

A. J. FABER.
SPARK PLUG.
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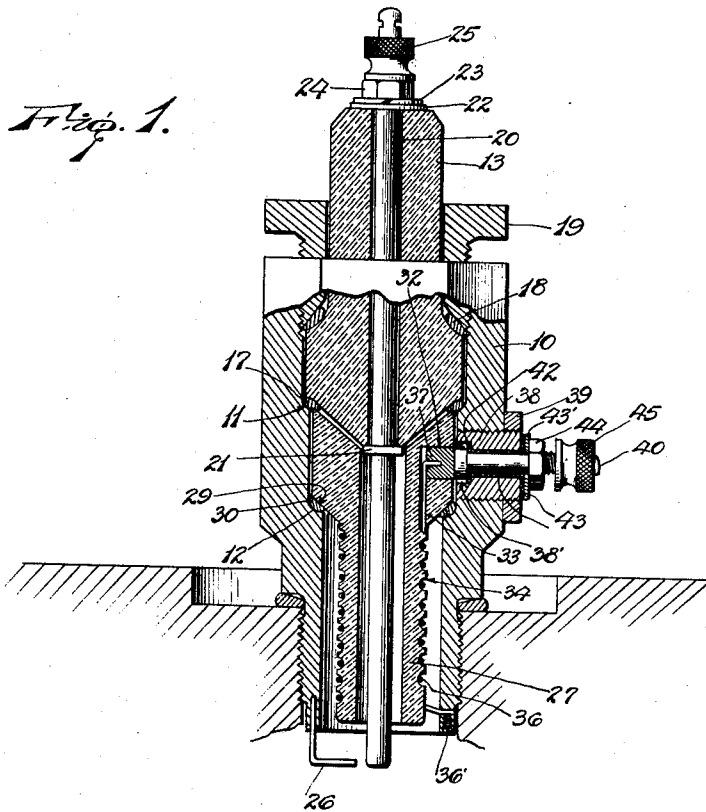
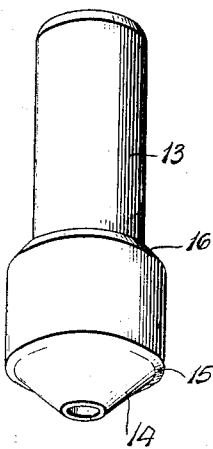
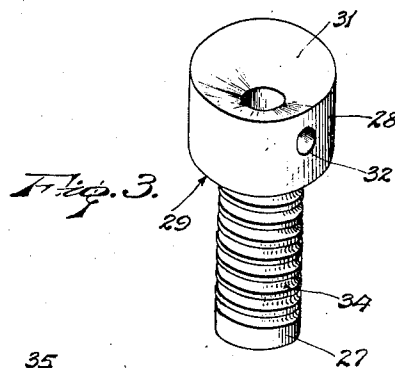
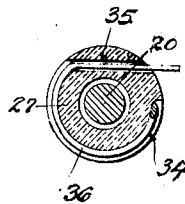


Fig. 2.



Inventor
A. J. Faber.

Lacey & Lacey, Attorneys

UNITED STATES PATENT OFFICE.

ALVIN J. FABER, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO ELECTRIC HEATED SPARK PLUG CO., INC., OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

SPARK PLUG.

Application filed March 17, 1921. Serial No. 452,950.

To all whom it may concern:

Be it known that I, ALVIN J. FABER, citizen of the United States, residing at St. Louis, and state of Missouri, have invented certain new and useful Improvements in Spark Plugs, of which the following is a specification.

This invention relates to an improved spark plug and has as one of its principal objects to provide a device of this character embodying a coil for heating the fuel gases within an engine cylinder whereby the engine may be readily started.

The invention has as a further object to provide a plug wherein the heating coil will be wound about a suitable insulating core therefor and wherein said core will form a continuation of the insulator for the main electrode of the plug surrounding said electrode.

A further object of the invention is to provide a plug wherein the core and the heating element will constitute an individual heating unit which may, should it become necessary, be removed so that should the core become broken or the efficiency of the coil become impaired, the heating unit may be renewed without discarding the plug.

The invention has as a further object to provide a plug employing a binding post for conducting current through the plug shell to the heating coil and wherein said post may be adjusted to form binding electrical contact with the coil.

And the invention has as a still further object to provide a plug employing at least three internal sealing gaskets so that the plug will be compression tight.

Other and incidental objects will appear hereinafter.

In the drawing:

Figure 1 is a vertical sectional view taken medially through my improved plug.

Figure 2 is a detail perspective of the insulator employed,

Figure 3 is a detail perspective view of the core employed for the heating coil of the plug,

Figure 4 is a detail perspective showing the terminal contact used upon the coil, and

Figure 5 is a detail section taken through the core of the coil and showing how the lower end portion of the coil is passed through an opening in the core.

In carrying the invention into effect, I employ a shell 10 provided internally with vertically spaced annular shoulders 11 and 12 respectively. Removably fitting in the shell is an insulator 13 which may be formed of porcelain or other approved material and as shown in detail in Figure 2, this insulator is provided with a frusto conical lower end 14 at the base of which is an annular shoulder 15. Above this shoulder the insulator is provided with a second annular shoulder 16. The shoulder 15 confronts the shoulder 11 of the shell and arranged between said shoulders is a suitable sealing gasket 17. Surrounding the porcelain to rest upon the shoulder 16 is a second sealing gasket 18 of approved character and threaded into the shell to coact with said gasket is a nut 19 binding the insulator within the shell. Extending through the insulator axially thereof is a main electrode 20 provided intermediate its ends with an annular shoulder 21 coacting with the lower end of the insulator and surrounding the upper end portion of said electrode to rest against the upper end of the insulator is a washer 22 against which is seated a lock washer 23. Threaded upon the electrode to coact with this lock washer is a lock nut 24 adjustable for binding the electrode upon the insulator while above said nut the electrode carries a binding nut 25 which may be adjusted for clamping a circuit wire between the nuts. To accommodate an ordinary slip connection, the electrode is preferably provided near its upper end with appropriate notches. Set into the lower end of the shell to cooperate with the main electrode is a ground electrode 26.

Mounted within the shell below the insulator 13 is a tubular core 27 provided at its upper end with an annular head 28 at the lower end of which is a shoulder 29 confronting the shoulder 12 of the shell and interposed between said shoulders is a sealing gasket 30 of approved character. As shown in Figure 1, the central opening through the core is of a diameter to receive the shoulder 21 of the electrode 20 while the head 28 of said core is cupped, as shown at 31, to mate with the frusto conical lower end 14 of the insulator. The core thus provides a continuation of the insulator and surrounds the lower end portion of the elec-

trode 20 within the shell to prevent short circuiting between the electrode and the shell. Formed in the head 28 of the core at one side thereof is a radial recess 32 from which leads downwardly a passage 33 entering a helical channel or groove 34 in the periphery of the core. Near the lower end of the core, this channel communicates, as best shown in Figure 5, with a chordal passage 35 through the core and lying in said groove is a resistance element 36 forming a heating coil upon the core. The lower end portion of said element is, as best shown in Figure 5, arranged to extend through the passage 35 and, at its free end, is fixed within a suitable opening in the lower end portion of the shell 10 by a set screw 36' for grounding the resistance element to the shell. The upper end portion of said element is arranged to extend through the passage 33 into the recess 32 and fixed to the upper end of said element is a contact or plug 37 snugly fitting in said recess. The contact 37 is preferably formed of brass and is provided axially with a socket to receive the adjacent end of the wire, the plug being center punched around the outer end of the socket for securing the plug upon the wire. Threaded through the wall of the shell 10 is a sleeve 38 provided at its inner end with a recess 38' and threaded upon the outer end portion of said sleeve is a lock nut 39 coacting with the shell. Extending through the sleeve is a binding post 40 provided at its inner end with a head received in the recess 38' and extending into the recess 32 of the core 27 to engage the contact 37. Surrounding said post is a bushing 40 of mica or the like insulating the post with respect to the sleeve and arranged between the head of the post and the sleeve within the recess 38' is a dielectric washer 42. A similar washer 43 is arranged to overlie the outer end of the sleeve and seating against said washer is a metal washer 43'. Threaded upon the post to coact with the washer 43' is a nut 44 securing the post upon the sleeve. At its outer end portion, the post carries a binding nut 45 by means of which a circuit wire may be connected to said post.

As will now be readily understood in view of the preceding description, the resistance element may be heated by closing a circuit through the binding post 40. Should this element become broken or its efficiency otherwise impaired, the core 27 may, as will be readily appreciated, be removed, the core and said element providing an individual heating unit which may be renewed as occasion may demand. To remove the core it will, of course, be necessary to withdraw the head of the binding post 40 from the recess 32. This may be accomplished by rotating the sleeve 38. On the other hand, in assembling the plug, said sleeve may be

adjusted for shifting the head of the post into binding engagement with the contact 32 when the nut 39 may then be adjusted to coact with the shell for locking the sleeve in adjusted position. The gasket 30 will, of course, form a closed joint between the core 27 and the shell while the gasket 17 will form a closed joint between the insulator 13 and the core. At the same time, the gasket 17 will also provide a closed joint between the insulator and the shell while the gasket 18 will serve a like function. Leakage of compression through the plug will thus be effectually prevented.

Having thus described the invention, what is claimed as new is:

1. A spark plug including a shell, an insulator therein, a main electrode carried by the insulator, a ground electrode upon the shell to cooperate with the main electrode, and an individual heating unit removably supported on the shell.

2. A spark plug including a shell, an insulator therein, a main electrode carried by the insulator, a ground electrode upon the shell to cooperate with the main electrode, and an individual heating unit removably supported on the shell and held against displacement by said insulator.

3. A spark plug including a shell, an insulator therein, a main electrode carried by the insulator, a ground electrode upon the shell to cooperate with the main electrode, and a heating unit confined within the shell by said insulator and providing a continuation of the insulator surrounding the main electrode.

4. A spark plug including a shell, an insulator therein, a main electrode carried by the insulator, a ground electrode upon the shell to cooperate with the main electrode, a heating unit clamped within the shell by said insulator, and means forming a sealed joint between said unit and the shell.

5. A spark plug including a shell, an insulator therein, a main electrode carried by said insulator, a ground electrode upon the shell to cooperate with the main electrode, a heating unit clamped within the shell by said insulator, means forming a sealed joint between said unit and the shell, and means forming a sealed joint between the insulator and said unit.

6. A spark plug including a shell, an insulator therein, a main electrode carried by said insulator, a ground electrode upon the shell to cooperate with the main electrode, a tubular core mounted within the shell below said insulator and providing a continuation thereof surrounding the main electrode, and a resistance element carried by said core.

7. A spark plug including a shell, an insulator therein, a main electrode carried by said insulator, a ground electrode upon the shell to cooperate with the main electrode, a

tubular core mounted within the shell below said insulator and providing a continuation thereof surrounding the main electrode, a resistance element carried by said core, and
5 an adjustably mounted binding post carried by the shell to cooperate with said element.

8. A spark plug including a shell, an insulator therein, a main electrode carried by said insulator, a ground electrode upon the
10 shell to cooperate with the main electrode, a tubular core mounted within the shell below said insulator and providing a continuation thereof surrounding the main electrode, a
15 sleeve adjustable upon the shell, and a binding post carried by said sleeve to cooperate with said element.

9. A spark plug including a shell, an in-

ulator therein, a main electrode carried by the insulator, a ground electrode upon the
20 shell to cooperate with the main electrode, a core mounted within the shell below said insulator and provided with a recess, a resistance element carried by the core and provided with a contact disposed within said
25 recess, and an adjustably mounted binding post carried by the shell to engage said contact.

10. A spark plug including a shell, a sectional insulator therein, a main electrode
30 carried by one of said sections, a resistance element carried by another of said sections, and a ground electrode upon the shell to cooperate with the main electrode.

In testimony whereof I affix my signature.

ALVIN J. FABER. [L. s.]