H. L. FLOOD.

SPARK PLUG.

APPLICATION FILED MAR. 21, 1919. RENEWED AUG. 30, 1921.

1,400,276. Patented Dec. 13, 1921.

Fig. 1.

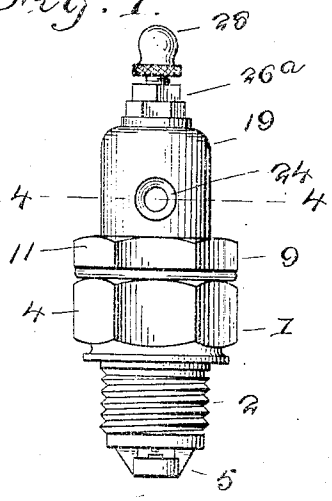


Fig. 2.

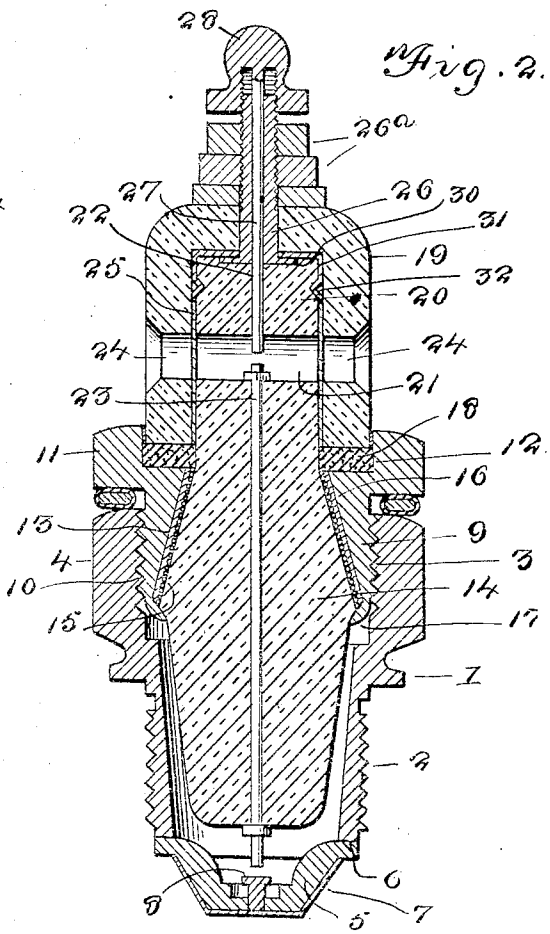


Fig. 3.

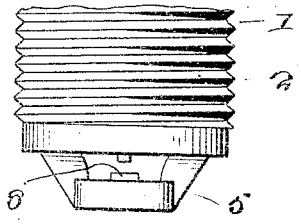
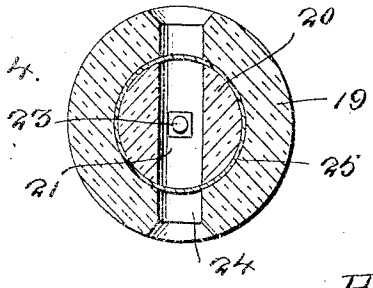


Fig. 4.



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SPARK-PLUG.

1,400,276. Specification of Letters Patent. Patented Dec. 13, 1921.

Application filed March 21, 1919, Serial No. 283,966. Renewed August 30, 1921. Serial No. 497,047.

To all whom it may concern:

Be it known that I, HENRY LEE FLOOD, a citizen of the United States, residing at Ponca City, in the county of Kay and State of Oklahoma, have invented new and useful Improvements in Spark-Plugs, of which the following is a specification.

My present invention pertains to spark plugs, and consists in the peculiar spark plug possessed of certain practical features of advantage chief among which is that the porcelain insulation may be removed to be cleaned, notwithstanding the plug is properly classed as a one-piece plug, as hereinafter described and definitely claimed.

In the accompanying drawings hereby made a part hereof:

Figure 1 is a side elevation of the spark plug constituting the preferred embodiment of my invention.

Fig. 2 is an enlarged diametrical section of the same.

Fig. 3 is an enlarged side elevation of the inner end of the plug.

Fig. 4 is a transverse section taken in the plane indicated by the line 4—4 of Fig. 1.

Similar numerals of reference designate corresponding parts in all of the views of the drawings.

Among other elements my novel plug comprises a shell 1, preferably of steel. The said shell is exteriorly threaded at 2, and interiorly threaded at 3, and is provided with the usual angular portion 4 for the application of a wrench or the like.

Attached to the inner end of the shell 1 is a heavy cast or wrought iron bridge 5 which possesses a higher melting point than other metals, and hence is not liable to become red hot and give rise to pre-ignition or to be destroyed by the intense heat to which it is subjected. The bridge 5 is attached to the shell by providing opposite gaps 6 in the inner end of the shell, disposing the ends of the bridge in said gap, and then burring the bridge in place with a set punch. As indicated by 7, the bridge is coated with fire-clay cement such as is used on gas mantle supporting wires, the said coating having a tendency to preclude red heating of the bridge. Attached to the bridge 5 for grounding purposes is an alloy sparking point 8.

The construction of my plug renders it unnecessary to remove the shell 1 from the motor when it is necessary to clean the porcelain insulation, as the points require no adjustment and there are no copper gaskets likely to cause trouble.

My novel plug also comprises a bushing 9, preferably of steel, that is exteriorly threaded at 10 and is of angular form at 11, and is provided in its outer end with a cup 12. The interior of the said bushing 9 is tapered outwardly as indicated by 13.

Disposed in the taper 13 of the bushing 9 and depending or extending inwardly from said bushing is the insulating body 14, said body being preferably of porcelain. In assembling the insulating body 14 and the bushing 9, the outwardly tapered portion of the insulating body is wrapped with asbestos yarn 15, and the tapered interior 13 of the bushing is filled with expansion and water and heat-proof cement 16. The inner end of the bushing 9 is burred over the insulating body 14 at the lower end of the tapered portion thereof, as indicated by 17. Manifestly the disposition of the outwardly tapered portion of the insulating body 14 in the correspondingly tapered interior of the bushing will result in the insulating body being tightened in the bushing when the plug is subjected to the action of an explosion. Moreover the asbestos yarn 15 and the cement 16 will form a bushing and will take care of expansion and contraction, with the result that the liability of breakage will be reduced to a minimum. Again breakage is practically eliminated by the fact that the removal of all other parts of the plug from the shell 1 and the re-insertion of said parts are effected by screwing the metallic bushing 9 out of and into the shell, no part other than the bushing 9 connecting with the shell 1. It will further be noted in this connection that the insulating body 14 is permanently affixed in the bushing 9, and that when the bushing 9 is turned out of the shell 1, the insulating body may be readily and thoroughly cleaned.

Disposed in the cup 12 at the outer end of the bushing 9 is an asbestos washer 18 to which is opposed the inner end of the insulating cap 19, preferably of porcelain. The said cap 19 is preferably provided with cement at its inner end, and is slipped over the outwardly extending tubular portion 20 of the insulating body 14, and has its inner end opposed to the said washer 18. The cap 19 adds materially to the insulation of the plug and is calculated to preclude damp-

ness or oil or other substance from causing exterior short circuiting. Manifestly the large surface of the cap 19 contributes toward these ends.

The tubular insulating portion 20 projects outwardly beyond the metallic bushing 9. The said tubular portion 20 is provided with a diametrical aperture 21 that intersects the longitudinal bore 22 and affords a peek-hole opposite the intensifying gap. Extending through the longitudinal center of the insulating body 14 is the conducting wire 23, the inner end of which is exposed at the inner end of the body 14, and is opposed to the point 8 of the bridge 5. Manifestly this arrangement of the terminal of the wire 23 and the considerable portion of insulating body 14 between said terminal and the shell 1 contributes materially to preventing short circuiting at that point.

The insulating cap 19 is provided at 24 with diametrically opposite apertures in registration with the peek-hole aperture 21 in the tubular portion 20. These apertures 24 are guarded by a mica wall 25, the said mica wall being adapted to guard the intensifying gap with a view to precluding the possibility of fire resulting from a leaky carbureter.

At 26 is a tubular spindle in which is a wire 27 the inner end of which is opposed to the outer end of the conducting wire 23. The wire 27 may be placed against the wire 23 to close the gap, whereupon the plug will operate in the same manner as a plug that lacks the gap. Again the wire 27 may be moved with respect to the wire 23 to adjust the gap. The spindle 26 is threaded and holds the terminal nuts 26^a together with the intensifying nut 28. The latter nut is preferably integral with the wire 27 so that the said wire may be adjusted and adjustably fixed with respect to the wire 23. At its inner end the spindle 26 is provided with a large and thin head 30 which is disposed below the top of a brass cap 31 that is burred at 32 into the tubular portion 20. Manifestly by turning the nut 28 the gap may be increased or diminished in size or may be entirely eliminated in the discretion of the user.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. In a spark plug, the combination of an interiorly and exteriorly threaded shell, a bushing threaded into and removable from said shell, an insulating body fixed in and extending inwardly from the bushing and having a tubular portion extending outwardly from the bushing, an insulating cap disposed over said tubular portion, a spark point at the inner end of the shell, a wire extending through the insulating body and having its inner end opposed to said point, a threaded spindle disposed in the tubular portion of the insulating body and the cap and containing a wire opposed to the outer end of the first-named wire, and a cap engaging said spindle and carrying the second-named wire.

2. In a spark plug, the combination of an insulating body having a tubular portion in which is a diametrical aperture, a conducting wire extending through said insulating body and having its outer end disposed opposite the aperture in the tubular portion, an insulating cap arranged over said tubular portion and having an aperture in registration with said diametrical aperture, a spindle containing a wire opposed to the outer end of the first-named wire, and an adjusting cap engaging the spindle and carrying the second-named wire.

3. In a spark plug, the combination of an insulating body having a tubular portion in which is a diametrical aperture, a conducting wire extending through said insulating body and having its outer end disposed opposite the aperture in the tubular portion, an insulating cap arranged over said tubular portion and having an aperture in registration with said diametrical aperture, a spindle containing a wire opposed to the outer end of the first-named wire, an adjusting cap engaging the spindle and carrying the second-named wire, and a mica guard wall carried in the insulating cap and covering the aperture therein.

4. In a spark plug, the combination of an insulating body having a tubular portion, a metallic cap arranged over said tubular portion and having its side wall burred into the same, a tubular spindle having a head disposed under the cap and also having an exterior thread, a threaded cap on said spindle, and a wire carried by the cap and movable through the tubular portion and also through the spindle.

In testimony whereof I affix my signature.

HENRY LEE FLOOD