

H. E. MAHER.
SPARK PLUG.
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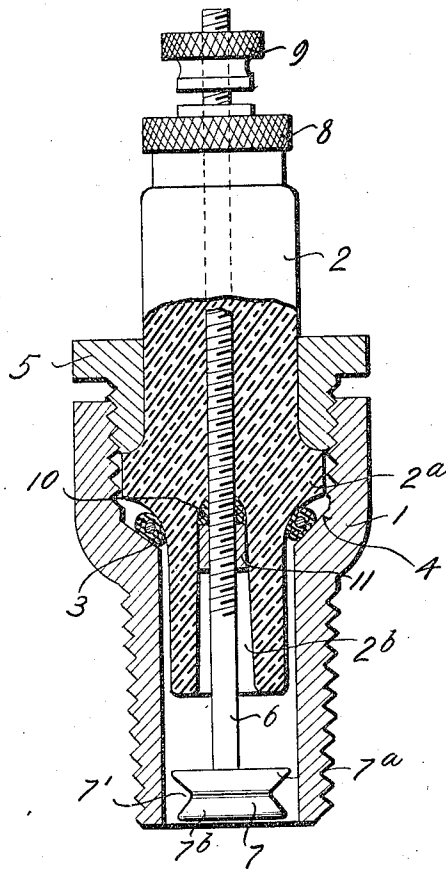


Fig. 1

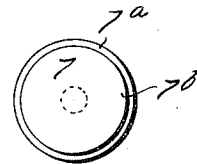


Fig. 2

Witnesses

E. Larson
W. J. Kime

Inventor

Harry E. Maher

By

Decker & Cobb
Attorneys

UNITED STATES PATENT OFFICE.

HARRY ELLSWORTH MAHER, OF CROOKSTON, MINNESOTA.

SPARK-PLUG

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To all whom it may concern:

Be it known that I, HARRY ELLSWORTH MAHER, a citizen of the United States, residing at Crookston, in the county of Polk and State of Minnesota, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification.

It has long been a desideratum in the art of construction of spark plugs for explosive engines, to provide a device of this class which is self-cleaning, so to speak, or in which soot, oil, or foreign matter tending to collect in the spark gap will be discharged during the operation of ignition of the explosive charge, thereby keeping the plug in constant condition for efficient service.

While I am acquainted with practically all the spark plugs on the market, I have never seen one which is really self-cleaning, or which will not clog at the spark gap, causing missing of the explosion of the motor and other disadvantages obvious to those acquainted with the operation of internal combustion engines.

It has therefore been the object of my invention to supply a spark plug embodying a central electrode as customary, the latter in my invention being peculiarly constructed to accomplish the results before described.

For a full understanding of the present invention, reference is to be had to the accompanying drawings, in which—

Figure 1 is a central vertical sectional view of a spark plug embodying the invention; Fig. 2 is an end elevation of the central electrode.

Throughout the following detail description and on the several figures of the drawings similar parts are referred to by like reference characters.

In the general construction of my plug, the main parts are similar to those commonly in use and comprise the outer shell 1 to be screwed into the engine cylinder, having a suitable insulating core 2 preferably of porcelain, the latter having an annular enlargement 2^a adapted to be seated against a gasket 3 interposed between the enlargement 2^a and an internal shoulder 4 on the shell or casing 1. The core 2 is held in place by a retaining nut 5. Passing through the core 2 is a central electrode rod 6 at the lower end of which is provided the central electrode 7, of the spark plug, the latter being integrally or otherwise connected with

the rod 6. A metallic cap 8 and the usual binding nut 9 are screwed on the upper end of the rod 6 for the usual purposes and the lower end of the core 2 has a longitudinal recess 2^b in which a packing 10 and packing nut 11 are arranged.

The construction of the electrode 7 is of primary importance to the present invention, said electrode consisting of an approximately circular body formed in its periphery with a V-shaped groove 7' by which are provided spaced flanges 7^a and 7^b, the latter being in spaced relation to, but received in the lower end of the casing 1. The flange 7^a is spaced closer to the casing 1 than the flange 7^b, and the two flanges form two spark gaps, the operation and advantages of which will now be described.

In the operation of the plug under normal conditions the flange 7^a being closer to the casing 1 than the adjacent flange 7^b, the sparks ordinarily jump the gap between the flange 7^a and the casing and the ignition of compressed gas in the cylinder takes place at this point, and the exploded gases expand in the V-shaped groove 7', passing outwardly at very high velocity, carrying with it any deposits of oil or soot entering the end of the spark plug or between the gap 7^b and the casing 1. The lower spark gap at the flange 7^b is thus kept free or clean, soot and foreign deposits being automatically cleared therefrom, so to speak, in the operation of the invention. Thus should the spark fail to cross the gap at the flange 7^a for any reason, the flange 7^b provides an auxiliary gap, insuring proper sparking and ignition of the gas to obtain best results. Naturally, also, the ignition of the compressed gas at the gap near the flange 7^b will tend to clear the gap at the flange 7^a with most advantageous results. Furthermore, the rush of the gas from within the casing 1 when ignition takes place tends to create a vacuum above the electrode 7, thereby drawing all foul gas out of the cavity at said point, the self-cleaning operation of the invention being thus subserved. By the use of the invention the explosive charge will mix more quickly when ignition takes place, causing a higher pressure of the explosion in the cylinder, increasing the power derived from the explosion five or ten per cent. By making the quick ignition of the explosive charge a weaker mixture of hydrocarbon and air may be used, affording a sav-

ing in running expenses and permitting the engine to run cooler with a weaker mixture.

The terms "upper" and "lower" as used herein are to be understood as relative, more especially in the sense of inner and outer, respectively, and in reference to the position of the flanges of the electrode 7.

Having thus described my invention, what is claimed as new, is:

10 1. In a spark plug, the combination of a casing, an electrode mounted therein and comprising a body spaced from the casing and provided with upper and lower spaced flanges, each of which are spaced from the
15 casing to form spark gaps.

2. In a spark plug, the combination of a casing, an electrode mounted in an end thereof and comprising a flat body spaced from the casing and provided with upper and
20 lower spaced flanges each of which are

spaced from the casing to form spark gaps, and the upper flange having its edge spaced closer to the casing than the edge of the lower flange.

3. In a spark plug, the combination of a 25 casing, an electrode mounted in an end thereof and comprising a flat round body formed in its periphery with a V-shaped groove providing upper and lower flanges and an intermediate space, the flanges being 30 unequally spaced from the sides of the casing to form two spark gaps, the one acting auxiliary to the other.

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

HARRY ELLSWORTH MAHER.

Witnesses:

A. A. MILLER,
L. S. MILLER.