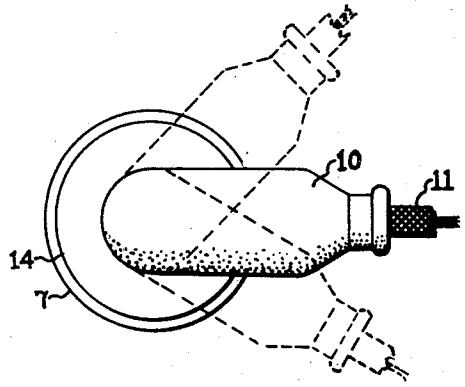
April 26, 1949. L. N. MURPHY 2,468,225

SPARK PLUG SHIELD

Filed July 17, 1944

Fig. 2.



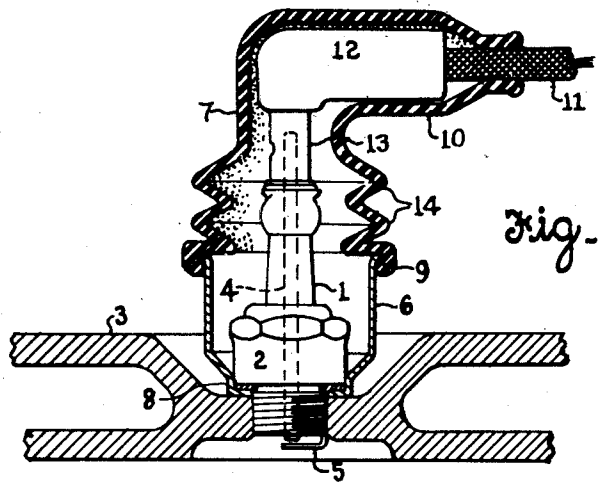
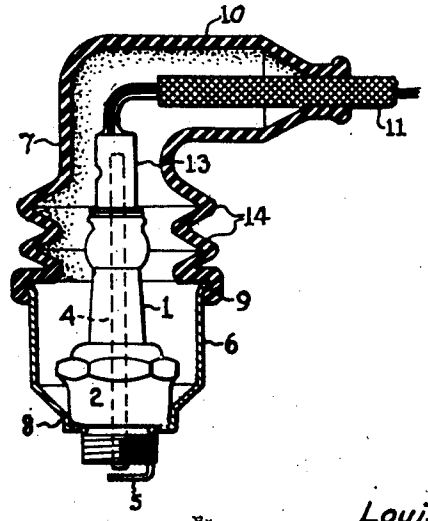


Fig. 1.

Fig. 3.



Inventor

Louis N. Murphy

By John C. Alexander

Attorney

UNITED STATES PATENT OFFICE

2,468,225

SPARK PLUG SHIELD

Louis N. Murphy, Detroit, Mich.

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6 Claims. (Cl. 123—169)

1

This invention relates to spark plug shields, such as enclose the exterior portions of installed spark plugs and also the electrical connections of lead-in wires to the plugs. The desirability of such shields is well recognized, for safeguarding plugs from moisture, soot, dust and oil and for minimizing interference with radio reception. Some use has been made of plastics and hard or semi-hard rubber in forming such shields, but these have been subject to breaking, cracking, or distortion, and we have found it decidedly preferable to form such shields of flexible material. Flexibility largely eliminates the likelihood of the shields being broken, cracked, or permanently distorted, facilitates their attachment to plugs and engagement of lead-in wires with the shields, and reduces the requisite bending of the lead-in wires since flexible shields may conform themselves largely to diverse directions of the wires.

An object of the invention is to form a spark plug shield either partially or entirely of a flexible material, as highly elastic rubber, and to very materially increase flexibility and also the heat-dissipating surface, by forming the shield with one or more annular corrugations, preferably coaxial with the plug.

Another object is to form the outer end portion of a spark plug shield of highly flexible rubber, while giving the inner end portion of the shield the form of a substantially rigid metal cup, adapted to be clamped in place by the plug, the flexible member of the shield being readily snapped on or detached from the cup to facilitate assembly and provide for ready access to the plug when desired.

A further object is to adapt a radio interference suppressor to be interposed between a lead-in wire and the central electrode of a spark plug and to be encased in and thoroughly protected by a shield applied to the plug, so that moisture, soot, dust and oil may have no access to the suppressor.

These and various other objects are attained by the construction hereinafter described and illustrated in the accompanying drawing, wherein:

Fig. 1 is an axial sectional elevational view of the shield as applied to a spark plug.

Fig. 2 is a top plan view of the same showing angular adjustability afforded by the shield.

Fig. 3 is a fragmentary view similar to Fig. 1 showing omission of the interference suppressor.

In these views, the reference character 1 designates the insulator of an ordinary spark

2

plug embraced by the usual metal shell 2 having its lower portion reduced in diameter and screw-threaded to mount the plug in a cylinder head 3. Extended centrally through the insulator is the usual elongated electrode 4, the lower end of which forms a spark gap with an electrode 5 fixed on the shell.

My improved shield comprises a substantially rigid inner cup member 6 formed preferably of sheet metal, and a freely flexible outer member 7 formed of quite elastic rubber or the like. The cup member is coaxial with and laterally spaced from the plug, its bottom being apertured to accommodate the threaded portion of the shell 2. Preferably said bottom has a shallow depression 8 of a diameter to freely fit the seat-forming upper portion of the shell, the annular bottom of this depression being clamped between the plug and cylinder head to rigidly mount the cup. It is preferred to extend the cup outwardly some distance beyond the shell.

The flexible member 7 of the shield is of a diameter to have ample clearance from the plug and its inner end is snapped over the outer end of the cup member, tightly embracing the latter. Preferably the cup member has its outer margin slightly expanded as indicated at 9 to better retain the flexible member in place. The outer end portion of the flexible member forms a tubular elbow 10 somewhat reduced in diameter as compared to the inner portion of said member, said elbow accommodating an insulated lead-in wire 11 and having its free end sufficiently reduced in diameter to snugly engage the insulation of the wire. It is desirable in many installations to dispose a radio interference suppressor 12 within said elbow, such suppressor being of ordinary construction and carrying a split socket element 13 projecting inwardly along the axis of the shield to engage the electrode 4. The same shield may be used, however, in constructions not requiring a suppressor, this being shown in Fig. 3. Between its inner end and the elbow 10, the member 7 is formed with any desired number of annular corrugations 14.

Corrugating the described shield, as shown, adds decidedly to its flexibility and permits it to stand rough usage that might otherwise be destructive. The shield will be subject to considerable heat, conducted and radiated from the cylinder head and plug, and the corrugations will add materially to ability of the shield to dissipate such heat.

It is to be noted that the described shield is thoroughly imperforate, very positively excluding

solid or liquid particles that might otherwise interfere with proper functioning of the plug. The elasticity of the member 7 tightly seals the two openings of said member so that a clean plug is assured. Enclosing the suppressor within the shield assures the same protection for the suppressor that is afforded the spark plug.

What I claim is:

1. In a dirt and moisture excluding shield for spark plugs, the combination with a spark plug including an insulator, an electrode extended through the insulator, and a metal shell surrounding the inner end portion of the insulator, of a substantially rigid cup member mounted on and apertured to receive said metal shell and surrounding an inner end portion of the spark plug, a freely flexible, elastic, electrically insulating casing surrounding the outer portion of the spark plug and having its inner end detachably fitted over and contracted upon said cup member, said casing having a reduced tubular extension from its outer end, an electrical conductor leading into and snugly embraced by said tubular extension, and means carried by and within said extension for electrically connecting the conductor to the electrode.

2. The combination as set forth in claim 1, said cup member having its rim outturned to afford retention to said casing.

3. The combination as set forth in claim 1, said electrical connecting means comprising a metal socket member projecting into the casing from said tubular extension and adapted to fit upon said electrode.

4. A dirt and moisture excluding shield as set forth in claim 1, said casing being annularly corrugated between its inner end and said tubular extension, increasing its heat-dissipating area and its flexibility.

5. A dirt and moisture excluding shield as set forth in claim 1, said tubular extension having a direction lateral to the remaining portion of the casing, and the last-mentioned portion being corrugated to afford angular movement of the tubular extension about the axis of the spark plug.

6. A spark plug shield formed of freely flexible, elastic, electrically insulating waterproof material, and comprising an elastic, annularly corrugated, freely flexible sleeve having its lower end portion increased in diameter and forming a socket for snap engagement with a support, the upper end portion of such shield being of reduced diameter and laterally extended to accommodate a lead-in wire and being terminally reduced to snugly embrace such wire.

LOUIS N. MURPHY.

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