification, taken in conjunction with the drawings, wherein—

Figure 1 is an elevation of my magneto-operating mechanism, showing the associated parts for actuating it from an engine shaft; Fig. 2 is an enlarged plan view of the device; Fig. 3 and Figs. 4 and 5 are further enlarged details thereof, respectively in elevation and in perspective; and Fig. 6 is a longitudinal central section showing the relation between the device and the magneto which it is to operate.

As shown in Fig. 6, my device is intended for use in conjunction with a magneto-electric current generator, and is especially advantageous for use to produce the spark for an internal combustion engine, such generator comprising in general a permanent field magnet 10, an armature generally indicated at 11, having suitable bearings 12—12, and appropriate contact mechanism, preferably inclosed in a housing as at 13. These parts may be of any desired character, but preferably the armature shaft at one end extends, as at 18, beyond a suitably shaped cap or housing structure 29, fixed to the magneto device.

To the shaft 18 I fix a collar having oppositely extending double arms 55′—55″ secured thereto by a screw 56, and vertically rising above the axis thereof, is a stem 57. Fixed to the cap or housing 29 by a screw 58 is a longer arm 59, carrying at its respective end hardened studs 60 and 61. These parts are longitudinally concaved as shown in Fig. 4. The two arms 55′ and 55″ carry similar studs 62 and 63 respectively; these studs being substantial duplicates of those indicated by 60 and 61. A stirrup 65, preferably made of hardened steel, is shown clearly in Fig. 5, each containing an inner projecting hardened bearing knife edge to engage the concaved surfaces of the respective studs. There are four such stirrups indicated by reference characters 65, 66, 67, and 68, respectively. The stirrups 65 and 66 are connected together by means of a coiled tensioning spring, 70, the stirrups 67 and 68 being connected together by a similar tensioning spring 71 of substantially equal strength.

The collar 55 is placed upon the shaft 18 in such manner that the poles of the armature 11 are held normally substantially midway between the poles of the permanent magnet, by the springs 70 and 71, and by the instrumentality of the double-armed collar 55, in the manner described. These devices serve to maintain the armature in the position described until disturbed, and the springs serve not only to retain it in this position of equilibrium when undisturbed, but forcibly to return it to this position after it has been displaced and released.

75 is the shaft of the engine, bearing the usual balance wheel 76 and a pinion 77, for a four-cycle engine meshing with a companion gear wheel, 78, in two-to-one relation. The gear wheel 78 is preferably adjustable on the shaft 79, so that the stud 80, carried by the wheel 78, may be made to occupy any predetermined position with relation to any part carried or driven by the shaft 75.

When the wheel 78 is rotated in the direction of the arrow, by the engine, the stud 80 is brought into contact with the stem 57, and the stem is angularly displaced accordingly, and the armature is thereby oscillated against the tension of the springs 70 and 71, which tend to hold it in its normal position against rotation or disturbance. When the stud 80 has passed the end of the stem 57,

in its rotary progress, the stem is thereby released, and at the particular critical moment, the armature 13 is given a rapid and energetic oscillating movement in the opposite direction from that in which it has been primarily moved by the stem 80, by means of the power that has been stored up in the springs 70—71, thereby giving considerable velocity of motion to the armature at the critical moment at which an impulse of current is required for the purpose of producing a spark within the cylinder of the engine. The high velocity of the armature, produced by the energy stored in the spring at the critical moment, or at the time when it is desired to cause a spark within the cylinder of the engine, affords a cheap, sure, and positive method of accomplishing the result with the minimum of power and with a positive action that may be relied upon. After the stem 80 has been released in the manner described, the springs return the armature to its normal position and the magneto is not required to perform any work and will not absorb any energy of the engine until the stud 80 has made a complete revolution, or the engine has made two revolutions in the cycle of operation and until the stud has again arrived at the position shown in Fig. 1.

What I claim is:

In a machine of the class described, a field magnet, a frame, an armature rotatably associated with said magnet, a two armed structure secured to said armature, carrying on each end hardened studs longitudinally grooved, other similar studs secured to the frame, stirrups having inwardly-turned knife edges engaging the grooves of said hardened studs, springs having their extremities secured to the confronting ends of said adjacent stirrups, and a stem for rotatively displacing said armature against the resistance of said springs.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

HOMER N. MOTSINGER.

In the presence of—

MARY F. ALLEN,

W. LINN ALLEN.