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RADIO SHIELDED SPARK PLUG

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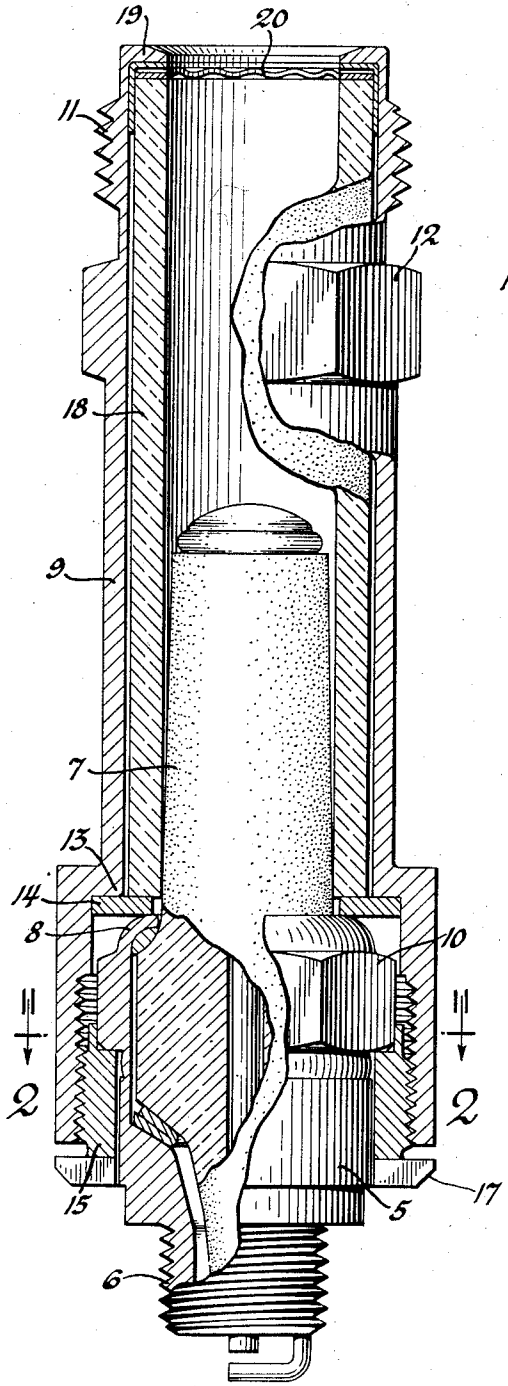


Fig. 1

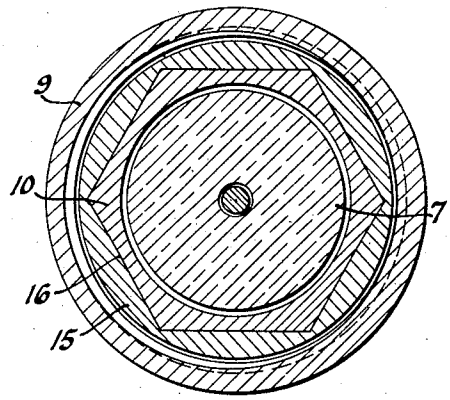


Fig. 2

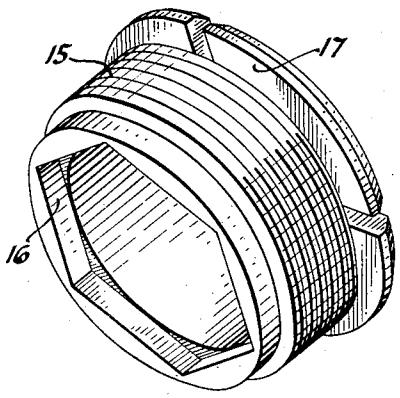


Fig. 3

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RADIO SHIELDED SPARK PLUG

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4 Claims. (Cl. 123—169)

My invention relates to radio shielded spark plugs designed to prevent high voltage oscillating or varying current supplied to the plug by a supply conductor leading thereto, from interfering with the proper operation of radio and like apparatus located adjacent an internal combustion engine having an ignition system of which my improved shielded plug forms a part; and the object of my invention is to provide an improved metallic shield device designed to enclose a spark plug made up of features heretofore known, and which are themselves not claimed herein. This metallic shield is tubular in form and is grounded to the engine through the plug because of metal-to-metal contact between them, and the fact that the hollow shell of the plug has an externally threaded portion adapted to screw into an opening in the engine cylinder. The tubular metallic shield is commonly threaded at its upper end to facilitate the securing thereto of a metallic conduit which encloses the supply conductor aforesaid; and the shield and the spark plug portion of my device when assembled as contemplated comprise a single unitary device or structure.

The drawing accompanying and forming a part of this specification illustrates the preferred form of my invention, although it may be embodied in other forms so long as they are within the scope of the concluding claims; and in the drawing:

Figure 1 is a view, much enlarged, showing my improved radio shielded spark plug upon a central vertical plane; the conventional spark plug portion thereof being shown in elevation.

Figure 2 is a view showing a section upon a transverse plane indicated by the line 2—2, Figure 1, looking down.

Figure 3 is a view showing an externally threaded annular sleeve of my invention in perspective.

Referring now to the drawing, the spark plug part of my invention is or may be of well known or conventional form; and comprises a hollow metallic shell or casing 5 threaded at its lower end, as indicated by the numeral 6, and adapted to screw into a threaded opening in the cylinder or cylinder head of an internal combustion engine. Within this shell is the usual insulating member 7 of porcelain equivalent material, which is held in place within the shell in any way as by means of an inturned flange 8 integral with the shell, and which flange lies above an upper shoulder upon the insulating member 7; the insulating member having another and lower shoulder which rests upon a ledge within the shell. Suitable gaskets are provided to insure gas tightness as is usual in spark plugs. The upper end portion of the shell 5 is enlarged to facilitate the holding of the plug per se in assembled relation within the lower end of a tubular metallic shield 9 of my invention, as exemplified by a hexagonal portion 10 of the shell; and the upper end of the tubular shield is commonly threaded, as at 11, so that a metallic conduit through which the conductor which supplies electricity to the plug extends. A hexagonal portion 12 is provided so that my improved radio shielded spark plug, comprising the shield 9, the spark plug per se and other elements as will hereinafter appear, may be conveniently screwed into and removed from a threaded opening in an internal combustion engine head.

The lower end of the shield 9 is internally threaded, as shown, and an abutment is provided adjacent said lower end which may be of any suitable form but is shown as comprising an internal ledge 13, and a washer 14 contacting with said ledge; the purpose of said abutment being to provide a stop for and to position the spark plug within the lower end of the shield because of engagement between the inturned flange 8, which is integral with the hollow shell or casing 5, and the said abutment.

The numeral 15 designates an externally threaded annular sleeve which surrounds the shell 5 and is in threaded engagement with the internally threaded lower end of the shield 9, and the upper end of which sleeve engages with the enlarged upper end portion of the shell and acts to force the upper end of the plug per se against the abutment aforesaid, shown as provided by the ledge 13 and the washer 14; said sleeve being shown as having a hexagonal recess 16 at its upper end within which the lower end of the hexagonal portion 10 of the shell lies when the parts are assembled, as shown in Figure 1, and which causes the shield 9 and shell or casing 5 to rotate together as the assembled radio shielded spark plug is screwed into or unscrewed from the opening provided for it in the engine cylinder. The lower end of the sleeve 15 has a notched flange 17 which provides for the use of a spanner wrench in assembling the parts; and inasmuch as there is metal-to-metal contact between the shield 9 and the shell or casing 5, and between said casing and the opening provided for it in the engine cylinder, it follows that when in use my improved radio shielded spark plug is grounded to the engine with which it is used.

The numeral 18 indicates a tubular lining member made of porcelain or equivalent insulating material, and the lower end of which abuts

against the washer 14 when the parts aforesaid are assembled, said metallic shield having an inwardly extending flange 19 disposed above the upper end of the lining 18 in the assembled device; and a resilient washer 20 is preferably interposed between the upper end of the lining member 18 and the flange 19 as shown.

In order that the threaded lower end 6 of the casing 5 of the spark plug part of my invention will become properly seated in the internally threaded opening provided for it in the cylinder or cylinder head when my invention is installed the length of the sleeve 15, see Figure 1, is such that the lower end thereof (the under side of the flange 17 in the form herein disclosed) will not abut against the upper surface of the head before the threaded lower end is properly seated within said opening; as if the length of said sleeve is such that the lower end thereof abuts against the cylinder head before the threaded lower end is properly seated there might be leakage of gas from within the cylinder along the thread. Preferably, and as shown, said sleeve 15 is sufficiently short that its lower end (or the under side of the flange 17) lies well above the upper surface of the cylinder head when the plug is screwed thereinto.

Having thus described and explained my invention I claim and desire to secure by Letters Patent:

1. In combination with a spark plug having a hollow shell threaded at its lower end to screw into an opening in an internal combustion engine cylinder, a hexagonal upper portion, and means at its upper end for holding an insulating member in place therein; an externally threaded annular sleeve surrounding said shell and the upper end of which abuts against the lower end of the hexagonal portion thereof; and a tubular metallic shield internally threaded at its lower end in engagement with said externally threaded annular sleeve, and having an internal member which abuts against the upper end of said spark plug shell.

2. In combination with a spark plug having a hollow shell threaded at its lower end to screw into an opening in an internal combustion engine cylinder, a hexagonal upper portion, and an inturned flange at its upper end adapted to hold an insulating member in place within said shell; and externally threaded annular sleeve surrounding said shell, and having a recess at its upper end into which the lower end of the hexagonal portion of said shell enters; a tubular metallic shield internally threaded at its lower end and in engagement with said externally threaded annular sleeve; and an annular washer held in place within said shield, and which washer abuts against the inturned flange at the upper end of said spark plug shell.

3. In combination with a spark plug having a hollow shell threaded at its lower end to screw into an opening in an internal combustion engine cylinder, a hexagonal upper portion, and in inturned flange at its upper end adapted to hold an insulating member in place within said shell; an externally threaded annular sleeve surrounding said shell, and having a recess at its upper end into which the lower end of the hexagonal portion of said shell enters; a tubular metallic shield internally threaded at its lower end and in engagement with said externally threaded annular sleeve, and which shield has an internal annular shoulder adjacent its lower end, and an inwardly extending flange at its upper end; an annular washer abutting against said internal shoulder and against the inturned flange at the upper end of said spark plug shell; a tubular insulating member within said metallic shield and the lower end of which rests upon said annular washer; and resilient means between said inwardly extending flange and the upper end of said insulating member.

4. In combination with a spark plug having a hollow metallic shell threaded at its lower end to screw into an opening in an internal combustion engine cylinder, an enlarged upper end portion, and means at its upper end for holding an insulating member in place within said shell; an externally threaded annular sleeve surrounding said shell and the upper end of which engages the enlarged upper end portion thereof; a tubular metallic shield internally threaded at its lower end and in engagement with said externally threaded sleeve; and an abutment adjacent the lower end of said shield, and which abutment engages with the upper end of said spark plug shell.

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