K. C. WIDEEN.

SPARKING PLUG.

APPLICATION FILED JAN. 25, 1906.

967,283.

Patented Aug. 16, 1910.

Fig. 1.

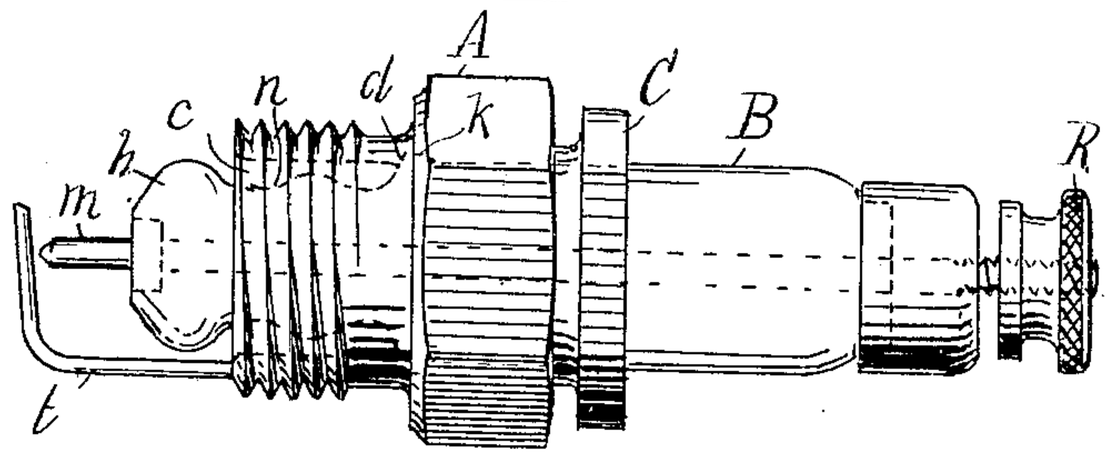
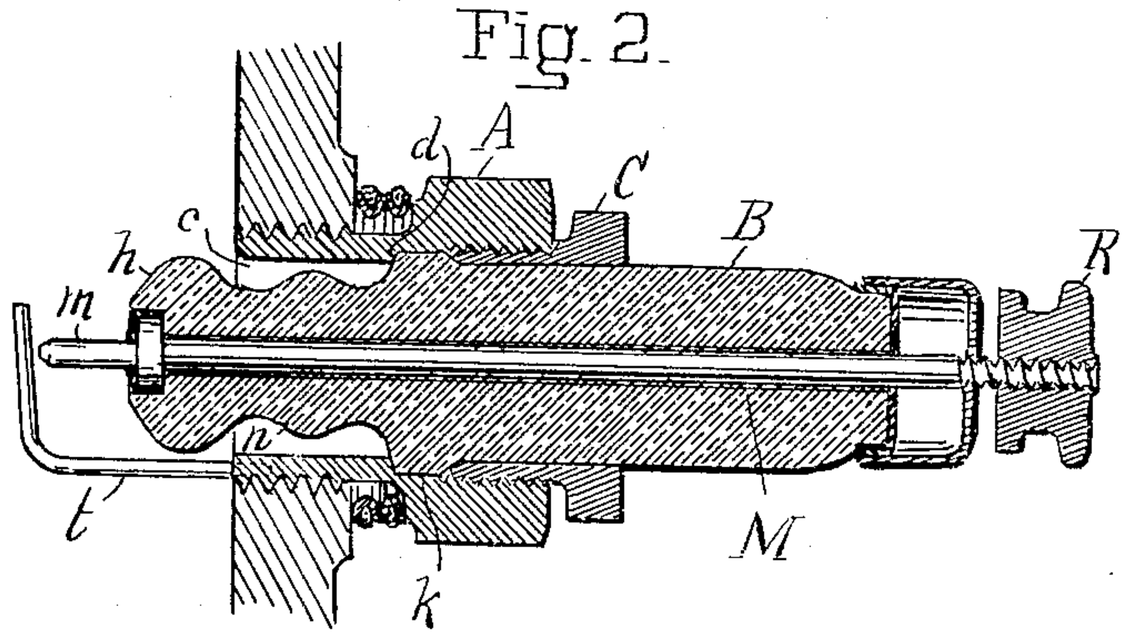


Fig. 2.



Witnesses=

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UNITED STATES PATENT OFFICE.

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SPARKING PLUG.

967,283. Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed January 25, 1906. Serial No. 297,730.

To all whom it may concern:

Be it known that I, KNUT C. WIDEEN, a subject of the King of Sweden, residing in the borough of Brooklyn, in the city of New York, county of Kings, and State of New York, have invented an Improvement in Sparking Plugs, of which the following is a specification.

This invention relates to the construction of devices for the support of the electric sparking points in the cylinders of explosive engines.

One object of the invention is to provide an insulating tube which separates the two conducting members of the sparking plug, and in which sooting of the exposed surface of the insulating tube with the consequent electrical surface creepage and short circuiting is lessened by the shielding of a part of such surface.

A further object of the invention is to increase the durability of the insulating tubes by enlarging or providing the tubes with heads at the exposed ends which adjoin the sparking points.

A further object of the invention is to reduce the liability to electrical surface creepage by corrugation and consequent extension of the length of exposed surface between the nearest points of contact of the two conducting members with the insulating tube.

In the accompanying sheet of drawings, which forms a part of this application, Figure 1 is an external view of a sparking plug embodying my invention. Fig. 2 is a longitudinal section through the plug in place in the wall of an engine cylinder.

The sparking plug comprises a metal bushing A, exteriorly screw-threaded for insertion in the wall of the cylinder of an explosive engine. In the assembled plug the interior of this bushing at the exteriorly-threaded end constitutes a chamber *c*. At the bottom of the chamber is an annular shoulder *d*, and the bushing at the other end is interiorly-threaded. A refractory tube B is contained within the bushing and projects from each end thereof, it having an enlarged annular collar *k* thereon which fits snugly within the bushing between the annular shoulder *d* on the latter, and a threaded collar C screwed into the bushing from the exterior end thereof. The inner end of the tube consists of a hemispherical head *h* of as large a diameter as will permit its insertion through the bushing, it being substantially of a diameter equal to the interior diameter of the latter, the head being united to the part of the tube which is surrounded by the collar *k* by a neck portion, which is of less diameter than the diameter of the bushing, so that an annular chamber *c* surrounds such portion of the tube, the neck portion being surrounded by undulatory grooves, whereby its surface is formed into a series of gentle curves *n*. The enlarged head is entirely located beyond the inner end of the bushing so that while it covers the annular chamber *c* it is out of contact with the inner end of the bushing. A bent wire *t* which is firmly secured to the rim of the bushing, lies across the axis of the bushing in front of the head of the insulating tube, and a conducting member M passes through the insulating tube and has an exposed wire-end *m* in proximity to the bent wire. The conducting member is firmly secured in the insulating tube and threaded at the end opposite to the end with the wire end *m* for a binding nut R, by which electrical connection may be made. The two wires are the sparking points of the sparking plug, and each wire, with the metal parts to which it is attached, constitutes one of the conducting members of the sparking plug.

The spark takes place between the end of the exposed wire-end of the conducting member and a point on the bent wire secured to the rim of the bushing, which is in proximity thereto. When the sparking plug is in place in the wall of the cylinder, these wires project within the cylinder. It has been found that the explosion frequently leaves a residue of solid matter as unconsumed oil and carbon, which is projected by the shock of explosion within the cylinder in all directions and causes all surfaces which may be exposed to the interior of the cylinder to become coated. As such matter has a certain amount of electrical conductivity, the coating of the surfaces of the insulating tubes causes short circuits, which interfere with proper sparking. This objectionable action is mitigated by the construction above set forth, first in the provision of the head portion on the insulating tube, which substantially covers the opening to the chamber of the plug sufficiently to shield the neck por-

tion, and which due to its rounded form, deflects such matter sidewise across the mouth of the chamber instead of permitting it to enter therein, and this action is further mitigated by reason of the circumferential corrugation of the neck portion, whereby the extent of surface which must be coated before there can be a short circuit is considerably extended.

What I claim as my invention and desire to secure by Letters Patent, is—

In a sparking plug, the combination of a chambered plug, an insulating tube contained within the plug and having an enlarged body portion thereon held within the plug, and having a hemispherical head not less than the diameter of the chamber of the plug located opposite to and having its largest diameter beyond the mouth of the plug and out of contact therewith, connected with the enlarged body portion of the tube by a corrugated neck portion having a diameter less than the diameter of the chamber of the plug and separated therefrom by an annular chamber.

Signed by me at New York city, N. Y., this 24th day of January, 1906.

KNUT C. WIDEEN.

Witnesses:
SAMUEL W. BALCH,
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