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SPARK PLUG

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Fig. 1.

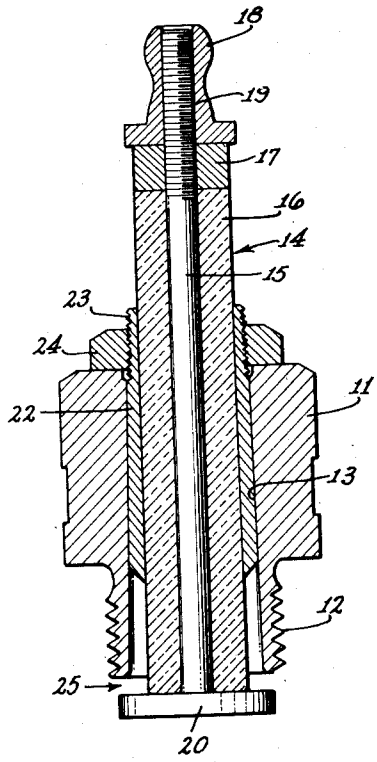
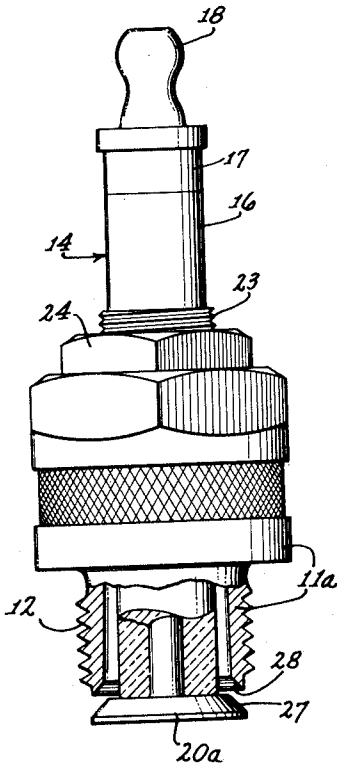


Fig. 2.



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SPARK PLUG

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Application April 24, 1939, Serial No. 269,682

5 Claims. (Cl. 123—169)

This invention relates generally to spark plugs for use in internal combustion engines.

It is a primary object of this invention to provide a spark plug for use in various types of internal combustion engines which will operate efficiently over long periods of use and under various types of operating conditions.

It is a particular object of this invention to provide a spark plug having an annular spark gap and embodying a disc or button below the shell of the plug as the electrode portion of the plug. It is a further object of this invention in this connection to provide a plug which tends to be self-cleaning.

It is also an object of this invention to provide a spark plug which may be easily assembled, which cannot leak and which may be adjusted by a novel method. In this connection it is a particular object to provide an electrode which is mounted in a shell having a tapered opening and to provide means associated with the electrode and its insulation jacket for mounting the electrode in the tapered opening in the shell. More particularly, it is an object of this invention to provide an electrode with a tapered member thereon adapted to be mounted in a correspondingly tapered bore in the shell of the plug so that the plug may be adjusted by grinding the surface of the tapered member.

These and other objects will be apparent from the drawing and the following description thereof. Referring to the drawing which is for illustrative purposes only;

Fig. 1 is a sectional elevation of the plug of this invention; and

Fig. 2 is an elevation, partly in section of a modified form of the invention.

More particularly describing the invention, reference numeral 11 indicates a shell of metal or other suitable material which is adapted to be mounted in the threaded opening of the cylinder block of an internal combustion engine by means of the lower threaded portion 12. This shell is provided with an internal tapered bore 13 which may be described as frustro conical in shape.

Adapted to be mounted in the shell is an electrode assembly generally indicated by reference numeral 14 which comprises the electrode 15, a jacket 16 of insulation material, such as mica or other suitable material, a retaining nut 17 and a terminal nut 18. The upper end of the electrode 15 is provided with screw threads 19 to accommodate the aforementioned nut 17 and terminal nut 18. At its lower end the electrode 15 terminates in a disc portion or button 20.

The electrode assembly further includes a sleeve 22 which is preferably shrunk on to the jacket 16 and may be formed of steel or other suitable material. The upper end of this sleeve is provided with screw threads 23 to accommodate a retaining nut 24 which serves to removably secure the electrode assembly in the shell 11. The outer surface of the sleeve 22 is tapered to correspond to the taper of the bore 13 of the shell 11 so that when the nut 24 is tightened the sleeve 22 will co-fit with the surface of the bore 13 in the shell. Preferably the dimensions of the sleeve 22 are so proportioned to the dimensions of the bore 13 that the electrode button 20 will be spaced below the lower end of the threaded portion of the shell 11 a desired distance, thereby leaving a spark gap between the button and the shell as indicated generally by reference numeral 25.

With the construction outlined above there is provided a spark plug having an annular spark gap 25 which tends to be self-cleaning and which has been found to resist corrosion and fouling. In this connection the location of the button 20 below the lowermost end of the shell 11 facilitates the self-cleaning action of the electrode since it provides free access of the circulating gases within the cylinder to the spark gap region.

The above construction also provides a means for positively seating the electrode assembly within the shell and thus serves to prevent any possibility of gases escaping through the spark plug under the high compressions used in present day internal combustion engines. In order to adjust the spacing of the button of the electrode with relation to the lower end of the shell it is possible to decrease this distance by merely grinding the surface of the steel shell 22. To increase the gap, the lower end of the shell may be filed or ground.

In Fig. 2 there is shown a modified form of the plug which is designed to have a greater self-cleaning action and which differs from the plug of Fig. 1 only in that the electrode button or disc indicated in Fig. 2 by reference numeral 20a is provided with a tapered or bevelled upper surface 27 and the lower end of the shell 11a is provided with a correspondingly bevelled or tapered portion 28. With this construction there is somewhat less tendency for carbon or other particles to remain in the region of the spark plug and the plug therefore has a somewhat

more pronounced self-cleaning action than the plug of Fig. 1.

Although the invention has been particularly shown and described, it is contemplated that various changes might be made without departing from the scope of the invention and it is intended to cover such changes as come within the scope of the claims.

We claim as our invention:

1. A spark plug comprising: a shell having a tapered bore therethrough; an electrode; an insulating jacket mounted on said electrode; a sleeve mounted on said jacket, said sleeve having a tapered surface corresponding in taper to the bore of said shell and having screw threads at its upper end; and a retaining nut threadably mounted on said sleeve for removably securing said sleeve and its associated parts in said shell.

2. A spark plug as defined in claim 1 in which the jacket is formed of mica and the sleeve is formed of steel.

3. A spark plug comprising: a shell having a tapered bore therethrough; an electrode terminating at its upper end in a screw threaded portion and at its lower end in a button; an insulating jacket mounted on said electrode; a retaining nut threaded on said electrode in abutting relation to said jacket; a terminal nut threaded on said electrode and abutting against said retaining nut; a metal sleeve mounted on said jacket, said sleeve having a tapered surface corresponding in taper to the bore of said shell and having screw threads at its upper end; and a retaining nut threadably mounted on said sleeve for removably securing said sleeve and its associated parts in said shell, said retaining nut being in abutting relation to the upper end of said shell.

4. A spark plug comprising: a shell having a tapered bore therethrough; an electrode having a disc at its lower end; an insulating jacket mounted on said electrode; a sleeve mounted on said jacket, said sleeve having a tapered surface corresponding in taper to the bore of said shell; and means cooperating with said sleeve for removably securing said sleeve and its associated parts in said shell so that the disc of said electrode is spaced below the lower end of said shell.

5. A spark plug comprising: a shell having a tapered bore therethrough; an electrode terminating at one end in a sparking disk portion; an insulation jacket on said electrode; and means for removably securing said electrode and its associated jacket in said bore to position said sparking disk portion in spaced relation with and beyond the end of the shell where the bore is of largest diameter.

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