

G. H. OAKES.
ELECTRIC IGNITING PLUG.
APPLICATION FILED DEC. 8, 1903.

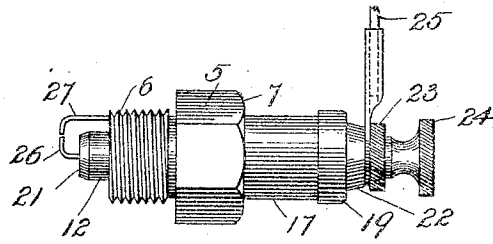


Fig. 1.

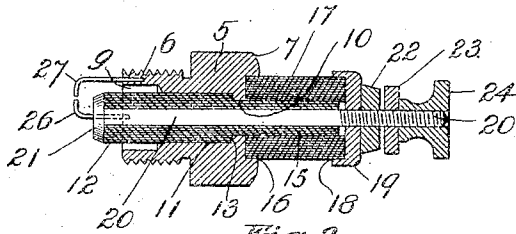


Fig. 2.

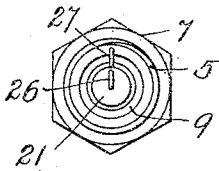


Fig. 3.

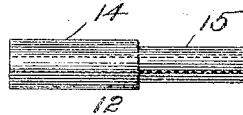


Fig. 4.

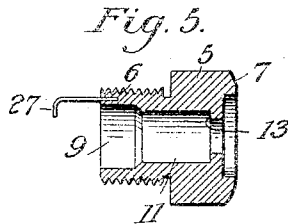


Fig. 5.

Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE H. OAKES, OF ARLINGTON HEIGHTS, MASSACHUSETTS.

ELECTRIC IGNITING-PLUG.

SPECIFICATION forming part of Letters Patent No. 782,873, dated February 21, 1905.

Application filed December 8, 1903. Serial No. 184,274.

To all whom it may concern:

Be it known that I, GEORGE H. OAKES, a citizen of the United States, residing at Arlington Heights, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Electric Igniting-Plugs, of which the following is a specification.

The object of this invention is to provide a simple, cheap, durable, and effective electric igniting-plug for gasolene-engines which is particularly constructed and adapted to avoid short-circuiting.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a side elevation of my improved igniting-plug. Fig. 2 is a central longitudinal section of the same. Fig. 3 is a left-hand end elevation of the same. Fig. 4 is a detail side elevation of the inner insulating-sleeve. Fig. 5 is a longitudinal section of the plug-casing.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 5 is a metallic casing having a screw-thread 6 formed upon the exterior thereof and a hexagonal head 7, whereby said casing may be conveniently attached to the cylinder of a gasolene-engine in a manner well known to those skilled in this art. The casing 5 is provided with a cylindrical aperture extending longitudinally there-through and comprising three chambers—an inner chamber 9, an outer chamber 10, and an intermediate chamber 11. The diameter of the inner chamber 9 is greater than that of the intermediate chamber 11, and the diameter of the intermediate chamber 11 is greater than that of the outer chamber 10.

When the igniting-plug is attached to the cylinder of the engine, the inner chamber 9 is adjacent to the interior of said cylinder and the outer chamber 11 projects outside said cylinder. A cylindrical inner insulating-sleeve 12 extends through the casing 5, projecting beyond the opposite ends thereof, and is of such dimensions as to form a driving fit in said intermediate and outer cham-

bers, the adjacent ends of said intermediate and outer chambers forming a shoulder 13 in the casing 5, against which the inner insulating-sleeve 12 is driven. Said inner insulating-sleeve is formed of sheet-mica wound in cylindrical form in layers extending longitudinally thereof, the portion 14 thereof which fits in the intermediate chamber 11 being of greater diameter than the portion 15, which fits in the outer chamber 10, said cylinders thus forming at their juncture a shoulder.

The outer end of the metallic casing 5 is provided with an annular groove 16, and surrounding the portion of the insulating-sleeve 12 which projects outside said casing 5 is an outer insulating-sleeve 17, also formed of sheet-mica wound around the projecting portion of said inner insulating-sleeve. The left-hand end, Fig. 2, of said outer insulating-sleeve 17 projects into said annular groove 16, and the right-hand end thereof projects into another annular groove, 18, formed in the left-hand face of a nut 19. The nut 19 has screw-threaded engagement with a bolt 20, constituting an electrode which projects through the inner insulating-sleeve 12, and is provided with a head 21, which bears against the left-hand end of said inner insulating-sleeve. The nut 19 is held firmly in position by a set-nut 22, having screw-threaded engagement with the bolt-electrode 20.

A nut 23 and set-nut 24 form a convenient means for attaching an electric wire 25 to the electrode 20. A wire 26 is fast to the left-hand end of the electrode-bolt 20 and terminates adjacent to a wire 27, fast to the metallic casing 5 and constituting a second electrode.

In constructing and assembling the parts of my improved electric igniting-plug the inner insulating-sleeve 12 is driven into the intermediate chamber 11 and outer chamber 10 until the right-hand end of the portion 14 of said insulating-sleeve abuts against the shoulder 13 in the metallic casing 5. The electrode-bolt 20 is then passed through said inner insulating-sleeve. The outer insulating-sleeve 17 is placed upon the portion of the inner insulating-sleeve which projects beyond the casing 5, at the right-hand side thereof, Fig. 2. The nut 19 is then screwed upon the right-

hand end of the bolt-electrode 20 and forces the outer insulating-sleeve toward the left and the inner insulating-sleeve toward the right, bringing the inner insulating-sleeve firmly against the shoulder 13 and forcing the left-hand side of the outer insulating-sleeve into the annular groove in the metallic casing 5. At the same time the right-hand end of the outer insulating-sleeve 17 is forced into the annular groove 18.

It will be seen and understood that both the inner and outer insulating-sleeves are formed of mica wound in cylindrical form and said mica is kept from unwinding in the case of the outer insulating-sleeve by the ends of said sleeve projecting into the annular grooves 16 and 18. The set-nut 22 is next screwed upon the bolt 20 and up against the right-hand face of the nut 19, holding the same firmly in position. The electric wire 25 is held in position by means of the nut 23 and set-nut 24.

The advantages secured by the construction hereinbefore described are as follows: The aperture and annular groove 16 being cylindrical are easily drilled or bored in the casing 5. The electrode 20 is thoroughly protected from short-circuiting by the inner insulating-sleeve 12 and by the outer insulating-sleeve 17. In addition to this there is a space between the periphery of the inner insulating-sleeve and the walls of the chamber 9.

The different parts of the device are easily assembled or taken apart when first constructed or subsequently when repairs become necessary; but most important of all the advantages secured by my device is the fact that the insulating material, being wound as described, extends longitudinally of the electrode-bolt and both ends of the outer insulating-sleeve and also the inner insulating-sleeve are covered, so that no oil can possibly pass through into the interior of the insulating-sleeves and assist in short-circuiting, and also it will be noted that as the outside of the inner insulating-sleeve comes in contact with the casing 5 it is driven and forced thereinto, so that no oil can possibly enter between said parts.

In carrying my improved igniting-plug into practical use the screw-threaded portion 6 of the casing 5 is screwed into the cylinder of a gasoline-engine, with the electrodes 20 and 27 projecting into the interior of said cylinder. The cylinder of the engine is connected with one of the electric wires of an electric circuit, the other wire, 25, being connected thereto in a manner well known to those skilled in the art.

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

1. An electric igniting-plug comprising in its construction an insulating-sleeve formed of sheet material wound in cylindrical form in layers extending longitudinally thereof, one

portion of said sleeve being greater in diameter than the other, said cylindrical portions forming at their juncture a shoulder.

2. An electric igniting-plug comprising in its construction a metallic casing constructed with a cylindrical aperture extending therethrough, said aperture comprising three chambers, an inner chamber, an outer chamber, and an intermediate chamber, the diameter of said intermediate chamber being greater than that of said outer chamber and forming a shoulder adjacent to the inner end of said outer chamber, and an inner insulating-sleeve extending through said casing formed of sheet material wound in cylindrical form in layers extending longitudinally thereof, one portion of said sleeve being greater in diameter than the other, said cylindrical portions forming at their juncture a shoulder, the larger cylindrical portion forming a driving fit in said intermediate chamber and the smaller cylindrical portion forming a driving fit in said outer chamber.

3. An electric igniting-plug comprising in its construction a metallic casing constructed with a cylindrical aperture extending therethrough, said aperture comprising three chambers, an inner chamber, an outer chamber and an intermediate chamber, the diameter of said intermediate chamber being greater than that of said outer chamber and forming a shoulder adjacent to the inner end of said outer chamber, an annular groove formed in the outer end of said casing, an inner insulating-sleeve extending through said casing formed of sheet material wound in cylindrical form in layers extending longitudinally thereof, one portion of said sleeve being greater in diameter than the other, said cylindrical portions forming at their juncture a shoulder, the larger cylindrical portion forming a driving fit in said intermediate chamber and the smaller cylindrical portion forming a driving fit in said outer chamber, and an outer insulating-sleeve surrounding the portion of said inner insulating-sleeve which projects outside said casing, said outer insulating-sleeve projecting into said annular groove.

4. An electric igniting-plug comprising in its construction a metallic casing constructed with a cylindrical aperture extending therethrough, said aperture comprising three chambers, an inner chamber, an outer chamber and an intermediate chamber, the diameter of said intermediate chamber being greater than that of said outer chamber and forming a shoulder adjacent to the inner end of said outer chamber, an annular groove formed in the outer end of said casing, an inner insulating-sleeve extending through said casing formed of sheet material wound in cylindrical form in layers extending longitudinally thereof, one portion of said sleeve being greater in diameter than the other, said cylindrical portions forming at their juncture a shoulder, the larger cylindrical portion forming a driving fit in said intermediate chamber and the smaller cylindrical portion forming a driving fit in said outer chamber, and an outer insulating-sleeve surrounding the portion of said inner insulating-sleeve which projects outside said casing, said outer insulating-sleeve projecting into said annular groove.

dricul portion forming a driving fit in said intermediate chamber and the smaller cylindrical portion forming a driving fit in said outer chamber, and an outer insulating-sleeve surrounding the portion of said inner insulating-sleeve which projects outside said casing, said outer insulating-sleeve projecting into said annular groove, an electrode extending longitudinally through said sleeves consisting of a bolt with a head at one end thereof and a nut having screw-threaded engagement therewith at the opposite end thereof and constructed to draw the shoulder of said inner insulating-sleeve against the shoulder in said casing, and said outer insulating-sleeve into said annular groove.

5. An electric igniting-plug comprising in its construction a metallic casing constructed with a cylindrical aperture extending there-through, an insulating-sleeve formed of sheet material extending through said aperture, said sheet material wound in cylindrical form in layers extending longitudinally thereof, one portion of said sleeve being greater in diameter than the other, said cylindrical portions forming at their juncture a shoulder, and means to clamp said shouldered portion of said sleeve against a shoulder formed in said casing, said clamping means forming a cover for the opposite ends of said sleeve.

6. An electric igniting-plug comprising in its construction a metallic casing constructed with a cylindrical aperture extending there-through, an inner insulating-sleeve extending through said aperture and projecting beyond the opposite ends thereof, said inner insulating-sleeve formed of sheet material wound in cylindrical form in layers extending longitudinally thereof, one portion of said sleeve being greater in diameter than the other, said cylindrical portions forming at their juncture a shoulder, an outer insulating-sleeve formed of sheet material wound in cylindrical form in layers extending longitudinally thereof and surrounding the portion of said inner insulating-sleeve which projects outside said casing, and means to clamp said insulating-sleeves to said casing, said clamping means forming a cover for the opposite ends of said inner insulating-sleeve.

7. An electric igniting-plug comprising in its construction a metallic casing constructed with a cylindrical aperture extending there-through, an inner insulating-sleeve formed of sheet material, wound in cylindrical form extending through said aperture and projecting beyond the opposite ends thereof, said sheet material wound in layers extending longitudinally of said inner insulating-sleeve, one portion of said sleeve being greater in diameter than the other, said cylindrical portions forming at their juncture a shoulder, an outer insulating-sleeve formed of sheet material, wound in cylindrical form in layers extending longitudinally thereof, surrounding the portion of said inner insulating-sleeve which projects outside said casing, an electrode extending longitudinally through said sleeves, consisting of a bolt with a head at one end thereof and a nut having screw-threaded engagement therewith at the opposite end thereof and constructed to clamp said insulating-sleeves to said casing, the head of said bolt and of said nut forming a cover for the opposite ends, respectively, of said inner insulating-sleeve.

8. An electric igniting-plug comprising in its construction a metallic casing constructed with a cylindrical aperture extending there-through, an inner insulating-sleeve formed of sheet material, wound in cylindrical form extending through said aperture, said sheet material wound in layers extending longitudinally of said insulating-sleeve, one portion of said sleeve being greater in diameter than the other, said cylindrical portions forming at their juncture a shoulder, an electrode extending through said sleeve, means for clamping said electrode to said sleeve, said electrode provided with a head extending entirely across the inner end of said sleeve and forming a cover therefor.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE H. OAKES.

Witnesses:

CHARLES S. GOODING,
ANNIE J. DAILEY.