J. M. BRINGMAN.

SPARK PLUG.

APPLICATION FILED DEC. 24, 1918.

1,333,897.

Patented Mar. 16, 1920.

Fig. 1.

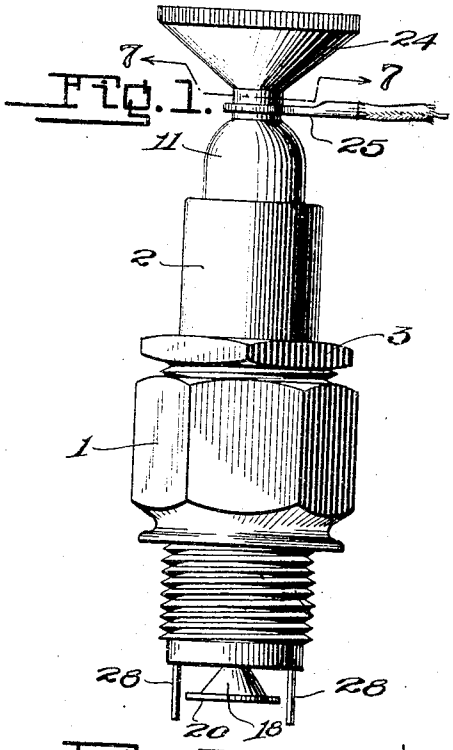


Fig. 2.

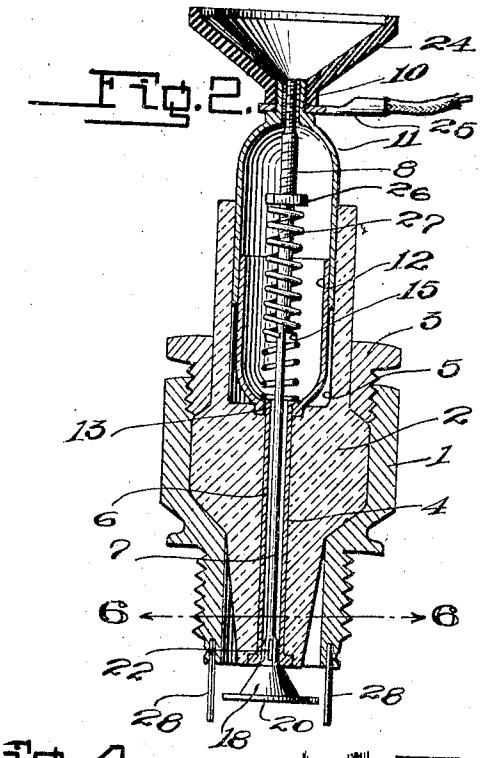


Fig. 3.

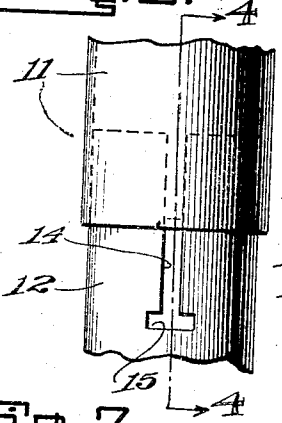


Fig. 4.

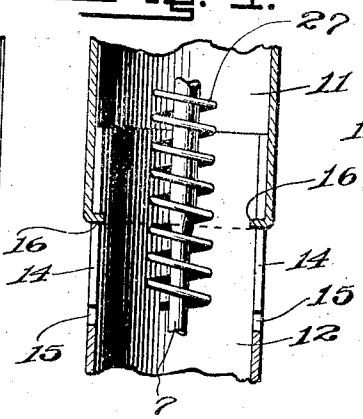


Fig. 5.

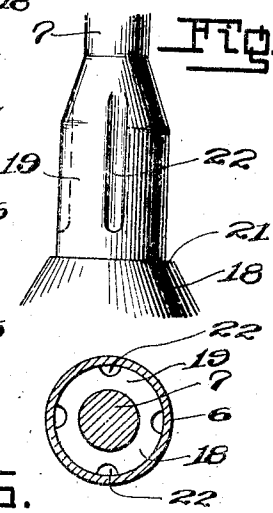


Fig. 7.

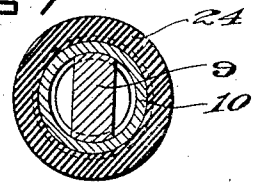


Fig. 6.

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SPARK-PLUG.

1,333,897. Specification of Letters Patent. Patented Mar. 16, 1920.

Application filed December 24, 1918. Serial No. 268,203.

To all whom it may concern:

Be it known that I, JOHN M. BRINGMAN, a subject of the King of Great Britain, residing at Rockyford, in the Province of Alberta and Dominion of Canada, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification.

This invention relates to spark plugs, and more particularly to a spark plug designed to facilitate the priming of an engine cylinder in connection with which the plug is used.

An object of the invention is to provide a priming spark plug which is relatively simple in construction, and is so constructed as to lend itself to be easily packed for transportation or storing, eliminating all parts which might project beyond the maximum diameter of the shell of the plug, and also to provide a plug which will prevent leakage of gas outwardly therethrough during the operation of the engine.

More specifically, the invention comprehends the provision of a spark plug including the usual porcelain insulator or core partially incased within the metal shell, which porcelain is provided with a recess opening out through its upper end and receiving therein a pair of shell members adapted to receive gasolene or analogous volatile fuel from which shell members the fluid will flow through a tube, and about the central electrode of the plug for spreading over the head of the central electrode of the plug to facilitate the priming of starting of an engine with which the spark plug is used; to provide a yieldable means within the spark plug construction to normally hold it in a position to prevent the passage of fluid therethrough which means is adapted to yield upon inward pressure of the upper casing section to permit the flow of gasolene or analogous fuel out of the plug upon the inner head of the electrode.

Other objects of the invention will appear in the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawing:

Figure 1 is a side elevation of the improved spark plug.

Fig. 2 is a longitudinal section through the spark plug.

Fig. 3 is a fragmentary side elevation of the gasolene receiving and retaining cup.

Fig. 4 is a vertical section on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary enlarged side elevation of the inner end of the central electrode.

Fig. 6 is a cross-section through the central electrode and the gasolene feeding tube taken on the line 6—6 of Fig. 2, and

Fig. 7 is a cross-section on the line 7—7 of Fig. 1.

Referring more particularly to the drawings, 1 indicates the metal shell of the spark plug in which the porcelain or insulating core 2 is confined by the usual type of packing nut 3.

The porcelain core 2 is provided with a centrally disposed bore 4 the upper end of which opens out into a recess 5. The recess 5 is formed in the upper end of the porcelain core 2 and opens out at the upper end of the said portion.

A tube 6 extends through the bore 4 and receives longitudinally therethrough the stem 7 of the central electrode of the plug. The upper end of the stem 7 is enlarged and screw threaded as shown at 8, having its upper end 9 flattened as shown in Fig. 7 and threaded into the nipple 10 formed upon the upper end of the section 11 of the gasolene retainer or shell member. The gasolene retainer or shell member comprises the upper section 11 and the lower section 12 which latter section is positioned wholly within the recess 5 and has its upper end seated in or telescopically mounted in the lower end of the upper shell 11. The lower end of the shell 12 is threaded to the upper end of the sleeve 6 as shown at 13. The shell 12 is provided with a pair of diametrically opposed longitudinally extending slots 14, the upper ends of which open out at the upper end of the shell while the lower ends terminate in transverse openings 15. Lugs 16 are formed upon the lower edge of the upper shell 11 and engage in the slot 14 for guiding telescoping movement of the section 11 with respect to the section 12 while a slight rotation of the shell 11 when the lug reaches the lower end of the slot 14, moving the lug into the transverse opening 15 will lock the shell 11 in its depressed or inner position, consequently moving the head 18 of the central electrode outwardly, unseating the valve or closure portion 19 thereof to allow gasolene to flow from within the shell 12 through the tube 6 and about

the head 18. The head 18 is substantially conical shaped having an annular horizontal flange 20 formed peripherally about its base. The valve or closure portion 19 of the central electrode is adapted to snugly fit within the lower end of the tube 6, while the shoulder 21 formed upon the upper end of the head 18 will engage the lower end of the tube, forming a closure to prevent the escape of gas outwardly through the tube when the head 18 is seated as shown in Fig. 2 of the drawing. The valve section or portion 19 of the central electrode is provided with peripheral longitudinally extending grooves 22 adapted to permit gasolene to flow therethrough upon the head 18 when the latter is forced inwardly.

A cup 24 of insulating material is threadably mounted upon the nipple 10 and this cup has communication with the bore of the nipple to allow the gasolene to flow therefrom through the bore about a flat portion 9 of the central electrode, into the shells 11 and 12. The cup 20 also serves as a binder for connecting the contact 25 to the central electrode 7.

A nut 26 is mounted upon the threaded portion 8 of the central electrode 7 and a spiral spring 27 is coiled about the electrode, having its upper end engaging the nut 26 and its lower end engaging the upper end of the sleeve 6. The spring 27 tends to hold the head 18 seated, to form a closure for the lower end of the tube 6.

When it is desired to prime a cylinder of an engine with which the spark plug is used, the cup 24 is filled with gasolene and depressed, which forces the shell 11 and central electrode 7 downwardly, moving the lower ends of the recesses 22 below or out of the lower end of the tube 6 allowing the gasolene to flow through the space in the nipple 10 about the flat portion 9 of the central electrode, through the shells 11 and 12, tubes and recesses 22 upon the head 18. The enlarged or valve portion 19 of the central electrode 7 is never wholly without the tube 6, thereby maintaining the proper spaced relation between the annular flange 20 which serves as one electrode or sparking point of the spark plug and the electrodes 28 which are carried by the shell 1. If it is desired to keep the lower end of the tube 6 open, the cup 24 and shell 11 may be slightly rotated after they have been moved downwardly to the limit of their downward movement for moving the lugs 16 into the transverse openings 15.

Changes in details may be made without departing from the spirit of this invention, but;

I claim:

1. In a spark plug, the combination, of an insulating core provided with a central bore and with a recess in its upper end, a slidable upper shell member forming a closure for said recess, a central electrode connected to and extending through said upper shell member, the lower end of said electrode being enlarged and forming a valve closure for said central bore, an upper shell section adapted to be depressed to unseat the enlarged valve portion and means normally holding said enlarged valve portion seated.

2. In a spark plug, the combination, of a pair of spaced electrodes, an insulating core provided with a central bore and with a recess in its upper end, a slidable upper shell member forming a closure for said recess, a central electrode connected to and extending through said upper shell member, the lower end of said electrode being enlarged and forming a valve closure for said central bore, said upper shell section adapted to be depressed to unseat said enlarged valve portion, means for normally holding said enlarged valve portion seated, the terminal of said central electrode below said enlarged valve portion being conical shaped to guide liquid toward said spaced electrodes.

3. In a spark plug, the combination, of a pair of spaced electrodes, an insulating core provided with a central bore and with a recess in its upper end, a slidable upper shell member forming a closure for said recess, a central electrode connected to and extending through said upper shell member, the lower end of said electrode being enlarged and forming a valve closure for said central bore, said upper shell section adapted to be depressed to unseat said enlarged valve portion, means for normally holding said enlarged valve portion seated, the terminal of said central electrode below said enlarged valve portion being conical shaped to guide liquid toward said spaced electrodes, and an annular flange formed about the base of said conical terminal adapted to form a sparking point or member for co-action with said spaced electrode.

4. In a spark plug, the combination, of an insulating core provided with a central bore and a recess in its upper end having communication with said bore, a gasolene retainer within said recess and having communication with the interior of the bore to permit the passage of gasolene from the retainer through the insulating core, the lower end of said electrode being enlarged for snug fitting in said bore to form a closure therefor, said enlarged end provided with recesses in its face for a portion of its length, to permit the escape of fluid therethrough when the enlarged end is partially unseated, and a spring coiled about said central electrode and normally holding the enlarged end in a closing position to prevent the passage of fluid through the core, said gasolene retainer comprising a pair of sections slidably connected to permit depression of one

section thereof, said central electrode connected to said depressible section whereby the enlarged end will be partially unseated upon depression of the depressible section.

5. In a spark plug, the combination, of an insulating core provided with a central bore and a recess in its upper end having communication with said bore, a gasolene retainer within said recess and having communication with the interior of the bore to permit the passage of gasolene from the retainer through the insulating core, the lower end of said electrode being enlarged for snug fitting in said bore to form a closure therefor, said enlarged end provided with recesses in its face for portion of its length, to permit the escape of fluid therethrough when the enlarged end is partially unseated, and a spring coiled about said central electrode and normally holding the enlarged end in a closing position to prevent the passage of fluid through the core, said gasolene retainer comprising a pair of sections slidably connected to permit the depression of one section thereof, said central electrode connected to said depressible section whereby the enlarged end will be partially unseated upon depression of the depressible section and means for holding the depressible section in a depressed position.

6. In a spark plug, the combination, of an insulating core provided with a central bore and with a recess in its upper end having communication with the bore, a gasolene retainer within said recess and comprising upper and lower shell members slidably connected to permit depression of the upper shell member, means connected to said upper shell member to permit the flow of gasolene through the insulating core when the upper shell member is depressed.

7. In a spark plug, the combination, of an insulating core provided with a central bore and with a recess in its upper end having communication with the bore, a gasolene retainer within said recess and comprising upper and lower shell members said upper member slidably supported to permit depression thereof, means connected to said upper shell member to permit the flow of gasolene through the insulating core when the upper shell member is depressed, and means for normally urging said depressible means outwardly to prevent the passage of fluid through the insulating core.

8. In a spark plug, the combination, of an insulating core provided with a central bore and with a recess in its upper end having communication with said bore, a gasolene retainer in said recess and comprising an upper and a lower shell member mounted to permit depression of the upper shell member, a central electrode extending through said gasolene retainer and bore and connected to said upper shell, the lower end of said electrode being enlarged for snug fitting in said bore to form a closure therefor and prevent the passage of gasolene through the bore.

9. In a spark plug, the combination, of an insulating core provided with a central bore and with a recess in its upper end having communication with said bore, a gasolene retainer in said recess and comprising an upper and a lower shell member mounted to permit depression of the upper shell member, a central electrode extending through said gasolene retainer and bore and connected to said upper shell, the lower end of said electrode being enlarged for snug fitting in said bore to form a closure therefor and prevent the passage of gasolene through the bore, the enlarged end of said electrode provided with longitudinally extending recesses in a part of its length adapted to permit the passage of gasolene therethrough when the enlarged end is partially unseated.

10. In a spark plug, the combination, of an insulating core provided with a central bore and with a recess in its upper end having communication with said bore, a gasolene retainer in said recess and comprising an upper and a lower shell member mounted to permit depression of the upper shell member, a central electrode extending through said gasolene retainer and bore and connected to said upper shell, the lower end of said electrode being enlarged for snug fitting in said bore to form a closure therefor and prevent the passage of gasolene through the bore, the enlarged end of said electrode provided with longitudinally extending recesses in a part of its length adapted to permit the passage of gasolene therethrough when the enlarged end is partially unseated, an inverted substantially conical shaped cup connected to the upper end of said upper shell, the upper end of said electrode being cut away to permit the passage of gasolene from said cup into the retainer.

JOHN MARTIN BRINGMAN.