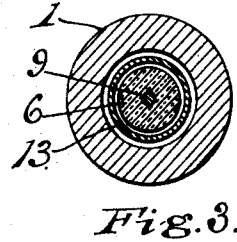
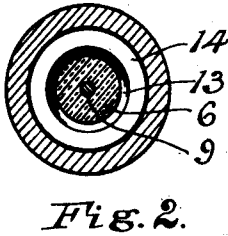
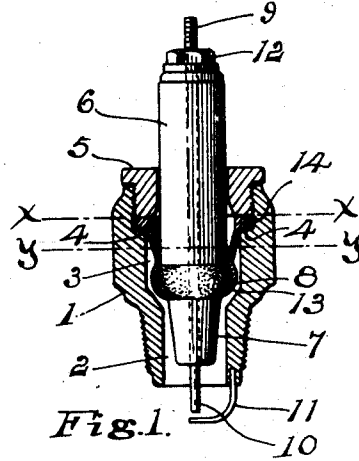


A. SCHMIDT.
SPARK PLUG.
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980,566.

Patented Jan. 3, 1911.



Witnesses
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SPARK-PLUG.

980,566.

Specification of Letters Patent.

Patented Jan. 3, 1911.

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To all whom it may concern:

Be it known that I, ALBERT SCHMIDT, a citizen of the United States of America, residing at Flint, in the county of Genesee and State of Michigan, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in spark plugs and its object is to provide a suitable support for the insulating member thereof which will permit of the free expansion of the parts and prevent breakage of the porcelain insulation, at the same time securely holding said porcelain insulating member and making a tight joint to prevent products of combustion from escaping.

To this end the invention consists in the construction, arrangement and combination of parts all as hereinafter more fully described and particularly pointed out in the claims reference being had to the accompanying drawing, in which,

Figure 1 is a vertical section through a device embodying the invention and showing the insulating plug in elevation; Fig. 2 is a transverse section on the line $x-x$ of Fig. 1; Fig. 3 is a similar section on the line $y-y$ of Fig. 1; and Fig. 4 is a perspective detail of a supporting thimble.

As shown in the drawing 1 is a metal bushing or shell provided with a tapering screwthreaded end and a hexagonal portion or head by means of which the bushing may be screwed into a screwthreaded opening in an engine cylinder. This bushing is formed with a bore 2 in its inner end and an enlarged bore or chamber 3 in its outer end, the extreme outer end of the chamber being further enlarged to form a shoulder or ledge 4 and is internally screwthreaded to receive a screwthreaded ring nut 5. A porcelain insulating plug 6 is supported within the bushing with its inner reduced and tapered end 7 extending within the bore 2 of the bushing and its outer cylindrical end extending outward through the nut 5. Within the lower end of the chamber 3 the plug 6 is formed with an enlarged rounded portion or bead 8 and an axial hole is provided in the plug for a rod 9, the inner end 10 of which forms one electrode. The other electrode of the device is formed by a wire 11

secured to the inner end of the bushing and bent laterally over and adjacent to the inner end of the rod. The rod 9 is secured within the plug in any desired manner as by a nut 12 on its screwthreaded outer end.

The insulating plug 6 is supported within the bushing with a space between it and the bushing, by means of a thimble 13 which is provided at its upper end with a thickened rim portion or ring 14 formed integral therewith and the body portion of the thimble extends downward from the ring and is contracted or inwardly tapered toward its lower end. This body portion of the thimble is of thin metal so that it may be forced upon the insulating plug with the extreme lower end of the body engaging the enlarged portion or bead 8 of said plug. The thin metal of the body is then spun or otherwise formed down upon the bead to embrace the same, and firmly engage the thimble with the plug. Preferably the bead, in the manufacture of the porcelain is left rough so that the bead may be plated with a deposit of copper or other suitable metal which will enter the pores of the porcelain and firmly adhere thereto. To this plated bead, the portion of the thimble which is formed down thereon may be secured by brazing or the like to firmly secure the lower end of the thimble to the plug and form a tight joint between, which will prevent the products of combustion from blowing through between the parts when the device is in use. The ring 14, when the plug is in place within the bushing engages the shoulder or ledge 4 and the ring nut 5 engages the upper side of the ring 14 and when screwed in firmly, clamps the ring 14 of the thimble securely between said ledge and nut. The insulating plug is thus suspended by the thimble within the chamber of the bushing and the thimble extending across the space between the plug and the walls of the chamber prevents the products of combustion from blowing through when the device is in use. The body of the thimble being formed of thin metal and flaring outwardly from the plug across the space between the plug and wall of the chamber, permits a free expansion and contraction of the parts without danger of putting such a strain upon the porcelain as to crack the same and render it useless.

Having thus fully described my invention what I claim is:—

1. A device of the character described comprising an insulating member, a member
5 within which said insulating member is supported with a space between, and a member spanning said space and rigidly secured at its inner portion to said insulating member and at its outer portion to said supporting
10 member, said spanning member being adapted to yield between its inner and outer portions.

2. A device of the character described comprising an insulating member, an outer
15 member surrounding the insulating member, and a tubular supporting member secured at one end to the insulating member to support and hold the same and secured at its opposite end to the outer member, said supporting member being adapted to yield intermediate its ends.

3. A device of the character described comprising an insulating member, an outer
25 member surrounding the insulating member with a space between, a tapering tubular supporting member rigidly secured at its smaller end to the insulating member, and forming a tight joint therewith and detachably and rigidly attached at its larger
30 end to the outer member, said member extending across the space between the insulating member and the outer member to close said space and free to yield laterally intermediate its ends.

35 4. A device of the character described comprising a bushing formed with a chamber having an inwardly projecting ledge, an insulating member in said chamber with a space between it and the wall of said
40 chamber, a supporting member rigidly secured at its inner portion upon the insulat-

ing member, and extending outward into engagement with said ledge, said supporting member forming a wall extending across said space to close the same and free to
45 yield laterally, and a ring nut within the outer end of the chamber to clamp the outer portion of said supporting member between said nut and ledge.

5. A device of the character described 50 comprising a bushing having a chamber, an insulating member supported within said chamber with a space between it and the wall of the chamber and having an annular bead, a supporting member embracing said
55 bead to rigidly secure the supporting member to the insulating member and having a yielding portion extending outward across said space, and means for detachably and rigidly securing the outer portion of the
60 supporting member to the bushing to form a tight joint therewith.

6. A device of the character described comprising a bushing, an insulating plug
65 formed with an annular bead and supported within the bushing with a space between the plug and bushing, a tapered tubular supporting member sleeved upon the plug, and having its smaller end formed down upon
70 said bead into engagement with the upper and lower sides of said bead to prevent the movement of said member upon the plug and to form a tight joint, and means engaging the larger end of the supporting
75 member to rigidly and detachably secure said member to the bushing.

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

ALBERT SCHMIDT.

Witnesses:

B. DE GUICHARD,
ALICE SWEETWOOD.