July 7, 1936. E. B. NOWOSIELSKI 2,046,650

IGNITION MECHANISM

Filed June 2, 1934

Fig. 1

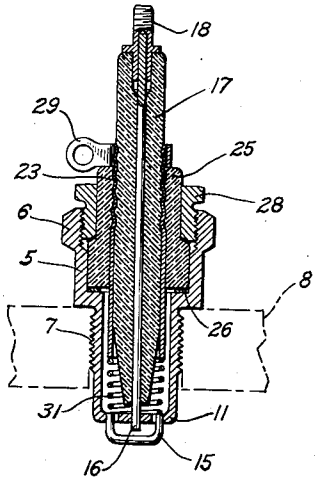


Fig. 3

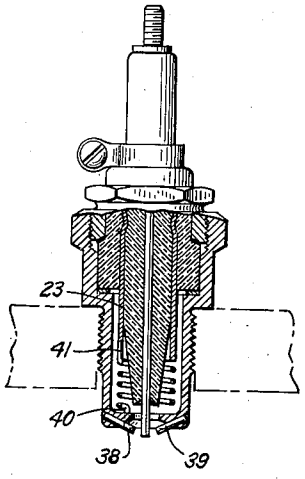
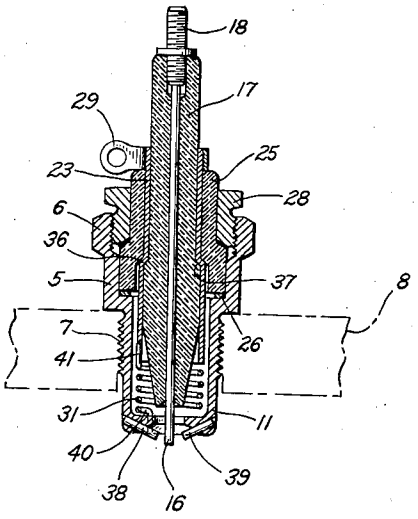


Fig. 2



INVENTOR.
Edward B. Nowosielski
BY
Martin J. Finnegan
ATTORNEY.

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IGNITION MECHANISM

Edward B. Nowosielski, Bloomfield, N. J., assignor to Eclipse Aviation Corporation, East Orange, N. J., a corporation of New Jersey

Application June 2, 1934, Serial No. 728,792

4 Claims. (Cl. 123—169)

This invention relates to ignition devices for internal combustion engines, and particularly, though not exclusively, to ignition devices wherein a heating coil is included for first heating the combustion chamber of an engine to expedite the attainment of ignition temperature, whereupon ignition is produced by means of a jump spark.

An object of the invention is the provision of a novel combined spark and glow plug of the type involving the use of a pair of electrodes separated by a small air gap, with one of the electrodes electrically connected to a glow coil of suitable resistance to produce high heat radiation.

In my earlier application No. 643,285, filed November 18, 1932, the glow coil is shown as contained in a chamber which protects it from contact with the products of combustion in the cylinder, and as a consequence of this protection there is no danger of breaking down of the insulation separating said coil (and the lead thereto) from the other current conducting parts of the plug. In the present invention, I dispense with the necessity of such protection by eliminating the insulating wrapper and in fact eliminating the coil lead itself, substituting therefor a metallic sleeve extending through the plug to a suitable point of connection with an outer terminal clamp, the said metallic sleeve being in the nature of a third electrode separated from the two jump spark electrodes by additional sleeves of insulating material, each of sufficient thickness and toughness to resist deterioration even though exposed to the products of combustion. With this revision in the method of feeding current to the glow coil it is possible to move the glow coil nearer the point of gas ignition and thus obtain a quicker and more intense heat exchange and a resulting improvement in ignition.

These and other objects and advantages of the invention will be more apparent from the following detailed description, taken in connection with the accompanying drawing wherein two embodiments of the invention are shown. It is to be expressly understood, however, that the drawing is for the purpose of illustration only, and is not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawing,

Fig. 1 is a longitudinal sectional view of a device embodying the invention;

Fig. 2 is a longitudinal sectional view of a second embodiment; and

Fig. 3 is a longitudinal sectional view of a device combining certain features of each of the other two.

Referring first to the embodiment shown in Figs. 1 and 2, the invention is therein shown as incorporated in a compact, symmetrical unit having a shell portion 5 of current conducting material adapted to constitute the negative electrode of the plug. As shown, the shell 5 includes an upper polygonal portion 6 adapted for engagement by the usual socket type of wrench for attachment of the unit, and a central externally threaded portion 7 adapted to engage corresponding threads cut in a member 8, which may be a part of the engine cylinder or an adapted member attachable to the engine cylinder by suitable means (not shown).

Integral with threaded portion 7 is a base 11 having three openings, two for the U-shaped electrode 15 and a central one through which projects the lower end of electrode 16 extending centrally through the insulating core 17 and terminating in the metallic cap 18 which serves for attachment of a suitable cable connection post (not shown). Preferably the core 17 is molded or otherwise shaped to present a helically grooved outer surface corresponding to the helical groove or thread formed in a metallic sleeve 23 which is shown fitting over the core 17 and within an insulating sleeve 25 whose bore is correspondingly threaded and whose base rests upon a sealing gasket 26 and an annular ledge on the inner surface of shell 5. A gland nut 28 holds sleeve 25 in place firmly, and a suitable clip 29 surrounds and contacts the upper end of the sleeve 23 and serves for attachment of the wire (not shown) feeding current, whenever desired, to the glow coil 31 whose ends abut the sleeve 23 and shell base 11, respectively, and thereby serve to conduct heat (as well as the coil current) from the former to the latter.

In Fig. 2 the core and sleeve threads of Figs. 1 and 3 are eliminated and sloping shoulders substituted, as shown at 36 and 37. Also, the U-shaped electrode 15 of Fig. 1 is replaced (in both Figs. 2 and 3) with a plurality of radially extending points 38 and 39, with one or more of which one coil end 40 engages. The upper coil end 41 may if desired, similarly engage with the wall of sleeve 23. Otherwise Figs. 1, 2, and 3 are similar.

What is claimed is:

1. In a device of the class described, a core of non-conducting material, a coil surrounding one end of said core, a shell enclosing said coil, a sleeve adapted to feed current to said coil, means

insulating said sleeve from said shell, and means engageable with both said shell and insulating means to cause the latter to apply pressure to said current carrying sleeve and thereby hold it in fixed position with respect to said coil.

2. In a device of the class described, a core of non-conducting material, an electrode extending through said core, a second electrode adjacent to the end of said first-named electrode, a coil having one end contacting said second electrode, and means for feeding current to said coil, said means including a metallic sleeve surrounding said core and engaging the opposite end of said coil.

3. In a device of the class described, a core of non-conducting material, an electrode extending through said core, a second electrode adjacent to the end of said first-named electrode, a coil having one end contacting said second electrode, and means for feeding current to said coil, said means including a metallic sleeve surrounding said core and engaging the opposite end of said coil, and a second sleeve engageable with said current carrying sleeve to hold it in fixed position with respect to said coil.

4. In a device of the class described, the combination with a central electrode and a surrounding shell, of a second electrode grounded through said shell, a coil having one end contacting said second electrode, and means for feeding current to said coil, said means including a metallic sleeve surrounding said central electrode and engaging the opposite end of said coil.

EDWARD B. NOWOSIELSKI.