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MAGNETO.

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1,141,336.

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Fig. 1.

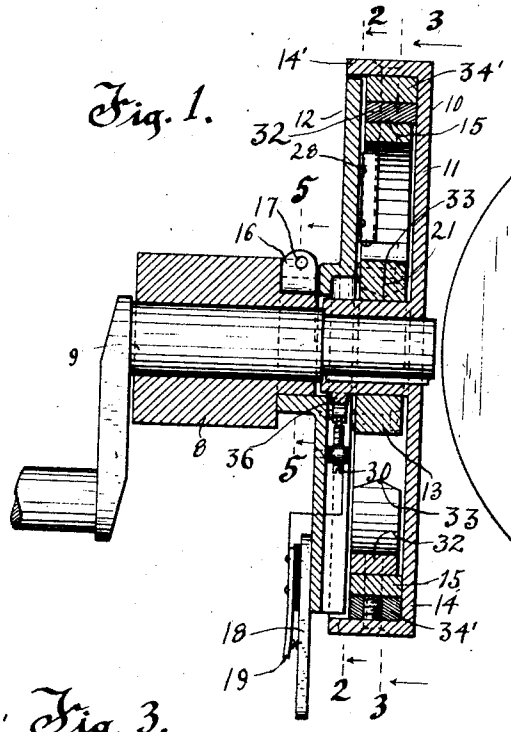


Fig. 2.

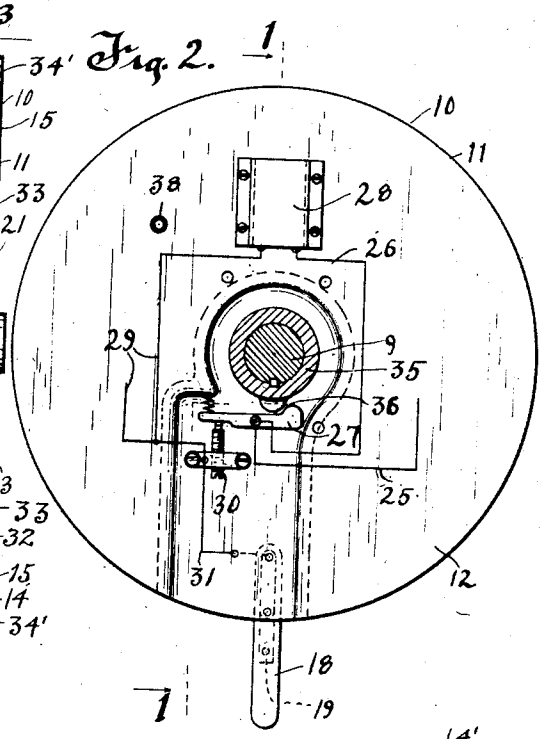


Fig. 3.

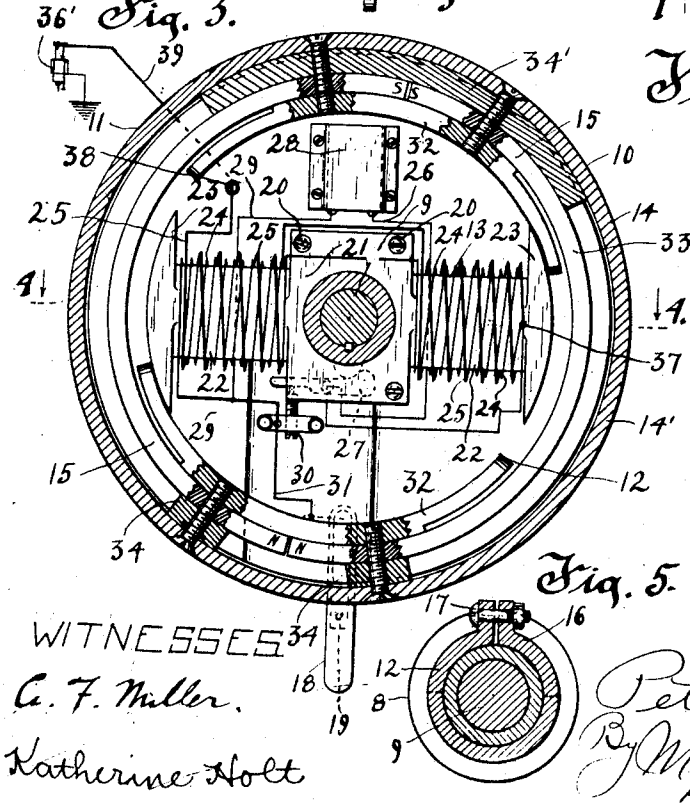


Fig. 4.

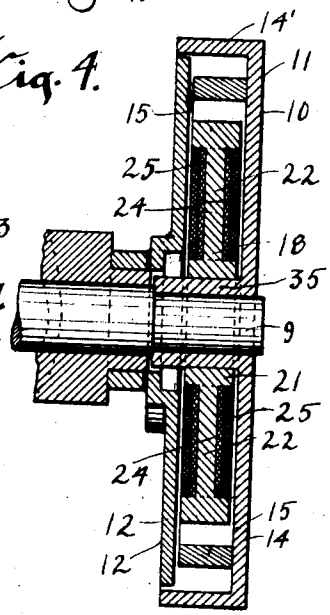


Fig. 5.

WITNESSES

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MAGNETO.

1,141,336. Specification of Letters Patent. Patented June 1, 1915.

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To all whom it may concern:

Be it known that I, PETER HAMM, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Magnetos, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in magnetos and more particularly to that type in which the magnet also serves as the fly wheel of the engine of which it forms a part.

In detachable rowboat motors, and also in other motors for propelling vehicles of various kinds, it is very desirable to provide an ignition system which is positive in its action, and in which the weight and size are reduced to the minimum.

It is one of the objects of the present invention to provide a magneto which possesses the before mentioned characteristics and is very simple in construction and is well adapted for the purpose desired.

A further object of the invention is to provide a magneto which may be substituted for the fly-wheel of an engine and which will perform the function of a fly-wheel and at the same time supply current for the ignition system of the engine.

A further object of the invention is to provide a magneto having means for retarding and advancing the sparking period to control the speed of the engine.

A further object of the invention is to provide a magneto in which the permanent magnets thereof revolve around the armature of the magneto.

With the above and other objects in view, the invention consists of the improved magneto and its parts and combinations as set forth in the claims and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Figure 1 is a sectional view taken on line 1—1 of Fig. 2 of the improved magneto shown mounted on the end of the cranked shaft of an internal explosion engine, only a portion of the shaft being shown; Fig. 2 is a sectional view thereof taken on line 2—2 of Fig. 1, the figure also showing a diagram of the electrical connections; Fig. 3 is a sectional view thereof taken on line 3—3 of Fig. 1, the figure also showing a diagram of the electrical connections; Fig. 4 is a sectional view thereof taken on line 4—4 of Fig. 3; and, Fig. 5 is a sectional detail view taken on line 5—5 of Fig. 1.

Referring to the drawing the numeral 8 indicates an engine bearing, 9 the cranked shaft and 10 the improved magneto mounted thereon.

The magneto comprises a casing 11 formed of a fixed armature plate 12 upon which the stationary armature 13 is mounted, and a flanged revoluble fly-wheel member 14 which carries the permanent magnets 15.

The armature plate 12 is provided with a split hub portion 16 which extends around the reduced end of the bearing 8 and is adjustably clamped thereto by the bolt 17 which draws the split portions of the hub together. The said plate 12 is also provided with a radially projecting handle 18 for convenience in turning the plate to advance or retard the time of sparking. The handle carries a short circuit switch 19 mounted thereon and insulated therefrom which is adapted to short circuit and control the stopping of the magneto.

The armature 13 is rigidly connected to the plate by screws 20 which pass through the medial rectangular portion 21, and from this portion armature cores 22 project from diametrically opposite sides thereof and terminate in peripheral heads or pole pieces 23 which are concentric with the cranked shaft 9.

The cores have primary and secondary coils of wire 24 and 25 respectively, wound therearound and which extend from one core to the other.

One end 26 of the primary wire is connected to a lever 27 to form a contact breaker and also to one of the terminals of a condenser 28 mounted on the plate 12, and the opposite end 29 of the wire is connected to the adjustable contact screw 30 and to the opposite terminal of the condenser thus completing the primary circuit when the make and break lever is contacting with the contact screw.

The make and break lever is grounded on

the plate 12 and a wire 31 extending from the wire 29 is connected to the short circuit switch 19 to provide for short circuiting the primary circuit to stop the engine when desired.

The annular flange 14′ of the fly-wheel member projects at right angles therefrom to form, in connection with the plate 12, the inclosing casing 11 within which is inclosed the armature and other parts just described and the permanent magnets 15. The permanent magnets are semi-circular in form and are positioned within the casing and diametrically opposite each other and with ends of similar polarity adjacent to each other. The ends of adjacent magnets are connected together by concentric pole shoes 32 which have their end portions offset from the magnets and their ends 33 slightly pointed to positively fix the points of break between the magnets and the pole pieces of the armature.

The magnets are spaced and magnetically insulated from the annular flange 14′ by brass washers 34 and 34′, the latter of which also serves as a counterweight to counterbalance the cranked portion of the engine shaft.

The fly-wheel member is provided with a projecting hub 35 which projects loosely through the rectangular portion 21 of the armature and is provided with a cam portion 36 on the periphery of its inner end which engages the contact breaker 27 once each revolution.

A strong magnetic field is formed between the pole shoes of the permanent magnets so that as they are revolved around the stationary armature, a current is produced in the armature primary winding which reaches its maximum power twice in each revolution, *i. e.*, when the pointed ends of the pole shoes revolve past the rear ends of the armature pole pieces, therefore permitting two sparks to be produced if desired.

In the drawing, however, only one of the maximum periods is utilized as only one cam is provided which is so positioned with relation to the maximum current as to break the primary circuit by engaging the contact breaker once at each revolution at the time of one of the two maximum current periods and thus by induction in the secondary coil produce a spark at the plug 36. It is obvious that with the addition of another cam that a spark may be produced at each half revolution and when connected up to a distributer (not shown) of ordinary construction the magneto would be adapted to be used with a multiple cylinder engine without departing from the spirit and scope of the invention. The secondary coil 25 of the armature begins at its point of connection 37 with the primary circuit wire 24, and from this point the secondary coil extends around the armature cores on opposite sides of the rectangular portion 21 and passes out of the back of the casing through an insulated opening 38 and a high tension wire 39 connected thereto extends to the spark plug 36 as indicated in diagram in Fig. 3.

The fly-wheel member is keyed to the cranked shaft and turns therewith. As the contact breaker is grounded on the casing and the casing is mounted on the engine shaft, these parts including the spark plug form the return circuit connection for the high tension circuit.

The pole shoes of the permanent magnets are so spaced with relation to the armature pole pieces as to just clear the same in revolving therearound.

By turning the fixed armature plate by means of the handle the spark may be advanced or retarded with relation to the engine upon which it is mounted.

From the foregoing description it will be seen that the magneto may be substituted for the fly-wheel of an engine and perform the function thereof as well as providing the ignition system for the engine. The magneto may also be used with the fly-wheel if desired.

The magneto is very compact in size and eliminates the use of the fly-wheel of the engine and is particularly adapted for use in connection with detachable row boat motors.

What I claim as my invention is:

1. A magneto comprising a member, a non-rotatable armature mounted thereon and provided with primary and secondary coils, permanent magnets revoluble thereabout, a circuit interrupter included in the primary circuit, for interrupting the current in the primary, and means for advancing or retarding the spark, comprising a split sleeve forming a part of said member and adjustably mounted upon the engine frame.

2. A magneto, comprising a member, a non-rotatable armature mounted thereon and having poles projecting therefrom, primary and secondary circuit coils surrounding said poles, a circuit interrupter included in the primary coil circuit, for interrupting the circuit therein, a rotatable member mounted upon the shaft of the engine adjacent said armature, permanent magnets mounted on said rotatable member, said magnets extending around the poles of the armature, and pole shoes connecting adjacent magnet ends together, said pole shoes having pointed ends, to positively fix the points of break between the magnets and the pole pieces of the armature.

3. A magneto, comprising a fixed member mounted upon the engine frame, a non-rotatable armature mounted thereon and provided with primary and secondary coils, a member carrying permanent magnets mounted upon the engine shaft and revoluble there-

with, a switch included in the primary circuit, and operable by said revoluble member, to interrupt the primary circuit, and a manually operable switch mounted on said fixed member, for continuously interrupting the primary circuit.

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

PETER HAMM.

Witnesses:
C. H. KEENEY,
GERTRUDE SCHOLZ.