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IGNITION MAGNETO FOR INTERNAL COMBUSTION ENGINES.
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Fig. 1.

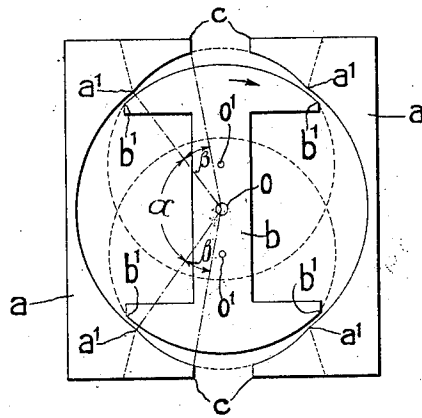
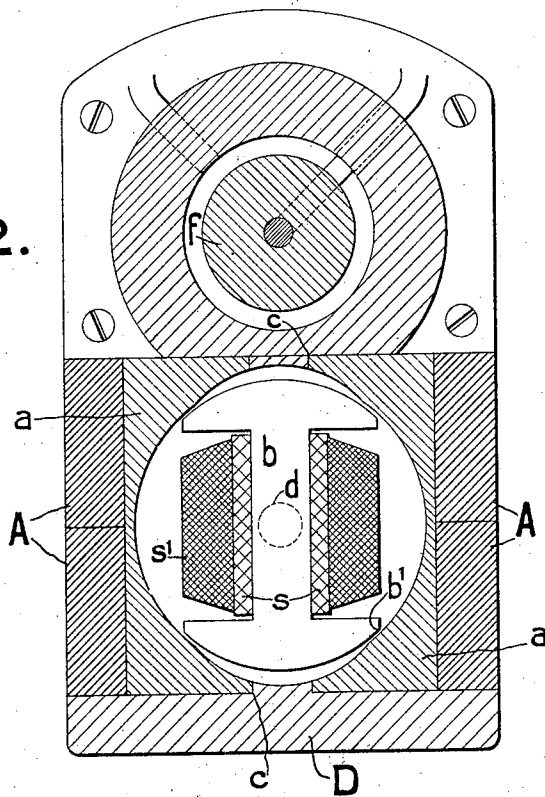


Fig. 2.



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IGNITION-MAGNETO FOR INTERNAL-COMBUSTION ENGINES.

1,379,953.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HECTOR ANDREINO, a citizen of the Swiss Republic, and resident of Le Locle, Switzerland, have invented 5 new and useful Improvements in Ignition-Magnetos for Internal-Combustion Engines, of which the following is a full, clear, and exact specification.

This invention relates to ignition magnetos for internal combustion engines and has for its object to provide an improved construction of field magnet with extended pole pieces embodying the features herein- 10 after described.

In certain types of ignition magneto as at present constructed, the pole face or angular pole pitch of each pole piece of the field magnet is defined, as shown for example in dotted lines on Figure 1 of the accompanying 15 drawing, by two pole edges a^1 subtending a certain polar angle α . When in operation, the armature being assumed to be rotating for example in the direction of the arrow, the secondary current only attains a practically 20 useful value during the very short interval of maximum variation of flux in the armature, that is to say when two of the diagonally opposite edges b^1 of the armature are leaving the two corresponding edges a^1 of the pole pieces of the field magnet. 25 The secondary current can therefore be graphically represented by a curve having, in absolute values, maxima, each of which is defined by a very steep and closely adjacent sudden ascent and descent, and it is only on the very small portions of this curve in the neighborhood of the maxima, that the interruption of the secondary current can effect a practically useful result.

As ignition magnetos are generally so regulated that the current "break" for advance to ignition must take place at a maximum, or at least in its immediate neighborhood, the current "break" for lag to ignition 30 necessarily takes place on the descending part of the curve for which the value of the secondary current is too weak to obtain an effect which is in practice always sufficient, thus giving rise to well-recognized disadvantages in starting the engine.

The present invention has for its object to overcome these disadvantages and to obtain with retarded ignition sufficient current to produce an effective spark. Many con-

structions with field pole extensions have 55 been proposed for this purpose, but none of them has the characteristics of the present invention, in which the extensions of the pole pieces of the field magnet have eccentrically curved faces which lie on the peripheral surface of geometrical cylinders 60 the axes of which are parallel to the axis of rotation of the magneto and have an equal distance apart on either side of this axis, the diameters of these cylinders being 65 equal to one another but less than the diameter of the bore of the pole pieces of the field magnet, so as to form between these curved extensions and the rotating element of the magneto, an air gap which increases 70 gradually from each pole edge to the outer end of its extension with the aforesaid object of obtaining with retarded ignition, sufficient current to produce an effective spark.

The construction of a magneto embodying 75 the principle of the invention is illustrated by way of example in the accompanying drawing, in which Fig. 1 shows diagrammatically in end elevation the pole pieces of the stationary field magnet and the rotary armature of the magneto, while Fig. 2 is a cross section of a constructional form 80 of a magneto according to the invention.

Referring now to the drawing, it will be seen that the magneto comprises a fixed 85 field magnet A (Fig. 2) having pole pieces a and a rotating armature b of double T shape with the edges or corners at b^1 . The field magnet A is carried by a non magnetic frame D. The armature b is mounted on a 90 shaft d the geometric axis of which is indicated at o in Fig. 1. It carries the usual induction coils s, s^1 . At the top of the magneto is arranged the usual current distributor f actuated from the armature shaft d 95 and designed to furnish the current to the spark supplying circuit.

The pole pieces a are each provided with extensions c subtending an angle β beyond 100 the usual pole edges a^1 (Fig. 1), the pole faces of the four extensions c being eccentrically curved so as to lie in pairs on the peripheral surfaces of two geometrical cylinders having axes o^1 parallel to the axis o and separated therefrom by equal distances. The 105 axes o^1 are on different sides of the axis o and lie in the symmetrical plane separating the two pole pieces a , while the two cylin-

dricul surfaces are of equal diameter less than the diameter of the bore of the pole pieces a . The air gap thus formed between each of these extensions c and the armature b as will be seen, increases gradually from the pole edge a^1 to the outer edge of the extension. The zone of maximum variation of the flux in the armature is thus extended over the whole arc of the polar extension, and this variation is thus less rapid and takes place during a longer period than in the case of the usual construction of magneto. As a result of this arrangement, the current is represented by a curve the maxima of which, without being appreciably displaced as regards its abscissæ, are lower than in the cases above mentioned, the ascent being still steep but the descent being on the contrary much less rapid; the curve is thus much less peaked and has a more flattened form over the whole angle β , the spark producing action of the "break" throughout this angle being very effective. Experience has shown that in this manner very satisfactory ignition on lag is obtained while maintaining ignition in advance in excellent condition.

The construction above described has the advantage of not requiring more than two supplementary bores to be machined, these operations presenting no difficulties.

The extensions of the faces of the pole

pieces can also be applied to magnetos having a stationary field magnet and armature and an intermediate rotating element, as well as to magnetos having a field magnet with more than two pole pieces.

What I claim is:—

An ignition magneto for internal combustion engines comprising a field magnet, a rotary armature, pole pieces on said field magnet and extensions on said pole pieces having eccentrically curved faces, each pair of which lie on the peripheral surface of a geometrical cylinder having its axis parallel to the axis of rotation of the armature, the axes of the two cylinders being equally distant from the axis of rotation and the diameters of the two cylinders being equal to one another and less than the diameter of the bore of the pole pieces of the field magnet, so as to form between the said curved extensions and the armature of the magneto, an air gap which increases gradually from each pole edge to the outer edge of its extension, for the purpose specified.

In witness whereof I have hereunto signed my name this 14th day of March, 1921, in the presence of two subscribing witnesses.

HECTOR ANDREINO.

Witnesses:

FRIDA KURZ,
AMAND BANNE.