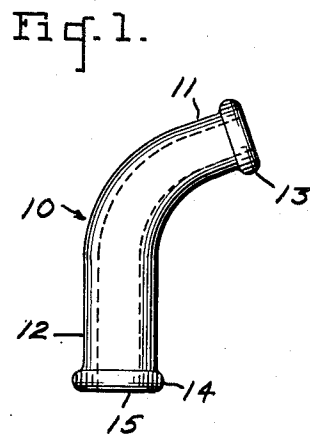
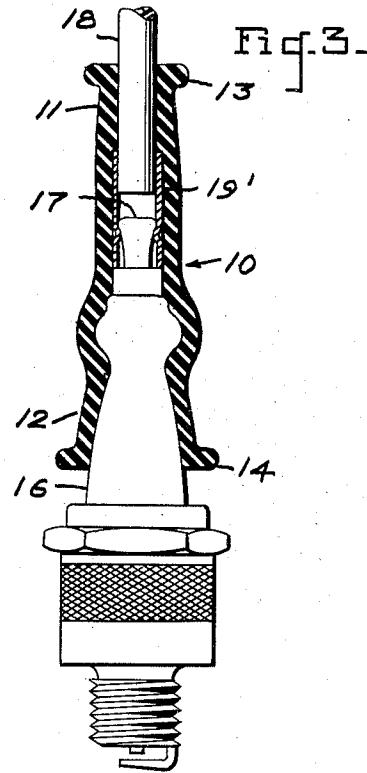
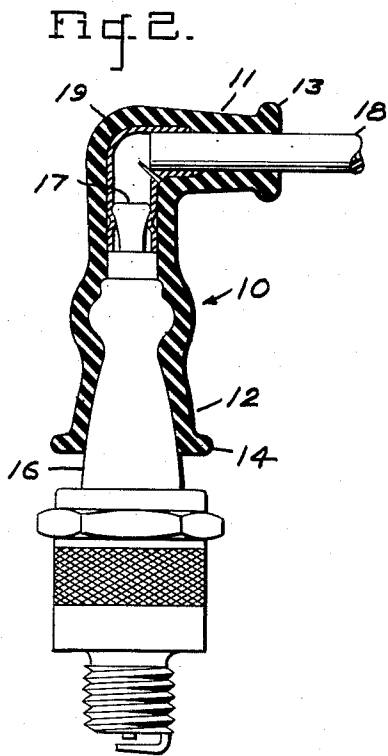


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SPARK PLUG TERMINAL PROTECTOR

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INVENTORS
JOHN P. LE GRAND
NORMAN W. YOUNG

By *Stowell & Evans*

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SPARK PLUG TERMINAL PROTECTOR

John Peter Le Grand and Norman Walter Young,
Detroit, Mich.

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6 Claims. (Cl. 174-77)

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This invention relates to spark plug terminal protectors for internal combustion engines such as are used in automobiles, trucks, motorcycles, airplanes, motor boats, tractors, and the like.

A principal object of the invention is to provide a spark plug terminal protector that will snugly fit all types of spark plugs and ignition cables eliminating all air spaces between the protector and the spark plug and conductor cable.

Another object is to provide a spark plug terminal protector that will tightly grip both 90 degree and vertical ignition wire cable terminals.

Another object is to provide a spark plug terminal protector that is easily installed using the terminal connectors provided with standard ignition cables, without using tools, or solder.

A further object of the invention is to provide a spark plug terminal protector which excludes moisture and dirt and eliminates the possibility of electric shock by preventing bodily contact with the exposed and bare contacts of the original spark plug connection.

Another object of this invention is to provide a device of the character specified that will reduce fire hazards, eliminate current flashes, and improve radio reception adjacent engines equipped therewith.

These and other objects and advantages are attained by the spark plug terminal protector of the invention which includes a sleeve member of resilient insulating material consisting of two sections, one of which is adapted to fit snugly over the insulating shell and terminal of a spark plug and to firmly grip the shell and terminal at all points, and the other of which is adapted to receive and snugly grip a conductor in such a manner as to bring the conductor into contact with the spark plug terminal and to firmly maintain such contact.

The invention will be more particularly described with reference to the illustrative embodiment of the invention shown in the accompanying drawings, in which:

Fig. 1 is an elevational view of a spark plug terminal protector embodying the principles of the invention.

Fig. 2 is a sectional view of the protector of Fig. 1 fitted to a spark plug having a horizontal conductor.

Fig. 3 is a sectional view of the protector fitted to a spark plug having a vertical conductor.

In the spark plug terminal protector illustrated in Fig. 1, 10 is the resilient insulating protective sleeve such as synthetic rubber of the oil-and-heat-resisting type. The sleeve is of

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elbow shape having two sections 11 and 12. Section 11 is of a length to receive a conductor terminal of an ignition wire cable, and section 12 of a length to receive the insulating shell and terminal of a spark plug. These two sections normally make an angle of between 100° and 150°. The bore 15 of the sleeve is normally in the range of from about 1/4 to about 3/8 inch. The bore can advantageously be uniformly tapered from about 1/4 inch at its lower end to 3/8 at its upper end, the side walls of the sleeve tapering correspondingly. A spark plug terminal protector of this design is adapted to fit snugly and grip tightly when used on spark plugs with either vertical or horizontal conductor connectors without wrinkling or bulging or forming air pockets in which dirt, oil and moisture may collect. At the ends of sections 11 and 12 beads 13 and 14 are preferably provided. The bead 14 aids in inserting a spark plug insulating shell and terminal into section 12 of the sleeve and bead 13 aids in inserting a connector and conducting cable into section 11. To separate the spark plug and conductor the sleeve is rolled back with the aid of these beads thus breaking the air seal and friction grip existing between the interior of the sleeve and the spark plug and conductor therein contained. The beads also reinforce the ends of the protector.

In Fig. 2 of the drawings section 12 of sleeve 10 is fitted over a standard spark plug insulating shell 16 and plug terminal 17, the sides of the sleeve snugly gripping all parts of the insulating shell providing the shell with a moisture, dirt and shock proof covering. Into bore 15 of section 11 has been inserted spark plug conductor cable 18 and its integral right angle connector 19. The sleeve conforms to the shape of the conductor and connector giving a smooth curve to the sleeve free from all wrinkles and bulges and firmly holding the connector 19 in contact with the spark plug terminal 17. The connector 19 is of standard construction and is fitted to the end of conductor 18 in a manner well known in the art.

In Fig. 3 the protector sleeve 10 of Figs. 1 and 2 is adapted to a spark plug having a vertical conductor connector 19'. The spark plug insulating shell 16 and terminal 17 is inserted and slipped into section 12 of sleeve 10 and the conductor 18 and its integral connector 19' is slipped into section 11 of sleeve 10 until the connector and spark plug terminal 17 are brought together and held in contact with each other. The sleeve conforms to the contour of the insulating shell

16, the connector 19' and the conductor 18, gripping them snugly and firmly with substantially no pockets, or wrinkles forming in the sleeve 10, and it is evident that with the protector of this invention, the spark plug terminal is positively protected from moisture, dirt, and mechanical shock, and such protection will greatly reduce fire hazards and current flash-overs and increase the useful life of the spark plug.

In a typical embodiment, the protector has an overall length of $2\frac{5}{8}$ ". The diameter of the bore in the lower section is $\frac{3}{8}$ " and the diameter of the bore in the upper section is $\frac{1}{4}$ ". The inner radius of the elbow portion is $\frac{1}{16}$ " and the outer radius is $1\frac{1}{2}$ ", the wall thickness tapering in the elbow portion from a uniform wall thickness of $\frac{1}{8}$ " in the lower section to a uniform wall thickness of $\frac{3}{32}$ " in the upper section. The lower section is 1" in length and the upper section is $\frac{7}{16}$ ". The angle included between the upper and lower sections is 125°.

These dimensions are illustrative and may be varied within reasonable limits. It is, however, advantageous to provide a gradual curve in the elbow portion between the upper and lower sections and to avoid sharp angles in this region that would give rise to wrinkles and the formation of air pockets when the elbow is flexed to accommodate connectors varying from the straight type to the 90° bend type.

From the foregoing description it is seen that the present invention provides a spark plug terminal protector that insures superior plug operation with concomitant increase in battery life, saving of gasoline, and reduction in spark plug fouling.

We claim:

1. A spark plug terminal protector comprising a flexible, resilient sleeve of annular cross-section formed of insulating material and consisting in the undeformed condition of two substantially straight end sections making an included angle of from 100° to 150° with each other and an intermediate gradually curved elbow-shaped section connecting said end sections the wall thickness of the elbow-shaped section diminishing substantially uniformly throughout its length.

2. A spark plug terminal protector comprising a flexible resilient sleeve of annular cross-section formed of insulating material and consisting in the undeformed condition of two substantially straight end sections making an included angle of from 100° to 150° with each other and an intermediate gradually curved elbow-shaped

section connecting said end sections, the bore and the wall thickness of the elbow-shaped section diminishing substantially uniformly throughout its length.

3. A spark plug terminal protector comprising a flexible resilient sleeve of annular cross-section formed of insulating material and consisting in the undeformed condition of two substantially straight end sections making an included angle of from 100° to 150° with each other and an intermediate gradually curved elbow-shaped section connecting said end sections, the bore and the wall thickness of the elbow-shaped section diminishing substantially uniformly throughout its length and the wall thicknesses of the two end sections being substantially uniform throughout their lengths.

4. A spark plug terminal protector of claim 3 wherein the substantially straight end sections have integral end beads.

5. A spark plug terminal protector comprising a flexible resilient sleeve of annular cross-section formed of insulating material and consisting in the undeformed condition of two substantially straight end sections making an included angle of about 125° with each other and an intermediate gradually curved elbow-shaped section connecting said end sections, the bore and the wall thickness of the elbow-shaped section diminishing substantially uniformly throughout its length and the bore and the wall thicknesses of the two end sections being substantially uniform throughout their lengths.

6. A spark plug terminal protector of claim 5 wherein the substantially straight end sections have integral end beads.

JOHN PETER LE GRAND.

NORMAN WALTER YOUNG.

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