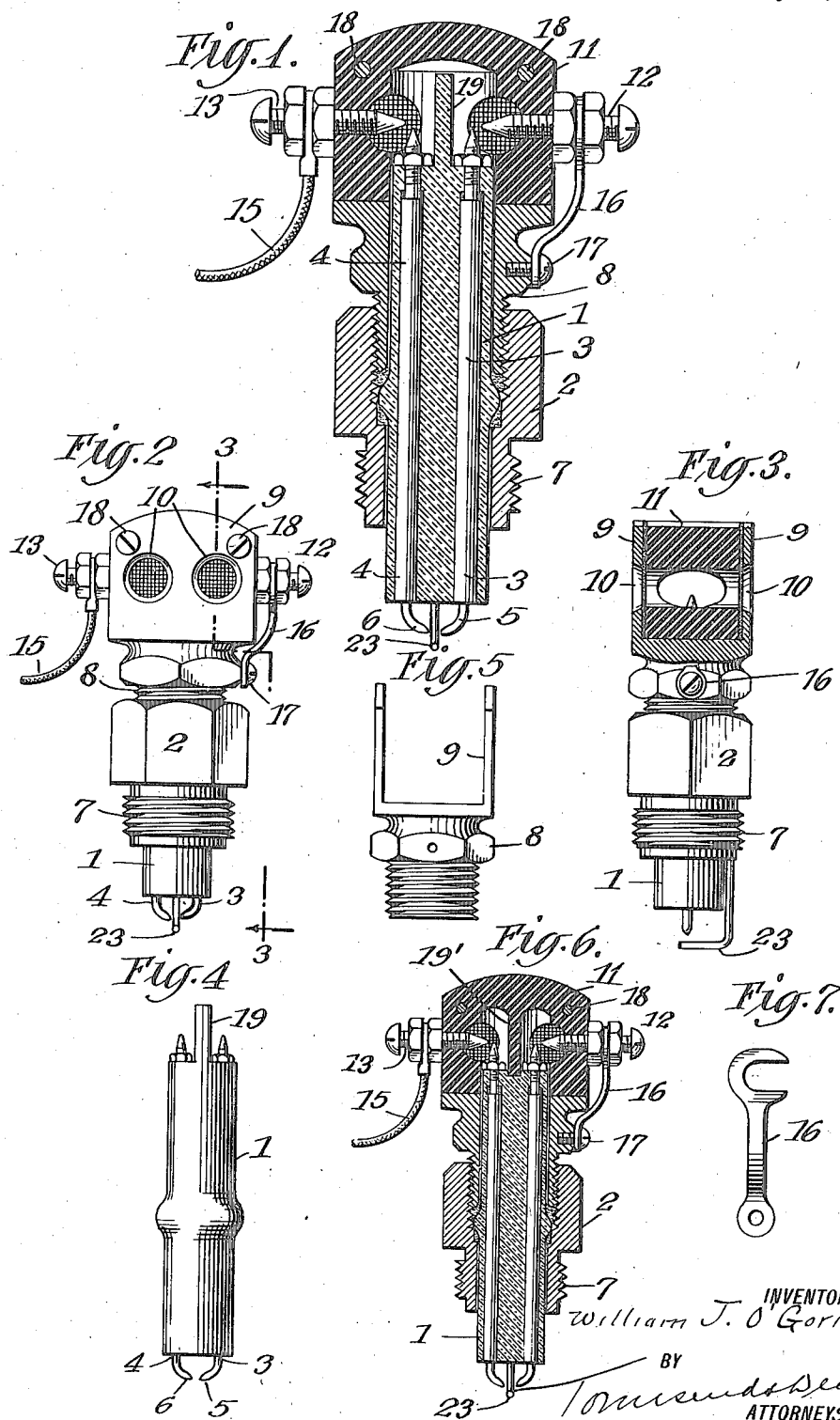


W. J. O'GORMAN.
SPARK PLUG.
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1,268,049.

Patented May 28, 1918.



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WILLIAM J. O'GORMAN, OF NEW YORK, N. Y.

SPARK-PLUG.

1,268,049.

Specification of Letters Patent.

Patented May 28, 1918.

Application filed February 10, 1917. Serial No. 147,761.

To all whom it may concern:

Be it known that I, WILLIAM J. O'GORMAN, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification.

The invention relates to spark plugs wherein provision is made for one or more artificial gaps located in the head of the spark plug and in the circuit of the ignition points of the plug as described in a prior Patent No. 1,228,958 dated June 5th, 1917. In the form of this type of plug as described in my prior patent, the artificial spark gaps are located in chambers formed in the porcelain or insulation part of the plug which carries the wires leading to the ignition gap.

My present invention consists, among other things, in locating the artificial gaps in a metallic protection formed by an extension of the clamp sleeve which clamps the porcelain in the metallic body or bushing and in extending the porcelain up into said metallic protection, whereby the porcelain or insulation of the plug is completely protected and the desired artificial gaps are at the same time provided for operation in the manner described in my prior patent.

My invention further consists in details of construction as hereinafter more particularly described and then specified in the claims.

Figure 1 is a vertical central section through a spark plug constructed in accordance with my invention.

Fig. 2 is a side elevation of the same in reduced size.

Fig. 3 is a section and side view on the line 3—3 Fig. 2.

Fig. 4 shows the porcelain or other insulating core removed from the plug.

Fig. 5 shows my improved clamp bushing removed from the plug.

Fig. 6 is a vertical section through the plug in a modified construction modified in construction to provide an insulating barrier between the artificial spark gaps.

Fig. 7 shows in detail a connection on the outside of the plug detached.

In the accompanying drawings, 1 indicates the insulating core of the plug wherein are located and insulated the lead wires or connections 3, 4 which terminate in the spark points 5, 6 of the normal ignition gap. The usual, metallic body or shell of the spark plug is indicated at 2 and is provided, as usual, with a screw thread at 7, for attachment of the spark plug to the engine.

8 indicates the threaded bushing or sleeve engaging the upper end of the shell or body 2 and adapted to clamp the porcelain or other core 1 in place. This sleeve in the usual construction of spark plug and in the form of plug described in my prior patent, is a short nut or bushing through which the porcelain or insulation of the core extends upwardly for attachment of the usual connections. In my prior patent said porcelain is also provided with the chambers in which the artificial spark gaps in the circuit of the sparking or ignition points are located, the sparking at said artificial gaps being visible through an opening in the side of the insulation forming the upward extension of the insulating core.

In my present invention, however, the said metallic bushing extends up around the porcelain and terminates in a metallic socket or holder 9 which is provided as shown at 10 with the observation openings through which the working of the artificial spark gaps may be observed. 11 indicates a block of insulating fiber or hard rubber or other suitable insulating material in which the spark plug terminal posts are directly secured. Said body of insulation has a suitable chamber or chambers provided with openings which register with the openings 10 and the posts terminate in points in said chambers opposite the openings and in cooperation with the points on the upper ends of the leading wires 3, 4 form artificial gaps in the circuit of the ignition gap.

One of these, 13, serves for attachment of the leading wire 15 of the ignition circuit; the other terminal 12 has the return wire or strap connection 16 used as the ground wire

grounded through the metal of the engine by attachment to the binding post or screw 17 secured to the metal body or shell of the plug. The socket or holder for the insulation 11 in the present form of my invention is shown as provided merely with two straight sides between which the block of insulation 11 is located and secured in place by screws or other devices 18. The observation openings 10 are closed by wire gauze used as a safety device to prevent ignition of gas outside the plug.

23 indicates a reserve and emergency spark point attached to the metal body of the plug and adapted to cooperate with the point 6 to form an ignition gap in case of failure of the main or principal ignition gap to function properly, or to form an emergency gap in case of need in a circuit between the wire 3 and the metal body of the plug and utilized by removal of the connection 16 and by employing the terminal 12 as the main or lead wire of the circuit as described in my prior patent.

25 The body of insulation 11 preferably extends slightly beyond the edges of the metallic holder or socket 9 and the edges of said insulation body 9 may be beveled or chamfered, as shown, between the metal edge of the body 9 and the outer surface of the insulation whereon the terminals 12, 13 are located.

The porcelain body or core 1 above referred to may be made of uniform cross-section up to the position of the artificial spark gap and above that point may rise in a web or barrier 19, as shown, extending if desired nearly up to the top wall of the insulation 11 forming, as shown, a part of the inclosure or chamber in which the artificial spark gaps are located. Said web or barrier 19 prevents the passage of the spark across from one artificial gap to the other directly, and compels passage of the current down to the ignition gap. The openings 10 may be located in both walls of the metal socket or holder for the insulation and in line with one another.

Instead of forming a web or barrier 19 upon the end of the core 1 it may be formed upon the insulating body 11 as indicated in Fig. 6 where it is shown as a downward extension 19' from the top of said insulating body extending down between the spark gaps and approximately into contact with the end of the core 1.

As will be seen in my improved construction, the porcelain forming the body or core of the plug is completely protected by the metal forming an extension of the clamping bushing thereof and by the insulating fiber or other insulating block fastened in said metallic extension and carrying the

terminals of the plug. Furthermore and inasmuch as ordinary insulating fiber may be employed which may be readily worked, the terminals may be more readily fastened or secured in place than is possible where they are mounted directly in opposite sides of the porcelain head of the porcelain core or body, which is the construction described in my prior patent.

I do not claim specifically herein the arrangement of the barrier 19' illustrated in Fig. 6 and shown as a part of the insulating body 11 extending downwardly between the artificial spark gaps and contacting with the end of the core 1 as this feature is claimed in my co-pending application for patent filed April 29th 1918.

What I claim as my invention is:—

1. In a spark plug of the character described, the combination of the insulating core, a metallic threaded bushing therefor having its upper end formed to constitute a socket or holder provided with observation openings in its sides, a chambered body of insulation mounted in said socket or holder and provided with openings in its sides registering with the openings in the holder and a terminal post mounted directly in said insulating body and having a spark point located in said chamber in line with the opening therein.

2. A spark plug having two artificial gaps located in the head of the plug and provided with an insulating core or porcelain having conducting wires or rods terminating at their upper ends in points for two artificial gaps, the end of said porcelain being extended as a web or barrier between said points to form an insulating barrier between the gaps and prevent short circuiting of the ignition gap.

3. In a spark plug having two artificial gaps located in the head of the plug, conducting wires or rods extending longitudinally through the insulating core or body and terminating at their upper ends in points for artificial gaps, said gaps being located in chambers the side walls of which are formed in part by the metallic extension of the fastening bushing for the core and in part by a chambered block of insulating material having openings registering with openings in the metallic extension and spark plug terminals the points of which terminate in the chambers formed in the insulation and opposite the upper ends of the said conducting wires or rods as and for the purpose described.

4. In a spark plug, the combination substantially as described, of the insulating body or core provided with the conducting wires or rods terminating at their upper ends in points for a spark gap or gaps, a

fastening bushing for said core extending
up above the level of said terminal points,
the metal of said extension being provided
with openings opposite the wire terminals,
5 and an insulating body fastened in said ex-
tension and carrying the spark plug termi-
nals, the ends of which cooperate with the
ends of said wires or rods to form artificial
spark plug gaps opposite said openings and

a web or barrier extending vertically be- 10
tween the spark gaps.

Signed at New York, in the county of
New York and State of New York, this 7th
day of February A. D. 1917.

WILLIAM J. O'GORMAN.

Witnesses:

F. B. TOWNSEND,
IRENE LEFKOWITZ.