

W. O. OLSON.  
SPARK PLUG.  
APPLICATION FILED MAY 20, 1918.

1,354,126.

Patented Sept. 28, 1920.

Fig. 1

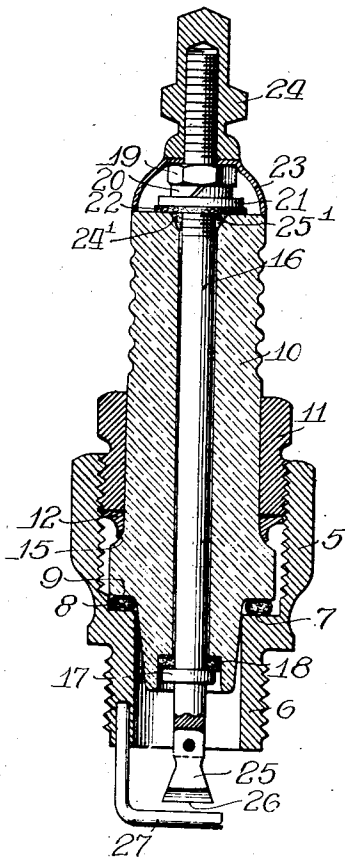


Fig. 2

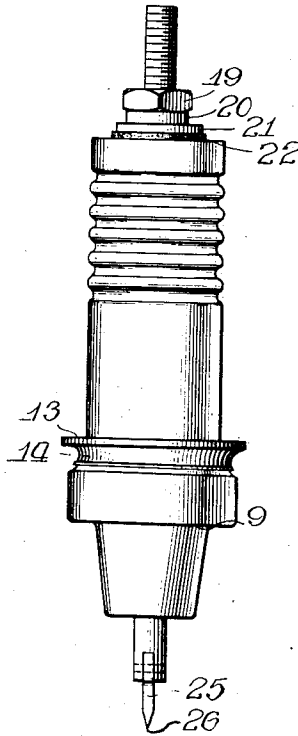
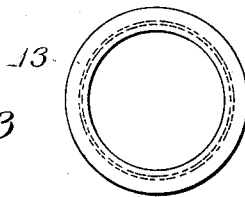


Fig. 3



Inventor:  
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By: *W. J. Bell* Atty.

# UNITED STATES PATENT OFFICE.

WILLIAM O. OLSON, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE ARC-O MANUFACTURING CO., INC., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## SPARK-PLUG.

1,354,126.

Specification of Letters Patent. Patented Sept. 28, 1920.

Application filed May 20, 1918. Serial No. 235,566.

*To all whom it may concern:*

Be it known that I, WILLIAM O. OLSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification.

This invention relates to spark plugs for internal combustion engines and has for its primary object the provision of a spark plug embodying electrode terminals adapted to be maintained in a highly heated or substantially incandescent condition during use whereby any oil which contacts with the terminals is immediately ignited and burned so that the terminals are maintained clear permanently.

A further object of my invention is the provision of a novel construction including a packing ring between the shell and core of a spark plug which insures a permanently tight joint.

Further objects and advantages of my invention will be apparent as it is better understood by reference to the following specification when read in connection with the accompanying drawing illustrating the preferred embodiment thereof, in which

Figure 1 is a longitudinal section through a spark plug according to my invention;

Fig. 2 is an elevation of a core showing the packing ring in place, and

Fig. 3 is a plan view of the packing ring.

Referring to the drawing, 5 indicates a shell having a reduced threaded neck 6 adapted for insertion in the head of internal combustion engine cylinders. The shell 5 is provided with a shoulder or seat 7 upon which a gasket 8 rests. A corresponding shoulder 9 of an insulating core 10 rests upon the gasket 8. The core 10 is held in assembled relation with the shell 5 by means of a threaded sleeve 11, the lower edge of which engages a packing ring 12. This packing ring is of particular form and is intended and adapted to maintain a thoroughly tight joint even when frequently removed and replaced. It comprises a ring of annealed brass having a flat face 13 adapted to be engaged by the lower edge of the sleeve 11 and a depending relatively thin lip 14 which conforms to a curved shoulder 15 on the core 10. As the ring 12 is forced against the shoulder by the sleeve 11, the lip 14 follows the curva-

ture of the shoulder and upon each replacement of the ring after removal thereof the lip 14 spreads slightly and conforms more closely to the curvature of the shoulder 13 thus insuring a permanently tight joint. 60

The core 10 is provided with a central opening through which a central electrode 16 extends and which is somewhat larger than the electrode to permit expansion of the electrode without subjecting the core to 65 pressure. A flange 17 near the lower end of the electrode 16 engages a gasket 18 held in a recess in the end of the core 10. The electrode 16 is held in assembled relation with the core 10 by means of a nut 19 be- 70 tween which and the end of the core 10 a spring washer 20, a flat washer 21, and an asbestos washer 22 are disposed. A cap 23 is threadedly mounted upon the electrode 16 covering the nut 19 and the washers 75 therebeneath and a terminal nut 24 is mounted above the cap 23 on the electrode. A recess 24' in the end of the core is adapted to receive a strip of asbestos yarn 25' which when compressed enters the threads 80 in and centers the electrode and holds it in assembled relation with the core.

The lower end of the electrode 16 is provided with a flattened terminal 25 rigidly connected to the end of the electrode and 85 provided with a sharpened edge 26 of considerable length. This terminal is constructed of metal having relatively low heat conductivity and which is not easily oxidized. The relatively low heat conductivity 90 of the terminal together with its flattened form insures its maintenance at a relatively high temperature or substantially incandescent when in use. A terminal 27 connected to the shell 5 is disposed so that the 95 edge 26 of the terminal 25 is parallel therewith. Thus the spark produced between the two terminals is a thin flattened sheet which insures firing of the charge within 100 the engine cylinders and the maintenance of the terminal 25 in a highly heated condition.

It should be understood that the electrode terminal in my spark plug is designed to provide a condition quite contrary to that 105 generally desired. I have discovered that in many modern internal combustion engines, owing to clearance between the pistons and cylinders and the dilution of the lubricating oil by condensed combustible 110 vapor, a considerable amount of oil reaches

the interiors of the cylinders and is deposited on the electrode terminals of the spark plugs when it carbonizes and prevents proper sparking. I have discovered that this difficulty may be overcome entirely by providing a spark plug in which the terminals are maintained in a highly heated or substantially incandescent condition, and I have found that the structure described herein is best adapted to accomplish this purpose.

From the foregoing it will be readily understood that I have perfected a spark plug having marked and desirable advantages over spark plugs commonly employed in internal combustion engines, and that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing any of the material advantages thereof, the form here-

inbefore described being merely a preferred embodiment thereof.

I claim:

A spark plug having a straight electrode therethrough and provided at its lower end with an axially disposed flattened terminal of non-oxidizing metal having a relatively low heat conductivity, the sparking end of said terminal being arranged transversely of said electrode and extended in length greater than the transverse diameter of said electrode and greater than the width of the terminal back of said sparking end, and another electrode having its terminal arranged beneath and parallel with said sparking end.

WILLIAM O. OLSON.

Witnesses:

ERNEST H. MERCHANT,  
M. A. KIDDIE.