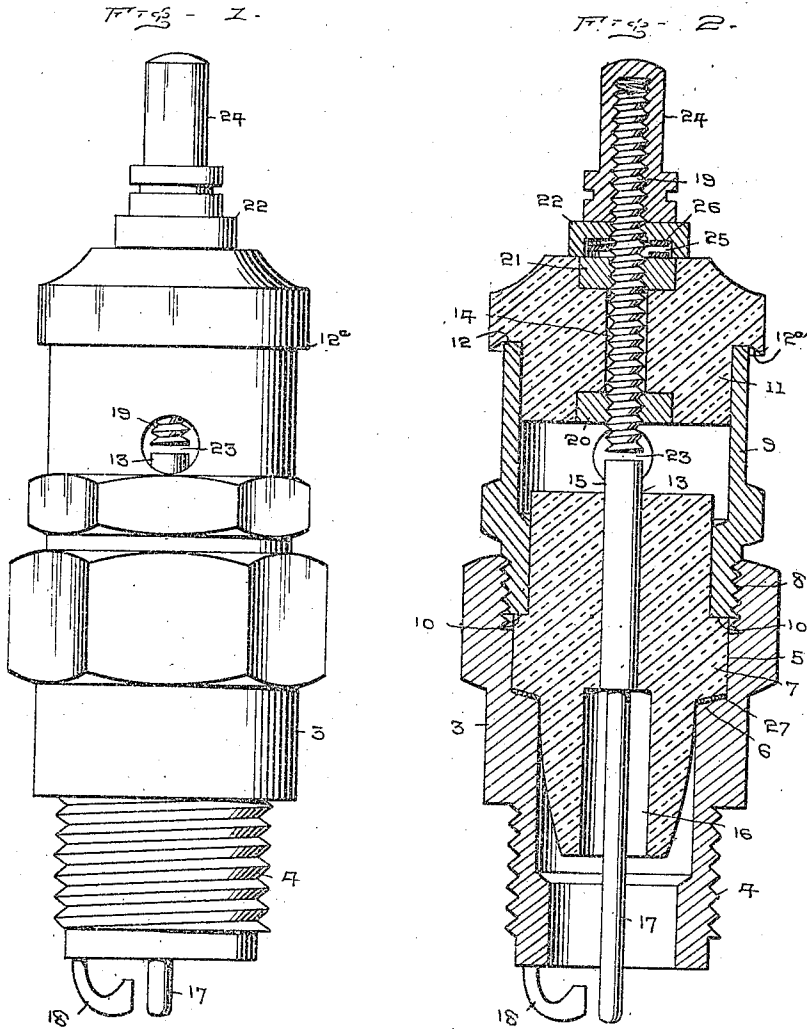


J. M. McKERNAN.  
SPARK PLUG.  
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1,279,387.

Patented Sept. 17, 1918.



Inventor  
J. M. McKernan  
By W. J. FitzGerald & Co.  
Attorneys

# UNITED STATES PATENT OFFICE.

JOSEPH M. McKERNAN, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO DAVID M. HUTCHINSON, OF ST. LOUIS, MISSOURI.

## SPARK-PLUG.

1,279,387.

Specification of Letters Patent.      Patented Sept. 17, 1918.

Application filed July 20, 1917.      Serial No. 181,837.

*To all whom it may concern:*

Be it known that I, JOSEPH M. McKERNAN, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Spark-Plugs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to spark plugs.

The extreme usefulness of electrical intensifiers or spark gap mechanism has long been acknowledged and earlier experimenters considered it necessary to make the spark plug and spark gap intensifiers as separate and distinct devices but later inventors have combined the two devices into the spark plug proper, but with very discouraging results, many difficulties and failures having been encountered in the practical use of such devices.

It is the primary object of my invention to provide an improved spark plug having combined therewith adjustable spark gap mechanism which will be economical in construction and absolutely reliable in operation, obviating and overcoming the difficulties encountered in other devices of the same character, which difficulties will be hereinafter mentioned as the description proceeds.

With this object in view the invention consists in the improved construction, arrangement and combination of parts hereinafter fully described and afterward specifically claimed.

In order that the construction and operation thereof may be readily comprehended, I have illustrated an approved embodiment of the invention in the accompanying drawings and will now proceed to fully describe the same, having reference to said drawings, in which—

Figure 1 represents the invention in side elevation and

Fig. 2, the same in central, longitudinal section.

Like reference characters mark the same parts in both figures.

Referring specifically to the drawings 3 indicates the body of the plug threaded at 4 to engage a threaded opening in the cylinder of the motor, the body forming the electrode. At 5 the interior of the body is

enlarged, forming a shoulder 6 upon which rests a shoulder on the insulating inner sleeve 7, the upper portion of the enlarged opening of the body being interiorly threaded, as at 8 to receive the exteriorly threaded end of a sleeve 9, which engages a shoulder 10 on the inner insulating sleeve 7.

Frictionally engaged in the upper end of the sleeve 9 is the insulating head 11 which is held from entering too far by a shoulder 12 which engages the upper end of sleeve 9, the shoulder extending laterally some distance and being undercut, as at 12<sup>a</sup>, so that rain, or other water will drip off and not gather between the shoulder 12 and the steel sleeve 9 and thus form a conductor to short-circuit between the terminal and said sleeve.

The insulating members 7 and 11 are made of any suitable insulating material such as porcelain, stone, fiber or the like, and are both provided with central longitudinal bores in alinement with each other as at 13 and 14, in the first of which is rigidly mounted an electrode 15 the lower end of the bore 13 being enlarged at 16, and the lower end of the electrode 15 being reduced as at 17 and extended through and beyond body 3 in position to coöperate with the spark point 18 secured in the usual manner to the body 3, the spark point being curved inward, as usual, toward the lower end of the electrode 13 and flattened vertically at its end in order to give a flat and widened spark.

A threaded electrode 19 mounted in the bore 14, is threaded through two bearing nuts, one, as at 20, being fixed in a recess in the bottom, and the other, as at 21, fixed in a recess in the top of the insulating member 11, a jam nut 22 being placed above the bearing nut 21 to lock the electrode 19 in adjusted position to properly space the points of the electrodes 13 and 19 at the spark gap 23, the sleeve 9 being provided with the usual opposite sight openings through which to observe the action at this point.

Upon the upper end of rod 19 is threaded a hand nut 24 by means of which the current conducting wire, attached to the rod 19, may be securely held by clamping it against the jam nut 22, the latter being recessed in its underside, as at 25, to ac-

commodate a spring washer 26, which prevents injury to the insulator 11, or the nuts coming loose, or change in the spark gap.

5 A suitable packing washer 27 is placed between the shoulders of the insulator 7 and the metallic body 3 to prevent injury to the former by contact with and pressure upon the former.

10 The operation of the invention will be readily comprehended by those skilled in the art and no extended description thereof seems necessary.

15 By the construction described I have remedied many defects which I have encountered in using spark plugs.

20 By reducing the diameter of the interior of the body at the bottom I have left a shoulder to support the lower or skirt part of the insulator sleeve so that if the latter should break, at the shoulder, as they frequently do, the parts cannot fall through the opening into the cylinder and injure the same.

25 The overhung, under cut shoulder 12, 12<sup>a</sup> is an extremely valuable improvement for the purpose of preventing short circuiting between the terminal and the steel sleeve, as explained heretofore.

30 By dispensing with the threading of the upper insulating member in the sleeve, I avoid the stripping of the threads which often occurs and causes the member to jam, rendering it impossible to screw it far enough to properly regulate the spark gap.

35 Very often, also, this member becomes worn because of the nature of the material of which it is made and will not hold so that it works upward and so widens the spark gap that the current will not jump

40 Having handled thousands of plugs, my

practical experience teaches me that my plug is more economical to manufacture, more simple, and stronger and more durable and dependable, than any other with which I am acquainted and assembles easily with any ordinary wrench. All special tools are rendered unnecessary and threaded fiber parts are avoided.

The upper part of my plug will apply to many now in use and may be marketed 50 separately for such purpose.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of United States, is:

55 A spark plug comprising a body, an insulating member loosely fitting therein, an electrode bar carried by said insulating member, a metallic sleeve threaded into the upper end of the body, an insulating member frictionally seated in the upper end of 60 the sleeve and having a peripheral undercut shoulder bearing on the top thereof, and a central vertical bore with widened recesses at the upper and lower ends thereof, a bearing nut fixed in each of said recesses, a 65 threaded electrode bar loosely seated in the bore and projecting through said bearing nuts, a recessed jam nut on the bar above the upper bearing nut, and a spring washer arranged in the recess of said jam nut to 70 bear on the upper bearing nut to hold the adjacent relative parts in adjusted position.

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

JOSEPH M. McKERNAN.

Witnesses:

ALBERT E. SCHNEIDER,  
HERBERT C. REINERT.