

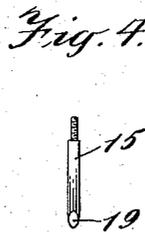
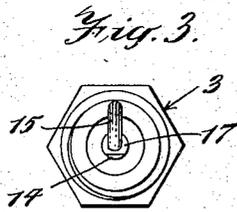
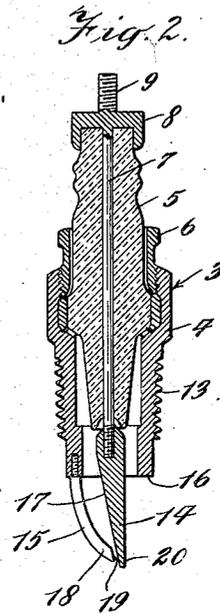
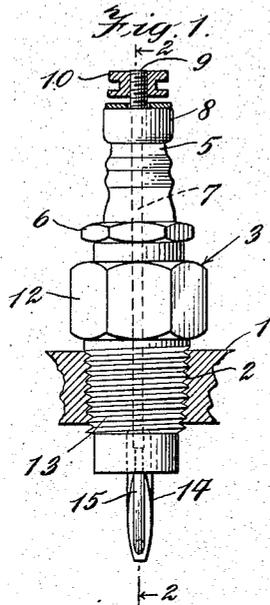
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H. VINCENT

2,021,928

SPARK PLUG

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INVENTOR  
*Henri Vincent*  
BY  
*Gifford, Scull & Burgess*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE

2,021,928

## SPARK PLUG

Henri Vincent, Sucrerie de Kom-Omba, Egypt

Application May 9, 1933, Serial No. 670,061

5 Claims. (Cl. 123—169)

This invention relates to a new and useful improvement in spark plug, the novel features of which will be best understood from the following description and the annexed drawing, in which I have shown a selected embodiment of the invention and in which:

Fig. 1 is an elevation of a spark plug constructed according to one embodiment of the invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a bottom view of the structure appearing in Fig. 1;

Figs. 4 and 5 are face views of the two electrodes.

By the use of the term "spark plug" herein, I intend to refer to a device located in the wall of a combustion chamber and adapted to ignite gases therein. Usually, as is well known in the art, such a device is made in the form of a plug which can be readily removed and reinserted, although the invention is not limited to that particular form of device. For the sake of convenience, however, I shall employ the term "spark plug" in the following description and claims.

In Fig. 1, I have indicated at 1 a fragmentary part of a wall of a combustion chamber having a threaded opening 2 therein in which may be threaded a spark plug 3. This plug may comprise an outer shell 4 of metallic or other conductive material, within which is disposed a core 5 of porcelain or other insulating material held in place in the shell by the gland 6.

Extending longitudinally through the core 5 is a rod 7 of conducting material having a cap 8 overlying the outer end of the core. This cap has a stem 9 upon which may be threaded a nut 10, thus forming a binding post to which an electrical conductor may be secured. The shell is provided with the usual wrench-engaging faces 12 and with threads 13 to engage corresponding threads on the wall of the opening 2.

The inner end of the plug, by which is meant the end within the combustion chamber, is provided with two electrodes 14 and 15, and these electrodes extend a substantial distance beyond the inner end of the electrode, which end I have designated 16. The electrode 14, which is here shown as the center electrode, is indicated as threaded into engagement with the rod 7, thereby forming a continuous path for the flow of an electric current from the binding post to the electrode, whereas the electrode 15 is shown as the side electrode threaded into engagement with the shell wall and thus forming a grounded connection, since the shell wall is threaded into engage-

ment with the metallic wall 1 of the chamber.

The electrode 14 is shown as being of relatively massive construction and having an extended flat surface 17, this surface being disposed so that it extends generally lengthwise of the plug but at a slight angle to the axis thereof. The surface 17 faces the electrode 15, which may be formed of a rod having its outer end 18 bent or arched inwardly towards the center electrode and cut obliquely of its length to form a relatively extended surface 19, as best shown in Fig. 4. The surfaces 17 and 19 are shown as being flat and substantially parallel to each other and generally close together so that a spark may readily pass between the two surfaces. The means for forming the spark is, of course, well understood in the art, and no description thereof is necessary for an understanding of this invention.

I have found that, by use of the spark plug described above, the sparking is produced at a point well within the combustion chamber, it being noted in this connection that the surface 19 at the extreme end of the side electrode 15 is disposed adjacent the inner end 20 of the electrode 14, thus promoting rapid ignition of the carburated mixture and a consequent lessening of the time necessary for ignition. Moreover, the spark is produced away from the wall of the chamber and away from any other point where there might be a collection of burnt or neutral gases, this again expediting starting of combustion within the chamber and consequently starting of the engine.

Another result which I have found to follow from the improved construction is that, instead of producing a single spark, a group or shower of sparks is produced and, because of the inclined surface 17, this shower of sparks is directed toward the bottom or lower end 16 of the plug; thus tending to clean the plug and maintain it clean. I have found that by the use of this plug, I have been able to operate engines for extended periods of time without causing the plugs to be clogged with carbon, grease, or other material, in spite of the fact that a grade of fuel was being used which would normally cause this result to follow. The improved results I believe to be caused at least in part by the features to which I have called attention above. Whatever may be the explanation, the result is a greatly improved one.

While I have shown the invention as embodied in a specific form, it is to be understood that various changes in details may be made without departing from the scope of the invention, and

I therefore do not intend to limit myself except by the appended claims.

I claim:

1. A spark plug comprising two electrodes extending lengthwise of the plug beyond the end thereof, one of said electrodes having an extended substantially flat surface disposed lengthwise of the plug and inclined to the axis thereof, and the other electrode having a relatively small surface disposed adjacent said surface on the first-named electrode.

2. A spark plug comprising two electrodes extending lengthwise of the plug beyond the end thereof, one of said electrodes having an extended substantially flat surface disposed lengthwise of the plug and inclined to the axis thereof, and the other electrode having a relatively small surface disposed adjacent said surface on the first-named electrode and parallel thereto.

3. A spark plug comprising two electrodes extending lengthwise of the plug beyond the end thereof, one of said electrodes having an extended and substantially flat surface disposed lengthwise of the plug and inclined to the axis

thereof, and the other electrode having a relatively small surface disposed adjacent said surface on the first-named electrode and adjacent the outer end thereof, at a location remote from said end.

4. A spark plug comprising center and side electrodes extending lengthwise of the plug beyond the end thereof, the center electrode having an extended, elongated area with a substantially flat surface disposed lengthwise of the plug but at a small angle to the axis thereof, the side electrode having a relatively small area at its end disposed adjacent the relatively large area of the center electrode and disposed at a location remote from said end.

5. A spark plug comprising two solid electrodes extending lengthwise of the plug beyond the end thereof, one of said electrodes having an extended substantially flat surface disposed lengthwise of the plug and the other electrode having a relatively small substantially flat surface likewise disposed lengthwise of the plug and facing said surface on the first-named electrode.

HENRI VINCENT.