A. E. PREMERY.

SPARK PLUG.

APPLICATION FILED JUNE 30, 1919.

1,433,149. Patented Oct. 24, 1922.

Fig.1.

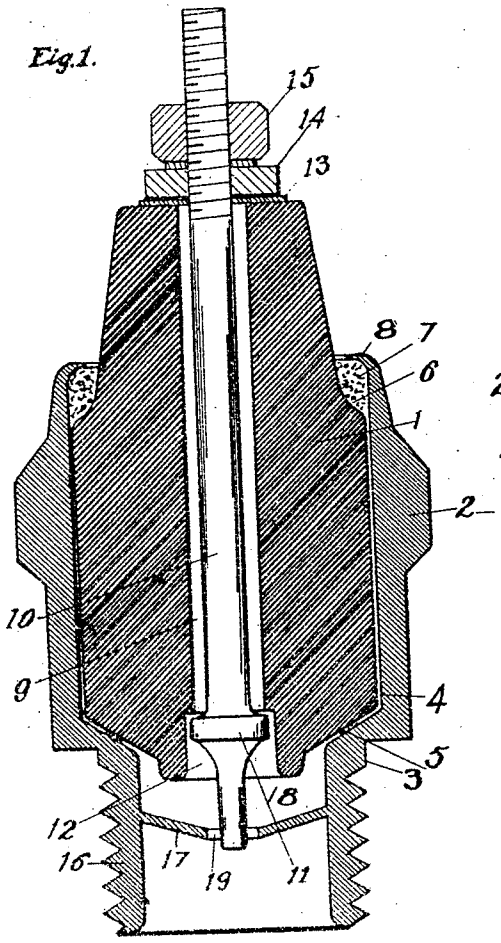


Fig.2.

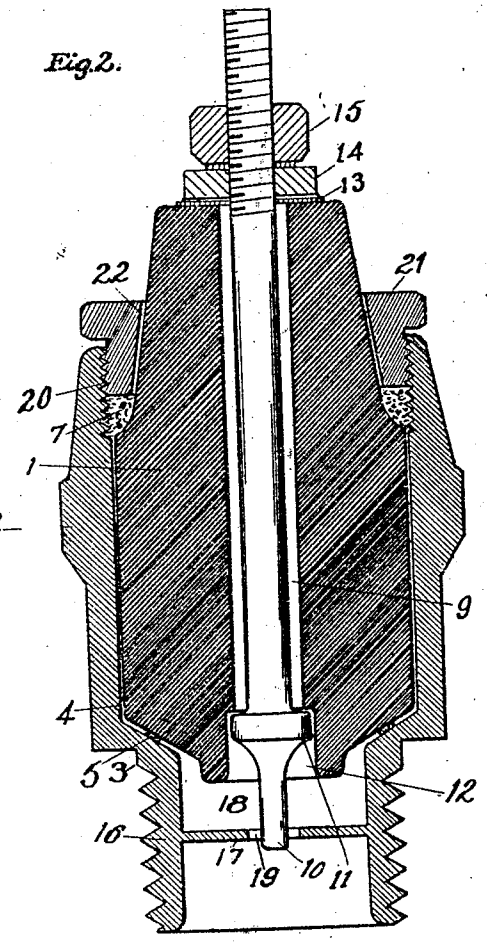


Fig.3.

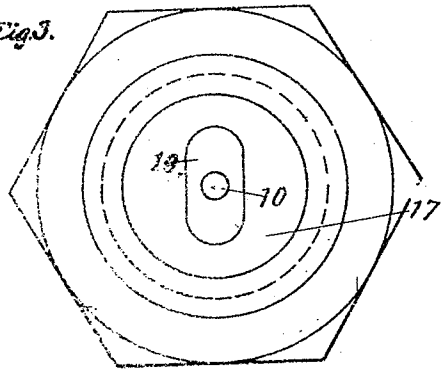
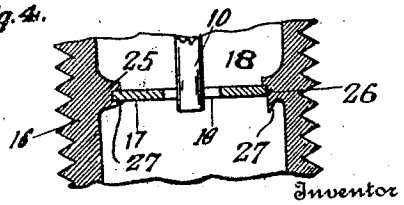


Fig.4.



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Patented Oct. 24, 1922. 1,433,149

UNITED STATES PATENT OFFICE.

ALBERT E. PREMERY, OF SAN FRANCISCO, CALIFORNIA.

SPARK PLUG.

Application filed June 30, 1919. Serial No. 307,589.

To all whom it may concern:

Be it known that I, ALBERT E. PREMERY, a citizen of France, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Spark Plugs, of which the following is a specification.

My invention is an improved spark plug for gas engines, characterized by a special explosion chamber, insuring, on account of its position, a perfect spark, and doing away with missings, whatever the speed of the engine or the compression of the fluids used in the motor.

Referring to the annexed drawing which forms a part of this specification:

Figure 1 is a longitudinal section of the preferred form of my spark plug.

Figure 2 is a longitudinal section of a modified form of my spark plug.

Figure 3 is a view of the inner end of the plug.

Figure 4 is a fragmentary sectional view of a portion of a modified form of my plug.

In the drawing 1 indicates an insulating body of porcelain, mica or other suitable refractory material, and 2 a metal jacket formed with an inclined shoulder 3 against which rests the inner end 4 of body 1 which is correspondingly inclined to fit shoulder 3. A gasket 5 is interposed between the shoulder 3 and the inclined body end 4. The body 1 is formed with an annular shoulder 6 intermediate its ends and tapers from said shoulder to its outer end. A metallic ring 7 of copper, aluminum, or other suitable material which is shock proof and moisture proof, surrounds the outer tapered portion of the body 1 and rests upon the shoulder 6. In the preferred form of my invention shown in Figure 1 the jacket 2 is formed with an annular lip 8 on its outer end which is bent over the ring 7, whereby the body 1 is held securely in position within the jacket 2. The body 1 is formed with a central longitudinal bore 9 through which extends an electrode 10, which has an annular embossment 11 near its lower end which fits within and rests against the end of an enlargement 12 of the bore 9 in the inner end of the body 1. A spring washer 13 fits over the outer end of the electrode 10 upon the outer end of the body 1. A slightly compressible washer 14 of copper, aluminum or other suitable material, fits over the outer end of electrode 10 upon spring washer 13. The outer end of the electrode is threaded and a nut 15 screws thereon against the washer 14 which draws the embossment 11 against the inner end of the bore enlargement 12 and holds the electrode properly within the body 1. The inner end of the jacket 2 is formed with an externally threaded nipple 16 which screws into the cylinder of the engine to support the plug in position therein. A partition 17 extends across the nipple 16, forming a special explosion chamber 18 between itself and the inner end of the body 1. In the preferred form of my invention (Fig. 1) the partition 17 extends at an angle to the nipple wall and converges toward the center of the nipple away from the inner end of body 1. Said partition is provided with a central opening 19 through which the inner end of the electrode 10 extends. Said opening is preferably elongated as shown in Fig. 3 but may be of any suitable shape.

In the modified form of my invention shown in Fig. 2, the upper end of the jacket 2 is provided with an internal thread 20 into which screws a nut 21 against the ring 7, the nut being provided with an outwardly converging opening 22 through which extends the outer tapered end of the body 1. The nut compressing the ring 7 forces the shoulder 4 against shoulder 3 and securely holds the body 1 within the jacket 2. In this modified form of my invention the partition 17 is perpendicular to the wall of nipple 16.

The spark takes place between the inner end of the electrode 10 and the edge of the opening 19 of the partition 17 which forms the other electrode, the partition being so constructed and placed as to easily produce a perfect spark between the seat of the electrode and its extremity without any missings. During the explosion fire is retained within the special explosion chamber 18 sufficiently to burn the walls thereof clean, thus preventing deposits of carbon upon the chamber walls.

The compression effected inside the special explosion chamber facilitates the perfect spark to light the gaseous fluid without risk of carbonization or of advanced sparking, caused by incandescence, regardless of what might be the fluid, the lubricant or the compression in the engine. In the special explosion chamber is produced a suction at the explosion cycle. Its construction fa-

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cilitates the evacuation of consumed gas and of the carbonized matters. The evacuation of useless matter is facilitated by the elongation of the opening 19 and by a depression caused by rapid suction. The expelling of the gas produces a vacuum which constantly cleans up the electrode. At the time of compression the new gas acts efficiently through the opening of the partition, avoiding the adherence of the carbonization.

My spark plug has been tested on vehicle and aeroplane motors of 275 H. P. and 600 H. P. of different makes and on rotary motors of 130 H. P. In putting four of these spark plugs thoroughly dipped in oil on a motor of six cylinders, or two spark plugs on a motor of four cylinders, or one spark plug on a motor of two cylinders, they will be free of any useless matter and in perfect order after a few minutes rotation.

In the modified form of my plug shown in Fig. 4, I make the partition 17 separate from the nipple, but is mounted in an annular ring 25 on the inner surface of the nipple, said ring being formed with a shoulder 26 against which engages one side of the partition, and an annular lip 27 which is bent against the other side of the partition.

The size of the opening 19 may be varied to vary the distance between the electrodes by bending the partition inwardly or outwardly.

Having described my invention, I claim:

1. In a spark plug, a body of insulation, a jacket in which said body is mounted, a plate having a central opening therein and positioned to provide a transverse partition in said jacket below said body forming an explosion chamber between it and said body, and an electrode extending through said body, the explosion chamber and said opening, said partition being bendable to vary the area of the explosive chamber to the plug.

2. In a spark plug, a body of insulation, a jacket in which said body is mounted, a transverse partition in said jacket below said body for forming an explosive chamber between it and said body, said partition being provided with an elongated opening, and an electrode extending through said body, said explosive chamber and into said opening of the partition to co-operate with the edge of the opening to form a spark gap, said partition being bendable whereby the spark gap and the area of said chamber in the plug may be varied.

In testimony whereof I affix my signature.

ALBERT E. PREMERY.