H. SCHWETGER.

SPARK PLUG.

APPLICATION FILED JAN. 3, 1920.

1,368,358. Patented Feb. 15, 1921

Fig. 1.

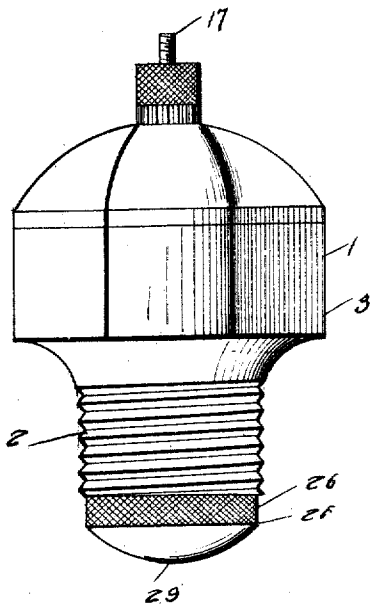


Fig. 2.

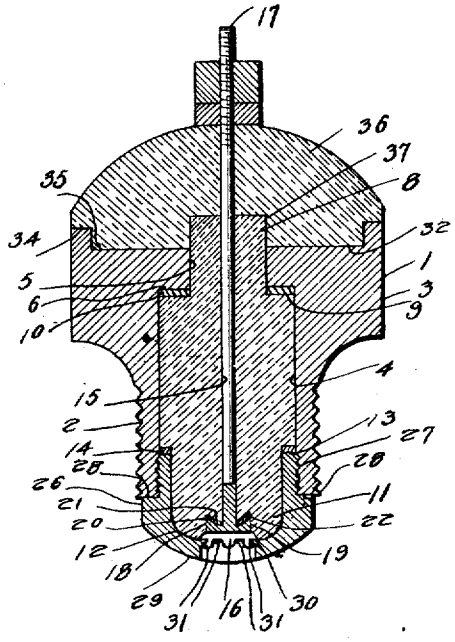
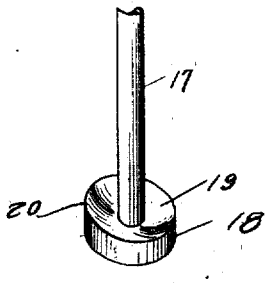


Fig. 3.



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SPARK-PLUG.

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To all whom it may concern:

Be it known that I, HENRY SCHWETGER, a citizen of the United States, residing at Roca, in the county of Lancaster and State of Nebraska, 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 new and useful improvements in spark plugs and has for one of its objects the provision of a device of this character wherein the spark producing parts are so arranged and associated with each other as to prevent the accumulation of carbon and other foreign matter thereon, thus obviating short circuiting of the device.

Another object of this invention is the provision of a sectional insulator so fitted together and to the body as to prevent the compression of an engine from leaking between the insulator and body and also provides parts that are not susceptible to be broken and when assembled will entirely obviate any danger of short circuiting of the central electrode to the body.

A still further object of this invention is the provision of a spark plug of the above stated character, which shall be simple, durable and efficient, and which may be manufactured and sold at a comparatively low cost.

With these and other objects in view as will become more apparent as the description proceeds, the invention consists in certain novel features of construction, combination, and arrangement of parts as will be hereinafter more fully described and claimed.

For a complete understanding of my invention reference is to be had to the following description, and accompanying drawing, in which:—

Figure 1 is a side elevation of a spark plug constructed in accordance with my invention,

Fig. 2 is a vertical sectional view of the spark plug illustrating the spark producing parts associated with each other,

Fig. 3 is a detail view of the central electrode.

Referring in detail to the drawing, the numeral 1 indicates a body having formed thereon the screw threaded extension 2 that is adapted to be threaded into the spark plug opening of an engine and the upper portion of the body is provided with the usual wrench engaging faces 3. The body 1 is provided with a bore 4 having its upper end reduced to form a restricted bore 5 and also an annular shoulder 6. The annular shoulder 6 is between the bore 4 and the restricted bore 5. An insulator 7 fits tightly within the bore 4 of the body 1 and has formed thereon an extension 8 that is disposed within the bore 5 and projects above the body 1. The extension 8 formed upon the insulator 7 defines an annular shoulder 9 that abuts the annular shoulder 6 of the body 1, and a washer 10 is adapted to be interposed between said shoulders for the purpose of establishing a leak-proof connection between the insulator and the body. The lower portion of the insulator 7 is reduced as illustrated at 11 and has its end rounded as illustrated at 12. The reduced portion 11 defines an annular shoulder 13 adapted to have positioned thereon a washer 14. The insulator 7 has a bore 15 extending throughout its entire length and the lower end of said bore terminates in an enlarged recess 16 that opens outwardly through the rounded end 12 of the reduced end 11 of said insulator 7. A central electrode 17 extends through the bore 15 and has a head 18 of annular formation formed upon its lower end and located within the recess 16. The top face of the head 18 is cut away as illustrated at 19 to define an annular shoulder 20 which shoulder fits within a recess 21 of a corresponding shape and which is formed within the bottom wall of the enlarged recess 16 of the bore 15. A washer 22 is interposed between the head 18 and the bottom wall of the recess 16 to establish a leak-proof connection between the head and the insulator 7. The washers heretofore described are preferably constructed from asbestos or may be made from any material suitable for the purpose.

From the foregoing description and with reference to the drawing, it will be noted that the lower portion of the head 18 is of considerable thickness so as to provide a very substantial firing terminal to the central electrode 15, thereby obviating the danger of the burning out of the electrode during the use of the device.

A retaining cap 25 that forms an outer

electrode includes a body 26 that has formed thereon a screw threaded extension 27 threaded into the lower end of the body 1 between the same and the reduced end 11 of the insulator 7 and abuts the washer 14 on the annular shoulder 13 of said insulator 7. The extension 27 defines an annular shoulder 28 to the body 26 of the cap 25 and which overlies the end of said body. The body 26 is rounded and provided with an opening 29 that alines with the recess 16 and has formed thereon an annular flange 30 confined within the recess 16 and which flange is cut-away to define teeth 31 that provide electrodes which are spaced from the head 18 to provide spark gaps. The electrical current is adapted to jump from the head 18 to the teeth of the cap 25 providing a series of sparks within the recess 16 igniting the fuel within the engine and as the explosion takes place in the engine, it has a tendency to remove any particles of foreign matter or carbon from the teeth 31 and the head 18.

The upper end of the body 1 is recessed to form an annular seat 32 and also define an annular shoulder 34 to said body for the purpose of receiving an annular extension 35 formed upon a dome-shaped insulator 36 that overlies and closes the upper end of the body 1 and has threaded connection therewith. The annular portion 35 has a recess 37 to receive the upper end of the extension 8 of the insulator 7 and said insulator 36 is provided with a bore to permit the central electrode 17 to extend therethrough and receive the usual terminal nut 38 which bears against the insulator 36 and secures the head 18 in tight engagement with the bottom wall of the recess 16 of the insulator 7. By increasing and decreasing the number of washers 22 the position of the head 18 with respect to the teeth 31 can be varied.

While I have shown and described the preferred embodiment of my invention, it will be understood that minor changes in construction, combination and arrangement of parts may be made without departing from the spirit and scope of the invention as claimed.

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

1. A spark plug comprising a body, an insulator carried by said body and projecting beyond the same and having a recess in its end, a central electrode carried by the insulator, a head formed on the central electrode and located within the recess, a cap secured to said body and overlying the end of the insulator and having an opening to expose the head, and a series of teeth carried by said cap and spaced from the head.

2. A spark plug comprising a body, an insulator carried by said body and projecting beyond the same and having a recess in its end, a central electrode carried by the insulator, a head formed on the electrode and located within the recess and having its upper face recessed to define an annular shoulder, said recess having a groove in its bottom wall to receive the annular shoulder, a cap secured to said body and overlying the end of the insulator and having an opening to expose the head, a series of teeth formed about the inner edge of the opening and spaced from the head.

3. A spark plug comprising a body, an insulator carried by said body and extending beyond the same, a central electrode carried by said insulator, said insulator having a recess in its end, a head formed on the electrode and located within the recess, a cap overlying the insulator, an extension formed on said cap and threaded to the body, between the same and the insulator, an annular flange formed on the inner edge of the opening of said cap and being slotted to define teeth, said teeth being spaced from the head.

4. A spark plug comprising a body, an insulator carried by said body and projecting beyond said body at each end thereof, an electrode carried by the insulator and projecting beyond the same at one end thereof, a cap overlying one end of the insulator and having an opening to expose the electrode and coöperate with the same in forming a spark gap, and a second insulator secured to the body and receiving the other end of the first named insulator and having an opening to permit the electrode to extend through the same.

5. A spark plug comprising a body, an insulator in said body and projecting beyond each end thereof, a second insulator of substantially dome shape detachably secured to said body and have a recess to receive one end of the first named insulator, a central electrode extending through said insulators, the first named insulator having a recess formed in one of its ends, a head formed on said electrode and located within said recess, a cap detachably secured to said body and overlying the last named end of the first named insulator and having an opening to expose the head, and a series of annularly arranged electrodes carried by said cap and spaced from the head.

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

HENRY SCHWETGER.

Witnesses:
OSCAR KRUEGER,
W. G. FISCHER.