Nov. 23, 1937. A. J. HOPKINS 2,099,737

SPARK PLUG CORE

Filed Sept. 16, 1935

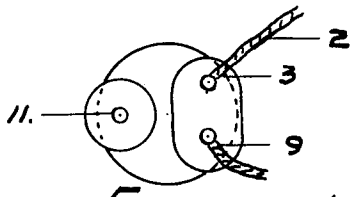


FIG. 2

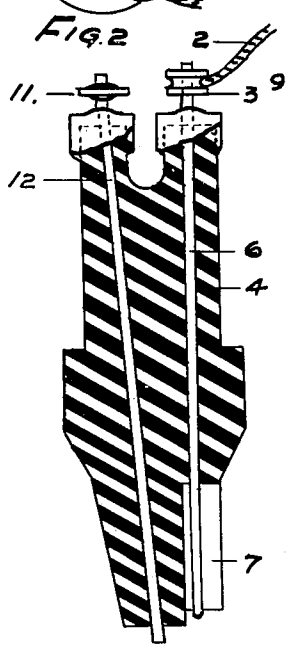


FIG. 1.

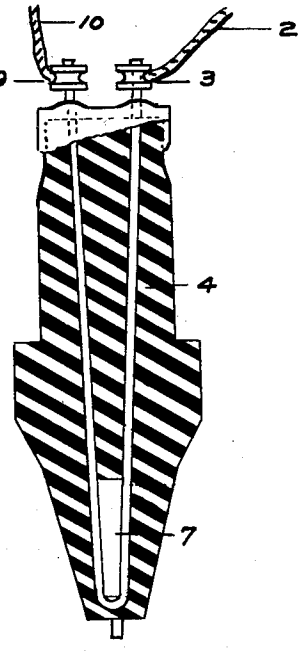


FIG 4

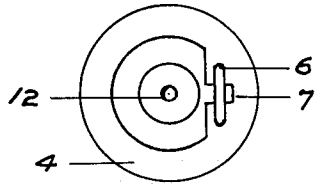


FIG. 3.

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SPARK PLUG CORE

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3 Claims. (Cl. 123—169)

The invention relates to improvements in spark plug cores as described in the present specification and shown in the accompanying drawing that forms a part of the same.

The main object of the invention is to provide simple and efficient means for heating the combustion chamber of an internal combustion engine whereby to insure easy starting, particularly in cold and damp weather.

Another object is to provide means for quickly heating and drying the spark plug points, thereby facilitating starting of the engine and also tending to keep the spark plug points clear of oil, carbon or other matter which would interfere with efficient operation of the plugs.

The invention consists in the novel features of construction, arrangements and combinations of parts described in the present specification and more particularly pointed out in the claims for novelty following.

In describing the invention reference will be had to the accompanying drawing in which:

Figure 1 is a vertical sectional view through a spark plug.

Figure 2 is a top plan view of the spark plug shown in Figure 1.

Figure 3 is a view of the lower end of the plug.

Figure 4 is a vertical sectional view through a plug taken at right angles to Figure 1.

Like numerals of reference indicate corresponding parts in the various figures.

Referring to the drawing 4 is the core which may be constructed of porcelain or other suitable insulating material and through which is extended longitudinally the electrode 12 which projects at the lower end beyond the core so as to enter the combustion chamber of the engine. The electrode 12 also projects from the top end of the core and the projecting part is threaded for the reception of a screw connection 11 by means of which the wire from the electrical system is secured to the electrode (such wire and electrical system not being shown in the drawing).

The core 4 is tapered towards its lower end and is cut away to provide a longitudinally disposed fin 7 which extends upwardly from the lower end of the plug and is adapted to lie within the combustion chamber of the engine with its lower end positioned slightly above the lower end of the electrode 12.

6 is a heating element consisting of a wire bent in substantially U-shape to extend around the lower end of the fin 7 and having its arms extending upwardly in engagement with the opposite sides of said fin and continuing lengthwise through the insulating core 4 and terminating slightly above said core in spaced relation to each other and to the electrode. The lower end of the fin 7 is preferably grooved transversely for the reception of the wire constituting the heating element 6 whereby to prevent lateral displacement of same.

The upwardly projecting ends of the heating element 6 are threaded for the reception of the threaded contact clamps 3 and 9 respectively.

To one end of the heating element 6 is connected by means of the clamp 3 a conducting wire 2, which latter has connection at its other end with a suitable two way switch located on the instrument board or in any other convenient position, and whereby electric current is supplied to the said heating element. As the construction and operation of switches of this type is well known it has not been considered necessary to show same in the drawing.

A conducting wire 10 secured to the other end of the heating element 6 by the clamp 9 provides means for connecting the plug with one of the ends of the heating element of the next plug. In a similar manner any desired number of spark plugs may be connected in series.

The operation of this invention is as follows: When it is desired to start the engine the current is admitted to the heating element 6 of the first spark plug in the series by the medium of the wire 2 controlled by the switch, and as the plugs are connected in series the heating elements of the respective plugs will be affected. The heat from the exposed portions of the heating elements which extend around the fins 7 is radiated within the combustion chamber, thereby heating the cold gas fumes from the carburettor and rendering them more combustible and at the same time heating the spark points prior to admission of electrical current to the electrodes 12. The heating elements are allowed to function for a few seconds (the length of time depending upon atmospheric conditions) to allow the combustion chamber and electrode points to become thoroughly heated, after which the current to the said elements is shut off and, preferably by the operation of the same switch, is transferred to the respective electrodes 12. The latter owing to their heated condition function efficiently from the start and thereby start the engine without undue use of the starting mechanism.

What I claim as my invention, and desire to obtain by Letters Patent is:

1. A spark plug for use in an internal combustion engine, including an insulating core, an

electrode extending through the core and projecting therefrom at the lower end thereof, a heating element positioned exteriorly of said core for a portion of its length adjacent to and above the projecting lower end of said electrode, and thereafter extending upwardly through said core in spaced relation to said electrode, and means connecting said heating element in the electric circuit.

2. A spark plug for use in an internal combustion engine, including an insulating core, an electrode extending through the core and projecting therefrom at the lower end thereof, and a heating element of U-shaped formation exposed for that portion of its length towards the lower end thereof adapted to lie within the combustion chamber and thereafter extending upwardly within said core in spaced relation to said electrode, the top ends of said heating element being connected in the electrical circuit, and a lateral projection from said insulating core adapted for engagement by the exposed portion of said heating element.

3. A spark plug for use in an internal combustion engine, including an insulating core, said core being cut away adjacent to the lower end thereof to provide a relatively narrow lateral fin in longitudinal alignment with the portion of the core thereabove, an electrode extending through the core and projecting from the lower end thereof, and a heating element of U-shaped formation extending around the lower end of said fin and upwardly in engagement with the respective sides thereof and thereafter extending through said core in spaced relation to said electrode, the ends of said heating element being connected in the electric circuit.

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