June 5, 1923. 1,457,389

LE ROY L. PETTY ET AL

SPARK PLUG

Filed May 16, 1921

Fig. 2

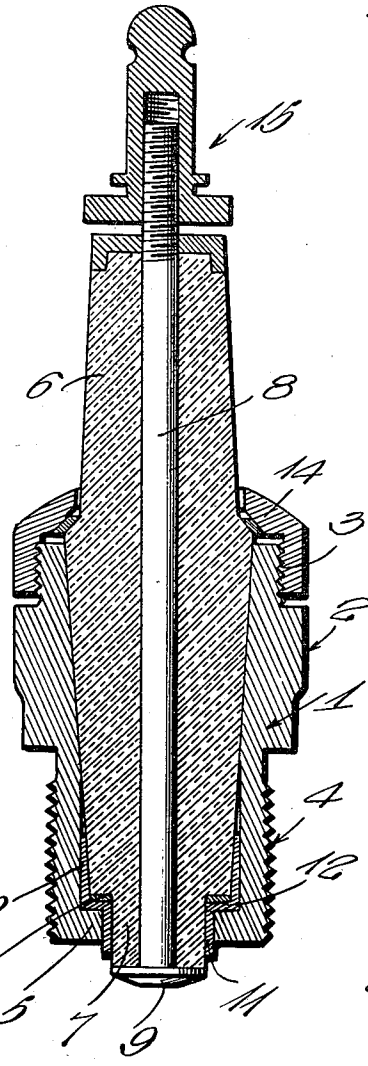


Fig. 1

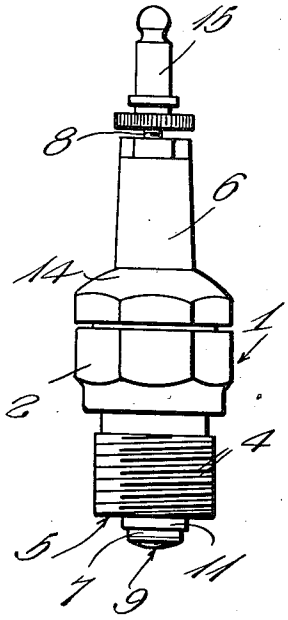
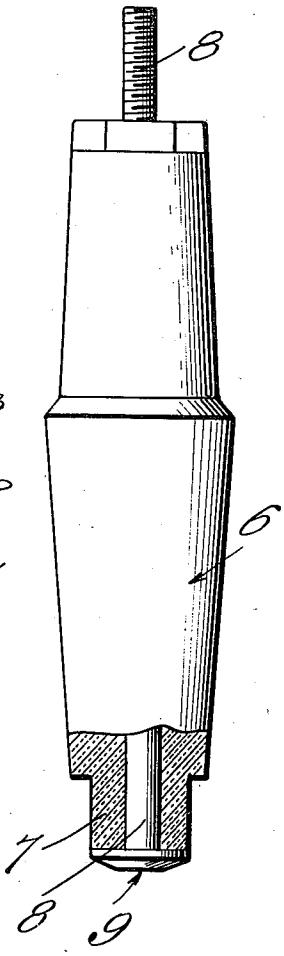


Fig. 3



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UNITED STATES PATENT OFFICE.

LE ROY L. PETTY, OF PHOENIX, ARIZONA, AND PAUL E. KELLER, OF MARION, OHIO.

SPARK PLUG.

Application filed May 16, 1921. Serial No. 470,043.

To all whom it may concern:

Be it known that we, LE ROY L. PETTY and PAUL E. KELLER, citizens of the United States, residing at Phoenix and Marion, in the counties of Maricopa and Marion and States of Arizona and Ohio, respectively, have invented certain new and useful Improvements in Spark Plugs; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved spark plug which is designed to be used in internal combustion engines for igniting the combustible mixture in the cylinders thereof.

The principal object of the invention is to generally improve upon devices of this class by the provision of one of extreme simplicity and durability, which effectively accomplishes the desired results, is of such construction that a long life thereof is insured, and the parts employed being few and simple to render the plug inexpensive to both the manufacturer and the user.

One of the principal features of the invention is the metal bushing which is arranged in the tapered bore of the shell to prevent possible leakage of gases between the bushing and shell, the bushing having the additional function of providng a second electrode for co-operation with the relatively large head of another electrode which is employed in the make-up of the plug.

A further and very important object of the invention is to provide a spark plug which is such in construction that all pockets and spaces at the effective inner end of the plug are eliminated to prevent excessive deposits of carbon which interfere with the effective operation of the plug.

Another and important object of the invention is to provide a plug embodying an electrode having a head and a bushing serving as an electrode, the head being spaced from the bushing to provide a plurality of spark gaps around the entire circumference of the bushing.

A still further object of the invention is to provide a plug wherein the structure is such that the spark gaps can be varied to produce a long or short gap as desired.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is an elevational view of a plug constructed in accordance with this invention.

Figure 2 is an enlarged central vertical sectional view thereof.

Figure 3 is a detail elevational view of the insulating body.

Referring to the drawings by numerals, 1 designates a metallic shell provided with the usual flat face wrench engaging intermediate portion 2 and external screw-threads 3 and 4, the last named screw threads being designed to be engaging with the threads of the opening in the cylinder head as is usual. The remaining threads 3 serve a purpose to be hereinafter described. This shell in general appearance, is somewhat like those now provided on marketed and patented plugs. However, close examination thereof will disclose the fact that the inner wall thereof is tapered instead of being straight as is usual. It is also to be noted that this shell is equipped at its lower end with an inturned annular flange 5 which constitutes a shoulder and serves a purpose to be later referred to. The lower tapered portion of an insulating body 6 is arranged inside of the shell and snugly contacts the greater portion of the inner wall of the latter to prevent possible leakage of gas between this body and shell. It is to be noted that the lower end of the body 6 is reduced in diameter as indicated at 7 and this portion is extended through and beyond the flange 5. Embedded in the center of the insulating body is an electrode 8 and this electrode is provided on its lower end with a circular substantially conical head 9 which bears against the lower end of the insulating body and is of the same diameter as the reduced portion 7 of the latter.

As before indicated, the plug in addition to embodying these parts, is equipped with a metallic bushing 10, which is interposed between the inner wall of the shell and insulating body as illustrated in Fig. 2. Here we wish to point out that the bushing is of sufficient size to snugly contact both the insulating body and the inner wall of the shell 1 to absolutely prevent the passage of any gases between these parts as sometimes occurs with the marketed and patented plugs

with which we are familiar. The bushing 10 has its lower end reduced in size to provide a neck 11 and a shoulder 12, the latter engaging the shoulder provided by the flange 5 and the neck extending beyond the flange and terminating short of the end of the insulating body to provide a spark gap between the head 9 and its extremity. It is to be noted that with this construction, there are no frail parts that can be quickly and easily burnt as is the case with the common types of plugs used. In actual use, one or more washers 13 can be placed between the shouldered lower end of the insulating body 6 and the shoulder 12 of the bushing to vary the spark gaps. It is hardly necessary to point out that a screw-cap embodying a flat faced portion and indicated by the numeral 14 co-operates with the screw-threads 3 to hold the insulating body 6 and shell together, this permitting quick and easy separation of said parts for cleaning, inserting or removing the washers 13 or for any other desired reasons. As is usual, the upper end of the electrode 8 is screw-threaded and extended beyond the corresponding end of the insulating body and a binding device 15 of suitable form is threaded on this end of this electrode for connecting the circuit wires with the plug.

A careful consideration of the description of the plug taken in connection with the drawings which clearly illustrate the construction thereof, will no doubt be sufficient to enable persons skilled in the art to obtain a clear understanding of the features, construction and advantages of the same. In view of this, a more lengthy and detailed description is thought unnecessary.

We claim:

A spark plug comprising a metallic shell having an inturned annular flange at its lower end forming a shoulder, a metal bushing arranged inside of the shell and tightly contacting the inner wall thereof and provided intermediate its ends with a shoulder resting on the first named shoulder and having a reduced neck extending through the lower end of the shell beyond said flange, a body of insulating material fitted snugly inside of the shell and having its lower end reduced in diameter and extending through and beyond the aforesaid neck, and an electrode embedded in said body and having a head on its lower end bearing against and of the same diameter as the reduced end of the body.

In testimony whereof we have hereunto set our hands.

LE ROY L. PETTY.
PAUL E. KELLER.