Nov. 25, 1930. O. C. ROHDE 1,782,745

SHIELDED SPARK PLUG

Filed Feb. 28, 1929

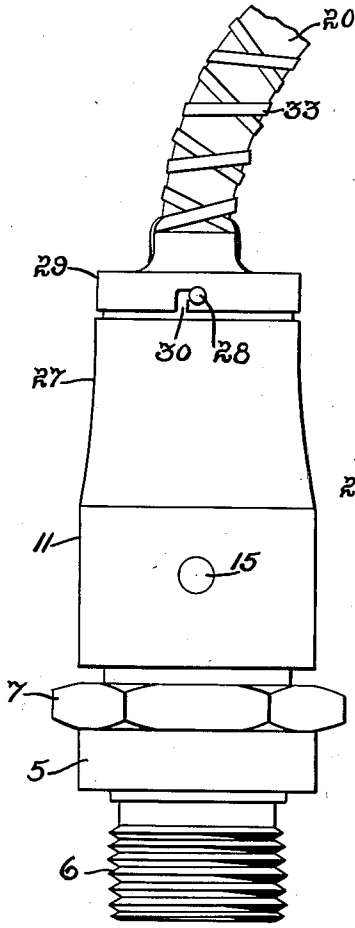


Fig. 1.

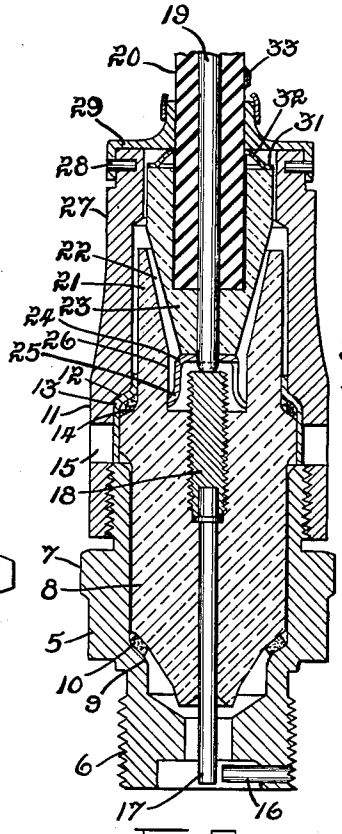


Fig. 2.

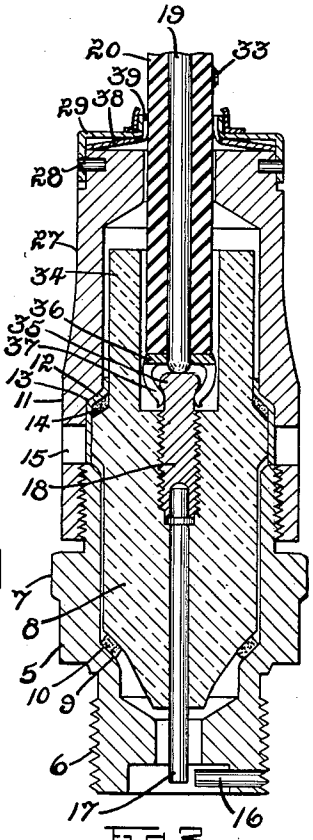


Fig. 3.

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UNITED STATES PATENT OFFICE

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SHIELDED SPARK PLUG

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This invention relates to an improved spark plug and the circuit connected therewith, and more specifically to a shielding device to prevent the high tension current, which passes through the plug, from interfering with radio reception in the vicinity.

In the modern development of air craft, it is becoming more and more common to carry a radio and to use a radio beacon in maintaining the correct course. It has been found, however, that the close proximity of the ignition circuit causes such interference with reception that it makes it difficult and sometimes even impossible to follow the beacon or to receive other messages.

It is an object of my invention, therefore, to provide a shield of electrically conductive material, encompassing the spark plug core, and also preferably to provide a shield for the conductor leading to the plug, said shield being grounded to the motor block so that it effectually prevents any electrical influence from the ignition circuit reaching the radio receiving circuit or affecting same in any way.

The invention will be more particularly described in connection with the accompanying drawings, in which

Figure 1 is a side elevation of my improved spark plug and a portion of the conductor connected therewith.

Figure 2 is a central longitudinal section of the same.

Figure 3 is a view similar to Figure 2 but showing a slightly modified construction.

As illustrated in the drawings, the spark plug comprises a metallic shell 5 having threads 6 at one end for engagement with the engine cylinder and having an enlarged portion 7 adapted to be engaged by a wrench or similar tool. A primary insulator in the form of a core 8, preferably made from sillimanite, is seated within the shell 5 against an internal shoulder 9, which may be provided with a suitable gasket 10.

A housing 11 is detachably secured to the shell 5, forming an extension thereof and cooperating therewith to enclose the core 8, thereby constituting an electrically conductive shield therefor, which is grounded on the engine. The housing 11 is formed with an internal shoulder 12, within which is a copper lining 13, and a suitable gasket 14 may be interposed between the lining and the opposed surface of the core 8. The housing 11 is preferably formed with holes 15 to afford ventilation for the core 8 and dissipate the heat therefrom.

The inner end of the shell 5 has the usual electrode 16, which is secured thereto in proper operative relation to a central electrode 17 which is secured in the core 8. A spindle 18, also secured in the core 8, constitutes in effect, a continuation of the electrode 17. The ignition circuit includes a conductor 19 encased with rubber or other suitable material 20 and adapted to be secured in contact with the outer end of the spindle 18.

The outer end of the insulating core 8 extends as shown at 21 beyond the end of the spindle 18 and is formed with a recess 22 within which the end of the conductor 19 is inserted for connection with the end of the spindle. In the form shown in Figure 2 a secondary insulator 23 of sillimanite is carried by the end of the conductor 19, this secondary insulator being cup shaped and receiving the end of the rubber casing 20. A spider 24 is soldered or otherwise secured to the extremity of the conductor 19 and is provided with divergent spring fingers 25 which are adapted to bear against the inside of the cup shaped extension 21 to center the conductor 19 in alinement with the spindle 18.

The outer end 27 of the housing 11 extends beyond the cup shaped extension 21 of the core and terminates in an annular seat having radially projecting pins 28 to which a metallic cap 29 is secured by means of bayonet slots 30. Co-operating with the cap 29 and secondary insulator 23 is a washer 31, having spring fingers 32 engaged by the cap so that the end of the conductor 19 is held firmly against the end of the spindle 18. The conductor casing 20 is also wrapped with a meshwork consisting of strands of metallic wire 33 or the like, which acts as an electrically conductive shield to prevent in-

terference from the current passing through the conductor. The strands 33 are preferably soldered to the cap 29, and the latter is grounded through the washer 31, housing 11 and shell 5.

In the modification illustrated in Figure 3, the secondary insulator 23 of sillimanite is omitted and the outward extension 34 of the primary insulating core 8 is shaped to receive the end of the conductor casing 20. In this form the spindle 18 is formed at its outer end with a head 35 and the conductor casing 20 extends into contact with a spider 36 secured to the extremity of the conductor and having inturned spring fingers adapted to grip the head 35. In connection with this modification a spring washer 38 is used in connection with the cap 29 and has fingers 39 which are forced against the casing 20. The strands 33 preferably extend outside of the fingers 39 and are soldered to the cap 29.

From the foregoing description, it will be seen that I have provided a plug, substantially of the same shape and size as the conventional unshielded spark plug heretofore used, at the same time providing a metallic shield not only for the spark plug core but also for the conductor, which leads to the electrode. This metallic shield, therefore, completely covers the insulator and the high tension circuit and is grounded to the engine. At the same time, the necessary electrical clearance is provided between the spindle and the metallic shield. It is obvious, therefore, that this improved spark plug, which provides a shield against the transmission of any electrical influence from the ignition circuit, may be substituted in any engine in place of the conventional type of plug heretofore used. The weight of this plug is substantially the same as that of an unshielded plug of similar design. It is also to be noted that this plug may be installed with an ordinary socket wrench.

While I have shown and described in detail the preferred forms of the invention, it is to be understood that the same is capable of various other modifications without departing materially from the scope of the invention or sacrificing any of its advantages. It is my purpose, therefore, to include all such modifications within the scope of the appended claims.

What I claim is:

1. A spark plug comprising a metallic shell, an insulating core seated therein and having a recess in its outer end, an electrode secured in said core and terminating at its outer end within said recess, a detachable metallic housing constituting a continuation of said shell, a conductor, a metallic cap having a bayonet slot connection with said housing for securing said conductor in contact with said electrode, a flexible casing of insulating material for said conductor, and flexible metallic strands wrapped about said casing and electrically connected to said cap.

2. A spark plug comprising a metallic shell, an insulating core seated therein, an electrode secured in said core, a metallic housing secured to the shell and extending outwardly beyond the core, a conductor, and a cap secured to said conductor and insulated therefrom, said cap having a pin and bayonet slot engagement with said housing to secure the conductor in contact with said electrode, said cap and shell constituting a continuous electrically conductive shield for said core.

In testimony whereof I have hereunto signed my name to this specification.

OTTO C. ROHDE.