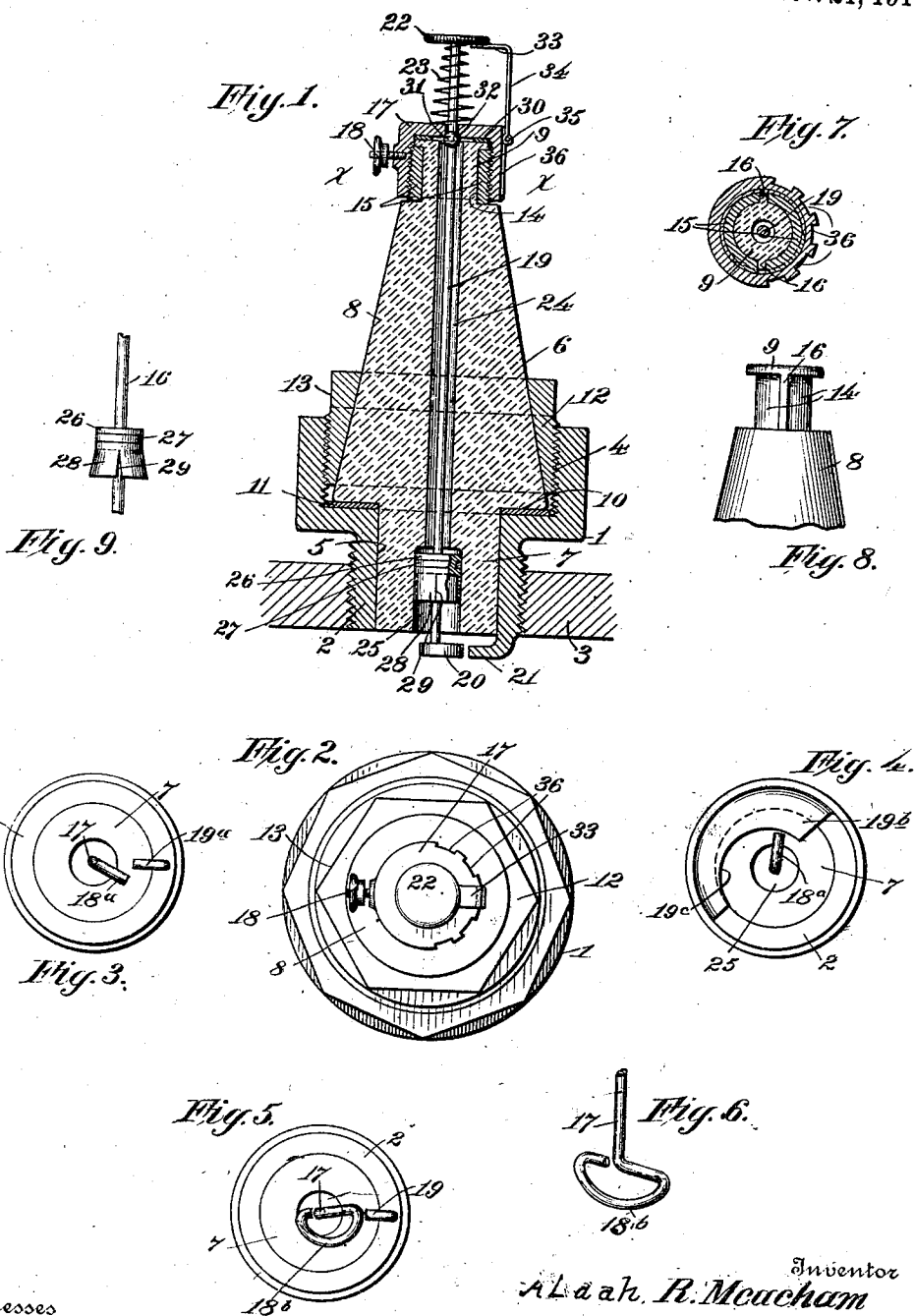


1,009,084.

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SPARK PLUG.
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SPARK-PLUG.

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To all whom it may concern:

Be it known that I, ALDAH ROBINSON MEACHAM, a citizen of the United States, residing at Oklahoma, county of Oklahoma, and State of Oklahoma, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification.

My invention relates to spark plugs for internal combustion engines, and the object of my invention is to provide a spark plug of the class mentioned which may be readily cleaned without removing the plug from the engine and that while the engine is in operation.

A further object of my invention is to provide a spark plug in which the sparking distance between the electrodes may be adjusted while the engine is running.

Other objects will appear hereinafter.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification and in which—

Figure 1 is a vertical central section of a sparking plug embodying my invention in its preferred form, Fig. 2 is a plan view of the same, Fig. 3 is a bottom plan view of the lower portion of the plug illustrating a modified form of the electrodes, Fig. 4 is a similar view illustrating a modified form of the outer or permanently stationary electrode, Fig. 5 is a similar view illustrating a modified form of the inner or movable electrode, Fig. 6 is a perspective view of the electrode illustrated in Fig. 5, Fig. 7 is a horizontal section taken on the line $x-x$ of Fig. 1, Fig. 8 is an elevation of the upper end of the insulating sleeve, and Fig. 9 is an elevation of the cleaning device.

Referring now to the drawings 1 indicates a metal bushing provided with a reduced threaded portion 2 which is adapted to be tapped into the wall 3 of an engine cylinder. The body 1 is externally squared to form a wrench hold, and is provided with a threaded socket 4. The extension 2 is formed with a smooth cylindrical socket 5 of less diameter than the socket 4 and extending from the socket 4 through the lower end of the bushing.

6 indicates a porcelain insulating sleeve comprising a lower cylindrical portion 7 fitting snugly within the socket 5 and an upper conical portion 8, which projects consider-

ably above the bushing and terminates at its upper end in cylindrical portion 9. The base of the portion 8 is of greater diameter than that of the portion 7, forming an annular shoulder 10 which rests upon the bottom of the socket 4 with a gasket 11 interposed between said shoulder and socket bottom. The gasket is preferably formed of compressible material.

12 indicates a sleeve threaded into the socket 4 and provided with a conical bore fitting snugly about the adjacent portion of the member 6. The upper end of the sleeve 12 is squared as at 13 to afford a wrench hold. It is obvious that by turning the sleeve 12 the member 6 will be firmly secured in the bushing and sufficient pressure may be had upon the gasket 11 to form a tight joint.

The upper end 9 of the member 6 is provided with a peripheral groove or socket 14 in which rest semi-cylindrical members 15 the outer faces of which are threaded as shown.

16 indicates a vertical rib or boss extending from top to bottom of the groove 14 and projecting between the ends of the members 15 to prevent rotation of the same in the groove. There may be one or two of the ribs 16 as desired and in Fig. 7 I have illustrated two. Threaded upon the member 15 is a cap 17 which is provided upon one side with a binding post 18. Extending longitudinally through the member 6 and through the cap 17 is a rod 19, the lower end of which is provided with the movable electrode 20.

21 indicates the stationary electrode provided upon the lower end of the portion 2 of the bushing. The upper end of the rod 19 is provided with a head or push button 22 and interposed between said head or button and the cap 17 is a spring 23. By pressing on the head 22 the rod 19 may be depressed, and when released the spring will return the same to normal position. The member 6 is provided with a cylindrical longitudinally extending passage way 24 terminating at the lower end in a recess 25 of greater diameter and extending inwardly from the lower end of the member 6 and concentric with the rod 19. Arranged within the recess 25 and fixed to the rod 19 is a piston 26 provided with a spring expansion ring 27 which frictionally engages the walls of the recess 25 at all times. Depending from the periphery of the piston is a cylin-

drical sheet metal shell or scraper 28 which is longitudinally split as at 29 and normally flared. This is compressed within the recess 25 and bears firmly against the walls thereof.

5 It is obvious that by depressing the rod 19 the carbon deposit which forms at the end of the plug adjacent the electrodes will be readily removed by the piston and scraper, and that the cleaning of the device may be accomplished while the engine is running.

10 30 indicates a shellacked leather washer interposed between the end of the member 6 and the cap 17. Fixed to the rod 19 and forming a stop to limit the upward movement thereof is a ball 31 which normally rests in a cylindrical seat 32 in the cap 17 and thus forms a valve to prevent leakage through the cap 17 about the rod 19. It should be noted that the passage way 24 is of greater diameter than that of the ball valve 31.

The electrode 20 is eccentrically mounted upon the end of the rod 19 so that by turning the rod the spark gap may be varied. Fixed 25 to the head 22 is a spring arm comprising a horizontal portion 33 and a vertical portion 34, the latter terminating at its lower end in a well rounded portion 35. The cap 17 is formed with a plurality of spaced vertical grooves or channels 36 adapted to receive the portion 35 of the spring arm. The arm being flexible, it may be withdrawn from the groove within which it is resting and the rod turned until it rests in one of 35 the other grooves. By this construction the rod may be turned to vary the spark gap and lock in adjusted position, and at the same time leave the rod free for vertical reciprocation. Further the spark gap may be varied while the engine is running.

40 In the drawings I have illustrated several forms of electrodes, but in each the electrodes comprise a stationary electrode and a movable electrode of such construction and arrangement that by rotating the latter the space or gap between them is varied. In Fig. 1 the stationary electrode comprises a bent tongue formed integral with the member 2 and the movable electrode comprises a disk eccentrically mounted on the end of the rod. As shown in Fig. 3 the end of the rod 19 is bent at right angles as at 18^a to form the movable electrode and the stationary electrode may partake of the form shown in 50 Fig. 1 or may be a bent rod 19^a having one end fixed in the member 2. In Fig. 4 the stationary electrode comprises a flange 19^b formed integrally with the member 2 and having an eccentric concave inner edge 19^c, the movable electrode being preferably the

form shown in Fig. 3. It is obvious that by turning the rod 19 the end of the electrode 18^a will be moved closer to or farther from the edge 19^c as the case may be. In Figs. 5 and 6 I have shown a modified form where- 65 in the stationary electrode partakes of the form shown in either Fig. 1 or Fig. 3, and the end of the rod 19 is bent to form an eccentric arc 18^b which constitutes the movable electrode. The rod 19 is first bent radially 70 outwardly and then curved to form the arc, the arc 18^b being in a plane at right angles to the rod.

Having described my invention what I claim as new and desire to secure by Letters 75 Patent is:

1. In a spark plug, a bushing, a porcelain insulating sleeve arranged in said bushing and provided with a recess in the inner end thereof, a rod extending through said sleeve 80 and recess, an electrode on said bushing adjacent the lower end of said sleeve, a second electrode on the inner end of said rod, a piston within said recess and fixed to said rod, a depending peripheral scraper on said piston, a head on said rod and a spring interposed between said head and said sleeve, substantially as described.

2. In a spark plug, a bushing, a porcelain sleeve fixed within said bushing and projecting above the same, a cap fixed to the upper end of said sleeve, a rod extending through said sleeve and said cap, an electrode on the inner end of said rod, an electrode on the adjacent end of said bushing, said electrodes 95 being eccentrically arranged with relation to each other, a head on the outer end of said rod, a spring interposed between said head and said cap, said cap being provided on its periphery with a plurality of vertically 100 disposed grooves and a spring arm fixed to said head and having a portion adapted to engage either of said slots for vertical reciprocation therein, substantially as described.

3. In a spark plug, a bushing, an insulating sleeve in said bushing, a rod extending through said sleeve and rotatably mounted therein, a radially extending electrode on the end of said rod and a fixed electrode on said bushing comprising an intumed flange 110 having an eccentric concave edge, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALDAH ROBINSON MEACHAM.

Witnesses:

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