R. H. WHISLER.

IGNITION SYSTEM.

APPLICATION FILED JAN. 10, 1919.

1,376,845. Patented May 3, 1921.

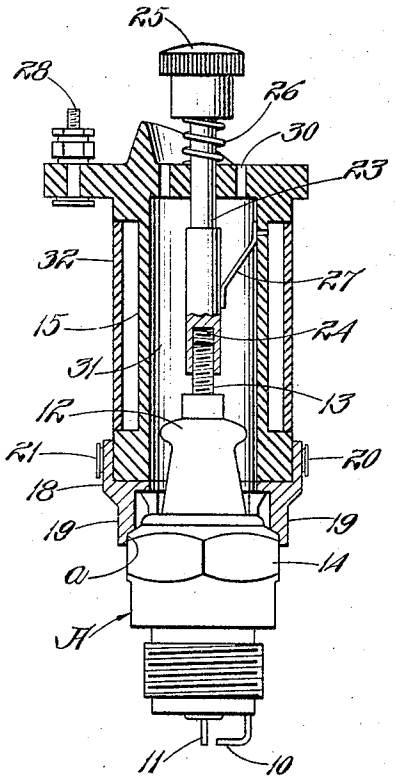


Fig. 2.

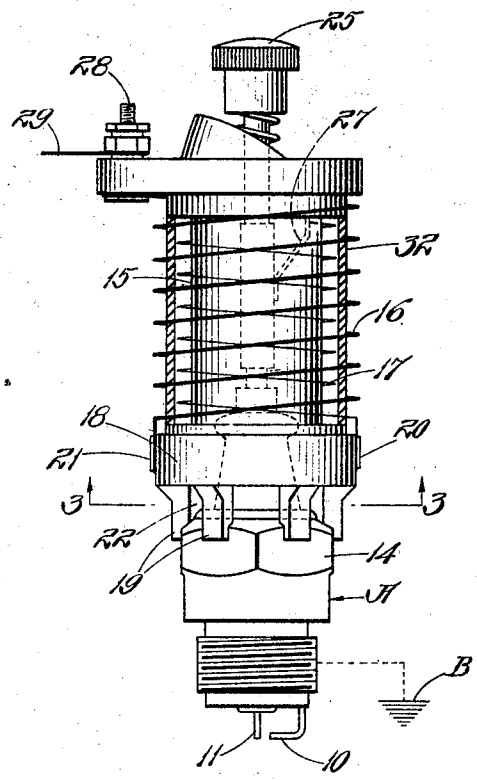


Fig. 1.

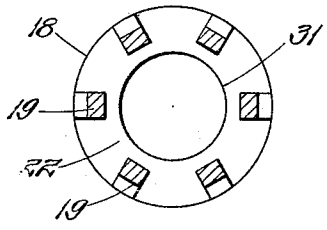


Fig. 3.

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UNITED STATES PATENT OFFICE.

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IGNITION SYSTEM.

1,376,845. Specification of Letters Patent. **Patented May 3, 1921.**

Application filed January 10, 1919. Serial No. 270,560.

To all whom it may concern:

Be it known that I, RALPH H. WHISLER, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Ignition Systems, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a coil to be used as a part of the ignition system described in my prior application Serial No. 213,655, filed Jan. 25, 1918. As therein described said ignition system comprises three circuits (*a*) a circuit in which is a source of electromotive force such as a batterv, a circuit breaker operated in time with the engine and the primary of an induction coil; (*b*) a circuit in which is located the secondary of said induction coil, a discharge gap and the primary of a disruptive discharge coil; and (*c*) a circuit containing the secondary of said disruptive discharge coil and the electrodes of a spark plug, said electrodes being located in the combustion chamber of an internal combustion engine.

In the practical application of my invention, I find it desirable to make the disruptive discharge coil into a unit which may be placed on the top of the spark plug. The present invention, therefore has for its object to provide such a unit. The coil embodying my invention is so constructed that it may be applied to a spark plug or removed therefrom very quickly. It is neat and compact and performs its electrical functions satisfactorily.

The invention will be fully understood from the following description when taken in connection with the accompanying drawings and the novel features thereof will be pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a side elevation partly in section of a spark plug to which is applied the coil embodying the present invention.

Fig. 2 is a vertical section of tne coil shown in Fig. 1 with the windings removed.

Fig. 3 is a section of the coil support 18 on line 3—3 of Fig. 1.

Referring now to the drawings, at A is shown a spark plug of ordinary construction being grounded on the cylinder block of the engine as indicated at B. The electrodes are designated 10 and 11 respectively. The electrode 11 is centrally disposed within an insulating bushing 12 and has its upper end formed into a screw threaded terminal 13 forming a binding post. The metallic body of the spark plug is designated 14. The coil embodying my invention is secured to the top of the spark plug and consists of a spool 15 constructed preferably of some insulating material on which is placed the secondary winding 17 and a sleeve 32 constructed preferably of some insulating material on which is placed the primary winding 16 which is indicated diagrammatically in Fig. 1. The lower end of the spool 15 is inclosed in a metallic support 18 to which the ends of the wires of the two coils 16 and 17 are electrically connected as shown at 20 and 21. The support 18 is formed with a series of downwardly projecting legs or prongs 19 separated by spaces 22, (see Fig. 3). The legs or prongs rest on the metallic body portion 14 of the spark plug and are rabbeted slightly as shown at *a* to fit over the shoulder more securely. It will be seen that there is a metallic contact between the metallic support 18 and the body of the spark plug which is itself screwed into the engine so that the primary winding of the coil is grounded.

Centrally disposed of the coil is a stem 23 screw threaded at its lower end as shown at 24 to receive the upper end of the central electrode 11 of the spark plug A. The upper end of the stem 23 is provided with a thumb nut 25 and a spring 26 is interposed between the end of the spool and the thumb nut. At 27 is shown a spring contact member which rests against the stem 23 and is connected to the secondary winding 17. The upper end of the primary winding is connected to a binding post 28 by means of which it is connected to a lead wire 29 forming part of the ignition system and described in my hereinbefore mentioned prior application.

The coil is secured to the spark plug by means of the stem 23. When it is desired to put the coil in place it is set on top of the spark plug with the prongs 19 of the metallic support 18 resting on the metallic body 14 of the spark plug. The stem 23 is then screwed down onto the upper end of the central electrode 11 of the spark plug until the spring 26 is compressed somewhat. This

holds the coil firmly on the top of the spark plug and the spring 25 permits unequal expansion without any undue strain on the parts or any resulting interruption of the electrical contact.

When in place on the spark plug, the current entering through wire 29 and post 28, passes through the primary winding 16 and through the metallic support 18 and the spark plug body 14 to the engine block and thence returns to the primary source. The current generated in the secondary winding 17 of the coil passes through the contact member 27 to the stem 23, thence through the central electrode 11 and across the gap to the electrode 10 thence through plug body 14, support 18 and connection 20 back to winding 17.

The construction described is such that, while the support 18 rests firmly on and makes a good electrical connection with the body of the spark plug, air may nevertheless circulate through the interior 31 of the coil thus tending to keep both coil and spark plug cool. The air enters through the spaces 22, passes up around the central stem 23, and out at the top through holes 30.

What I claim is:

1. In combination with a spark plug having a central electrode the end of which is screw threaded, a coil comprising primary and secondary windings on a spool, and a central member screw threaded for engagement with the spark plug and electrically connected with said secondary winding.

2. In combination with a spark plug having a central electrode the end of which is screw-threaded, a coil comprising primary and secondary windings on a spool, a metallic support for the coil adapted to fit the metallic shell of the spark plug, both of said coils being electrically connected to the support, and a central member screw-threaded for engagement with the electrode, said central member being electrically connected with the secondary winding and serving to secure the coil to the spark plug and also to make electrical contact with the electrode.

In testimony whereof I affix my signature.

RALPH H. WHISLER.