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RADIATION SHIELD FOR SPARK PLUGS
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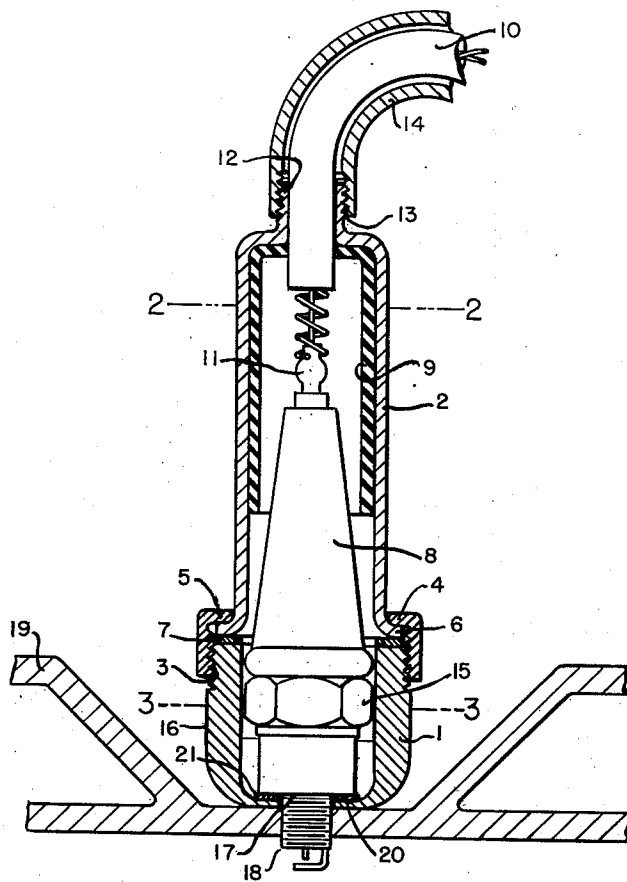


FIG. 1.

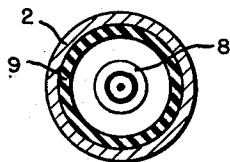


FIG. 2.

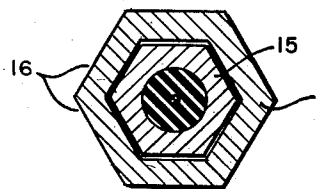


FIG. 3.

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RADIATION SHIELD FOR SPARK PLUGS

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the United States of America as represented by
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1 Claim. (Cl. 123—169)

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sec. 266)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment of any royalty thereon.

This invention relates to radiation suppression shields for the high voltage sparking systems of internal combustion engines and particularly to shielding the spark plugs therefor.

The suppression of radiation is only one characteristic which such shields must possess. The present invention has to do not only with prevention of radiation but is particularly directed to providing such a shield having maximum mechanical ruggedness coupled with greatly facilitated means for installing upon and removing from all types of internal combustion engines.

The invention also provides for tightly sealing the shielding system against moisture, which not only prevents internal corrosion thereof but also maintains the electrical system at its top efficiency.

The shield is composed of a top section and a base section. The top section may have any suitable construction adapted to enclose the upper portion of the spark plug and has provision for the reception of the end of the high voltage sparking cable connected to the spark plug electrode. Desirably provision should also be made for connection of the spark plug shield to the shielding system for the remaining elements of the engine sparking system.

The base section of the shield is of special construction and is generally cup shaped. The bottom wall thereof desirably is made relatively thin and has an aperture therein for the reception of the threaded nipple on the spark plug. The side wall of the base section extends upward to embrace the hexagonal wrench receiving portion of the spark plug and is provided with means to rotatably couple the base section to the plug. The base section thus serves as a drive nut when installing the spark plug. Desirably also the base section is provided with screw threads for securing and sealing it to the top member of the shield.

It is an object of the invention to provide a spark plug shield offering effective radiation suppression together with superior structural characteristics.

A still further object of the invention is to provide a spark plug shield having means for installing which is adapted to the design of conventional spark plugs especially with respect to their installation upon engines of conventional design.

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Another object of the invention is to provide a spark plug shield having a base portion inter-engaging with and acting as the driving means for the spark plug when it is installed or removed.

A still further object of the invention is to provide a spark plug shield which can be installed and serviced with conventional tools and standardized equipment.

Other objects and features of the invention will more fully appear from the following description taken in connection with the accompanying drawings and will be particularly pointed out in the claims.

To provide a better understanding of the invention, a particular embodiment thereof will be described herein and illustrated by the accompanying drawings in which:

Fig. 1 is the vertical cross sectional view of a preferred embodiment of the invention showing a spark plug in operative position within the shield;

Fig. 2 is a cross section on line 2—2 of Fig. 1; and

Fig. 3 is a cross section of line 3—3 of Fig. 1.

A shield constructed under the principles of the invention is extremely compact and for that reason may be applied to engines having limited space areas for the reception of spark plugs. The shield is composed of two main sections, a relatively short base section 1 and a top section 2. The top section is secured to the base section in any desired manner such as by screw threaded means.

A convenient manner of tightly uniting the members 1 and 2 is to provide screw threads 3 upon the upper end of the base 1. The screw threads receive a complementary threaded clamping member 4, having a flange 5 arranged to overlie an outwardly extending flange 6 upon the lower end of the member 2.

To establish a tight connection between the members a compressible electrically conducting gasket 7 may be interposed between the top of the member 1 and the flange 6.

The member 2 as shown is substantially of hollow cylindrical form having an internal diameter sufficient to receive the upper portion of the spark plug 8 and is provided with an internal insulating member 9 secured to the inner surface thereof. The member 2 is made of impermeable metal, as shown, to form a complete inclosure for the plug.

Any suitable means may be used to admit the spark plug cable 10 to the interior of the shield.

A desirable means is shown in the drawing wherein an aperture is provided in the top wall of the member 2 and the insulating member 9 through which the cable extends to be connected to the electrode 11 of the spark plug. The member 2 is also provided with an integrally formed sleeve 12 through which the cable extends and which is provided with screw threads 13 for connection to a cable shielding system 14.

The base member 1 is constructed to impart to the whole shield a maximum of rigidity and durability coupled with a high degree of convenience for installation and servicing. With these ends in view the base is generally cup shaped having its side wall extending upward to embrace the lower portion of the spark plug and its hexagonal wrench receiving portion 15. It will be noted that the member 1 closely embraces the spark plug and thus may be made to present a small external diameter to enable it to be readily received in small areas such as the spark plug wells or other limited space provided therefor in conventional engines.

The upper portion of the base member 1 is made relatively heavy to withstand the stress imposed thereon by the application of wrenches during installing and removing operations. As shown herein the chamber within the base 1 has a cross sectional shape complementary to that of the hexagonal portion of the spark plug. The chamber may, however, have any convenient contour which will effectively rotatably couple the base member to the plug. The external face of the side wall of the base member is provided with wrench receiving areas 16 of any form or the external face of the side wall may have a conventional hexagonal conformation. The upper portion of the base member is made cylindrical and has screw threads formed thereon for engagement with the thread upon the clamping member 4.

The wrench receiving areas 16 are formed upon the relatively thick and rigid side wall of the base 1 thereby to withstand the excessive torsional stress resulting from the application of installing wrenches while the bottom wall thereof is made relatively thin to be clamped beneath the shoulder 17 of the plug.

The construction of the base member 1 may be modified by lengthening the side wall thereof and forming the wrench receiving areas thereon at a point a substantial distance above the base of the plug. This modified structure may be ad-

vantageous in restricted areas where the application of a wrench is difficult.

To install the shield, a spark plug of conventional design having a threaded installation nipple 18 is slipped into the chamber in the base member with the nipple thereof extending through the aperture in the bottom wall of the base member. The plug and the member 1 are then applied to the threaded plug receiving opening upon the cylinder block 19 of the engine and are both rotated until the plug seats itself in operating position with the annular portion 20 of the bottom wall of the base member 1 clamped between the plug and the cylinder block of the engine. A conventional gasket 21 may be inserted to more completely seal the plug to the engine. The top portion 2 is then secured in place by tightening the locking member 4.

It will be particularly noted that standard wrenches may be used to install, remove and service the plug and its shield. Servicing of the system is readily accomplished by removing the locking member 4 between the top section 2 and the base 1 which permits removal of the top section 2 thus exposing substantially the whole plug and shield for inspection and to perform any required servicing operation.

I claim:

A cup shaped radiation shield member for a spark plug having a wrench receiving portion and a threaded attaching nipple ending in a shoulder, said member having a thin bottom wall with a hole through which the nipple may be inserted with the shoulder against said wall, and a side wall having an inner surface in the form of a wrench to be coupled to the wrench receiving portion of the spark plug and a corresponding outer surface in the form of a wrench receiving means, and means on said side wall for attaching a further shielding member to enclose the spark plug.

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