June 5, 1934. E. E. MAIN 1,961,240

SPARK PLUG

Filed Sept. 14, 1932

FIG. 1

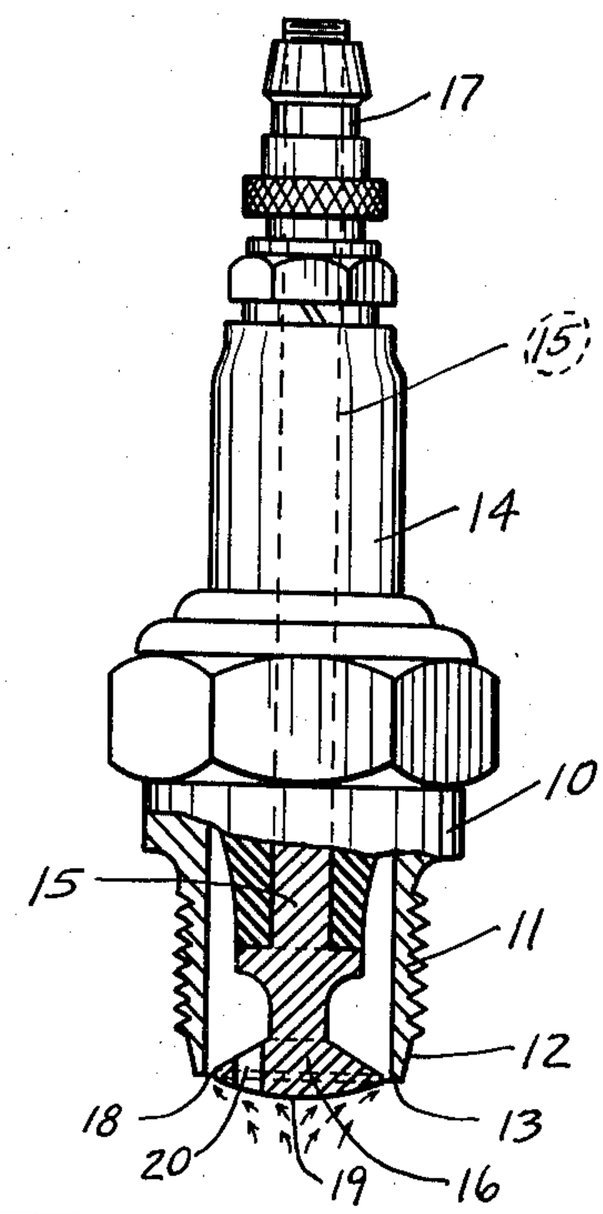


FIG. 2

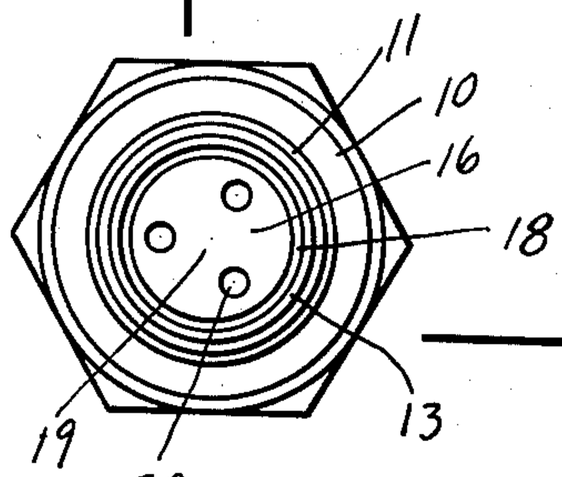


FIG. 3

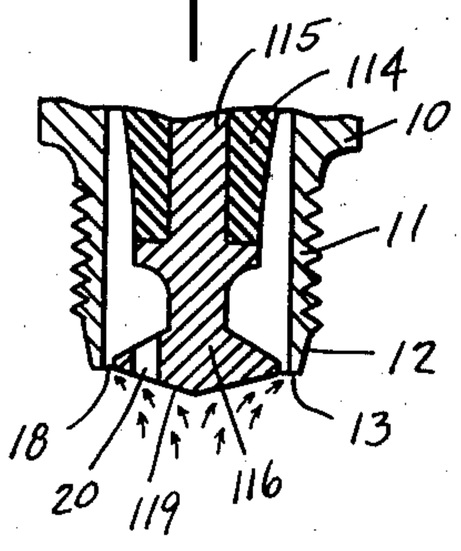
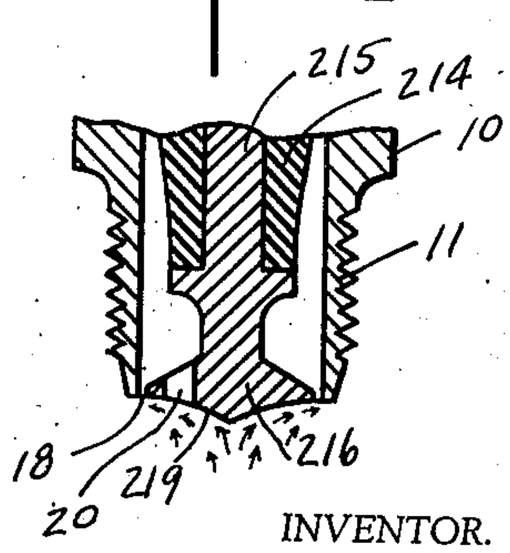


FIG. 4



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SPARK PLUG

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3 Claims. (Cl. 123—169)

This invention relates to an improvement in spark plugs, and particularly that character of spark plug set forth and disclosed in Letters Patent No. 1,305,660, dated June 3, 1919.

Making particular reference to the type of spark plug disclosed in said Letters Patent, it is the purpose of this invention to form the lower end of the central electrode, which comprises a disk, in such manner as to act as a deflector for directing the fuel to the sparking gap surrounding the same, increase the combustion thereof, and speed up the flame. Thus, the lower end of this electrode serves in a dual capacity, to provide a terminal for causing the electric spark to jump the gap surrounding it, and as a fuel and oil deflector.

By reason of the exposed convex surface of the lower end or face of the central electrode, which convex face may be curved, conical, or both, the oil, liquid fuel or gases impinging thereon are deflected radially to the spark gap between the central and outer electrodes. Thus, all such fluids or other substances impinging against this surface are directed to the gap where they are readily burned. This not only maintains a clean surface, but directs the combustible fluids to the spark gap so as to cause the combustion thereof and thereby increase the efficiency of the charge.

It will act to also deflect any oil, carbon or other heat producing particles that may come in contact therewith, to the outer shell, which in turn will dissipate the heat carried thereby through the walls of the combustion chamber. The plug will thereby be kept from overheating, and preignition will be eliminated as well as fouling through accumulation of carbon.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:

In the drawing Fig. 1 is an elevation of a spark plug with the lower portion thereof broken away. Fig. 2 is a bottom plan view of the plug. Fig. 3 is a modified form showing the lower cross sectional view thereof. Fig. 4 is the same as Fig. 3, showing a second modified form.

In the drawing there is shown a spark plug having a metallic body or shell 10 and shank 11 provided with the usual screw threads. The shank 11 has a continuous beveled face 12 which tapers into an annular terminal surface 13 and constitutes the outer electrode of the plug. The plug is provided with the usual insulating shell 14 secured in the metallic body or shell 10 which carries and insulates therefrom the stem 15 of the central electrode 16. The upper end of said stem is provided with a terminal 17.

This invention relates to the positive or central electrode 16. It will be noted that the terminal edges of both electrodes are circular, that of the electrode 13 being of slightly greater diameter than that of the electrode 16, so that a circular spark gap 18 is provided about the periphery of the button-like inner electrode 16. Said button-like electrode is formed with a curved convex face 19 terminating in the periphery thereof, and may also be provided with a plurality of perforations 20. It will be seen that the edges of the convex face 19 of the inner electrode are substantially flush with the terminal surface 13 of the outer electrode. Since an electric discharge between electrodes takes place with greatest intensity between projecting points or corners, the spark is concentrated at the exposed outer corners of the electrodes directly in the path of the mixture deflected by said convex surface.

In the modified form of the invention shown in Fig. 3, the electrode 116 is provided with a conical convex face 119. In Fig. 4, said electrode 216 is provided with a convex face 219 of conical, but curved form. While the invention pertaining to the deflector is shown herein as comprising the lower surface of the electrode terminal, thereby forming a part thereof, a deflector serving the same purpose may be employed in other types of spark plugs for deflecting the fluid and particles toward the spark gap.

As more specifically set forth in the above mentioned patent, the perforations 20 may be employed for cooling purposes, whereby the spark plug can be used in a hot or cold motor.

The invention claimed is:

1. A spark plug adapted to be mounted in a combustion chamber to ignite the gaseous fuel therein, said plug having an annular outer electrode, a circular inner electrode surrounded thereby and having its periphery spaced therefrom to provide a circular spark gap, and a deflector formed by the exposed surface of said inner electrode for deflecting the gaseous fuel and particles of material carried thereby radially toward said gap, the edges of said deflecting surface being substantially flush with the under surface of the outer electrode.

2. A spark plug adapted to be mounted in a combustion chamber to ignite the gaseous fuel therein, said plug having an annular outer electrode, a button-like inner electrode surrounded thereby and having its periphery spaced therefrom to provide a circular spark gap, and a con-

vex surface carried by said inner electrode against which the gaseous fuel and particles of matter carried thereby may impinge and be deflected radially towards said gap, the edges of said convex surface being substantially flush with the under surface of said outer electrode.

3. A spark plug adapted to be mounted in a combustion chamber to ignite the gaseous fuel therein, said plug having an annular outer electrode, a button-like inner electrode surrounded thereby and having its periphery spaced therefrom to provide a circular spark gap, a convex surface carried by said inner electrode against which the gaseous fuel and particles of matter carried thereby may impinge and be deflected radially towards said gap, and a plurality of perforations in the inner electrode for cooling the same, the edges of said convex surface being substantially flush with the under surface of the outer electrode.

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