A. H. NEULAND.

IGNITION AND LIGHTING APPARATUS.

APPLICATION FILED SEPT. 19, 1916.

1,275,292.

Patented Aug. 13, 1918.

Fig. 1

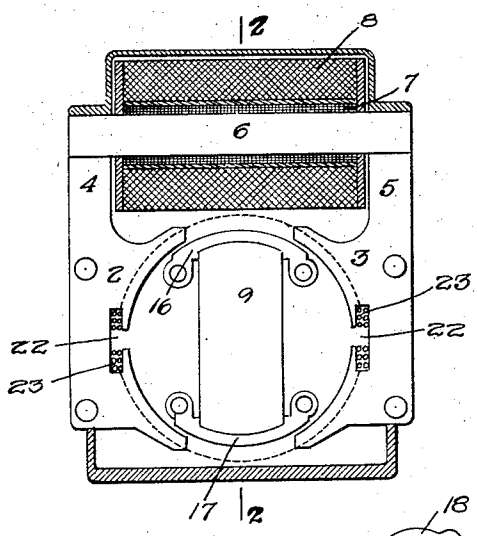
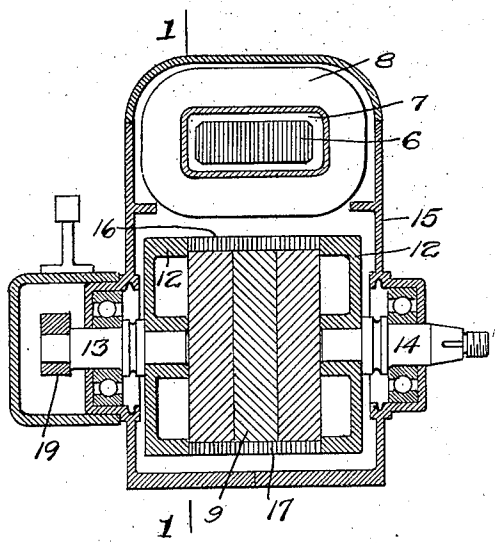


Fig. 2



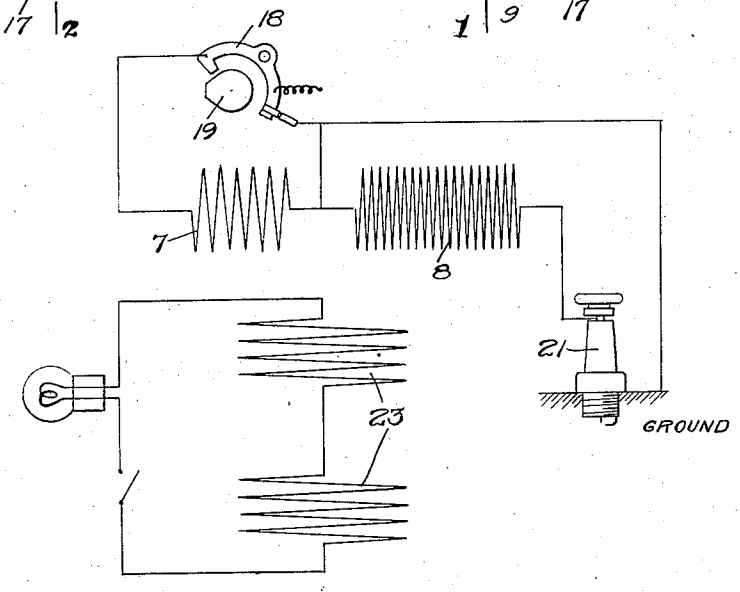


Fig. 3

WITNESSES:

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UNITED STATES PATENT OFFICE.

ALFONS H. NEULAND, OF SAN FRANCISCO, CALIFORNIA.

IGNITION AND LIGHTING APPARATUS.

1,275,292. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed September 19, 1916. Serial No. 121,015.

To all whom it may concern:

Be it known that I, ALFONS H. NEULAND, a subject of the Czar of Russia, and a resident of the city and county of San Francisco and State of California, have invented a certain new and useful Ignition and Lighting Apparatus, of which the following is a specification.

My invention relates to dynamo electric machines and particularly to an apparatus for providing ignition for internal combustion engines and also for providing electric current for lighting or other purposes. The apparatus is particularly adapted to be used on internal combustion engine driven vehicles and eliminating the lighting feature, may be termed a magneto.

An object of the invention is to provide an ignition device of simple construction in which the high tension coil is stationary.

Another object of the invention is to provide an ignition device in which a comparatively large amount of winding space is provided for the high tension winding.

A further object of the invention is to provide an ignition device which also generates a low tension current for lighting or other purposes.

The invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description, where I shall outline in full that form of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. In said drawings I have shown one specific form of the device of my invention, but it is to be understood that I do not limit myself to such form, since the invention may be embodied in a plurality of forms without departing from the invention as expressed in the succeeding claims.

Referring to said drawings:

Figure 1 is a cross section of one form of apparatus of my invention taken on the line 1—1, Fig. 2.

Fig. 2 is a longitudinal section taken on the line 2—2, Fig. 1.

Fig. 3 is a diagrammatic representation of the windings of the apparatus and their associated circuits.

Magnetos that are now on the market may be divided into two general types. In one type there is a revolving armature carrying the high tension winding which possesses only a small amount of winding space, making insulation difficult and requiring a high tension collecting member. In the other type of magneto, an inductor arrangement is employed in which the high tension coil is stationary, but the mechanical complications are such that the manufacture of the magneto is very expensive. Neither of these types of magnetos is capable of successfully furnishing a low tension current for lighting without interfering with the high tension ignition current.

In my present invention these difficulties have been overcome and my present device comprises a simple construction having a stationary high tension coil, which by reason of the large space available therefor, makes the winding and insulation thereof cheap and simple. In addition, my present device provides a low tension winding for generating current for lighting purposes, which is arranged in electrical space quadrature with the high tension winding, so that it does not interfere with the current in the high tension winding. It is to be understood that when the device is to be used solely for the purpose of ignition, that the low tension lighting current winding may be omitted and I do not limit myself to the combined lighting and ignition features.

The device comprises two stationary, preferably laminated, pole-pieces 2—3 opposing each other, and provided with upwardly extending projections 4—5 which are joined together by a laminated core 6 on which is arranged the low tension winding 7 and the high tension winding 8 of the ignition circuit. Rotatably arranged between the pole-pieces, is a magnet 9, preferably permanent, which upon rotation causes a reversal of flux through the laminated core 6 and the windings thereon.

The magnet may consist of a single magnet, but preferably consists of several magnets arranged side by side with their like poles contiguous. The magnets are held together by suitable bolts which seat in the end plates 12, or brass, aluminum or other suitable non-magnetic material, and the end plates 12 are secured to stub shafts 13 and 14, suitably journaled in the casing 15. The magnet may be of such length as to directly face the pole-pieces 2—3, but I prefer to provide the ends of the magnet with lam-

inated pole shoes 16—17 to facilitate the rapid shifting of the flux from one side of the end of the magnet to the other. As the magnet rotates, the flux is rapidly reversed through the laminated core and the ignition windings thereon. The primary or low tension ignition winding is provided with a breaker 18 preferably operated by a cam 19 on the stub shaft 13. At the time of breaking the primary ignition winding, the magnet is approximately in the position shown in Fig. 1 and the flux, at the moment of break, rapidly shifts from one pole tip to the other, thereby quickly reversing the flux through the ignition windings, and it is the purpose of the laminated pole shoes to facilitate this rapid shifting of the flux. In accordance with present practice, the low tension and high tension ignition windings 7 and 8 are preferably connected in series and the spark plug 21 is connected across the high tension winding and the breaker across the low tension coil.

When the device is to be employed to generate also a low tension current for lighting or other purposes, a longitudinal slot 22 is provided in the middle of each pole piece and a low tension lighting coil 23 is arranged in the slots, in the present instance the coil being formed in two sections. This coil is out of phase with the ignation coils. When the magnet is in the vertical position shown, none of the flux will pass through the ignition windings and all of it will traverse the lighting coil and when in a horizontal position, the flux traverses the ignition windings and not the lighting coil. For this reason, the generation of the ignition circuit is substantially unaffected by the condition of the lighting circuit and vice versa. The short circuiting of the primary ignition current and the generation of the high tension ignition current will not materially interfere with the lighting current.

I claim:

1. In a dynamo electric machine for ignition and lighting purposes, a rotatable magnet, a plurality of pole-pieces facing the magnet, a laminated core connecting said pole pieces, a high tension ignition winding on said core, and a low tension winding on the pole-pieces arranged in electrical space quadrature to said high tension ignition winding.

2. In a dynamo electric machine for ignition and lighting purposes, a rotatable magnet, pole-pieces facing said magnet, a laminated core connecting said pole-pieces, a high tension ignition winding on said core, said pole-pieces being provided at their centers with slots and a low tension winding arranged in said slots.

3. In a dynamo electric machine for ignition and lighting purposes, a rotatable magnet, pole-pieces facing said magnet, projections on said pole-pieces, a laminated core connecting said pole-pieces, low tension and high tension ignition windings arranged on said core, said pole-pieces being provided at the center of their faces with longitudinal slots and a low tension winding arranged in said slots.

In testimony whereof I have hereunto set my hand at San Francisco, California, this 13th day of September 1916.

ALFONS H. NEULAND.

In presence of—
H. G. PROST.