

W. O. KENNINGTON.
HIGH TENSION MAGNETO ELECTRIC MACHINE.
APPLICATION FILED OCT. 10, 1911.

1,039,543.

Patented Sept. 24, 1912.

FIG. 1.

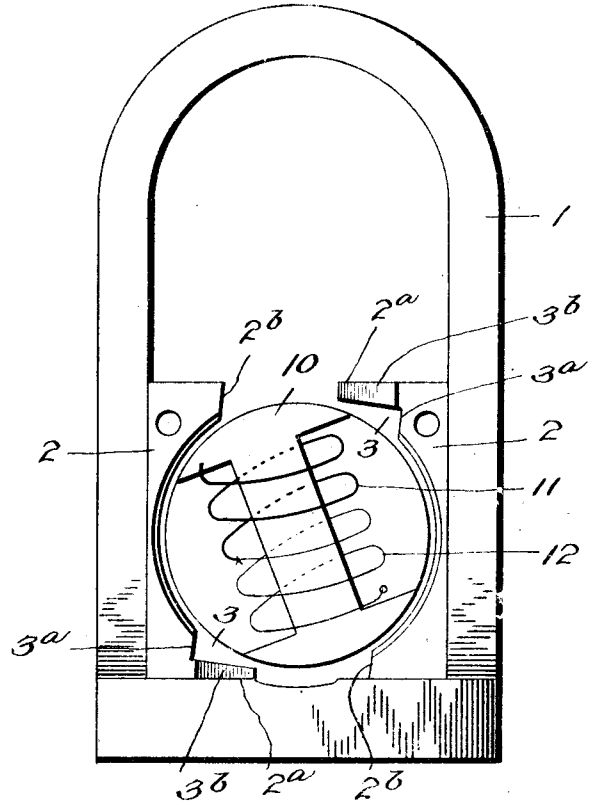
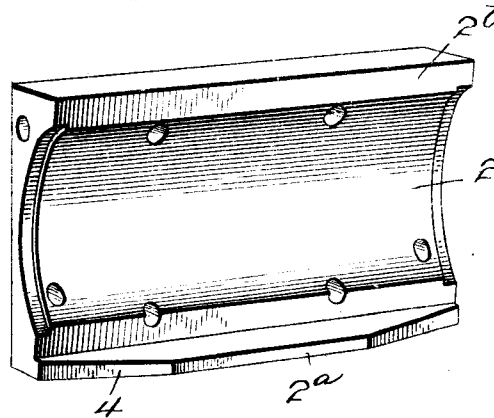


FIG. 2.



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WILLIAM O. KENNINGTON, OF BLOOMFIELD, NEW JERSEY, ASSIGNOR TO THE SIMMS MAGNETO CO. INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

HIGH-TENSION MAGNETO-ELECTRIC MACHINE.

1,039,543.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed October 10, 1911. Serial No. 653,974.

To all whom it may concern:

Be it known that I, WILLIAM O. KENNINGTON, a subject of the King of England, citizen of London, England, residing at 5 Bloomfield, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in High-Tension Magneto-Electric Machines; and I do hereby declare the following to be a full, clear, and 10 exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in the novel features hereinafter described reference being had to 15 the accompanying drawings which show one form or embodiment of the invention which I have selected for purposes of illustration, and the invention is fully disclosed in the following description and claims.

20 The object of my invention is to provide a high tension magneto electric machine, the armature of which has two maximum or sparking positions in each half revolution thereof one at full advance and one at full 25 retard, in which the armature cuts the greatest number of lines of magnetic force, compared with other positions, and also to so construct the machine that one of the said maximum or sparking positions will 30 produce the best spark at one of said positions for low speed, while at high speed the best spark will be produced at the opposite extreme position.

In the embodiment of the invention which 35 I have selected for purposes of illustration herein, the objects of my invention are accomplished by the peculiar construction of the pole shoes of the permanent magnets, and in the construction herein illustrated the 40 best spark at low speed will be produced at full retard, and the best spark at high speed will be produced at full advance.

In the accompanying drawing, Figure 1 45 represents an elevation of so much of a magneto electric machine embodying my invention, as is necessary for a clear understanding of my invention. Fig. 2 is a perspective view of one of the pole shoes detached.

In the drawing, 1 represents the magnets 50 of the magneto, which have their poles provided with the pole pieces 2, 2, surrounding the rotary armature, the core of which is shown at 10 and which is provided with the usual primary winding 11 and secondary 55 winding 12, the windings being represented

diagrammatically. Each pole piece is provided with an extended portion 2^a at one end, the other end being cut off and terminating in a vertically disposed face 2^b. Each of the pole pieces is provided with a longitudinally 60 extending angular recess 3 having a vertically disposed face 3^a and a horizontally disposed face 3^b. For convenience in forming the pole shoe, I prefer to have the vertically disposed face 3^a in exact alinement, or in the 65 same vertically disposed plane as the face 2^b at the other end of the pole piece, and the face 3^b perpendicular to the face 3^a, whereby the faces 2^b, 3^a and 3^b may be formed by a single cut of a suitable milling tool, but I do 70 not limit myself to this exact construction.

The effect of the longitudinal grooves or recesses 3, is to provide two points in the revolution of the armature, where the greatest number of lines of force are cut by the 75 coils of the armature, the one, as the coils leave the adjacent edge of the faces 3^a, and the other as they leave the inner edge of the adjacent edge of the faces 3^b. It is also advantageous to arrange that of the two maxi- 80 mum positions, the retarded position will be best for low speed and the advance position will be best for high speed, and to accomplish this the trailing tips of the extensions 2^a of the pole shoe are cut off adjacent to 85 each end of the shoe leaving inclined faces 4. This causes a greater reluctance to the flux at full retard at a high speed of the armature compared with the reluctance at full advance. It follows therefore, that with the 90 armature rotating at slow speed, with the circuit breaker or interrupter for the primary circuit at full retard, the best spark will be produced, and in fact with this construction the spark so produced at slow 95 speed is as hot as the spark produced when the magneto armature is rotating at full speed.

When the armature is rotated at high speed the spark is advanced, so that the pri- 100 mary circuit is broken just before the coils leave the edges of the faces 3^a where the best spark is obtained under the conditions of high speed.

My improvement is adapted particularly 105 to magneto electric machines for use in connection with ignition devices for internal combustion engines, especially those used in automobiles and other vehicles, and it is obvious that in cranking the engine and in 110

running at slow speeds a full spark will be furnished for the ignition of the explosive charges, in the cylinders, by throwing the timing lever of the circuit breaker into the retarded position. I do not however, limit myself to the use of the invention for these purposes.

It will be understood that the magneto will be provided with the usual or any preferred form of circuit breaker for the primary circuit, provided with means such as a timing lever, for advancing or retarding the spark in the cycle of the armature and as these devices are so well understood, I have not considered it necessary to illustrate any particular form of circuit breaker or timing lever for this purpose. I may, for example, employ the form of contact breaker and timing lever used in the well known "Simms" high tension magneto electric machine, and shown for example in the British patent to Simms No. 1263 of 1909.

What I claim and desire to secure by Letters Patent is:—

1. In a magneto electric machine, the combination with the magnet thereof, of a pole shoe for the magnet having one extremity extended in a direction around the armature beyond the other extremity, the inner face of said pole shoe being provided adjacent to the extended extremity thereof with a transversely extending recess, to enable the armature coils to cut substantially the greatest number of lines of force at two different positions in each revolution thereof, while passing said shoe.

2. In a magneto electric machine, the combination with the magnet thereof, of a pole shoe for the magnet having one extremity extended in a direction around the armature beyond the other extremity, the inner face of said pole shoe being provided adjacent to the extended extremity thereof with a transversely extending recess, to enable the armature coils to cut substantially the greatest number of lines of force at two different positions in each revolution thereof, and also with means for causing a greater reluctance to the magnetic flux in one of said positions than in the other.

3. In a magneto electric machine, the combination with the magnet thereof, of a pole shoe for the magnet having one extremity extended in a direction around the armature beyond the other extremity, the inner face of said pole shoe being provided adjacent to the extended extremity thereof with a transversely extending recess, to enable the armature coils to cut substantially the greatest number of lines of force at two different positions in each revolution thereof, portions of the extended extremity of the pole shoe being cut away to cause a greater reluctance to the magnetic flow at high speed.

4. In a magneto electric machine the combination with the magnet thereof, of a pole shoe for said magnet having the extremity which is last passed by the armature coils, during the rotation thereof extended beyond the other extremity of the shoe, and having a transverse recess in the inner face of said shoe adjacent to the said extended extremity whereby the armature will be given two sparking positions.

5. In a magneto electric machine the combination with the magnet thereof, of a pole shoe for said magnet having the extremity which is last passed by the armature coils, during the rotation thereof extended beyond the other extremity of the shoe, and having a transverse recess in the inner face of said shoe, adjacent to the said extended extremity whereby the armature will be given two sparking positions, the said extended extremity of the shoe being of greatest length centrally of the shoe and diminishing in length toward each lateral end thereof, whereby a greater reluctance to the magnet flux at one position is caused at high speed, than at the other position.

6. A pole shoe for high tension magneto electric machines, having a curved inner face for embracing the armature, and having one end extended in a direction around the armature, to a greater extent than the other, said pole piece being provided with a recess adjacent to said extended portion, said recess extending across the inner face of the pole shoe in a direction substantially parallel to the axis of rotation of the armature.

7. A pole shoe for high tension magneto electric machines, having a curved inner face for embracing the armature, and having one end extended in a direction around the armature, to a greater extent than the other, said pole piece being provided with a recess adjacent to said extended portion, said recess extending across the inner face of the pole shoe in a direction substantially parallel to the axis of rotation of the armature, the extremity of said extended portion being cut away at each end on lines disposed angularly to the end face of said extended portion.

8. A high tension magneto electric machine provided with a pole shoe, one end of which is provided with an extended portion, and having adjacent thereto a longitudinal groove or recess provided with a vertically disposed wall, in the plane of the outer face at the other end of the shoe, said recess having a longitudinally disposed face, disposed substantially perpendicularly to the said vertically disposed wall.

9. A pole disk for high tension magneto electric machines provided with an extended portion at one end, and having adjacent thereto a longitudinally disposed groove or recess provided with an inner vertically dis-

posed wall in the plane of the outer face of the other end of the shoe, and a horizontally disposed wall substantially perpendicular to the vertically disposed wall, the said
5 extended portion being cut away at each end to form faces inclined to the extreme outer face thereof.

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

WILLIAM O. KENNINGTON.

Witnesses:

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