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L. VOLLMAR

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SPARK PLUG

Filed June 23, 1932

Fig. 1.

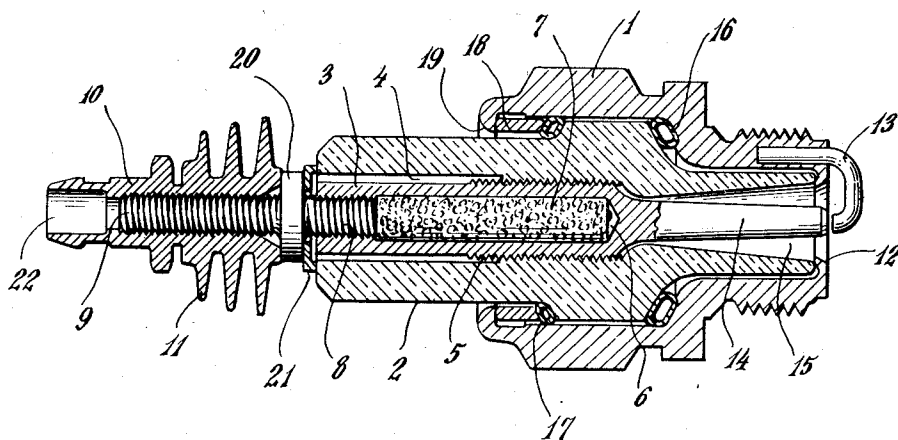


Fig. 2.

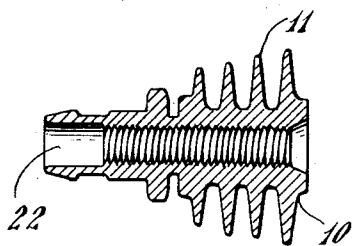
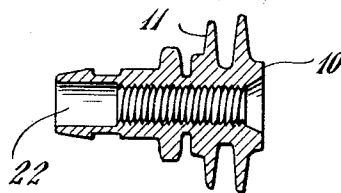


Fig. 3.



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SPARK PLUG

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This invention relates to improvements in igniters and especially igniters of the spark plug type for internal combustion engines.

5 An object of the invention is to provide a spark plug adapted to operate without derangement when extremely hot; and to that end the central electrode stem or rod is made hollow and filled with a suitable medium to prevent overheating.

10 Another object of the invention is to provide an inexpensive, compact and durable plug shaped so that its inner end prevents short-circuiting of the spark points by deposits of carbon, and with the inner extremity of the insulating sleeve so engaged by the adjacent edge of the shell of the plug that, in case the insulator is broken, the end will not drop into the combustion chamber of the engine.

20 The objects and advantages of the invention are set forth fully in the ensuing description and the novel features are defined in the appended claim. While the accompanying drawing shows one embodiment of the invention, I, of course, may make changes in details without departing from the principle of the invention or exceeding the scope and spirit thereof.

On the drawing:

30 Fig. 1 shows a spark plug according to this invention in longitudinal section, and

35 Figs. 2 and 3 are sectional views of specially formed securing nuts for the outer ends of the main electrode to contribute to the cooling effect.

The same numerals identify the same parts throughout.

40 I show at 1 the metal shell or bushing of the spark plug which receives the insulating sleeve 2 made fast to the plug 1. Within this sleeve is the central electrode rod or stem 3 which occupies a longitudinal bore through the sleeve, a part of this bore being smooth and larger than the stem as indicated at 4. 45 The middle of this bore and the middle of the stem are threaded so that these two parts will securely engage each other as shown at 5. The stem is hollowed out to provide an axially extending chamber 6 to receive a cooling medium 7, and near the outer end

of the plug this chamber is internally threaded at 8 to receive the end of a threaded bolt 9 on which is screwed the nut 10 which holds in place the high tension lead which conducts current to the plug 1.

55 The material 7 in the chamber 6 may be lithium nitrate, potassium nitrate, copper in powdered or other form or any other suitable material which will fill this chamber and absorb heat. The binding nuts 10 may have radiating ribs or fins 11 and these fins 60 may be varied in number as indicated in Figs. 1, 2, and 3.

At its inner end the edge of the bushing or shell 1 is spun over as shown at 12 and secured to this end is the grounded electrode 13. The inner extremity of the stem 3 beginning at the threaded portion 5 is tapered at 14 and extends to within sparking distance of the electrode 13. Around this tapering extremity 14 the insulator is provided with an expanding annular recess 15 to provide a large surface and diminish as much as possible the liability of the plug to become foul and short circuited. When carbonization takes place, a film generally forms, beginning at the inner end of the insulator and creeping therefrom until it covers the entire inner surface of the electrode. The insulator 2 has the tapered recess 15 of some length 70 which comes into direct contact with the flame of the burning gases in the combustion chamber and the surface of the inside of this recess becomes hot, preventing fouling of the plug at low speeds because the point where the fouling begins is relatively close to the flame in the engine.

80 Further by spinning over the inner end 12 of the shell 1 and causing it to engage directly with the inner end of the insulator 2 there is no likelihood of any part of the insulator dropping into the combustion chamber in case a portion of the insulator should be broken off. At this point, however, it is important that the edge 12 should not exert 85 any pressure on the insulator.

The enlarged portion of the insulator 2 is provided with the usual packing rings or gaskets 16 and 17 on the shoulders thereof and the outer packing ring may be engaged 100

by a sleeve or ring 18 against which the outer edge of the shell 1 is riveted over to hold the insulator in place. Of course, the construction may be varied and in place of bending over the outer end 19 of the shell 1 other means of securing the insulator in place may be adopted. A ring 20 surrounds the bolt 9 between the nut 10 and the end of the insulator and this ring abuts a washer 21. The outer end 22 of the nut which is secured on the bolt 9 may be hollow to increase the cooling effect.

With this construction of spark plug having a salt or other filler in the stem thereof a very superior cooling effect is obtained and the plug will operate at its highest efficiency even when the temperature of the engine rises to a considerable degree.

Having described the invention, what is claimed is:

A spark plug comprising an insulated electrode having a cavity therein containing a heat absorbing medium, a bolt screwed in the outer end of said cavity and an elongated nut having circumferential heat radiating fins on its exterior on said bolt, an insulator for said plug, said insulator having a threaded bore and said electrode being screw-threaded to enable it to engage said bore, a shell in which the insulator is mounted, the inner end of said insulator having a tapered recess surrounding the inner end of the stem, and the inner end of the shell being turned over to engage the insulator and prevent detachment of any broken part thereof.

In testimony whereof I affix my signature.

LUDWIG VOLLMAR.

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