

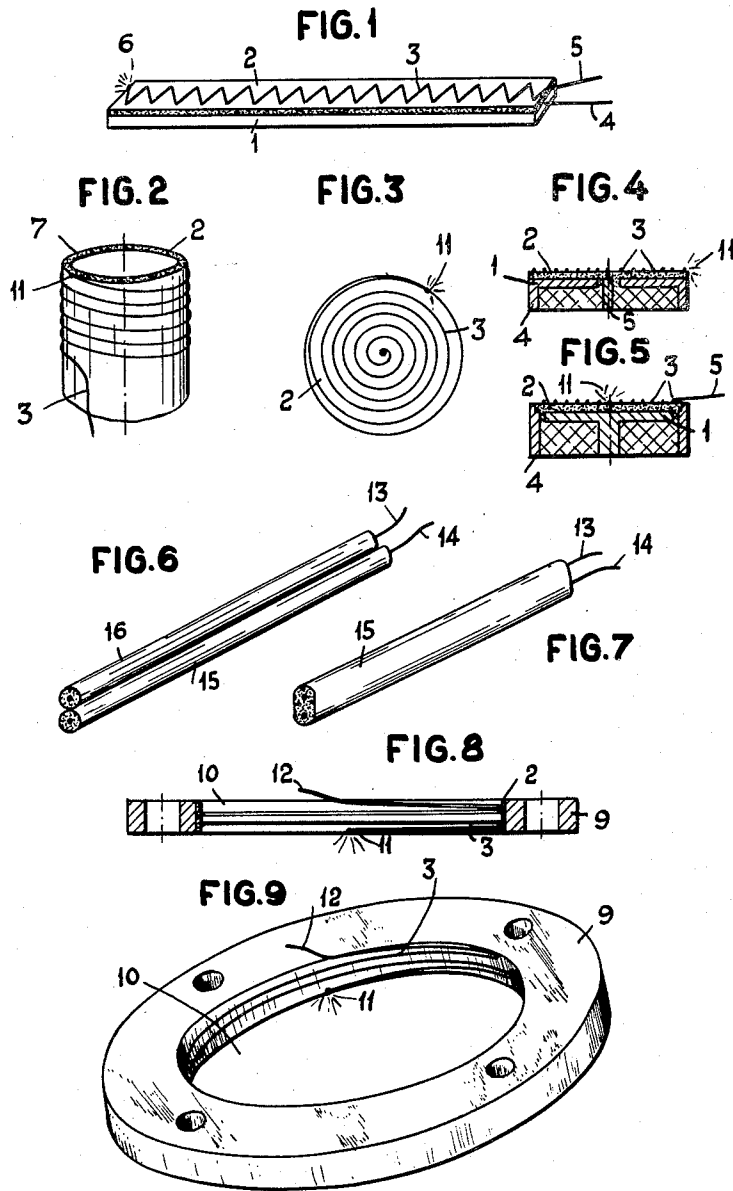
Aug. 9, 1960

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2,948,824

DEVICE FOR IGNITING GASEOUS OR LIQUID FUELS

Filed Nov. 26, 1956



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DEVICE FOR IGNITING GASEOUS OR LIQUID FUELS

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Filed Nov. 26, 1956, Ser. No. 624,433

1 Claim. (Cl. 313-130)

The invention relates to a device for igniting gaseous or liquid fuels, operating on the surface-discharge sparking principle, comprising two electrodes of molybdenum, tungsten or a similar high-temperature-resistant material, separated by insulating or semi-conductive material, such as is known from the published Dutch patent application No. 175,395.¹

In the manufacture of the electrodes a round wire, the sparking edges of which are ground flat or bevel, is usually taken. The wire serves along its full length as the place for the spark to jump across.

A portion of this material, which is very expensive, will thus already be lost during manufacture. During the use of the sparking plug a further portion of the electrode material will be gradually burnt away, and when the plug has reached the end of its service life, a large portion of the material will still be present in the plug body, so that this remaining material, too, is lost.

Thus it resulted from experiments that about four fifths of the electrode material are lost and only one fifth is used effectively.

The invention has for its object to provide an ignition device which on the one hand is constructed in such a way that during its service life all the material is effectively used to the full and that on the other hand a considerably longer life can be attained, which may, if necessary, be determined in practice by the user.

According to the invention at least one of the electrodes may consist of a very thin wire or tape, which is fitted on or in the insulating or semi-conductive material, in which case exclusively the end of the wire serves as the place for the spark to jump across.

It is observed that from the Dutch patent specification No. 71,869 a sparking plug is already known in which one or both of the electrodes consist(s) of a wire embedded in the insulating or semi-conductive material, while exclusively the end of the wire serves as the place for the spark to jump across. In this case, however, the sparking plug serves as the light-source of an arc lamp, the wire-shaped electrode or electrodes, which is (are) made of a readily atomized material, being adapted to move in the insulating or semi-conductive material, so that upon the electrodes being gradually burnt away the distance between the electrodes can be kept constant.

The invention is elucidated more fully with reference to the drawing illustrating a number of embodiments, it having to be noted that the component parts are shown on a considerably enlarged scale, since e.g. the wires used will have a diameter of the order of size of 0.1 to 0.5 mm. and the size of the other parts will be proportional.

Fig. 1 is a perspective illustration of an embodiment of the device according to the invention in the form of a small plate.

Fig. 2 is a second embodiment, in the form of a small rod.

Fig. 3 is a third embodiment, comprising a spiral wire.

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Figs. 4 and 5 are two different cross-sections through an embodiment according to Fig. 3.

Figs. 6 and 7 show two further embodiments.

Fig. 8 illustrates a gasket for an internal combustion engine, constructed in accordance with the invention.

Fig. 9 is a front view of this gasket.

Fig. 1 shows a small plate 1 consisting of a metal having the same or approximately the same coefficient of expansion as the wire that is fitted on it. Applied on this plate is a thin layer of insulating material, e.g. enamel or glass, and on this a wire 3 has been fitted singly or in multiple or in zigzag form.

The plate and the wire 3 are connected at 4 and 5 to the poles of the source of voltage. If a small portion of the insulator is removed at the end 6 of the wire, so that the sparking path is formed by the thickness of the insulation, the spark will start to operate there. The wire 3 and the insulation 2 will gradually be burnt away until the whole of the wire has been used and the sparking device has to be renewed.

As may be seen from Fig. 2, one of the electrodes may also consist of a small metal rod 7, coated with a thin insulating layer 2, about which the wire 3 has been wound and to which it is secured. Here the spark starts at the point 11.

Figs. 3, 4, and 5 illustrate an embodiment in which one of the electrodes consists of a small metal plate 1, which again is coated with a thin insulating layer 2, on which the spiral wire 3 is secured, thus forming the other electrode.

According to Fig. 4 the wire 3 will be burnt away from the outside inwards, whereas the reverse will take place according to Fig. 5.

In Fig. 4 the poles of the sparking element are designated by 4 and 5, while the place where the spark starts operating is indicated by 11. In Fig. 5 the numerals 1 and 5 denote the electrodes, 5 being secured to 4.

As Figs. 6 and 7 show, the ignition device may also consist of two small insulating tubes 15 and 16, containing wires 14 and 13 respectively, these tubes being fastened together according to Fig. 6, so that the wires 13 and 14 act as electrodes and are both burnt away gradually along with the intermediate insulator material. Instead of two tubes, it is also possible to use one tube 15 (Fig. 7), into which two wires, insulated from one another, have been fused.

In Fig. 8 the numeral 9 designates a normal gasket with opening 10. The wall of the opening 10 is coated with an insulating layer 2, while a wire 3 in some form or other is again secured on the latter; the sparking starts at the point 11.

From Fig. 9 it appears that the wire 3 may extend along the wall of the opening in such a way that the sparks will be able to occur only in a given part of the combustion chamber. In this case, the numeral 12 denotes the connection of this electrode 3 to the source of voltage.

I claim:

A device for providing a surface discharge form of spark to ignite an explosive mixture, comprising a conductive gasket with the inside annular surface thereof immediately adjacent said mixture, an insulative coating on said surface and having an outside surface entirely exposed to said mixture, and a thin conductive wire of small thickness secured along a portion of said annular surface and substantially entirely exposed to said mixture, the sparking end of said wire terminating at an edge of said outside surface of said coating.

References Cited in the file of this patent

UNITED STATES PATENTS

257,776	Solignac	May 9, 1882
2,775,234	Smits	Dec. 25, 1956

¹A patent was subsequently granted on this under No. 77,076.