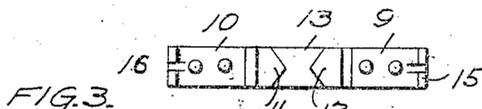
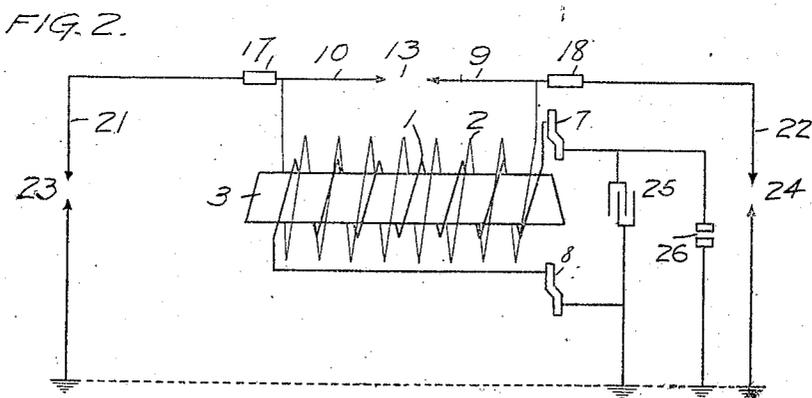
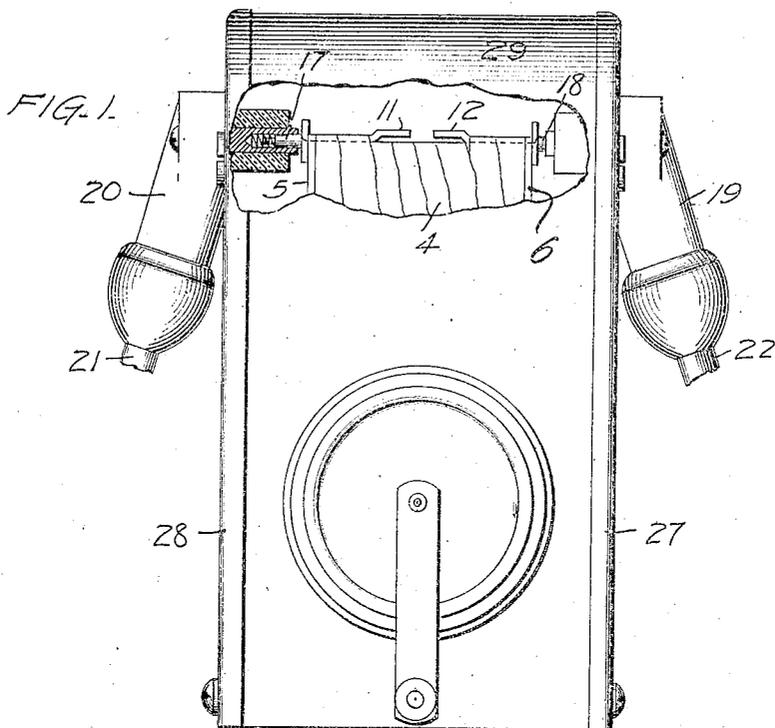


J. G. ZIMMERMAN,  
 IGNITION DYNAMO.  
 APPLICATION FILED MAY 12, 1916.

1,298,624.

Patented Mar. 25, 1919.



Inventor

James G. Zimmerman,

*H. C. Kuehn*

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Attorney

# UNITED STATES PATENT OFFICE.

JAMES GARFIELD ZIMMERMAN, OF SUMTER, SOUTH CAROLINA, ASSIGNOR TO  
SPLITDORF ELECTRICAL COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION  
OF NEW JERSEY.

## IGNITION-DYNAMO.

1,298,624.

Specification of Letters Patent.

Patented Mar. 25, 1919.

Application filed May 12, 1916. Serial No. 97,033.

*To all whom it may concern:*

Be it known that I, JAMES GARFIELD ZIMMERMAN, a citizen of the United States, residing at Sumter, in the county of Sumter and State of South Carolina, have invented certain new and useful Improvements in Ignition-Dynamos, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to ignition dynamos commonly known as magnetos, and comprises an improved arrangement of the circuits and parts, whereby the magneto will produce two simultaneous sparks, and may be used on a two cylinder engine having cylinders 180 degrees apart. The spark in the cylinders of such engines may occur simultaneously, for when the piston in one cylinder is in the firing stroke, the other piston is on the exhaust stroke. By my invention the usual distributor is eliminated, as are also all moving contacts or sliding brush connections during the operation of the machine.

A further object is to provide a compact and efficient generating coil, carrying a safety spark gap, and instead of having the spark gap on some portion of the magneto separate from the windings and requiring wires or members forming connections, I combine the spark gap as an element directly with said windings, thus enabling the windings to be removed without disconnecting the spark gap, thereby enabling the windings to be tested with the spark gap adjustment as actually used in service on the magneto.

I also show and describe an improved arrangement for a magneto of this type in which all of the ends of the coil windings are brought out to separate terminals, thereby eliminating the resistance of the joints in the framework of the machine, which resistance is present when the frame is employed to conduct the current from one of the windings to any other part, such as the condenser or interrupter contacts.

In the accompanying drawing, Figure 1, is an end view of a magneto, partly in sec-

tion, showing the side of the generating coil and the two high tension terminals connected therewith. Fig. 2, a diagram showing the connections of the coil and the improved arrangement of the terminals. Figs. 3 and 4 show in detail the high tension terminal and the insulating plate riveted thereto, this complete structure forming the safety spark gap.

Like figures of reference denote the same parts wherever they are shown.

Any suitable type of magneto may be employed with this invention, and I show a well known type known as the "Dixie," in which a stationary coil as shown in Fig. 1, is employed. This magneto has a rotating or oscillating member causing the flux to pass in alternately opposite directions through the core of the coil. Such a coil in the case of a high tension magneto has two windings, the primary designated by the numeral 1, and the secondary by the numeral 2. The core 3 supports the insulating heads 5 and 6, and upon one of these is mounted the primary terminals, 7 and 8 and one of the high tension or secondary terminals 9. The remaining high tension terminal 10 is mounted on the opposite head. These high tension terminals have pointed portions indicated at 11 and 12, between which is formed a safety spark gap 13 for limiting the potential in the secondary winding. To insure the proper spacing of the gap 13, and to provide a unit arrangement that is readily secured to the coil, I provide an insulating plate of mica or the like, shown at 14, to which the high tension terminals are riveted. The result is a complete unitary terminal structure forming a safety spark gap, all as shown at Fig. 3, the ends 15 and 16 of the terminals forming contact surfaces for the brushes 17 and 18 of the high tension terminals 19 and 20, carrying the cables 21 and 22 leading to the spark plugs indicated at 23 and 24. The ends 15 and 16 of the unitary spark gap member have portions turned downwardly as shown in Figs. 1 and 4, so as to embrace the insulating heads 5 and 6 of the coil thereby pre-

venting endwise movement of the said unitary structure.

The primary terminals connect to a suitable condenser 25 and to the usual interrupter mechanism, indicated in the diagram at 26.

The secondary terminals 19 and 20 are mounted upon the side or cover plates 27 and 28 of the magneto, which together with the magnet casing 29 serve to completely surround and inclose the coil.

As the operation of a magneto of this description is already well known I will not describe the same, except to state when the secondary winding is energized, simultaneous sparks will be produced at the plugs 23 and 24. In case of trouble in the plugs or an open circuit in one of the cables connected thereto, the safety spark gap 13 will become operative, thereby limiting the potential and saving the secondary winding from "breakdown."

It will be seen that the coil is readily removed from the magneto as a unit, by taking off the side plates and lifting the coil out of place, and that this can be accomplished without disassembling the safety spark gap or secondary terminals, which are attached to the coil proper in any suitable manner such as by the layer of tape indicated at 4. When the coil is removed, by connecting a suitable source of energy to the primary terminals thereof, the coil may be tested with the safety spark gap 13 in operative connection therewith, and with assurance that all of the terminal connections are as actually in use in the magneto.

Having thus described my invention I claim:

1. In an ignition dynamo, a coil having a primary and a secondary winding, heads on said coil, terminals on said heads for the secondary winding forming a safety spark gap, and means for connecting conductors to said terminals.

2. In an ignition dynamo, a coil comprising a core having primary and secondary windings thereon, heads on said core, terminals on said heads connected to the ends of said secondary winding and forming a safety spark gap across said coil, and cable-connecting means in contact with each of said terminals.

3. In an ignition dynamo, a generating winding having heads, terminals for said windings on said heads, cover plates adjacent the ends of said winding, and terminals carried by said plates and in contact with the terminal ends of said windings.

4. In an ignition dynamo, a generating winding having insulating heads, terminals for said winding carried on said heads, cover plates adjacent the heads of said winding, and terminals carried by said cover

plates and in contact with the winding terminals.

5. In an ignition dynamo, a generating winding, heads on said winding, terminals for said winding carried on said heads, cover plates adjacent said winding, and terminals carried by said cover plates and connected to said first mentioned terminals whereby a series circuit is completed from a terminal on one cover plate through said generating winding to a terminal on the remaining cover plate, substantially as described.

6. In an ignition dynamo, a fixed generating winding, terminals for the ends of said winding forming a safety spark gap across the winding, a pair of cover plates adjacent the ends of said winding and serving together with other parts to inclose the winding, and terminals on said cover plates insulated therefrom and passing therethrough and in contact with said winding terminals, substantially as described.

7. In an ignition dynamo, a coil comprising a core having primary and secondary windings thereon, heads on said core, an insulating member overlying the windings between the heads, terminals riveted to said insulating member and forming across the top thereof a safety spark gap, means for securing said terminals to said windings, and means on said terminals engaging said heads and forming thereon surfaces adapted to be engaged by circuit-conducting means, substantially as described.

8. In an ignition dynamo, a unit coil structure comprising a core, heads thereon, a primary and secondary winding inclosed between said heads, terminals for the secondary winding forming a safety spark gap, an insulating plate, means for securing said terminals to said plate whereby they are properly spaced apart, means for securing said terminals to said coil, contact surfaces on said terminals, a casing inclosing all of the foregoing parts, and means carried on said casing projecting therethrough and engaging said surfaces whereby current may be conducted outside the magneto, substantially as described.

9. In an ignition dynamo, a unit coil structure comprising a core, heads thereon, a primary and secondary winding inclosed between said heads, a plate of insulating material overlying the windings between said heads, terminals for the secondary winding secured to said plate and forming across the top thereof a safety spark gap, downwardly extending portions on said terminal adapted to embrace said heads and prevent endwise movement of said terminals on the coil, and upturned portions on said terminals forming contact surfaces, substantially as described.

10. In an ignition dynamo, cover plates, a unit coil structure, a primary winding thereon, a secondary winding about said primary winding and electrically separate therefrom, and a pair of detachable cable terminals on said plates in contact with said secondary winding, whereby both ends of

said winding may be connected to translating devices for the production of simultaneous sparks thereat.

In testimony whereof I hereunto affix my signature.

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JAMES GARFIELD ZIMMERMAN.