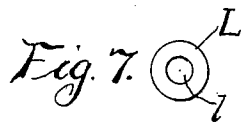
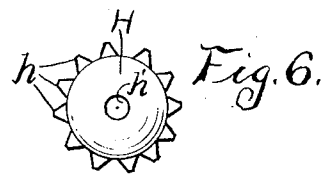
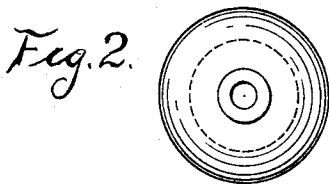
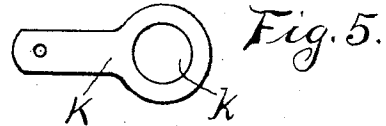
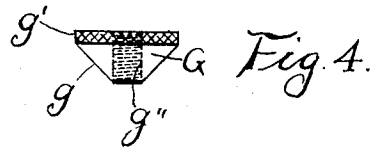
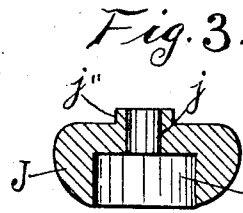
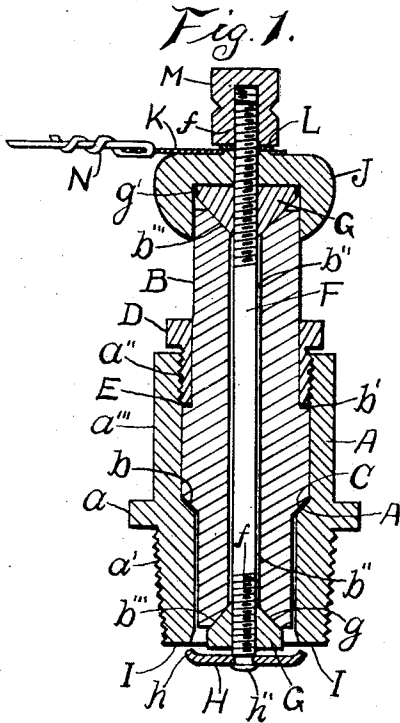


L. S. ROSS.
SPARK PLUG.

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1,332,691.

Patented Mar. 2, 1920.



Witness:

E. G. Jacker

Inventor:

Leo S. Ross

By Charles Turner Brown
Att'y.

UNITED STATES PATENT OFFICE.

LEO S. ROSS, OF CHICAGO, ILLINOIS.

SPARK-PLUG.

1,332,691.

Specification of Letters Patent.

Patented Mar. 2, 1920.

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To all whom it may concern:

Be it known that I, LEO S. ROSS, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Spark-Plugs for Quick-Combustion Engines, of which the following is a specification.

Among the objects of the invention is to obtain a spark plug by means of which a number of sparks or flashes are simultaneously obtained of considerable intensity relative to the voltage of the primary and generating current; to obtain a spark plug having few parts which are easily assembled and not liable to break or get out of order, a spark plug which is easily adjusted and not liable to be accidentally or wilfully put out of adjustment; and a spark plug which is economically made and durable.

In the accompanying drawing a construction is illustrated which embodies this invention and,

Figure 1 is a vertical sectional view of the assembled elements forming a spark plug.

Fig. 2 is a top plan view of the cap member of the spark plug and Fig. 3 a vertical sectional view thereof.

Fig. 4 is a side elevation of a cone tightening and adjusting member.

Fig. 5 is a top plan view of a connection member.

Fig. 6 a top plan view of a terminal member, and Fig. 7 a top plan view of an insulating member.

A reference letter applied to designate a given part indicates said part throughout the several figures of the drawing wherever the same appears.

A represents the main body or shell of the device which is of electric conducting material and provided with an annular flange (*a*) midway thereof, the external screw threads (*a'*) at one end and internal screw threads (*a''*) at the other end thereof. The screw threads (*a'*) are adapted to fit into corresponding screw threads in an aperture provided therefor communicating with the combustion chamber of an engine. The body part or shell (*a*) of the spark plug is provided with faces, indicated by reference character *a'''*, to which a wrench may be applied, as is common in spark plugs.

B represents a plug of insulating material, preferably porcelain, which is provided with shoulder *b*, adapted to abut against shoulder *A*¹ of shell A, and C represents packing material interposed between said shoulders *b* and *A*¹. Plug B is also provided with the additional shoulder *b'* and with the longitudinally extending passageway *b''*. The ends of plug B are provided with the flaring faces *b'''*.

D represents a hollow nut which is provided with external screw threads corresponding with and fitting into the internal screw threads *a''* of shell A. E represents packing material which is interposed between the shoulder *b'* of plug B and the end of the hollow nut D, and said plug B is firmly secured in shell A by means of said hollow nut D in the usual manner.

F is a conductor which extends loosely through the longitudinal passageway *b''* and is provided with screw threads *f* at the ends thereof. G, G, are nuts which are respectively provided with the conical face *g*, the knurled periphery *g'* and the screw thread aperture indicated by letters *g''* in Fig. 4.

The internal screw threads of apertures *g''*, *g''*, correspond and fit the screw threads *f*, *f*, on the conductor F, and by means thereof the passageway *b''* is closed at both ends. H represents a terminal having a plurality of teeth or points (*h*) on the periphery thereof and the aperture *h'* therethrough. Terminal H is firmly attached to one end of the conductor B by turning said end of said conductor down to fit closely into aperture *h'* and riveting, (as at *h''*, Fig. 1), the end of said conductor over onto said terminal.

The adjustment of the points *h* relative to the end (I) of shell or case A is made, (in assembling the several parts of a spark plug and also at any time thereafter) by turning the screw threaded nut G which is adjacent to said terminal into proper position on conductor F relative to said terminal and thereafter turning the other one of said nuts G closely to place against the flaring face *b'''* at the other end of said plug, thus bringing the conical face of nuts G firmly against the flaring faces *b'''* and closing the passageway *b''* through said plug, as hereinbefore recited.

J represents a cap of insulating material, preferably porcelain, which fits over one end of plug B. Cap J is provided with aperture *j* which fits loosely on conductor F, and
 5 when, said cap is in place on said plug, interference with the adjustment of terminal H, obtained by means of nuts G, G, as hereinbefore described, cannot be made. The upper face of cap J is provided with the annular
 10 flange *j''* and K represents a conductor which is provided with aperture *h* fitting over flange *j''*.

L represents a washer of insulating material which is provided with aperture *l*
 15 fitting loosely over conductor F, and M represents a nut also fitting over said conductor F and provided with internal screw threads corresponding with and fitting to the screw threads on said conductor.

20 The insulating washer L is interposed, as illustrated in Fig. 1, between the conductor K and the nut M so when said conductor is forced against J by the turning of nut M to place said conductor G is insulated
 25 from said conductor F so that when an electrical current flows from conductor N to conductor K said current must jump from conductor K to nut M and from thence flow on conductor F to terminal H and again
 30 jump from point *h* thereof to end I of shell A, from whence it flows to the source of said current in the ordinary manner over the conductors supplied therefor.

A double break in the ignition current is
 35 thus provided for, one thereof, from terminal H in the fuel contained in the combustion chamber of the engine and one thereof from conductor K external to said combustion chamber. The length of the external
 40 break or jump is determined by the thickness of the washer L.

I claim:

1. In a spark plug, a shell of conducting material, a plug of insulating material provided with a passageway extending longitudinally therethrough, with the ends of
 45 said passageway flaring outwardly, means to secure said plug in said shell, a screw threaded conductor in said passageway extending beyond the ends thereof, screw
 50 threaded nuts on said conductor respectively provided with a conical periphery fitting to the flaring ends of said passageway to close the same, a terminal secured to one end of
 55 said conductor and adjacent to one end of said shell, a cap of insulating material fitting over the end of said plug, said cap provided with an annular flange on the face thereof, and provided with an aperture fitting
 60 loosely around said screw threaded conductor, a terminal fitting around said flange, a screw threaded nut to hold said last named terminal to said cap, and a washer of insulating material interposed between it and
 65 said cap, all arranged to obtain gaps at

both ends of said spark plug, to be bridged by a current of electricity flowing through said spark plug.

2. In a spark plug, a shell of conducting material, a plug of insulating material provided with a passageway extending longitudinally therethrough, with the ends of said passageway flaring outwardly, means to secure said plug in said shell, a screw threaded conductor fitting loosely in said
 70 passageway, screw threaded nuts respectively provided with a conical periphery fitting in the flaring ends of said passageway to close the same, a terminal secured to said conductor at one end of said plug, a
 75 cap of insulating material fitting over the other end of said plug and provided with an annular flange on the face thereof, and provided with an aperture fitting loosely around said screw threaded conductor, a
 80 terminal fitting around said flange, and means to secure said terminal in place with insulating material interposed between said last named means and said terminal.

3. In a spark plug, the combination of a
 90 shell of conducting material, a plug of insulating material provided with a passage way extending longitudinally therethrough, with the ends of said passage way flaring outwardly, means to secure said plug in said
 95 shell, a conductor provided with screw threads at the ends thereof fitting loosely in said passage way, a terminal secured on said conductor at one end thereof and a screw threaded nut on said conductor adjacent to
 100 said terminal, said nut provided with a conical periphery fitting to the flaring end of the passage way in said plug, a nut provided with a flaring periphery fitting to the flaring end of said passage way at the other
 105 end of said plug, insulating material fitting over said other end of said plug and around said conductor, an additional terminal, additional insulating material on said additional terminal, to insulate it from said
 110 conductor, and means to secure said additional insulating material and said additional terminal to said first named insulating material and to force said last named nut with the flaring periphery thereof to the
 115 flaring end of said plug to close said passage way, said means to secure being made of conducting material separated from said last named terminal by said additional insulating material.

4. In a spark plug, a shell of conducting material, a plug of insulating material provided with a passageway extending longitudinally therethrough, with the ends of
 120 said passageway flaring outwardly, means to secure said plug in said shell, a screw threaded conductor in said passageway and extending beyond the ends of said plug, screw threaded nuts respectively provided with a conical periphery fitting the flaring
 130

ends of said passageway to close the same, a terminal provided with a plurality of points secured on one end of said conductor, a cap of insulating material on said conductor,
5 said cap provided with an annular flange and an additional terminal fitting said flange and including electric conducting means to secure said last named terminal on

said flange, and insulating material interposed between said terminal and said con- 10 ducting means.

LEO S. ROSS.

Witnesses:

CHARLES TURNER BROWN,
JOSIE BECK.