Jan. 3, 1939. C. SMITH 2,142,383

SPARK PLUG

Filed June 25, 1938

Fig. 1.

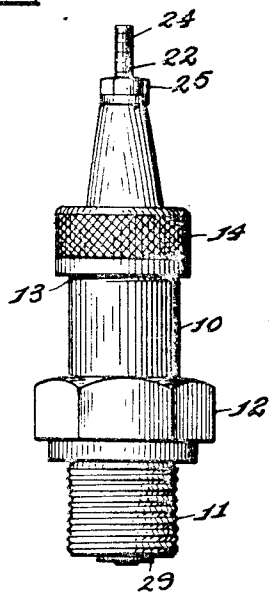


Fig. 3.

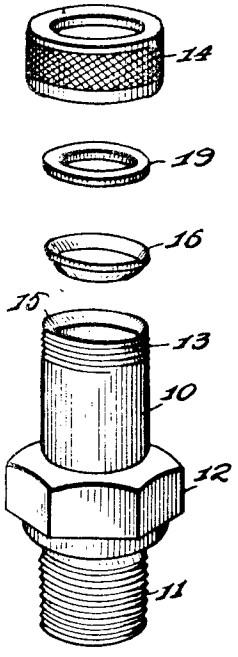


Fig. 2.

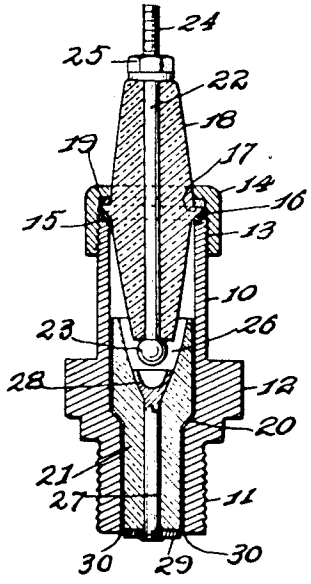


Fig. 5.

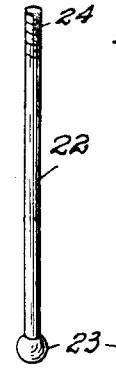


Fig. 7.

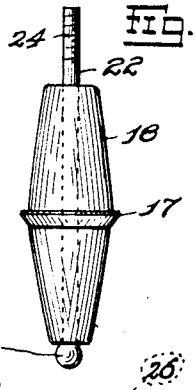


Fig. 9.

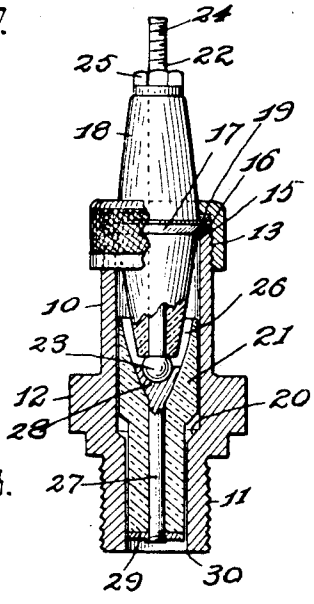


Fig. 4.

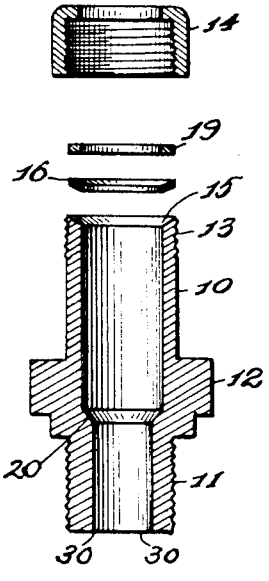


Fig. 6.

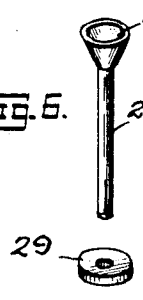
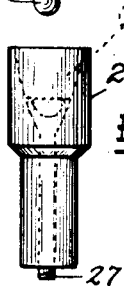


Fig. 8.



Inventor.

Charles Smith.

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UNITED STATES PATENT OFFICE

2,142,383

SPARK PLUG

Charles Smith, St. Louis, Mo., assignor to Otis T. Hodge, St. Louis, Mo.

Application June 25, 1938, Serial No. 215,861

5 Claims. (Cl. 123—169)

This invention relates to improvements in spark plugs and has for its object a plug constructed preferably of an aluminum shell with removable insulated cores each carrying electrodes, which electrodes may be replaced in the event the same should become inoperative

Another object is to provide a plug having one of its electrode supporting members arranged to freely move within the casing and to arrange its spark producing end to make a positive spark between its periphery and the inner periphery of the lower end of the casing.

Another object is to produce a plug which will be appropriate for aluminum motor blocks so as to provide for the proper expansion between like materials, thus preventing binding which would occur where iron and aluminum are connected owing to the variation of expansion taking place in different metals.

Another object of my improved spark plug is, to produce a plug where the inner insulating members, preferably porcelain can be removed in the event the same should become broken or otherwise out of commission and a new unit placed in the outer casing thereby producing much saving and avoiding purchasing a new plug.

The electrodes carried by the insulating members are so arranged that during each compression in the cylinder the lower electrode and its insulating member will raise and make contact with the projecting end of the electrode in the upper insulating member thereby completing a connection causing the spark to form at the bottom of the plug. Further there are no contact points to become burned out as appears in the present standard plugs now in use.

Another object of the invention is the general arrangement, construction and combination of parts as will be fully hereinafter described and set forth in the claims.

Figure 1 is a side elevation of my complete invention.

Figure 2 is a central vertical sectional view of the same.

Figure 3 is a perspective view showing the casing, cap and washers in a position ready to be assembled.

Figure 4 is a vertical sectional view of the same.

Figure 5 is a perspective view of the upper electrode made use of.

Figure 6 is a perspective view of the lower spark producing electrode ready to be connected to its sparking disc.

Figure 7 is a side view of the upper insulating member with the electrode carried therein.

Figure 8 is a side view of the lower insulating member with its electrode incased therein.

Figure 9 is a vertical sectional view of the plug showing the two electrodes brought in contact.

In the general construction of the invention I provide an outer casing **10** the same having the usual threaded end **11** by which the plug is attached to the engine or motor block, it is also provided with a hex enlargement **12** to which a wrench may be applied, and on its upper end is formed screw threads **13** to which a cap **14** may be applied.

The upper inner edge of the casing is beveled as indicated by the numeral **15** and in it is seated a flexible washer **16** against which seats the tapered flange **17** of the upper insulating member **18** which is preferably of porcelain, and on the top of the flange **17** is seated a washer **19** then the cap **14** is applied for firmly binding the porcelain member **18** in position.

As will be observed, the lower end of the casing **10** is of a decreased diameter and forming therein a shoulder **20**, in this lower end of the casing, and before the upper insulating member is placed in position is inserted the lower free moving insulating member **21** the same being shaped to conform with the shape of the cavity of the casing, and is of such dimension as to permit the same to freely move up and down during each compression taking place in the engine cylinder.

The upper insulating member **18** is provided with an electrode **22**, its lower end provided with a globular head **23** and its upper end provided with screw threads **24** for the application of a binding nut **25** and washer as well as to permit the application of a contact cap (not shown) to be attached thereto which is connected to the wire leading from the distributor.

The lower insulating member **21** has its upper end provided with a cavity **26**, and in this member is positioned an electrode **27** its upper end being cupped as indicated by the numeral **28** and arranged to snugly fit against the globular end **23** of the upper electrode whenever the insulating member **21** is raised during the compression of the engine, and when so contacting it completes an electrical connection and directing the same to the spark producing disc **29** positioned on the lower end of said electrode **27**.

There are several advantages produced by this form of plug, the spark producing disc **29** will create a positive spark at any point on the edge

30 of the casing, then again during the vertical movement of the lower member 21 it automatically cleans itself and prevents the accumulation of carbon within the plug thus preventing fouling, the electrical connection is made whenever the two electrodes contact in a manner as shown in Figure 9.

Should at any time any one of the electrodes or insulating members become broken or in otherwise inoperative, by merely removing the cap 14 the internal parts can be readily removed and new parts inserted without discarding the outer casing.

This arrangement provides economy and simplicity in assemblage.

Having fully described my invention what I claim is:

1. A spark plug comprising an outer casing, a cap provided on the same, insulating cores positioned in said casing, one of the same being rigidly positioned, the other permitted to move freely therein, and electrodes carried by said insulating cores and arranged to be brought in contact with each other during the compression of the motor.

2. A spark plug comprising a casing the lower portion thereof being of decreased diameter, an insulating member positioned in the upper part of said casing and held rigid therein, a cap placed over the insulating member and attached to the casing for binding the insulating member in position, a second insulating member positioned in the lower portion of the casing and permitted to freely move therein, electrodes carried by said insulating members and arranged to be brought in contact during the compression of the motor and a spark forming disc carried by the lower electrode.

3. A spark plug of the character described comprising a casing, a pair of insulating cores positioned therein, the upper of said cores being held stationary yet detachable from the casing, the other movable therein, and electrodes carried by said cores the upper one held firm with the core, the lower one carried with the core and arranged to be brought in contact with the upper electrode during the movement of the movable core, the movement of the lower core cleaning the cavity in which it is seated free from carbon.

4. A spark plug comprising a casing the same provided with a bore the lower portion thereof being of diminished diameter, an insulating core positioned in the upper portion of said casing, a cap applied to said casing and fitting over the insulating core for firmly binding the same in position, a lower insulating core positioned in the lower portion of the casing and permitted to freely move therein, electrodes carried by said insulating cores and arranged to contact when the lower core is elevated, a spark forming disc carried by the lower core and arranged to create sparks between its periphery and in the periphery of the lower end of the casing.

5. A spark plug of the character described comprising a casing of aluminum material, insulating cores positioned therein, electrodes carried by said cores, the upper core being rigid in position, the lower core movable, an enlargement formed on the upper electrode, a cup formed on the upper part of the lower electrode and arranged to snugly fit the contour of the enlarged portion of the upper electrode, and a spark forming disc carried by the lower electrode for creating the spark at the lower end of the casing.

CHARLES SMITH.