Dec. 20, 1960 R. SEYFARTH 2,965,871

SPARK PLUG LEAD TERMINAL CONNECTION

Filed Dec. 6, 1956

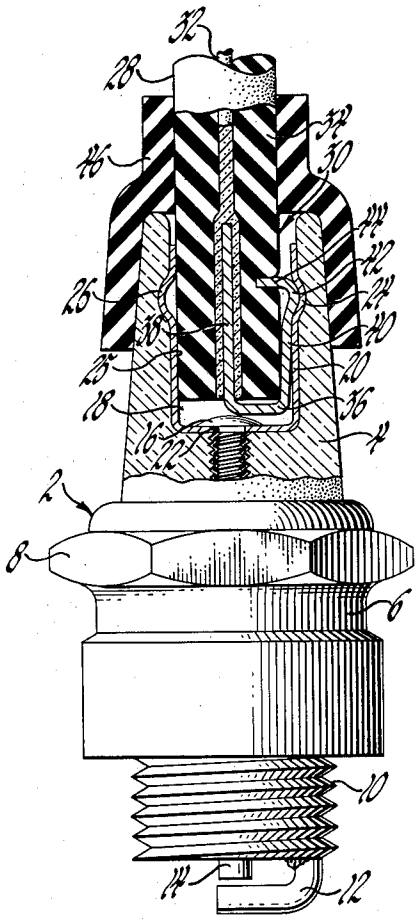


Fig. 1

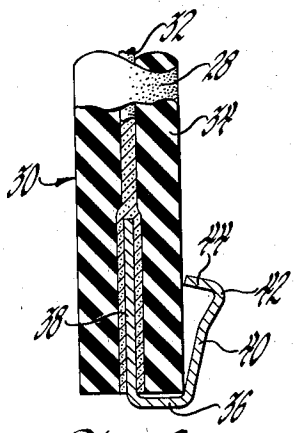


Fig. 2

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United States Patent Office 2,965,871
Patented Dec. 20, 1960

2,965,871

SPARK PLUG LEAD TERMINAL CONNECTION

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Filed Dec. 6, 1956, Ser. No. 626,661

1 Claim. (Cl. 339—100)

This invention relates generally to improvements in electrical connections and more particularly to an improved terminal connection between an end of a spark plug cable leading from a distributor to a spark plug and one of the electrodes of the plug.

To obviate the difficulty of condensation occurring on the outer spark plug surfaces which tends to short out the electrodes of the plug, it is proposed by this invention to shield the connection between the plug and the lead and locate it within the plug so that such connection is at all times protected from the condensation or moisture which occurs exterior of the plug. The connection which must be quickly made in order to be practical, comprises simple but unique adapter assemblies for the terminal end of the lead and the center spark plug electrode which are quickly applied to provide a spring detent connection that is easily made by one or two simple motions. The unusual spring detent feature insures that an extremely good electrical pressure connection is made between the terminal end of the lead and the center spark plug electrode.

For a fuller understanding of the invention and the objects thereof, reference may be had to the accompanying detailed description and drawings, in which:

Fig. 1 is a view in elevation of a spark plug and the terminal end of a spark plug lead from a distributor with parts in section and broken away, illustrating the improved quick-making connection located within the body of the plug.

Fig. 2 is a view of the terminal end of the spark plug lead removed from the body of the plug and with the novel adapter applied thereto.

Referring now to the drawing, the spark plug which is indicated generally by a numeral 2 comprises an outer ceramic shell having a lower metallic body 6 in which lower end of shell 4 is fixed. Body 6 is provided with the usual polygonal portion 8 adapted to be engaged by a suitable wrench for turning a threaded portion 10 in engagement with mating threads in the engine cylinder of an internal combustion engine. The spark plug is provided with the usual electrodes 12 and 14, the electrode 12 being shown fixed to the lower end of the threaded portion 10 which in turn is grounded when fixed to the engine block in conventional maner. The upper end of the electrode 14, as indicated in Fig. 1, is provided with a flanged head 16 and is threaded and maintained in position by mating threads provided in the ceramic shell 4. It will be observed that located in the upper portion of shell 4 is a downwardly extending bore or recess 18 in which is located a metallic female member 20 which in configuration is similar to a thimble and has a hole 22 in the base thereof. The thimble 20 intermediate the ends thereof but closer to its upper open end is provided with an outwardly extending ripple, rib or convolution 24. The inner surface 25 of bore 18 has in cross section a similar ripple 26 which, when thimble 20 is properly positioned in recess 18, engages rib 24 and secures thimble 20 in place. In addition to being held in place in the recess 18 of sleeve 4 by the mating ripples

or convolutions 24, 26, the thimble 20 is held with its base securely against the base of recess 18 by the head 16 of the upper end of the electrode 14 when it is inserted through the hole 22 in the base of thimble 20 and threaded into place in the shell 4.

From the foregoing it will be appreciated that by reason of the flanged head 16 of electrode 14 and the pressure exerted between this head and the base of thimble 20 through the turning of the threaded portions of electrode 14 and shell 4, a good electrical contact is made between electrode 14 and thimble 20.

In order to make a good, internally-protected connection between the terminal end of spark plug lead 28 and the electrode 14 of the spark plug, the terminal end of lead 28, which end is indicated generally by a numeral 30, has applied thereto a U-shaped member or clip 36. One leg 38 of U-shaped member 36 is forced into the center of cable 28 (which includes the usual central wire conductor 32 and outer insulation 34) at the end thereof so that it engages wire 32 along a substantial portion of the length of the wire at the spark plug terminal end of lead 28. As seen in Fig. 2, the other leg 40 of clip 36 stands upwardly on the outside of the cable and has a rounded portion 42 formed adjacent the end thereof by the end 44 being bent so that it extends more or less normal to the outer surface of the insulation 34. When the end of the spark plug lead 28 is formed as shown in Fig. 2, it will be appreciated that it may be readily inserted into thimble 20 so that the rounded portion 42 snaps into place in a part of the ripple 24, also causing the end 44 to bite into the insulating material 34 so that the end of the cable or lead 28 is securely fastened in the recess 18 of shell 4 and a good electrical conducting electric connection is made between the leg 40 and thimble 20, particularly at the point where the rib 24 is located.

Located on the outside of the cable 28 is an umbrella shield or boot 46 which, when the end 30 is pressed down into place in thimble 20, engages the outer surface of shell 4 and further and completely protects the connection from any moisture or other foreign matter which might tend to impair the operation of the plug connection.

From the foregoing it may be appreciated that an extremely simple but effective quickly-made connection between a spark plug electrode and the terminal end of a spark plug lead has been provided. By utilizing the U-shaped piece 36, the legs may be made to any size in order to obtain the proper contact with the wire 32 and also with the female member 20. When the parts are all properly assembled with the end of lead 30 in the plug, the parts are securely held in place insuring a completely insulated and protected good electrical conducting connection.

I claim:

In combination with a thimble-like member having an annular exterior rib forming an annular interior recess intermediate the ends thereof and having the end of an insulated conductor located therein and spaced from a side wall thereof, a U-shaped spring clip consisting exclusively of a first leg, a base, and a second leg, said first leg extending axially into the end of said conductor and in engagement therewith within the insulation about said conductor, said second leg extending axially exteriorly of said insulation between said insulation and said side wall taking up the space therebetween, a detent rib on said second leg yieldably received in said recess, and an end on said second leg extending normal to said conductor and into the insulation about said conductor, said second leg being shorter than said first leg so that said end on said second leg is adjacent an intermediate portion of said first leg, said second leg with its end normal to said conductor and detent rib constituting the sole means to pre-

vent axial withdrawal of said first leg from engagement with said conductor within said insulation and removal of said insulated conductor end from said thimble-like member.

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