I. B. OWENS.

SPARK PLUG.

APPLICATION FILED JUNE 2, 1917.

1,306,834.

Patented June 17, 1919.

Fig. 1

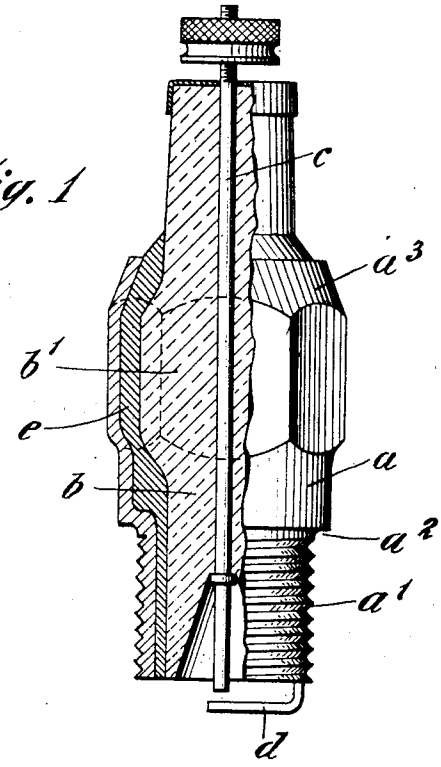
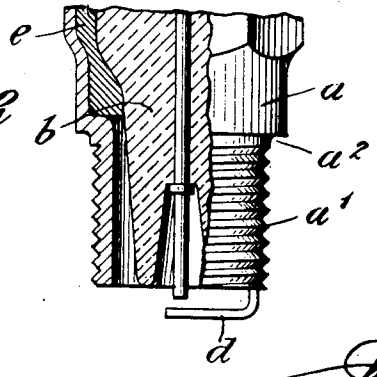


Fig. 2



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SPARK-PLUG.

1,306,834. Specification of Letters Patent. Patented June 17, 1919.

Application filed June 2, 1917. Serial No. 172,404.

To all whom it may concern:

Be it known that I, ISAAC B. OWENS, a citizen of the United States, and a resident of the borough of Manhattan, city and State of New York, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a description in such full, clear, and exact terms as will enable any person skilled in the art to which it pertains to make and use the same.

My invention relates to an improvement in spark plugs the object of which is to simplify the cost of the plug and at the same time produce a more durable and efficient article.

To this end the invention resides in certain features of construction and arrangement of parts which will be fully set forth hereinafter and particularly pointed out in the claims.

Reference is now had to the accompanying drawing in which—

Figure 1 is a sectional elevation of my improved plug, and

Fig. 2 is a fragmentary section of a modification.

Referring to Fig. 1, the usual body a of the plug may be made in any desired manner with the threaded lower end a^1 to enter the cylinder head, the shoulder a^2 to engage the top of the cylinder head and an inturned upper portion a^3 the function of which will be fully set forth hereinafter.

b indicates the usual mass of insulation which extends centrally through the body of the plug and carries the conductor rod c extending through it in the usual way and cooperating with a sparking pin d secured to the threaded part a^1 of the body a, all in the usual manner.

In assembling the plug the porcelain b with its rod c is inserted into the body a through the upper end thereof. It will be noted that the porcelain has an enlargement b^1 at its middle portion and the porcelain is adjusted so that this enlargement b^1 lies between the shoulder a^2 and the inturned upper part a^3 of the body a. When the parts are thus disposed and the porcelain is centered in the body, a mass of soft metal, e, in molten form is run into the space between the porcelain b and the body a, and is allowed to harden into form from the threaded extremity a^1 continuously to the upper edge a^3 of the body. This mass e may be any relatively soft metal, such as lead or the alloys thereof or what is known as Babbitt metal or any soft metal which will stand the required heat.

The metal e may or may not extend below the shoulder a^2. In Fig. 1 it is shown extending to the very lower extremity of the body a while in Fig. 2 it is shown as stopped at the shoulder a^2. The construction shown in Fig. 2 provides a greater insulation surface at the lower end of the plug and does not expose the soft metal to the intense heat at the point of ignition of the charge.

It should be noted that the soft metal e which is molded into the plug as described serves five functions, namely: (1) It holds the porcelain permanently and securely in the body of the plug; (2) it serves as a packing or gasket means between the porcelain and the body to prevent the escape of gases from the cylinder; (3) it establishes a close metallic connection all along the opposing surfaces of the porcelain and the metal body and carries away the heat which would otherwise accumulate in the porcelain and which is responsible for the frequent crackings of the porcelain in spark plugs; (4) it greatly cheapens the structure of the plug by doing away with the packing gaskets which are ordinarily employed and also with the screw collar or gland which is usually employed in the outer end of the plug to hold the porcelain in place; and (5) the heat conducting qualities of the metal e prevents loss of current or spark and by keeping the porcelain and adjacent parts relatively cold avoids preignition.

What I claim is:—

1. A spark plug, having a body with its lower end threaded and a shoulder immediately above the threaded portion, the upper part of the body being inturned, a central porcelain insulator having an annular enlargement, the insulator extending through the body and spaced therefrom and projecting above the same and the annular enlargement lying between the said shoulder and the inturned upper end of the body and a mass of relatively soft metal molded within the body of the spark plug between the said shoulder and the inturned upper end thereof, by which relatively soft metal the insulator is permanently held gas tight in place in the body and the heat absorbed by the insulator is carried off to the body and permitted to

radiate from the same to prevent the heat cracking the porcelain.

2. A spark plug, having a metal body, an insulator extending centrally through the same and spaced therefrom and a mass of relatively soft metal molded within the body of the plug between inner walls thereof and the insulator, whereby the insulator is permanently held gas-tight in position and the heat absorbed by the insulator is conducted to the walls of the metal body and permitted to radiate from the same.

3. A spark plug having a metal body, a centrally disposed insulator spaced from the body at all points and a mass of relatively soft metal molded within the body between the inner walls thereof and the insulator, the insulator and body being provided with means for permanently holding the said mass of metal gas-tight in place for the purpose specified.

4. A spark plug having a metal body, a porcelain insulator extending centrally through it and spaced therefrom at all points, a mass of relatively soft metal molded within the body of the plug between its inner walls and the porcelain, the body and porcelain having means for permanently holding said mass of metal in place, whereby the porcelain is held in place and the heat absorbed by the porcelain is carried off to the body and permitted to radiate from the same to prevent the heat cracking the porcelain.

5. A spark plug, comprising a metal body provided with a polygonal sided enlargement, an insulator passing therethrough and spaced therefrom, provided with opposed shoulders, and a mass of relatively soft cast metal within said enlargement and engaging said opposed shoulders upon the insulator.

6. A spark plug, comprising a metal body having opposed shoulders, an insulator within said metal body and spaced therefrom, having opposed shoulders, and a mass of cast metal within said metal body and engaging the opposed shoulders of said body and insulator to hold the same in fixed position.

7. In a spark plug, the combination with a metal body, of an insulator having its inner end exposed, and cast metallic means between said body and insulator for directly carrying off the heat from said exposed end to said body.

8. In a spark plug, the combination with a metal body, of an insulator having its inner end centrally recessed, and a mass of cast metal within said metal body between its inner walls and the outer walls of said insulator and extending to the innermost end of said insulator.

In testimony whereof I have hereunto signed my name in the presence of two witnesses.

ISAAC B. OWENS.

Witnesses:
PATRICK A. BOLGER,
ETHEL S. HUGHES.