A. SCHMIDT.

SPARK PLUG.

APPLICATION FILED JULY 26, 1909.

999,343. Patented Aug. 1, 1911.

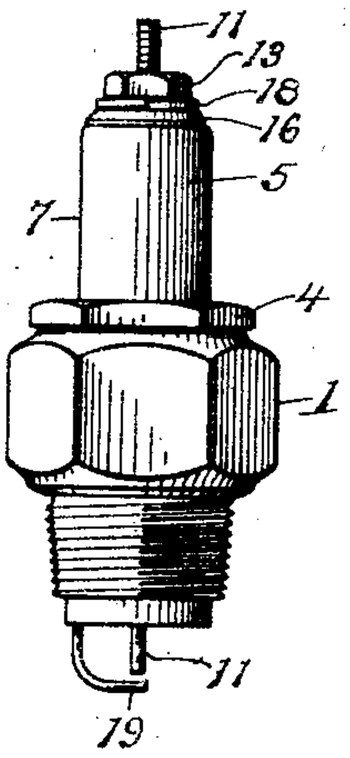

Fig. 1.

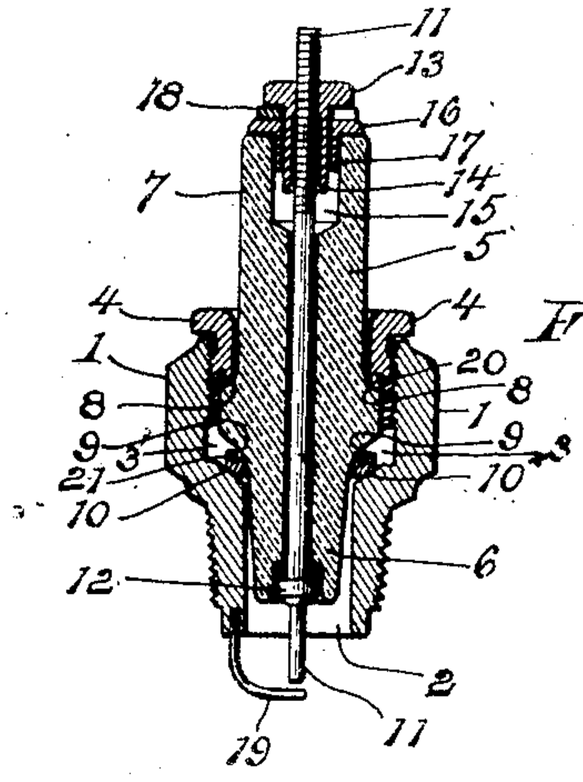

Fig. 2.

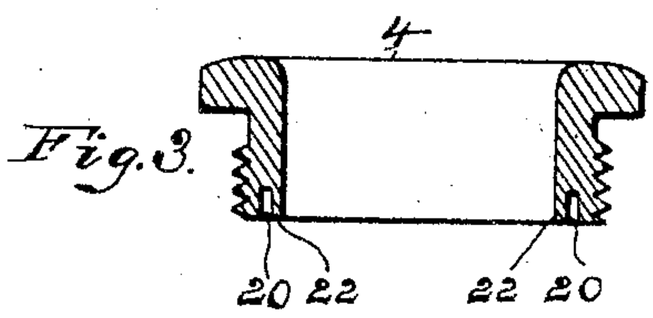

Fig. 3.

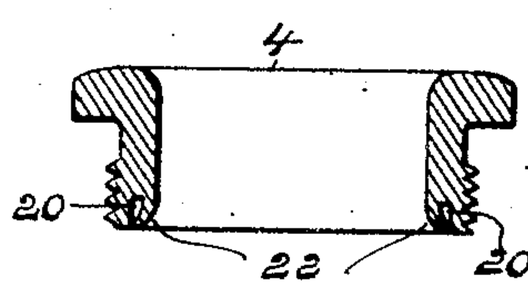

Fig. 4.

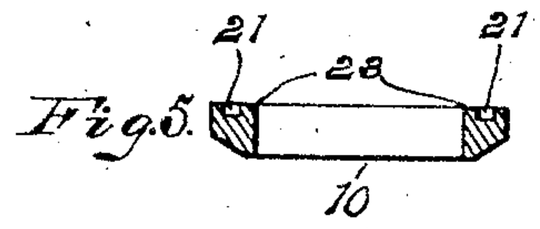

Fig. 5.

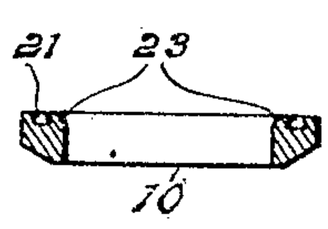

Fig. 6.

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SPARK-PLUG.

999,343. Specification of Letters Patent. Patented Aug. 1, 1911.

Application filed July 26, 1909. Serial No. 509,526.

To all whom it may concern:

Be it known that I, ALBERT SCHMIDT, a citizen of the French Republic, 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 very simple, cheap and efficient construction having certain new and useful features all as hereinafter more fully described, reference being had to the accompanying drawings in which:—

Figure 1 is a side elevation of a device embodying the invention; Fig. 2 is a longitudinal section of the same; Fig. 3 is an enlarged sectional detail of the binding ring before being applied to a spark plug; Fig. 4 is a similar view of the ring after having been used; Fig. 5 is an enlarged sectional detail of the collar before its application to a spark plug; Fig. 6 is a similar view of the collar after use on a plug.

As shown in the drawings 1 is a suitably shaped metal bushing or shell provided with a tapering screw-threaded end and a hexagonal portion or head by means of which the bushing may be screwed into a screw-threaded opening in an engine cylinder, and this bushing is formed with an axial bore 2 in its inner or screw-threaded end and an enlarged bore or chamber 3 in its outer end, interiorly screw-threaded to receive a binding nut or ring 4 having a wrench hold. A porcelain insulating plug 5 is placed within the bore of the bushing with its tapering inner end 6 extending into the bore 2 and its outer cylindrical body portion 7 extending outward through the binding ring. The plug 5 is enlarged within the chamber 3 to form a shoulder 8 on the plug adapted to be engaged by the inner end of the ring 4, and to also form a shoulder 9 adapted to be engaged by a collar 10 which seats upon the bottom of the chamber 3 around the bore 2 in the inner end of the bushing 1. The porcelain is also formed with an axial hole or bore to receive a rod 11 and with a small recess or chamber at its inner end within which an enlargement or collar 12 on the rod, seats. The outer end of the rod is screwthreaded to receive a nut 13 formed with a sleeve portion 14 extending inward around the rod into a suitable chamber 15 formed in the upper end of said porcelain. A washer 16 engages the outer end of the porcelain plug and is provided with a sleeve portion 17 through which the sleeve 14 projects and is adapted to slide upon contraction or expansion of the parts, such contraction and expansion being provided for by a spring washer 18 on the sleeve 14 between the nut 13 and washer 16. The rod 11 forms one electrode, the wire conductor being attached in any suitable manner to its outer end, and a platinum wire 19 secured in the inner end of the bushing 1 extends over the inwardly projecting end of the rod 11, forming the other electrode.

The sleeves 14 and 17 form a guide for the rod 11 to prevent its binding within the washers upon contraction or expansion of the parts and the inner end of the binding ring 4 and the upper side of the collar 10 form seats on bearings for the porcelain plug to make a tight joint between the plug and bushing. These seats are formed by providing a groove 20 in the end of the ring and a groove 21 in the collar at a little distance from the inner angle or edge of the ends, thus forming a thin flange or lip 22 on the ring and a similar portion 23 on the collar to engage the shoulders 8 and 9. The ring and collar are preferably made of a soft metal, such as brass, and when the porcelain plug is set in place upon the collar within the bushing and the binding ring 4 screwed down hard, the flange or lips 22 and 23 will be bent or formed over as shown in Figs. 4 and 6 to conform to the shape and any irregularities in the shoulder. In this manner the seats for the plug are formed by the securing of the plug in place in the bushing and if as often happens, the porcelain is warped or its shoulders are uneven or out of parallelism, the seats will be formed accordingly and a tight joint secured. The diameter of the body 7 of the porcelain is slightly smaller than the internal diameter of the ring so that when the ring is screwed in, the plug may rock or adjust itself slightly, thus aiding in the forming of the seats.

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

1. A device of the character described comprising a bushing, an insulating member

having an enlargement within said bushing, and a member surrounding the insulating member within the bushing in engagement therewith and provided with an annular groove in its end face forming at one side thereof a yielding annular lip adapted to be formed outwardly by its engagement with said enlargement.

2. A device of the character described comprising a bushing having an internally screwthreaded chamber, an insulating plug having an enlargement within said chamber, a collar engaging the bottom of the chamber and provided with an annular groove forming an upstanding flange at the inner side thereof to engage said enlargement, and a screwthreaded ring to engage the screwthreaded chamber of the bushing and provided with an annular groove in its inner end forming a flange on the ring at the inner side of the groove adapted to engage the enlargement of the insulating plug and be formed outwardly thereby.

3. A spark plug comprising a bushing, an insulating plug having an axial opening and a recess in its outer end, means for securing the plug in the bushing, a rod extending through the plug and engaging one end of the plug, a nut on the opposite end of the rod having a sleeve extending into the recess in the end of the plug, a washer engaging the end of the plug and having a sleeve through which the sleeve on the nut is freely movable, and a spring washer on the sleeve of the nut between said nut and the washer.

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

ALBERT SCHMIDT.

Witnesses:

B. DE GUICHARD,

ALICE SWEETWOOD.