T. HUBERT.

ELECTRIC IGNITION DEVICE.

APPLICATION FILED NOV. 23, 1906.

926,698.

Patented June 29, 1909.

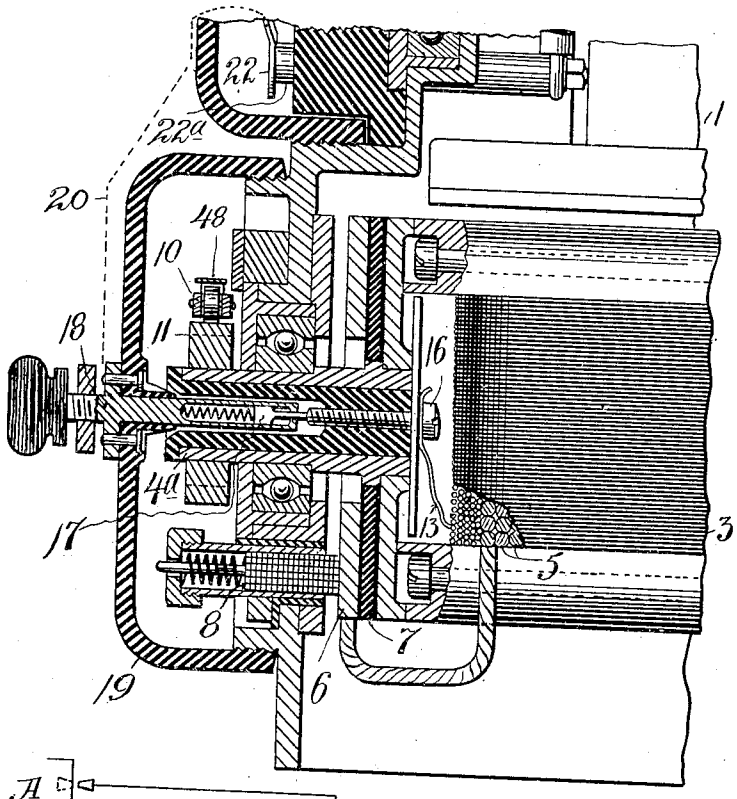

Fig. 1.

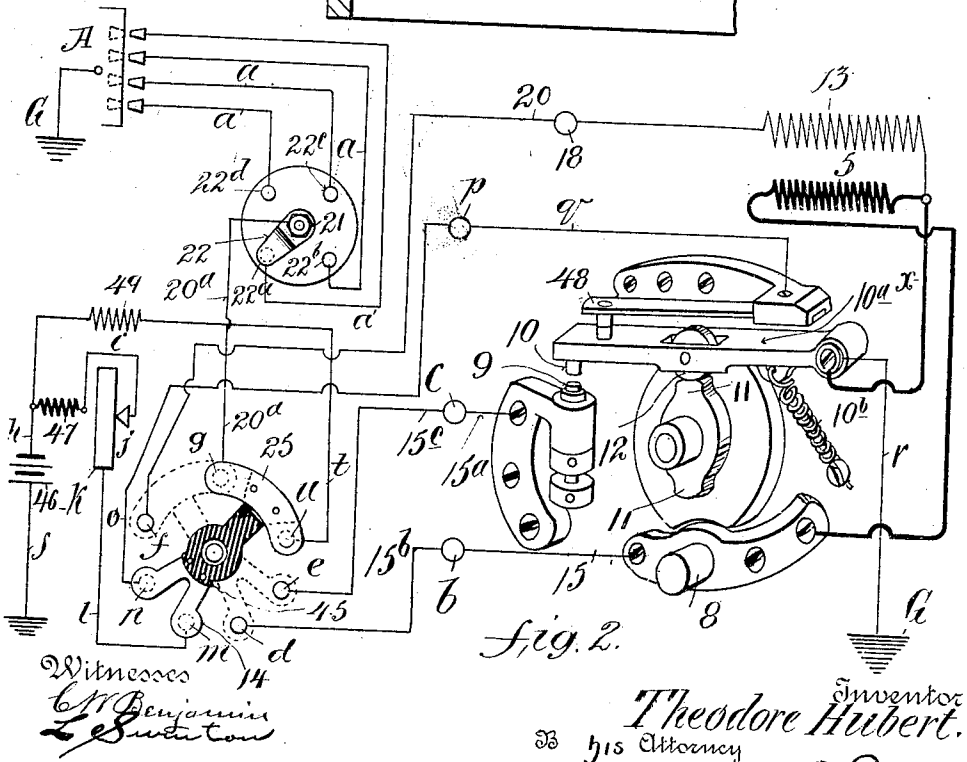

Fig. 2.

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ELECTRIC IGNITION DEVICE.

No. 926,696. Specification of Letters Patent. Patented June 29, 1909.

Original application filed April 4, 1906, Serial No. 309,736. Divided and this application filed November 23, 1906. Serial No. 344,702.

To all whom it may concern:

Be it known that I, THEODORE HUBERT, a citizen of the United States, and resident of New York city, borough of Brooklyn, New York, have invented certain new and useful Improvements in Electric Ignition Devices, of which the following is a specification.

This application is a division of my application filed April 4, 1906, Serial No. 309,736, for improvements in electric ignition devices, and the object of my invention is to cause the movable member of the primary magneto circuit to cause the make and break in a separate circuit.

My invention comprises a magneto having make and break contacts and means to operate the movable member thereof, with a contact for a separate circuit arranged to be made and broken by the action of said movable member of the magneto contacts.

The invention also comprises the novel arrangements and combinations of parts hereinafter more fully set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming part hereof, wherein—

Figure 1 is a sectional detail view of a portion of a high tension magneto adapted for use in connection with my improvements, and Fig. 2 is a perspective view illustrating diagrammatically the circuits and devices of my invention.

The magneto 1 may be of any well known construction of high tension magnetos in which the armature 3 is mounted to rotate within usual fields (not shown,) and the primary winding 5 of the armature is shown connected with a metal plate 6 rigidly carried by the armature but insulated therefrom, as by insulation 7, and engaging a brush 8 carried by but insulated from the frame of the magneto.

At 9 is a contact in the primary circuit supported by and insulated from the frame of the magneto, and at 10 is a movable contact shown carried by a pivoted arm 10^a supported by the frame of the magneto and which may be grounded through the frame with which one terminal of the primary winding may also be grounded. The contact 10 is operated by a cam 11 carried by the magneto shaft 4^a, said cam being shown provided with two projecting portions to engage a roller 12 of arm 10^a, a coil spring 10^b serving to pull the arm toward the cam, all whereby, when the primary magneto circuit is closed and opened the discharge in the secondary armature winding 13 will be produced in well known manner in high tension magnetos. To control the magneto primary circuit at will I provide a switch indicated at 14 in a branch line 15, as hereinafter explained. The secondary magneto winding 13 is shown connected by a screw 16, insulated from shaft 4^a, with a spring pressed contact 17 in circuit with a binding post 18 shown carried by an insulated cap 19 secured upon the magneto frame, the post 18 being shown connected by wire 20 (Fig. 1) with a suitable distributer contact 22 adapted to engage a contact 22^a in the secondary circuit, the opposite terminal of the secondary winding being grounded through the magneto frame as indicated by wire x in Fig. 2.

In Fig. 2 I have shown means whereby a battery circuit and vibrator coil or coils may be used in connection with the magneto and its circuits, and wherein when the battery circuits are being used the magneto circuits may be cut out, and vice versa. To this end I have shown the wire 15 of the primary magneto circuit connected with a binding post b and the wire 15^a of said circuit connected with a binding post c, wires 15^b, 15^c connecting said posts b and c, respectively with contacts d and e. The circuit through contacts d and e is adapted to be opened and closed by the contact or switch 14 that is shown secured to an insulating block 45 to be operated by a suitable handle, whereby when the circuit is closed at d, e, the current will flow from brush 8 to 15, 15^b, d, 14, e and 15^a, the contacts 9 and 10, thence through the primary coil of the magneto, back to brush 8.

I have also shown the secondary circuit of the magneto arranged to be opened and closed with the opening and closing of the primary circuit thereof, and to this end the circuit, instead of running direct from post 18 to the contact 22 by wire 20, as in dotted lines in Fig. 1, the wire 20 leads to contact f and wire 20^a leads from contact g to contact 22, and switch 25 is adapted to close the circuit between contacts f and g at the time that switch 14 closes the circuit between contacts d and e, as in dotted lines in Fig. 2. Switch 25 is shown secured to insulating post

45 so as to be operated coincidently with switch 14. Thus, when switch 25 closes circuit between contacts *f* and *g* the secondary circuit of the magneto will be from the secondary winding 13 through post 18, wire 20, contact *f*, switch 25, contact *g*, wire 20ª, contact 22 and through contact 22ª, and wire *a*, to ground, as at an engine frame A, and thence through the frame of the magneto, back to the secondary winding, as by wire *x* in Fig. 2.

A separate circuit for a battery, and the primary and secondary of a vibrator coil and circuits, are arranged as follows: From the battery 46 the wire *h* leads to the primary coil 47 and thence by wire *i*, contact *j*, and vibrator spring *k* through wire *l*, contact *m*, and from an associate contact *n* through wire *o*, post *p* and wire *q* to the spring or contact 48 adapted to make and break the circuit with movable member 10ª which member leads thence back to the battery, as by ground through the mechanism, indicated in Fig. 2 by wires *r* and *s* to ground. Switch 14 is adapted to open and close the circuit through contacts *m* and *n* and when in such position the rotation of cam 11 will cause the primary battery circuit to be made and broken at contacts 10ª and 48. Thus it will be seen that the time of the make and break between contacts 10ª and 48 caused by the lifting of contact 10ª by cam 11 will be slightly retarded with respect to the make and break between contacts 9 and 10 of the primary magneto circuit, so that, for instance, when an engine provided with my improvements is being started by means of the battery circuit the spark will be slightly retarded with respect to the time of the spark produced by the magneto, because the latter occurs at the break between contacts 9 and 10, and the battery circuit break does not occur until after the cam has left arm 10ª and spring 10ᵇ has pulled the latter from contact 48, thereby making it more safe to the operator, as respects a "back kick" from the engine, to start the engine with the battery circuit. The secondary winding 49 of the vibrator coil is grounded at one terminal as through the mechanism, or through wire *h* in Fig. 2, and the wire *t* leads from the other terminal to the contact *u* to be engaged by switch 25 to place said winding in circuit with contact 22, through contact *g* and wire 20ª when switch 25 is in the position shown in Fig. 2. Thus, when the battery primary circuit is closed by switch 14 at contacts *m*, *n*, the battery secondary circuit will be from ground or the mechanism through winding 49, wire *t*, contacts *u* and *g*, switch 25, wire 20ª, contact 22, and through contacts 22ª, etc., and wire *a* back to ground.

From the foregoing it will be understood that by simply turning switch 45 for contacts *d*, *e*, and *f*, *g* the magneto primary and secondary circuits may be closed for operating igniting devices while the battery primary and secondary circuits will be broken, and that by placing the switch in the position shown in full lines in Fig. 2 the magneto primary and secondary circuits will be broken while the battery primary and secondary circuits will be closed for such igniting devices, and thus, the same cam 11 and movable member 10ª, serve for making and breaking the primary magneto circuit at 9, 10, and for making and breaking the vibrator coil primary and secondary at 10ª, 48, and that only one of said primary circuits will be operating at one time.

In this application I do not claim the details of construction of the magneto shown and described, as they are embraced in my aforesaid application, Serial No. 309,736, and also shown in my application, Serial No. 344,703, filed Nov. 23, 1906.

Having now described my invention what I claim is:—

1. The combination of a magneto having make and break contacts, and means to operate the movable member thereof, with a contact for a separate circuit arranged to be made and broken by the action of said movable member of the magneto contacts.

2. The combination of a magneto having contacts in the primary circuit, and a movable member to operate one of said contacts, with a contact in a separate circuit and located on the side of said movable member opposite its associate contact of the magneto primary circuit, whereby the magneto primary circuit will be broken before contact is made by said movable member with said contact in the separate circuit.

3. The combination of a magneto having a contact, and a contact operated by a movable member, with a contact for a separate circuit located on the side of the movable member opposite said first named contact.

4. The combination of a magneto having a contact, a contact operated by a movable member, a cam operated by the magneto armature, and a spring to pull said member toward said cam, with a contact in a separate circuit arranged to be made and broken by the action of said movable member.

5. In an ignition system for explosion engines, a vibrator, and contact points on opposite sides of said vibrator for closing the circuits of separate current sources by the movement thereof.

6. In an ignition system for explosion engines, a vibrator, contact points separated by the movement of the vibrator to open a dynamo circuit, and additional contacts closed by the movement of the vibrator in the same direction for closing a battery circuit.

7. In an ignition system for explosion engines, a plurality of induction coils having their primaries in separate circuits, a vibra-

tor lever, means for closing one of said circuits by movement of the vibrator in one direction, and means for closing another of said circuits by its movement in the opposite direction.

8. In an ignition system for explosion engines, a dynamo circuit, a battery circuit, a vibrator, means for opening the dynamo circuit by movement of said vibrator in one direction, and means for closing the battery circuit by movement of said vibrator in the same direction.

9. In an ignition system for explosion engines, a dynamo circuit, a battery circuit, a vibrator, contacts in the path of said vibrator for closing said dynamo circuit or said battery circuit by movements of the vibrator in opposite directions.

10. In an ignition system for explosion engines, a circuit including a dynamo and the primary of an induction coil, a second circuit including a battery and the primary of another induction coil, said last mentioned induction coil having a trembler, and a vibrator having a to and fro movement to open the first named circuit and close said last named circuit substantially simultaneously.

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