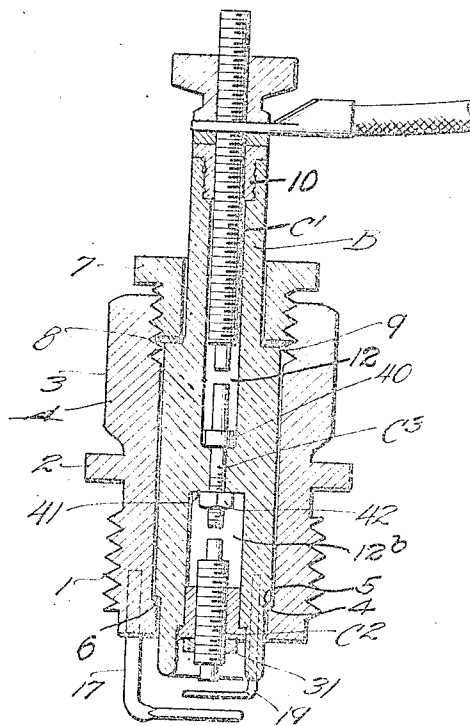


Apr. 17, 1923.

F. A. CARTER
SPARK PLUG

1,451,939

Filed March 7, 1921



The enter-
Francis A. Carter
William Grady,
See Mr. Caleb Atlys.

UNITED STATES PATENT OFFICE.

FRANCIS A. CARTER, OF CHICAGO, ILLINOIS.

SPARK PLUG.

Application filed March 7, 1921. Serial No. 469,967.

To all whom it may concern:

Be it known that I, FRANCIS A. CARTER, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Spark Plugs, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to spark plugs for use in connection with internal combustion engines, and the principal object of the invention is to provide an entirely satisfactory device of this kind that is of rugged construction, that may be economically manufactured, and which is so constructed as to afford one or more intensifier gaps which are provided by parts of the plug unit.

Other features of novelty will appear as the following detailed description progresses.

In the drawing I have shown a sectional view of a plug showing the features of my invention.

A represents the integral metal spark plug shell, which comprises the conventional threaded portion 1, the flange 2 and hexagonal nut 3. Near its lower end the shell 30 A is provided with an annular beveled shoulder 4, which co-operates with a corresponding shoulder 5, formed on the insulator B. A gasket 6 is conveniently interposed between shoulders 4 and 5, as illustrated. The member B may be formed of any one of the materials commonly employed as spark plug insulators. The insulator B is held in position by the externally threaded collar 7, which co-operates with internal screw threads at the upper end of shell A. A suitable gasket 8 is preferably interposed between collar 7 and insulator shoulder 9. The sleeve B is formed to provide a pair of recesses in which electrode 45 members C¹, C² and C³ are intended to co-operate for the purpose of intensifying the spark. Electrode C¹ is threaded in the sleeve 10 imbedded in the insulator sleeve B, and said electrode terminates within re-

cess 12 and co-operates with central electrode C³. Electrode C² is adjustably mounted in a sleeve, and may be locked in any desired position by lock nut 31. The element C² is provided with a shoulder 40, which rests on the upper surface of a web 41 in the central portion of the member B, and the web is formed with an opening to receive the lower portion of the member C², the said lower portion being screw threaded to receive lock nut 42. As illustrated, electrode C² co-operates with electrode C³ and terminates in recess 12^b closed to the atmosphere.

Preferably imbedded in the lower end of the shell, and projecting downwardly therefrom, is a pin 17 of conducting material, which has its free end turned at right angles to the insulated electrode C² and lying directly under, but spaced from the lowermost portion of the insulated electrode. Imbedded in the insulator B and projecting downwardly therefrom is a pin 19 of electricity conducting material, the free end of which is turned in a plane parallel with the free end of pin 17. The free end of pin 19 lies directly between the lower end of the insulated electrode C² and the free end of pin 17.

In practice, the members C¹ and C² are so adjusted that the gap between the members C¹ and C² and the gap between the members C² and C³ are substantially equal to each other, and substantially equal to the gaps at the lower portion of the plug. The upper and lower ends of the longitudinal passages in the insulator are effectively closed so that the sparks passing the two confined gaps derive such benefit as is afforded by operating within the confined space from which the oxygen has been dissipated.

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

A spark plug comprising a metal sleeve provided with an electrode, an insulator sleeve mounted in the metal sleeve, said insulator sleeve being provided with a pair of longitudinal recesses separated by an in-

tegral wall of the insulator sleeve, a central electrode mounted in the wall, means to adjust said electrode, end closures for said recess, threaded inner and outer electrodes
5 mounted in said end closures and co-operating with said central electrode, and an electrode imbedded in the insulator sleeve and having its free end disposed between the in-

ner electrode terminal and the electrode on the metal sleeve.

In witness whereof, I hereunto subscribe my name this 4th day of March, 1921.

FRANCIS A. CARTER.

Witnesses:

ALBIN C. AHLBERG,
E. J. BOURGEOIS.