R. H. HASSLER.
MAGNETO GENERATOR.
APPLICATION FILED MAR. 23, 1908.

939,910.

Patented Nov. 9, 1909.

2 SHEETS—SHEET 1.

Fig. 2.

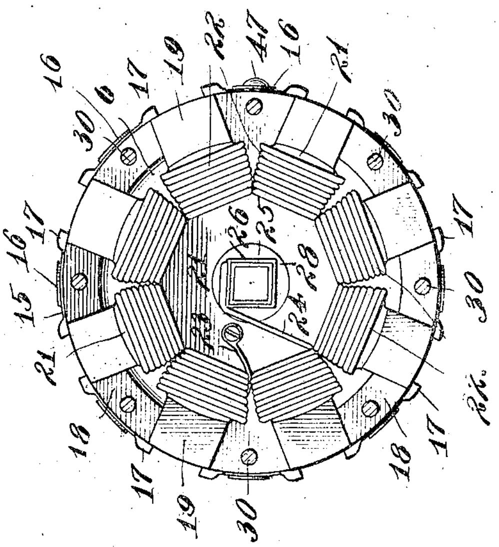
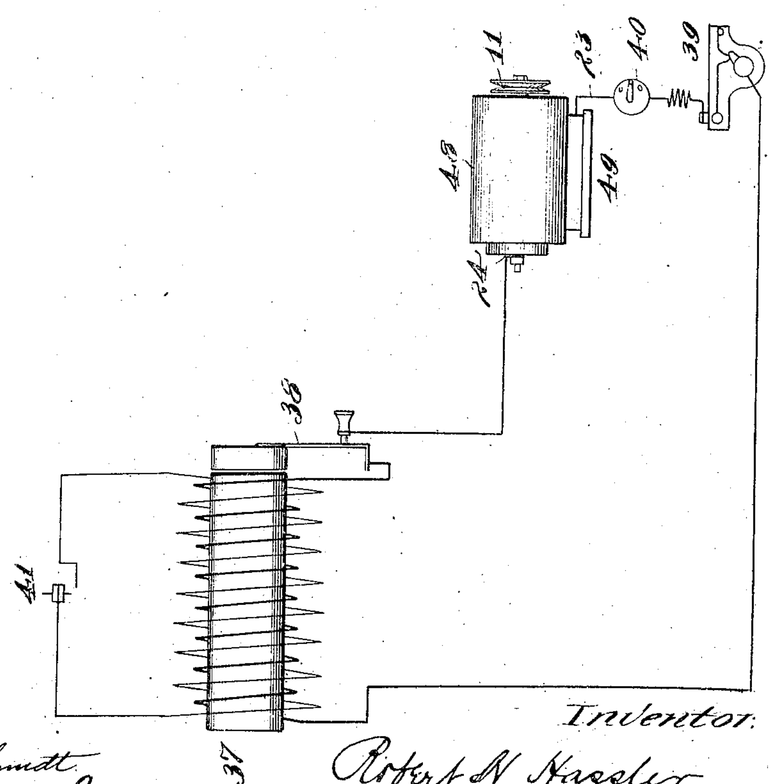


Fig. 1



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2 SHEETS—SHEET 2.

Fig. 4

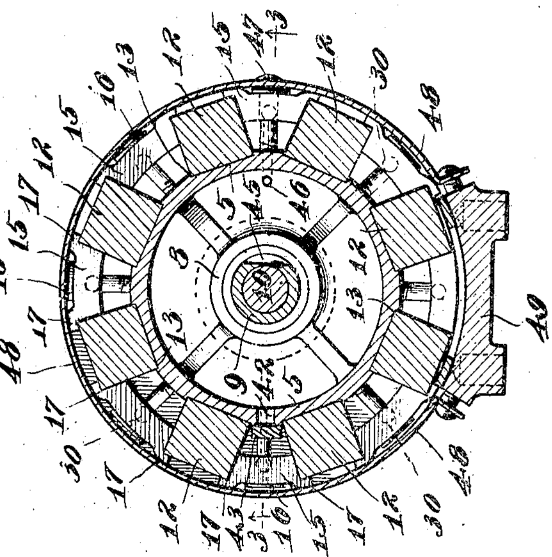
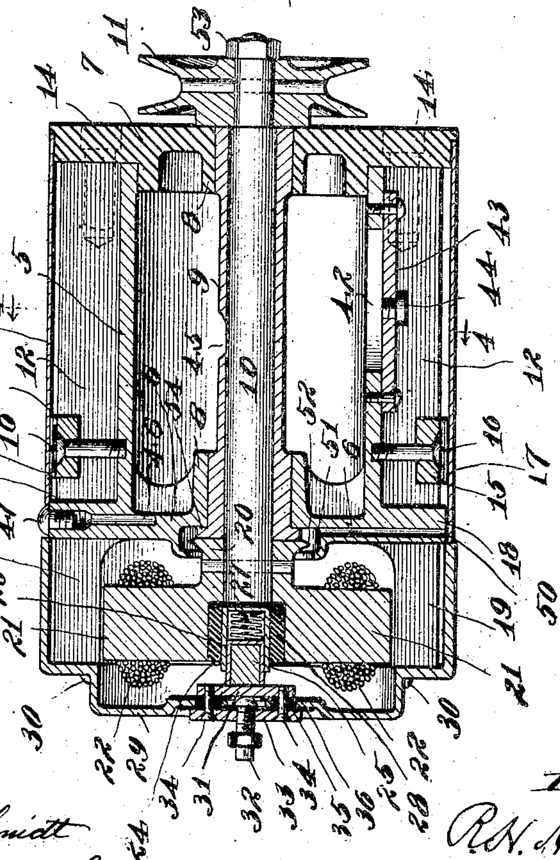


Fig. 3



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UNITED STATES PATENT OFFICE.

ROBERT H. HASSLER, OF INDIANAPOLIS, INDIANA.

MAGNETO-GENERATOR.

939,910. Specification of Letters Patent. Patented Nov. 9, 1909.

Application filed March 23, 1908. Serial No. 422,840.

To all whom it may concern:

Be it known that I, Robert H. Hassler, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Magneto-Generators, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to magneto electric generators and has particular reference to an alternating current generator to be used as an accessory to explosive engines to furnish the current for the spark to ignite the gaseous or liquid fuel, and which shall be especially applicable to such engines having a wide range of speed, as for driving automobiles and motor-boats.

In producing sparks to explode charges of fuel in explosive engines it is necessary that the alternations of current have a certain frequency with relation to the speed of the engine, it being desirable that several alternations occur while the timing commutator or distributer is making contact in order that an efficient spark be obtained at different engine speeds. For this reason approximately sixteen alternations of current should occur for each revolution of the engine, and in some cases a higher number of sparks is desirable; to produce this frequency magnetos as heretofore constructed have been driven many times faster than the engine, as a two-pole alternator or magneto would be required to revolve or run at eight times the speed of the engine and a four-pole alternator at four times the engine speed. Such high speeds of the magneto are objectionable for many reasons; for example, they necessitate impractical or undesirable methods of driving the magneto, cause rapid deterioration of the magneto bearings, and require too much care and attention to insure proper lubrication, especially during long periods of use. While the magneto speed may be reduced by employing an increased number of magnets, such arrangement with the usual forms of construction heretofore employed would necessitate a magneto of large and clumsy proportions; the nature of the work demands an alternator which may be readily installed in the limited space available about an automobile or boat engine, and hence it must be compact and of small proportions.

The primary object of my invention is to provide a novel and improved alternator of compact form capable of producing a high number of alternations at a low armature speed.

In alternators of all speeds, either high or low, it is desirable that the journals and bearings be of such construction as to require infrequent attention as to lubrication, and that means be provided for lubrication during extended periods of use.

A second object of my invention is to provide a magneto or alternator having efficient lubricating facilities, and specifically one which may be packed with grease or other lubricating material so that it is self-contained in this respect.

The particular and special object of the invention is to provide an alternator or magneto in which all the above advantages will be obtained, namely, a large number of poles to produce a high number of alternations at low armature speed, compact formation and arrangement of all the parts, and self-contained lubricating facilities.

With these several objects in view, the invention consists in the organizations and arrangement of parts hereinafter described and then pointed out in the appended claims.

In the accompanying drawings, which illustrate the preferred embodiment of my invention, Figure 1 is a diagrammatic view showing the generator in circuit with a commutator and an induction coil provided with a vibrator, a spark-plug being included in the secondary circuit of the coil; Fig. 2 is an end view of my generator with the cap removed; Fig. 3 is a longitudinal sectional view of the generator on the line 3—3 of Fig. 4; and Fig. 4 is a cross-sectional view of the same on the line 4—4 of Fig. 3.

In the drawings the reference numeral 5 designates a cylindrical casing of brass or other suitable non-magnetic metal, having a head 6 at one end and an annular magnetic yoke 7 at its other end. The yoke and head are provided with central bearings 8 which support an elongated shaft-journal 9 extending centrally and longitudinally of the chamber formed by the casing and its end-closures and in which a driving shaft 10 is journaled adapted to be rotated by a suitable pulley 11 from any source of power.

A plurality of permanent magnets 12 of any suitable size and shape are disposed along the outside of the casing and longitudinally thereof, and in the present embodiment of my invention I have shown eight such magnets which are substantially square in cross-section and adapted to seat in channels 13 in the casing. The yoke is secured to one of the ends of the magnets by screws 14 and the magnets are held seated in the channels by non-magnetic retainers 15, or other suitable means, which are positioned between the magnets and are secured to the casing by the screws 16. The head of each retainer is provided with two flanges 17 disposed one on each side thereof and transversely of the magnets upon which they bear. The other ends of the magnets pass through suitable openings or slots in a ring 18 formed by an annular projection on the head 6, beyond which their pole-segments 19 project to form an interpolar space. The driving-shaft carries an armature which may be of any suitable form but in the present instance comprises a steel disk or core 20 having eight radially projecting poles 21 provided with convex faces corresponding with the concave faces of the poles of the magnets. It is of course understood that the coils 22 which surround each of the armature poles are connected in series, and one of the terminals of the windings as 23 is connected to the armature core and thence grounded through the base and frame of the machine, while the other terminal 24 is electrically connected to a rotating brush or contact 25 mounted in the armature. For this purpose the core of the armature is provided in its outer side with a metallic cup or pocket 26 which projects somewhat beyond the face of the core to electrically connect with the terminal 24 and receives the brush or contact 25, which rests upon a suitable spring 27 located in the bottom of the cup; the brush substantially fills the cup so as to provide electrical continuity therewith, and the cup is seated in an insulated holder 28 by which it is carried and insulated from the armature.

The armature core and the adjacent ends of the magnets are inclosed by a cap 29 of brass or other non-magnetic metal which is secured to the annular flange 18 by lag screws 30. The cap is centrally reamed out to receive a conducting plate 31 to which the binding post 32 is suitably attached and against which the brush 25 bears. The plate 31 is secured in suitable manner being insulated from the cap; in the form shown the plate 31 is connected to an outer plate 33 adapted to overlie the opening in the cap by screws 34 passing through an intermediate annular insulating washer 35 having an annular flange overlying the inner face of the cap to insulate the plate 31 therefrom, a suitable insulating washer 36 also being interposed between the cap and plate 33. By this construction the parts are held in fixed relation and the current is carried to the binding post 32.

The binding post 32 is in circuit with the primary winding of an induction coil 37 having a magnetic vibrator 38, the circuit being completed through a commutator 39 and switch 40 back through the base and frame of the magnets to the other terminal 23 of the armature windings. When the armature is rotated sixteen alternations are obtained for each revolution of the engine by which the pulley 11 is driven, and this alternating current is sent through the primary winding of the induction coil; the high tension current induced in the secondary winding of the coil is delivered to the spark plug 41 in the circuit of the secondary winding to produce a jump-spark in the engine cylinder. If the armature is driven at twice the engine speed, several alternations of curernt will be obtained while the commutator is making contact, thus producing an effective spark in the cylinder.

The support for the magnets is preferably made as a self-containing lubricator for the armature shaft by packing the chamber formed in the interior of the casing 5 with grease or waste and oil. For this purpose the chamber may be packed before the yoke 7 is secured in place upon its end, or it may be provided with a longitudinal slot 42 through which waste or other material is passed to pack the lubricating reservoir comprising substantially the entire interior of the casing, the slot being closed by a metal strip 43 suitably secured to the casing and which in turn may be provided with a port through which oil is admitted to the well and which may be closed by a screw-cap 44. The bearing 9 is provided with a suitable opening 45 through which the oil or grease is adapted to be fed from the well to lubricate the shaft. In order to provide for conveniently supplying the chamber with oil, I may form an oil inlet 46 in the head 6 and its ring 18, the screw-cap 47 forming the closure of the inlet being accessible from the outside of the inclosing casing 48 which surrounds the parts and is connected to a supporting base or bracket 49. The head 6 and flange 18 also may have a drain passage 50 leading from an annular drip-cup 51 on the head and surrounding flange 52 on the armature core, whereby the armature windings are protected from oil or grease leaking through the bearing. The shaft 10 is held against longitudinal displacement by any suitable means, as the wheel 11 held by its nut 53 and the annular flange 52 of the armature core keyed to the shaft and abutting against the projecting end of the shaft-journal 9 which in turn is flanged as at 54 to bear against the outer face of the associated head 6.

In the form shown the casing 5 performs

the double function of supporting the magnets and forming an oil-chamber; when its latter function is not present it may take any suitable form or be otherwise embodied so long as it supports the field-magnets about the axis of the armature-shaft. The timing commutator is preferably so arranged that several alternations of current will occur while the commutator is making contact in order that an efficient spark may be obtained at different engine speeds.

Various changes may be made in the details of the several features of the device without departing from my invention; for example, while I have shown the magnets in the form of bar magnets they may be of other forms, such as horseshoe magnets, and while the present exemplification discloses my invention with relation to a structure in which its various features are practically embodied, I do not limit myself to any specific forms.

Having described my invention I claim as new and desire to secure by Letters Patent:—

1. In a device of the class described, a cylindrical support providing a lubricating reservoir, a series of magnets arranged about the axis of the support and projecting at one end to form a multipolar magnetic field, a shaft in the reservoir and carrying an armature in the said field, and means whereby the shaft may be revolved.

2. In a magneto-electric generator, a casing of non-magnetic material, a driving-shaft in the casing, a lubricating reservoir within the casing and communicating with the driving-shaft, a plurality of magnets mounted on the casing, and an armature secured to the driving-shaft and adapted to be rotated thereby.

3. In a device of the class described, a casing of non-magnetic material forming a lubricating reservoir, a bearing in the reservoir and having a port opening into the reservoir, a driving-shaft journaled in the bearing, a plurality of magnets on the casing, and an armature on the driving-shaft and adapted to be rotated thereby.

4. In an alternating current generator for ignition purposes, a cylindrical casing of non-magnetic material forming a reservoir for lubricating material, a plurality of magnets arranged lengthwise on the outside of the casing, a shaft extending through the reservoir, an armature on one end of the shaft, and means whereby the shaft may be driven.

5. In an alternating current generator for ignition purposes, a cylindrical non-magnetic casing forming a reservoir for lubricating material, a plurality of magnets arranged lengthwise on the outside of the casing, projecting portions of the magnets forming pole pieces at one end, a shaft extending through the casing, an armature on the shaft, and means to introduce lubricant into the reservoir without disassembling the armature and pole pieces.

6. In an alternating current generator for ignition purposes, a cylindrical casing of non-magnetic material, a plurality of magnets arranged lengthwise on the outside of the casing and projecting at one end to form an interpolar space, a shaft having a journal surrounded by lubricating material extending the entire length of the non-magnetic cylinder, and an armature on the shaft in the interpolar space.

7. In an alternating current generator for ignition purposes, a non-magnetic cylindrical cup, magnets arranged on the outside of the cup and projecting at one end to form a multipolar magnetic field, an annular magnetic body at the other end forming a yoke for the magnets and closing the end of the cylindrical cup to form a space for journal and lubricating materials, and an armature revolubly mounted in the field.

8. In a magneto-electric generator, a cylindrical support, a plurality of magnets mounted on the support, a shaft on the support, an armature adapted to be rotated by the shaft, a cap inclosing the armature and magnet poles, a brush carried by the armature and forming a terminal of the armature-winding, a binding-post on the cap, and means to secure electrical continuity between the post and brush.

9. In a device of the class described, a cylindrical support, a driving-shaft journaled in the support, a plurality of magnets mounted on the support about the shaft, an armature adapted to be rotated by the shaft, a spring-pressed brush carried by the armature in electrical extension of the armature-winding, a cap inclosing the armature and magnet poles, a contact-plate insulatingly mounted on the cap and engaged by the brush, and a terminal on the plate.

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

ROBERT H. HASSLER.

Witnesses:

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George R. Harbaugh.