B. GLAZE.

SPARK PLUG.

APPLICATION FILED MAR. 11, 1918.

1,360,392. **Patented Nov. 30, 1920.**

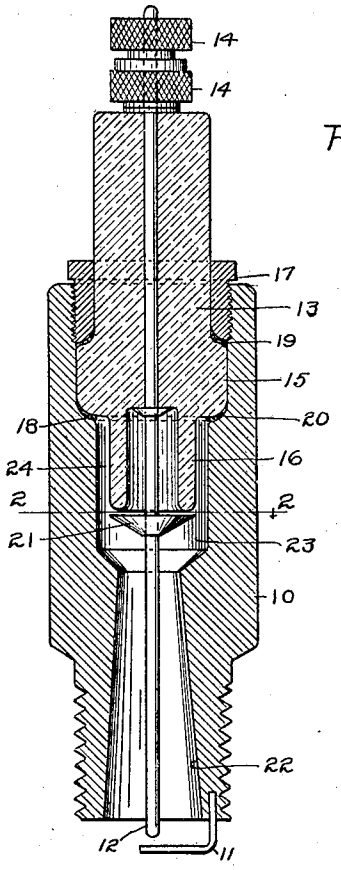
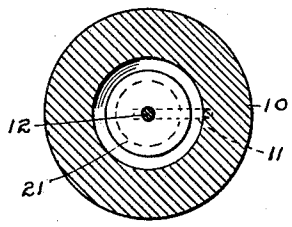


Fig. 1.

Fig. 2.



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BRUCE GLAZE, OF ANDREWS, INDIANA.

SPARK-PLUG.

1,360,392. Specification of Letters Patent. Patented Nov. 30, 1920.

Application filed March 11, 1918. Serial No. 221,599.

To all whom it may concern:

Be it known that I, BRUCE GLAZE, a citizen of the United States, residing at Andrews, in the county of Huntington and State of Indiana, have invented new and useful Improvements in Spark-Plugs, of which the following is a specification.

The invention relates to spark plugs for internal combustion engines and the object of the invention is to provide a device in which the danger of short-circuiting is practically eliminated, such short-circuiting being due to the collection of carbon upon the porcelain core or insulator and between the two electrodes of the plug. Another object is to provide a spark plug in which the porcelain core or insulator is surrounded with air of substantial uniform temperature and thereby avoid heat fracture of the same.

I accomplish the objects of the invention by the device illustrated in the accompanying drawings in which Figure 1 is a vertical cross-section of a device embodying the invention and Fig. 2 a cross-section on line 2—2 of Fig. 1.

Referring to the drawings I use for the outer electrode of the plug the detachable shell 10 which is adapted to be attached to the engine in the usual manner. Shell 10 carries the sparking point 11. The central or inner electrode 12 is supported in porcelain or insulator 13 and at its upper projecting end are the usual clamping nuts 14 to which the usual circuit wire leading from the source of electrical current is attached. Shell 10 is of course grounded through the engine and frame of the car or other device supporting the engine as is now commonly done. The porcelain is formed with an annular enlargement 15 and below the enlargement a cup-shaped extension 16 is formed on the porcelain the diameter of which is less than the inner diameter of the shell to provide an air space between the extension and the shell. Cylinder plug 17 is threaded into the upper end of the shell and serves in coöperation with shoulder 18 on the shell and enlargement 15, together with packing rings 19 and 20, to form a stuffing box. Immediately below the lower end of extension 16 of the porcelain a deflector 21 is fixed to central electrode 12, which deflector covers the cavity within the extension and causes all carbon produced by the explosion of the mixture when a spark is produced at the electrode extremities, to pass into the air space surrounding extension 16 where it can not collect on the electrode or within the cavity of the extension and produce a short-circuit between the electrode and shell 10. Shell 10 is extended below the lower end of extension 16 and cavity 22 is formed therein which preferably tapers upwardly so that its upper opening into cavity 23 is approximately in diameter, equal to or somewhat less than the diameter of deflector 21. Cavity 22 and cavity 23 and the space 24 between extension 16 and shell 10 form, together, an air chamber between the ignition point of the electrodes and the lower end of the porcelain proper in which air of practically the same temperature throughout the entire cycle of the engine is present and surrounds the porcelain, thereby preventing heat-breaking of the porcelain.

It is apparent that by means of the deflector attached to the central electrode and the depending extension on the porcelain carbon formed within the shell cannot collect on the electrode above the deflector but is diverted by the deflector into the space surrounding the wall of the extension where it collects and accumulates as it will without danger of producing a short-circuit between the central electrode and the shell. The air chamber between the ignition points of the electrodes and the lower end of the porcelain is an important advantage in the plug since fracture of the porcelain by heat destroys the usefulness of the plug. The air chamber provides an even temperature for the porcelain so that the danger of fracture is practically eliminated.

What I claim is:

A spark plug comprising an outer electrode carrying member having three communicating annular cavities between its opposite open ends the upper cavity having a greater diameter than the intermediate cavity and the lower cavity being longer than either of the other two cavities and tapering upwardly from its lower end at the lower end of the said member, to its juncture with the intermediate cavity, the diameter of said lower cavity at its upper end being less than the diameter of the intermediate cavity, an insulating member secured in the upper cavity and having a cup-

shaped portion extending down into the intermediate cavity and having the wall of said cup-shaped portion spaced from the adjacent wall of the intermediate cavity, an electrode extending through the insulating member, the cup-shaped portion and through the lower cavity and a deflector secured to the electrode immediately below the lower end of said cup-shaped portion as and for the purpose described.

In witness whereof I have hereunto subscribed my name this 6th day of March, 1918.

BRUCE GLAZE.