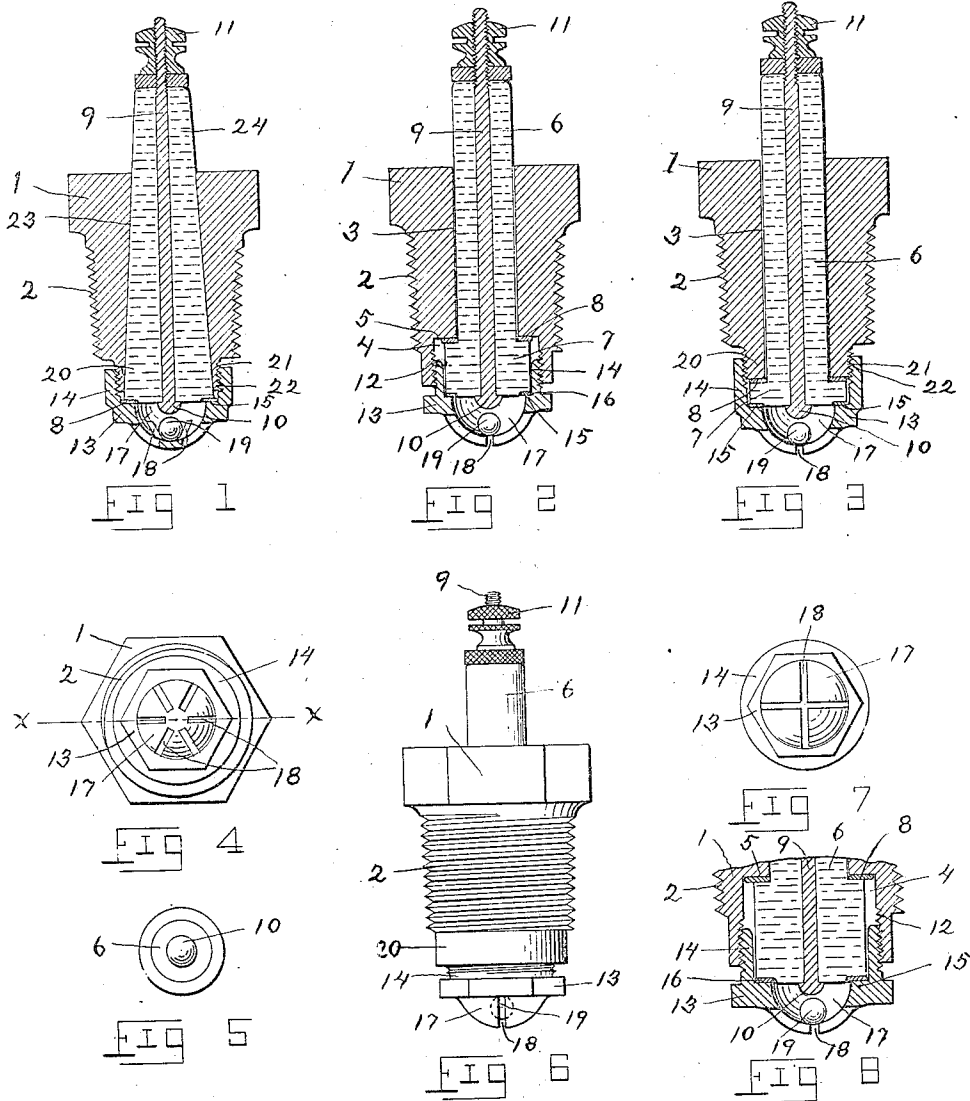


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SPARK PLUG.

APPLICATION FILED JAN. 25, 1910. RENEWED SEPT. 18, 1911.

1,042,818.

Patented Oct. 29, 1912



Witnesses:

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SPARK-PLUG.

1,042,813.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed January 25, 1910, Serial No. 540,045. Renewed September 18, 1911. Serial No. 640,319.

To all whom it may concern:

Be it known that I, ALBERT J. PARCHER, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Spark Plugs, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to a spark-plug or igniter for internal combustion engines, and has for its object to produce a spark-plug of this class, which will be simple, reliable and so constructed that it cannot become fouled by oil or carbon.

A still further object of the invention is to provide a spark-plug which is provided with a movable contact which will render the plug self-cleaning.

Another object is to produce a plug in which the porcelain or other insulating material is inserted in the plug from the bottom, thus preventing all danger of the insulation being blown out, and also all the pressure tends to force the insulating material into closer contact with the plug to prevent all escape of gas.

Another object of the invention is to form a spark-plug, in which one terminal is provided by the bushing nut or cap which is threaded upon the lower end of the plug and which may be adjusted in relation to the movable point of contact to produce spark gaps of various lengths.

With these and other objects in view my invention consists in certain construction and combination of parts as will hereinafter be fully described and claimed and illustrated in the accompanying drawings, which form a part of this application, and in which like figures of reference refer to corresponding parts in all of the views; but it is fully understood that while I have here described my invention as here shown, that I do not confine myself to the exact design as shown, as slight changes may be made in the construction and arrangement of the several parts without departing from the spirit of the invention.

In the drawings:—Figure 1, is a vertical sectional view of a spark-plug, taken on the line X—X of Fig. 4, embodying my invention, and showing one form of insulation. Fig. 2, is a vertical sectional view, showing

another form of insulation. Fig. 3, shows still another modified form of the invention. Fig. 4, is a bottom plan view of a plug of the form shown in Fig. 1. Fig. 5, is a bottom plan view of the insulating member, showing the head of the terminal case. Fig. 6, is a side elevation of the plug shown in Fig. 2. Fig. 7, is a bottom plan view of the bushing nut, or cap. Fig. 8, is a partial enlarged detail sectional view of Fig. 2.

Referring to the drawings, 1, indicates the metallic body of the plug, which is provided with the usual external screw threads 2, for attaching to the engine.

Referring to Figs. 2, 6, and 8, of the drawings, which illustrate the preferred embodiment of my device, the plug body 1, is formed with the axial cylindrical opening 3, which communicates at its lower end with the orifice or recess 4, which is of greater diameter than the opening 3, thus forming the shoulder 5. While within said cylindrical opening 3, and the orifice 4, is placed the insulating member 6, which is formed upon the lower end with the head 7, for engaging the shoulder 5; the gasket 8, being placed between to form a gas-tight joint. The insulating member 6, is provided with a metallic conductor 9, which is formed at its lower end with the conical head 10, and provided at its upper end, with the terminal 11.

The orifice 4, is formed with the internal threads 12, for the reception of the bushing-nut or cap 13, which is formed with the external threaded flange 14, and the shoulder 15, for engaging the lower edge of the insulating member 6; (with the gasket or washer 16, placed between) and designed to retain the insulating member 6, within the plug body 1. The lower end of the nut or cap 13, is formed with a conical end 17, which is provided with the vent slots 18; while within said conical end 17, is placed the steel ball 19, which forms a movable contact point between the conductor 9, and the nut 13, which forms the other conductor. The ball 19, is free to move within the conical end 17, thus keeping the same and the head 10, of the conductor 9, free from dirt and carbon; while a spark may be obtained while the plug is in any position, as the spark gap is either between the ball 19, and the head 10, or between the ball 19, and the conical nut 13, and is always the same;

and the length of spark may be adjusted by employing gaskets of varying thicknesses as required.

In Fig. 3, I show the plug body 1, formed with the reduced end 20, which is provided with the external threads 21; while the head 7, of the insulating member 6, bears against the bottom edge of the end 20; and the flange 14, of the nut 13, is provided with the internal threads 22, for engaging the end 20.

In Fig. 1, I show a plug body 1, which is formed with a tubular opening 23, which is of less diameter at the top than at the bottom; and within which is retained a tapered insulating member 24, by the action of the nut 13.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A spark plug, having a metal cage constituting an electrode, an electrode at the upper part of said cage, and a metal ball within the cage between said electrodes and constituting part of the sparking circuit, the interior of said cage being larger than said ball and affording unobstructed space for free movement of the ball up and down so as to touch the bottom of the cage and the electrode at the top thereof and also for free movement from side to side into contact with the side walls of the cage.

2. A spark plug, having a metal cage constituting an electrode and having an opening centrally through the bottom and other openings through the sides, an electrode at the upper part of the cage, above said bottom opening, and a freely movable metal ball in said cage constituting a movable electrode.

3. A spark plug, having a metal chamber constituting an electrode and having an opening through the wall thereof, an electrode projecting into said chamber and insulated therefrom, and a freely movable metal ball in said cage constituting a mov-

able electrode, said ball resting normally in said opening but too large to pass there-through.

4. A spark plug, comprising a metal shell presenting a chamber in its lower part, said chamber having an opening centrally through its bottom and presenting an electrode surface at the margin of said opening, an electrode at the upper part of the chamber, and a freely movable metal ball in said chamber between said electrodes.

5. A spark plug comprising a body portion provided with a terminal at one end, a plurality of fingers connected to the body portion and provided with inwardly directed outer ends which terminate short of one another and which form terminals, the fingers and their inwardly directed ends forming a cage, and a metallic ball adapted to be seated normally on the inwardly directed outer ends of said fingers and having vibratory movement in said cage between the inwardly directed outer ends of the fingers and the terminal of the body portion and between said terminal of the body portion and the fingers above said inwardly directed ends of the fingers.

6. A spark plug comprising a body portion provided with a terminal, fingers connected to said body portion and having their outer ends directed inwardly, said fingers with their inwardly directed ends forming a cage, and terminals, and a movable element confined within said cage and adapted for vibratory movement between said terminals, the fingers being bendable to provide for adjustment in the space between the terminal of the body portion and the inwardly directed ends of said fingers.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT J. PARCHEM.

Witnesses:

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