

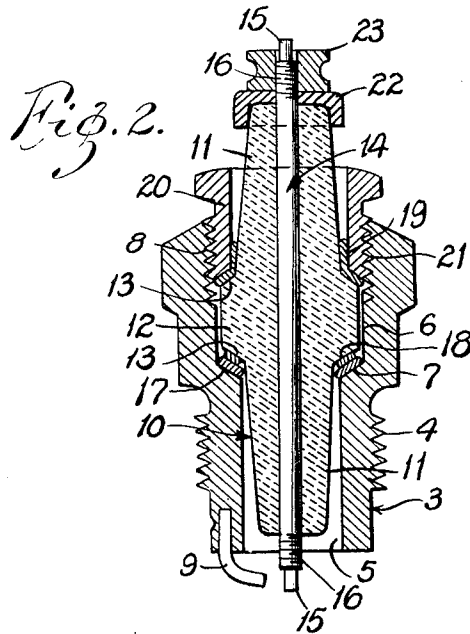
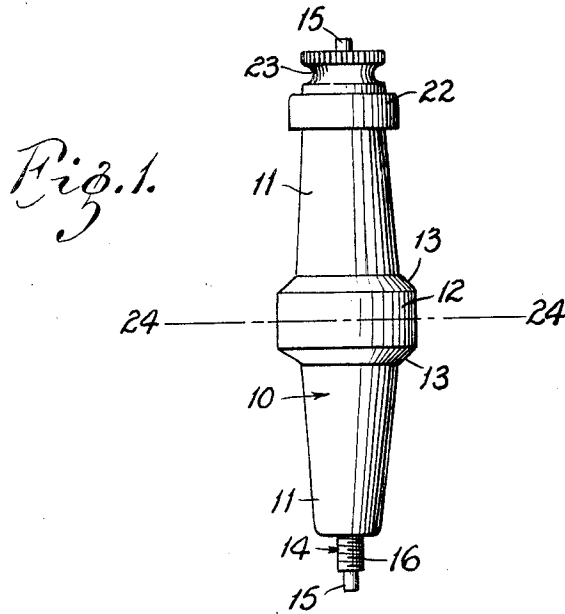
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SPARK PLUG

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SPARK PLUG

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1 Claim. (Cl. 123—169)

The object of my invention is to make an improved spark plug. The porcelain insulator in the conventional spark plug must be replaced at intervals, because a portion of it deteriorates in use. The portion of the porcelain insulator that extends into the cylinder is subjected to high temperatures and becomes coated with a carbon deposit, when used for a length of time. By the action of the heat and the carbon coating, the dielectric strength of the insulator is greatly weakened or destroyed. With the average use of the conventional spark plug, the entire spark plug is discarded when the porcelain insulator becomes defective.

A specific object of my invention is to double the use of the conventional spark plug in time of use by so designing the porcelain insulator that it may be used twice as long as the ordinary insulator. This is accomplished by so designing the porcelain insulator that it is reversible, that is that either end of the porcelain insulator may be inserted into the cylinder end of the spark plug. The reversible insulator is simply and cheaply made and lends itself readily to multiple production.

With these and other objects in view, my invention has relation to certain novel features of construction and arrangement of parts, as will be hereinafter more fully described, pointed out in the claim and illustrated in the drawing in which

Fig. 1 is a front elevation of the insulator used in my spark plug, showing the wire terminal and means of connecting the terminal with the insulator.

Fig. 2 is a longitudinal sectional elevation of a conventional spark plug, with my insulator operatively positioned therein.

Numeral 3 designates the conventional plug having the external threads 4. The plug 3 is hollow having the cylindrical pipe portion 5 at the external threaded portion. The opposite end of the pipe portion 5 is enlarged as shown at 6, the jointure between the pipe portion 5 and the enlarged portion 6 being made in the inclined annular seat 7. The upper end of the enlarged portion 6 has the internal threads 8. The outer configuration of the plug 3 is of the conventional type.

Numeral 9 designates the conventional electrical terminal, which is secured in the plug 3, as shown in Fig. 2. The portion thus far described is entirely conventional.

Numeral 10 designates the insulator, which is usually made of porcelain or other similar material, having a high electrical resistance. The

insulator 10 is composed of two similar frusto-conical portions 11. These portions 11 are integrally joined by the enlarged cylindrical portion 12. The jointure between the frusto-conical portions 11 and the enlarged cylindrical portion 12 are made by the inclined faces 13. Numeral 14 designates a metallic rod usually made of copper or an alloy of copper, which passes longitudinally centrally through the insulator 12 and is permanently secured therein by any well known method of frictional engagement. The rod 14 extends beyond the ends of the insulator 10. The external ends of the rod 14 are reduced in cross sectional area, so as to leave the protruding terminals 15. The portions of the rod 14 above the protruding terminals 15, externally to the insulator 11 are externally threaded with the threads 16.

Numeral 17 designates a washer, which is positioned on the inclined annular seat 7. Numeral 18 designates a second smaller washer positioned on the washer 17. The insulator 10 is positioned in the plug 3, so that one of the inclined faces 13 rests upon or is seated on the second smaller washer 18. Numeral 19 designates a washer, which is positioned on the upper inclined face 13 of the insulator 10. Numeral 20 designates an assembly lug, which has the external threads 21, which threads 21 are in threaded engagement with the internal threads 8 of the plug 3. The lower end of the assembly lug 20, when the assembly lug 20 is screwed down sufficiently comes in contact with the washer 19. By these means the plug 3, the insulator 10, the washer 17 and the second smaller washer 18 and the washer 19 and the assembly lug 20 are secured in positive assembled positions.

Numeral 22 designates a cap, which is fitted over the rod 14 into contact with the upper end of the insulator 10. The peripheral edge of the cap 22 is bent downwardly into contact with the upper lateral surface of the insulator 10. The cap 22 may preferably be closely fitted to the top of the insulator 10.

Numeral 23 designates a nut, which is in threaded engagement with the threads 16 of the rod 14 externally to the cap 22. As is well known, the electrical circuit is made between the rod 14 through the gap between the electrical terminal 9 and the protruding terminal 15. The plug 3 is grounded on the cylinder. The one wire connection to the spark plug is made to the upper end of the rod 14. In order to secure this wire (not shown), it is wrapped or bent around the rod 14 above the cap 22 and beneath the nut

23. By screwing the nut 23 down against the wire, the wire is forced into contact with the cap 22 and a solid jointure made between the wire and the nut 23, cap 22 and rod 14. The purpose of the cap 22 is to prevent the direct contact between the wire and the exposed end of the insulator 10. It will be observed that the portion of the insulator 10 above the horizontal line 24—24 is identical with the portion below that line. Only one cap 22 and one nut 23 are necessary.

When the portion of the insulator 10 that extends into the cylinder, that is to say, the lower portion, is sufficiently deteriorated, the insulator 10 may be reversed by unscrewing the nut 23 and removing the cap 22 and removing the assembly lug 20 and the washer 19. Specifically this reversal is accomplished after the parts that are to be removed are removed, by removing the insulator 10 and turning it upside down and then replacing the washer 19 and the assembly lug 20. The cap 22 will now be positioned on the upper end of the insulator 10, and the electrical wire (not shown) wrapped around the rod 14 and the nut 23 placed in position. It will be seen that the damaged or disintegrated portion of the insulator 10 is now in the upper portion of the plug 3 and that the portion that has not been disintegrated or damaged is in the lower portion of the plug 3. By these means the life of the insulator 10 is doubled, because the portion that has been damaged by being in the cylinder may perform the function of the insulator that is above the cylinder perfectly.

What I claim is:

A spark plug comprising a hollow plug externally threaded near its inner end for engagement in an engine cylinder, the outer end being internally enlarged and threaded, an inclined seat being formed between the outer enlarged end and the inner end, and an electrical terminal secured to the inner end of said hollow plug and extending radially inwardly, an integral porcelain insulator, said insulator formed with two similar frusto-conical portions, these portions being joined by an enlarged cylindrical portion, the frusto conical portions and the cylindrical portion being joined by inclined faces, a metallic rod secured centrally in said insulator and extending beyond the ends of said insulator, the external ends of said rod being reduced in cross sections, so as to produce protruding terminals, the portions of said rod above the protruding terminal external to said insulator being threaded, washers positioned on the inclined seat of said plug in frictional engagement with the inclined faces of said insulator, and an externally threaded assembly lug in threaded engagement with the internal threads of said plug, so that the inner reduced end of said rod is in sparking relationship with the inner protruding terminal formed on said plug, a cap operatively secured over the outer end of said rod in contact with the outer end of said insulator, a nut in selective threaded engagement with the outer end of said rod external to said cap.

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