April 13, 1926. 1,580,562

H. D. MOORE

TRANSLUCENT SPARK PLUG INTENSIFIER

Filed April 11, 1923

Fig. 1.

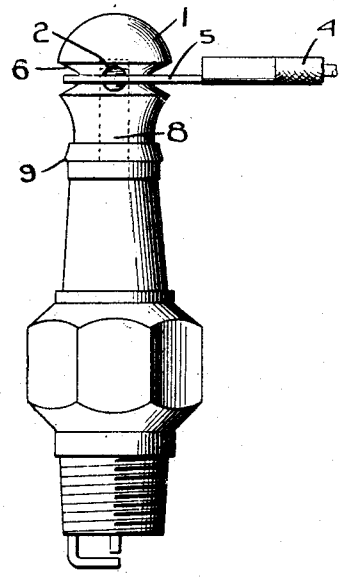


Fig. 2.

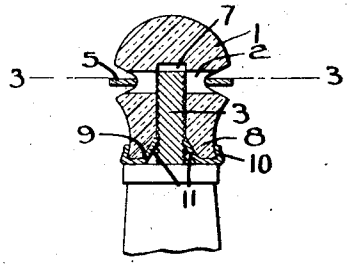


Fig. 3.

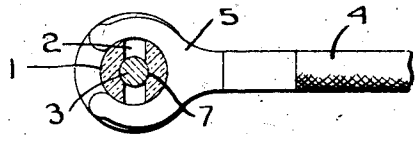


Fig. 4.

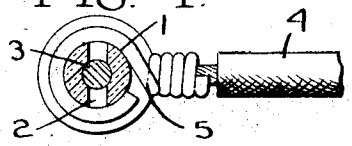


Fig. 5.

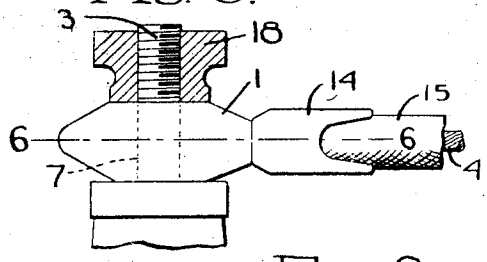
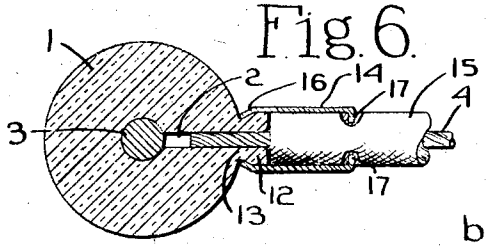


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TRANSLUCENT SPARK-PLUG INTENSIFIER.

Application filed April 11, 1923. Serial No. 631,274.

To all whom it may concern:

Be it known that I, HENRY D. MOORE, a citizen of the United States, and resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Translucent Spark-Plug Intensifiers, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to a spark intensifier and the object thereof is to provide a novel spark intensifier of the type forming a gap in the circuit wire of a spark plug.

A further object of the present invention is to form such a spark intensifier in which the auxiliary spark gap is visible.

A further object of the present invention is to provide an electrically insulating translucent spark plug cap having an aperture therein which forms a spark gap and an inclosed visible spark chamber.

A further object of the present invention is to provide a glass spark plug cap forming an auxiliary spark gap.

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

In the drawings:

Fig. 1 is an elevation of the spark intensifier applied to a spark plug with means on the intensifier for engaging the spark plug electrode to retain the intensifier on the spark plug;

Fig. 2 is a vertical section through the intensifier and the top of the spark plug shown in Fig. 1;

Fig. 3 is a section on line 3—3 Fig. 2;

Fig. 4 is a section similar to Fig. 3 but showing different means for retaining the terminal of the spark plug lead wire on the intensifier;

Fig. 5 is an elevation of the intensifier with minor detail changes applied to the end of the spark plug;

Fig. 6 is a section on line 6—6 Fig. 5.

The device illustrated herein is designed to be used in conjunction with an electric circuit having therein a spark gap. It is particularly designed to be used in the circuit wire of a spark plug on an internal combustion engine to form a spark gap auxiliary to the spark gap on the end of the plug which lies in the cylinder of the engine, and to form an inclosed visible spark chamber for the auxiliary spark gap. This is desirable to permit the operator of the engine actually to see, during the period when the engine is running, that current is flowing through the circuit wire of the spark plug by seeing the spark jump across the auxiliary spark gap in the visible chamber and thus assure himself that, should the engine be running irregularly, the trouble does not lie in the ignition system between the magneto, or other source of high voltage current, and the plug.

As illustrated herein the device consists of an electrically insulating translucent bulb 1 made of any suitable material, such for instance as glass, having an aperture 2 therein, acting to provide a path for the current across a separating gap and to form an inclosed visible spark chamber. The wire of the electric circuit illustrated herein comprises the spark plug electrode 3 and the spark plug lead wire 4 which has a terminal 5.

In the form of device illustrated in Figs. 1 to 4 inclusively the bulb 1 is made in the form of an electrically insulating translucent spark plug cap presenting a groove 6 on its periphery to receive and support the terminal 5 of the spark plug lead wire and the aperture 2 has one end communicating with said groove. An opening 7 communicates with the aperture and houses the end of the electrode 3 which projects above the spark plug in the usual manner. The aperture 2 is formed at such a height above the base 8 of the cap that the terminal of the electrode lies adjacent one end of said aperture. For convenience in making, the aperture extends entirely through the cap forming two apertures and the opening 7 communicates with the inner end of each while the terminal 5 of the spark plug lead wire has portions lying adjacent to the outer end of each of said apertures. The terminal 5 may have either the form shown in Fig. 3 or that shown in Fig. 4. The form of terminal shown in Fig. 3 is the usual clip terminal with which automobiles are usually provided while the form shown in Fig. 4 is one which the owner of the automobile may make out of the end of an ordinary wire.

Any means may be associated with the

cap for retaining the cap on the spark plug. Such a means is shown at 9 Figs. 1 and 2 and consists of a section of any suitable material, preferably metal, which is spun on the glass cap and has a section 10 embracing the outer periphery of the bottom of the cap and a section 11 which extends into the opening 7 to engage the terminal of the electrode 3.

The form of the device shown in Figs. 5 and 6 is the same in all essentials as that shown in Figs. 1 and 2. In both forms the cap acts to hold the electrode and the terminal of the spark plug lead wire in spaced and insulated relation and the aperture acts to provide a path for the current between said electrode and said terminal and to form an enclosed visible spark chamber. The cap itself has, however, been made in a slightly different shape in order to permit the use of another form of means to retain on the cap the terminal of the lead wire. In this form of cap the aperture 2 does not go entirely through the cap but merely extends as far as the opening 7 which houses the electrode 3. The cap is formed with a projection 12 thereon having a reduced neck 13 connecting said projection with the main body of the cap and aperture 2 extends through both the projection and the reduced neck. The means for retaining the lead wire on the cap is preferably a metal sleeve 14, of a size closely to embrace the insulation 15 of the lead wire, with a reduced end 16 which fits over the projection 12 and around the reduced neck 13 to retain the sleeve on the cap. The end of the sleeve lying away from the cap is turned inwardly as shown at 17 to bite into the insulation of the lead wire and thus hold the terminal of the lead wire, which in this case is the bare end of the wire itself, adjacent the end of the aperture. With this form of device the nut 18 ordinarily supplied with the spark plug is used to retain the cap on the plug.

Thus the device in either form illustrated is adapted to fit over the electrode of any ordinary spark plug without alteration of the spark plug construction. In the form shown in Figs. 1 to 4 the usual nut on the spark plug is discarded and the device is itself provided with means for holding it in position on the spark plug while in the form shown in Figs. 5 and 6 the device is made thinner and the usual nut acts as the retaining means.

From the above description it will be seen that the spark intensifier which forms the subject matter of this invention is extremely simple and can be cheaply manufactured.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent is:

1. An electrically insulating, translucent, solid, integral spark plug bulb having an opening to fit over the spark plug electrode and having an aperture communicating with and extending transversely of the opening, the spark plug electrode lying adjacent one end of the aperture and the terminal of the spark plug lead wire lying adjacent the other end of the aperture when the bulb is in position on the spark plug electrode, whereby the bulb acts to hold said electrode and said terminal in spaced and insulated relation and the aperture acts to provide a path for the current between the electrode and the terminal and forms an inclosed visible spark chamber.

2. An electrically insulated translucent spark plug cap presenting a groove on its periphery to receive and support the terminal of the spark plug lead wire, having an aperture with one end communicating with said groove, and having an opening communicating with the aperture to house the spark plug electrode adjacent the end of said aperture whereby the aperture will act to provide a path for the current across the gap between the electrode and the lead wire terminal and to form an inclosed visible spark chamber.

In testimony whereof, I have signed my name to this specification.

HENRY D. MOORE.