Aug. 3, 1937. C. A. XARDELL 2,088,945

SPARK PLUG

Filed Sept. 24, 1936

Fig. 1.

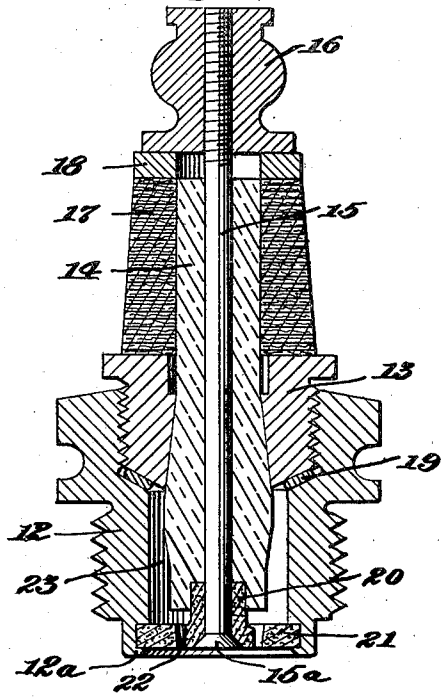


Fig. 4.

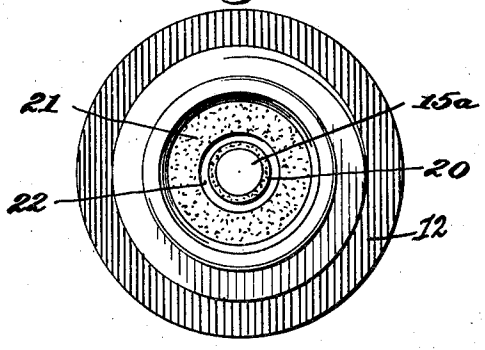


Fig. 2.



Fig. 3.



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SPARK PLUG

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2 Claims. (Cl. 123—169)

This invention has for its object to provide spark plugs, suitable for aviation or other engines, which will withstand the intense heat developed by the high tension electrical currents employed in such engines. To this end the improved spark plugs comprise co-operating, boro-carbide elements at the sparking ends of the plugs and between which there are narrow spark gaps; as also to provide improved mica non-conducting elements, as will be hereinafter fully set forth.

In the accompanying drawing Fig. 1 is a vertical section of the improved spark plug; Figs. 2 and 3 are detail sections of the non-metallic sparking elements preferably employed, and Fig. 4 is a bottom end view of this plug.

Referring to the drawing, 12 denotes the screw-threaded shell of the plug, which is of a well-known form, and into which shell a gland nut 13, also of well-known form, is screwed. Passing through a non-conducting core 14, of porcelain or other suitable material, is a main electrode 15 of high heat resisting and of high electrical conductivity, this electrode being slightly flared at its lower end, 15a, and being threaded at its upper end for the reception of the terminal nut 16.

Interposed between the nut 16 and the gland nut 13 is a non-conducting element 17 composed of thin leaves of mica. This mica element is assembled under a pressure of several tons, thus forcing the mica leaves or washers into perfect contact, and while still under pressure this compacted element is coated on its outside with a strong adhesive which will set quickly thus holding the mica leaves or washers under compression until said mica element is assembled in the spark plug. In other words this non-conducting element is a highly compacted mica unit and is not assembled by screwing down the terminal nut, as usual, which usual practice does not afford sufficient pressure to seal the joints between the mica leaves or washers perfectly.

In the construction shown in the drawing a washer 18 is interposed between the terminal nut 16 and the mica element 17; and a washer 19 is also shown interposed between the gland nut 13 and the shell 12.

The main electrode rod 15 is of high heat-resisting material, such as chromium, tungsten or a suitable alloy; and this rod is preferably coated with silver which is of a high heat-resisting and high conducting character. At the sparking end of this main electrode is located a non-metallic conducting sleeve 20 held in place by the flared end 15a of the said main electrode. This sleeve 20 and the non-metallic conducting ring 21 are spaced apart to afford an annular sparking gap at 22, said sleeve and ring being of boro-carbide, which is of high heat-resisting and high conducting material, non-fusible by the intense heat to which they may be subjected in use. The non-metallic ring 21 is held in place by spinning over the lower end of the shell 12, as shown at 12a.

It will thus be understood that these boro-carbide and non-fusible sparking elements will result in the production of spark plugs of long life under the high heat of combustion in the engine cylinders, and will also result in spark plugs which will avoid the erosion of the ordinary metallic electrodes due to high tension sparking, thus rendering these plugs particularly suitable for aviation engines; and these plugs will also be effective when low grades of hydro-carbon are used for fuel.

It will be noted that the spark gap 22 opens into a space 23 between the shell 12 and the core 14, so that an aspirating action of the gasses during suction, compression and sparking will result, this aspirating action serving to clean the spark gaps, thus contributing to efficient sparking.

While an annular spark gap is shown in the drawing the non-metallic and practically indestructible sparking elements may comprise sparking points affording a plurality of sparking gaps, if desired; or the boro-carbide sparking elements may be of any other suitable form.

The invention is not to be understood as being limited to the details shown and described, as variations, within the province of mechanical skill, may be made without departing from the scope of the invention as defined by the claims hereunto appended.

I claim and desire to secure by Letters Patent:—

1. A spark plug comprising spaced-apart boro-carbide, sparking elements of a high heat-resisting character.

2. A spark plug according to claim 1 which comprises a main electrode having a flared end and in which one of the boro-carbide sparking elements is in the form of a sleeve held in place against said main electrode by said flared end.

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