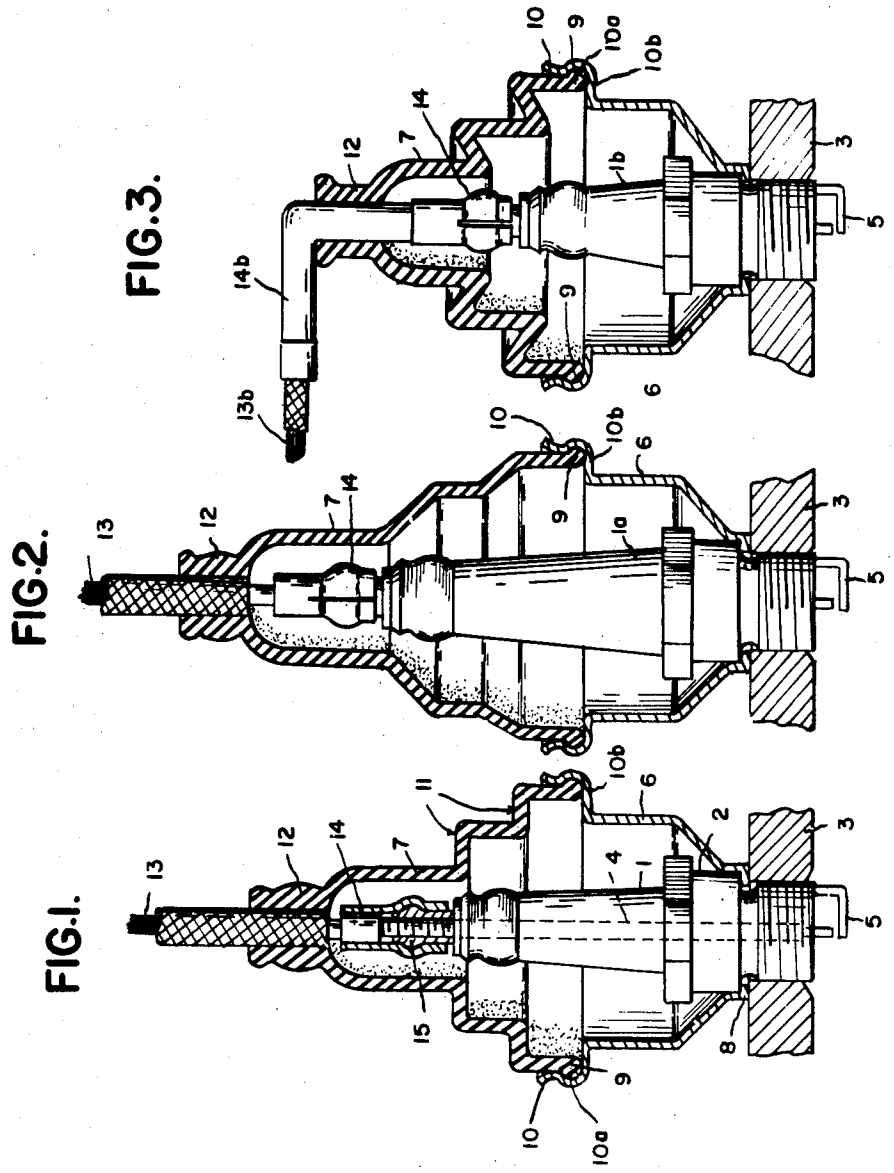
April 26, 1949. L. N. MURPHY 2,468,226

SPARK PLUG SHIELD

Filed July 27, 1945



INVENTOR.

LOUIS N. MURPHY.

BY

John G. Alexander

ATTORNEY

Patented Apr. 26, 1949

2,468,226

UNITED STATES PATENT OFFICE

2,468,226

SPARK PLUG SHIELD

Louis N. Murphy, Detroit, Mich.

Application July 27, 1945, Serial No. 607,439

4 Claims. (Cl. 123—169)

1

This invention relates to spark plug shields, suited to enclose exterior portions of installed spark plugs and the electrical connections to such plugs. Such shields safeguard the plugs from moisture, soot, dust and oil, and may also be useful in minimizing radio interference.

A free flexibility and elasticity of such shields are highly desirable, so that they may not be damaged by an accidental impact, may conform themselves to different spark plug installations, and may be forced into desired engagements by expansion and held in such engagements by resultant contraction.

An object of the invention is to provide a freely flexible and highly elastic spark plug shield deriving its flexibility largely from a novel annularly stepped formation: and further adapted by this formation to be readily expanded and contracted along its axis to adapt it to various sizes of standard plugs.

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

Fig. 1 is an axial sectional elevation of my improved shield as applied to a spark plug.

Fig. 2 is a similar view showing how the shield accommodates itself to a larger sized plug than shown in Fig. 1.

Fig. 3 is a similar view showing the same shield applied to a smaller plug than shown in Fig. 1, there being illustrated a modified connection to the plug of an ignition circuit wire.

Referring first to Fig. 1, the reference character 1 designates the insulation of an ordinary spark plug embraced by the usual metal shell 2 having its lower portion reduced in diameter and screw-threaded to retain the plug in cylinder head 3. Extended centrally through the insulator is the usual elongated electrode 4, the lower end of which forms a spark gap with 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 hollow outer member 7 formed of quite flexible and elastic rubber or the like. Said 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 up some distance beyond the shell.

2

The flexible member 7 of the shield is of circular cross section with an open lower end defined by a bead 9 of a diameter to be snapped into the outwardly flared upper end 10 of the cup member. Just below its flared edge 10, the cup member has an annular internal recess 10*a* to receive the bead 9, and a shoulder 10*b* is formed just below this recess, as a seat for the outer member 7. As it extends upwardly, the member 7 is formed with two or more annular steps or shoulders 11, effecting successive reductions in its diameter. The upper end portion of the member 7 forms a collar 12 proportioned to snugly embrace the insulation of a conductor 13 whereby the plug is connected in the usual ignition circuit. As illustrated, the conductor 13 has soldered or otherwise electrically and mechanically connected thereto, within the upper portion of the member 7, a coupling sleeve 14 split to yieldingly embrace a nut 15 threaded on the upper end of the electrode 4.

Fig. 2 shows the same shield applied to a somewhat longer spark plug, the stepped construction of the member 7 permitting such member to readily elongate in adapting itself to the increased plug length.

Fig. 3 shows the same shield applied to a shorter plug than that of Fig. 1, the stepped construction of the member 7 affording a contracting of the latter. In this connection there is illustrated an elbow forming coupling sleeve 14*b* adapting the conductor 13*b* to lead off in a direction transverse to the plug axis, such a connection being often desirable. It will be noted that in using this type of coupling, it would be necessary to construct the member 7 in different sizes to accommodate different lengths of plugs, were it not for the illustrated adaptability of said member.

The stepped construction of the shield member 7 not only adapts the shield for elongation or contraction to suit various sizes of plugs, but further allows a ready lateral distortion of said member under impact, safeguarding it against rough usage and prolonging its useful life. Also this construction adapts the shield to be torsionally stressed to readily permit the conductor 13*b* (Fig. 3) to lead off in selective directions radial to the plug axis.

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 mounted on said cup member, said casing being formed with a succession of annular steps progressively reducing its diameter as it extends upwardly, an electrical conductor leading into said casing and snugly embraced by the outer portion of the casing, and means carried by and within the casing for electrically connecting the conductor to said electrode, whereby said shield is adapted to various electrode lengths.

2. A dirt and moisture excluding shield comprising a cup member formed of sheet material and having its bottom apertured to receive a spark plug, and a freely flexible, elastic casing having an inner end removably inserted in said cup member and having its outer end forming an expansible collar to embrace a conductor leading to said spark plug, said casing being progressively reduced in diameter as it extends from the cup member to said collar.

3. A dirt and moisture excluding shield, as set forth in claim 2, said cup member having its mouth portion increased in diameter to form an internal annular shoulder to seat said casing.

4. A dirt and moisture excluding shield for spark plugs, said shield comprising a casing formed of freely flexible, elastic, electrically insulating material for enclosing the upper portion of a spark plug, said casing having an open lower end and a substantially closed upper end and being formed with a succession of annular steps progressively reducing its diameter as it extends upwardly, said upper end being apertured to snugly receive a lead-in wire, and a substantially rigid annulus detachably engaged by the lower end of said casing and adapted to be fixed on a spark plug.

LOUIS N. MURPHY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
878,551	Mills	Feb. 11, 1908
1,943,739	Nowosielski	Jan. 16, 1934
1,979,999	Rabezzana	Nov. 6, 1934
2,065,315	Keath	Dec. 22, 1936
2,383,018	Shere	Aug. 21, 1945

FOREIGN PATENTS

Number	Country	Date
290,820	Great Britain	May 24, 1928
313,296	Italy	Dec. 22, 1933