June 14, 1949. H. R. WEBBER 2,473,317

SPARK PLUG

Filed Jan. 29, 1946

Fig. 1.

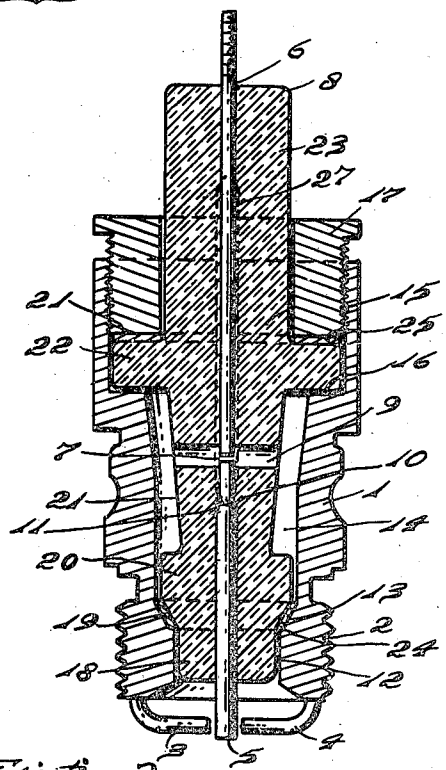


Fig. 2.

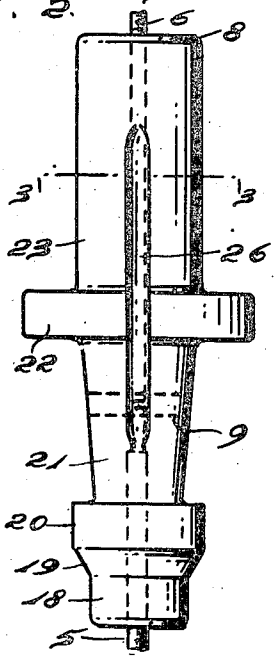
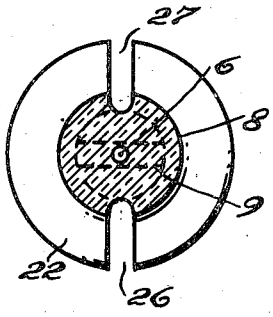


Fig. 3.



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SPARK PLUG

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1 Claim. (Cl. 123—169)

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The object of this invention is to devise a novel spark plug having spark intensifying means within the insulator and having means to vent a chamber surrounding the insulator to the atmosphere.

A further object of the invention is to devise a novel insulator.

With the foregoing and other objects in view as will hereinafter clearly appear, my invention comprehends a novel spark plug having novel intensifying means for the spark.

It further comprehends a novel spark plug wherein the insulator is constructed in a novel manner to provide for a spark intensifier within the insulator and vented to the atmosphere.

For the purpose of illustrating the invention, I have shown in the accompanying drawings a preferred embodiment which, in practice, will give satisfactory and reliable results. It is, however, to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and the invention is not limited to the exact arrangement and organization of these instrumentalities as herein set forth.

Figure 1 is a sectional elevation of a spark plug embodying my invention.

Figure 2 is a side elevation of the insulator, showing also the main electrode.

Figure 3 is a top plan view of the construction shown in Figure 2.

Similar numerals of reference indicate corresponding parts.

Referring to the drawings:

The shell 1 is threaded as at 2 to adapt it to be screwed into position on the engine with which it is to be used.

The shell at its inner end has ground electrodes 3 and 4 which are deflected towards the lower section 5 of a main electrode to provide the proper spark gap. The section 5 of the main electrode is spaced at its outer end from the outer section 6 of the main electrode to provide a spark gap 7 which is preferably the same spacing as that between the ground electrodes 3 and 4 and the inner section 5 of the main electrode.

The main electrode is secured in an insulator 8 having an aperture 9 extending laterally through it at the spark gap 7. The inner electrode section 5 is of greater diameter than the section 6 except at its outer portion where it is of reduced diameter to form a shoulder 10 which abuts against a shoulder 11 in the insulator.

The shell 1 has a differential bore, being of reduced diameter at 12, having a seat 13, a chamber

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14 and an enlarged diameter 15 which forms a seat 16 at its inner end, and which has the outer portion of its wall internally threaded to receive a nut 17.

The insulator 8 has at its inner end a portion 18 to fit the diameter 12 of the shell and such portion merges into an outwardly diverging portion 19, which in turn merges into a substantially straight portion 20. The portion 20 merges into a portion 21 of reduced diameter at its inner end and increasing in diameter towards its outer end where it merges into an enlarged portion 22. The outer end portion of the insulator is of reduced diameter relatively to the portion 22 and extends through and beyond the nut 17.

The seat 13 has a gasket 24 and the seat 16 has a gasket 25.

The insulator has longitudinally extending slots 26 and 27 in its periphery which extend from the chamber 14 outwardly beyond the nut 17, thereby venting the chamber 14 and the aperture 9 to the atmosphere.

When the parts are assembled as shown in Figure 1, the inner portion of the insulator is sealed with the seat 13 so that products of combustion cannot pass from the engine cylinder to the chamber 14, and the outer end of the chamber 14 is sealed at the seat 16.

The spark gap 7 materially intensifies the spark produced between the inner electrode section of the main electrode and the ground electrodes, and since this spark gap 7 is within the insulator it is not subject to climatic conditions and deleterious foreign material which might affect the spark if the intensifier was on the spark plug or in the line leading to the spark plug.

Any heat in the chamber 14 can vent to the atmosphere through the slots 26 and 27 and the spark plug will be maintained at the proper temperature.

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

In a spark plug, a shell having a differential bore with an annular internal portion at its forward end, a conical seat in rear of said annular portion and a rear, flat seat of greater diameter than said conical seat, an insulator in said shell having a cylindrical portion closing the front end of the shell, a conical seat in rear of said cylindrical portion, an enlarged rear shoulder to engage the rear seat, a portion of reduced diameter between said seats forming with the shell an annular chamber, and a lateral passage opening at its ends into said chamber, a nut encircling the

insulator, in threaded engagement with the shell and bearing against said shoulder, said insulator having passages in its periphery extending from said lateral passage through its rear shoulder and beyond said nut, a ground electrode at the front end of the shell, and a sectional main electrode extending longitudinally through the shell with juxtaposed ends spaced at said lateral passage to form a spark gap of substantially the same spacing as that of the main and ground electrodes.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,206,736	Steinberger	Nov. 28, 1916
1,311,039	Burman	July 22, 1919
1,327,382	Garber	Jan. 6, 1920
1,487,659	Johnson	Mar. 18, 1924
1,721,158	Leonard	July 16, 1929
2,194,251	Walter et al.	Mar. 19, 1940