June 20, 1939. H. L. HALL 2,163,362

SPARKING PLUG

Filed May 9, 1938

Fig. 1.

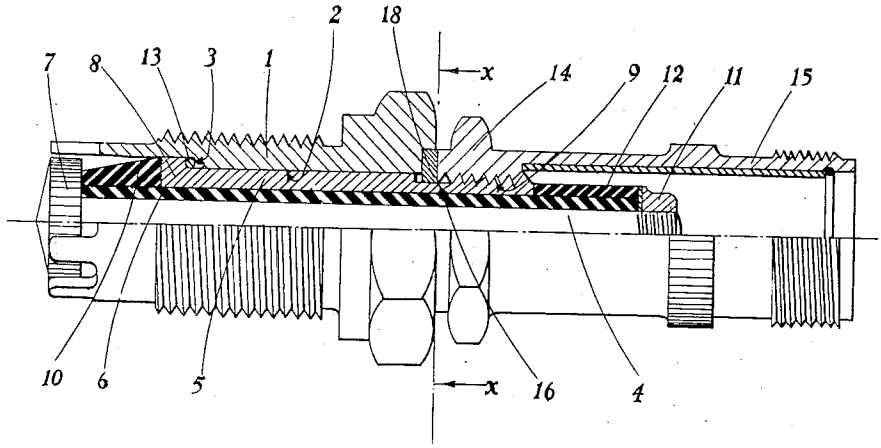
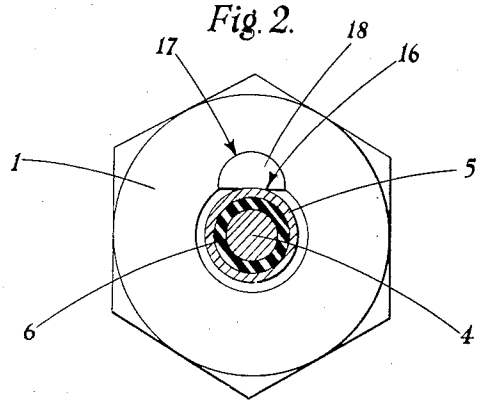


Fig. 2.



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Patented June 20, 1939

2,163,362

UNITED STATES PATENT OFFICE

2,163,362

SPARKING PLUG

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Application May 9, 1938, Serial No. 206,853
In Great Britain May 25, 1937

2 Claims. (Cl. 123—169)

This invention relates to sparking plugs and has for its object the provision of improved means for preventing plugs attaining objectionably high temperatures.

Hitherto it has been common practice to swage on to the mica around the central electrode a metal sleeve which ensures that the mica is gas-tight at working pressures, provides a convenient means for attaching the central electrode assembly to the body of the plug and serves to limit the length of mica which is exposed to attack by the flames of combustion.

The sleeve and body are made of metal with clearances which prevent them contacting at working temperatures and therefore the gap between them restricts the amount of heat passed by the sleeve to the body and permits the surfaces on either side of the gap to collect heat from the direct attack upon them of the flames of combustion.

To attain the objects of this invention it is proposed to form the plug with an inner central element comprising a central electrode provided practically throughout its entire length with a sleeve of insulation, a metal sleeve swaged on to the central portion of said insulation, a collar surrounding the inner end of said metal sleeve, insulations disposed between the inner face of the head of the central electrode and the inner end of the metal sleeve and between the outer end of said metal sleeve and the nut on the outer end of the central electrode, an outer plug body, the bore in which is provided with a shoulder or seating against which the collar surrounding the metal sleeve on the inner central element is arranged to coact, means provided on the outer end of said inner central element for drawing the collar thereon into intimate or gas-tight contact with the shoulder on the body or with a washer interposed between the two surfaces, the distance of said shoulder from the inner end of the plug body being such that when the parts are in the assembled position the head of the inner central element is contained within the body of the plug whereby the length of said inner central element exposed to attack by the flames of combustion is reduced.

According to a further feature of this invention that part of the metal sleeve on the inner central element between the collar on the inner end thereof and the screw threaded portion on the outer end thereof is adapted to make contact with the body of the plug, said sleeve and body being made of metals having dissimilar co-efficients of expansion and the dimensions of the respective parts being such that the inner central element is easily removable from the body when cold but is held firmly in contact therewith at working temperatures.

In the accompanying drawing which illustrates this invention:

Figure 1 is a side elevation with the upper half in section of one embodiment, and,

Figure 2 is a transverse section on line x—x of Figure 1.

Referring to the drawing, the body 1 of the plug is provided throughout its entire length with a cylindrical bore 2, the end of said bore at the inner end of the body adjacent the spark gaps being of enlarged diameter and at the point where the enlarged bore meets the smaller bore a flat seating 3 is provided, said seating being disposed at right angles to the axis. The central electrode 4 is of cylindrical formation and is furnished with a metal sleeve 5 swaged on to the mica insulation 6. The inner end of the sleeve 5 which terminates some distance from the head 7 of the central electrode is furnished with a collar 8. The external diameter of the sleeve 5 and that of the collar 8 is slightly less than that of the respective bores in the body 1 and the outer end of the sleeve 5 is furnished with a screw thread 9. That part of the inner end of the central electrode between the head 7 of the central electrode and collar 8 is provided with mica insulation 10, preferably of conical formation as shown, the small end of the cone being disposed immediately behind the head 7, and that part of said central electrode between the outer end of the sleeve 5 and the nut 11 is also provided with a sleeve 12 of insulating material.

When assembling the plug the central element is inserted into the inner end of the body 1, a washer 13 being disposed between the seating 3 and the collar 8. The central element may now be firmly secured in the body and the collar drawn into intimate contact with the seating by a nut 14 which may, as shown, be formed integral with a radio-screen 15.

For the purpose of preventing any rotative movement of the central element within the body, particularly when the parts are being assembled, the sleeve 5 is milled flat to the depth of the thread as shown at 16, a semi-circular recess 17 is milled in the end of the body 1 and a key 18 of corresponding formation is fitted in said recess, a clearance being provided between the inner face of the key and the end of the unthreaded part of the sleeve 5 as shown.

According to a modification the seating 3 in

the body may be of conical formation, the coacting face of the collar 8 being formed to correspond therewith, the coacting faces being ground to provide a gas-tight joint. If desired, the collar 8 may be formed separately from the sleeve 5.

The sleeve 5 and the body of thee plug may be made of metals having dissimilar co-efficients of expansion, the dimensions of the respective parts being so adjusted that they are easily separated when cold but are held firmly in contact with each other at working temperatures.

What I claim is:

1. A sparking plug for internal combustion engines comprising in combination an inner central element composed of a central electrode provided with a head on the inner end and a nut on the outer end thereof and practically throughout its entire length with a sleeve of insulation, a metal sleeve swaged on to the central portion of said insulation, a flange surrounding the inner end of said metal sleeve, insulations disposed between the inner face of the head of the central electrode and the inner end of the metal sleeve and between the outer end of said metal sleeve and the nut on the outer end of the central electrode, an outer plug body, the bore in which is provided with a seating against which the flange surrounding the metal sleeve on the inner central element is arranged to coact means provided on the outer end of said inner central element for drawing the flange thereon into intimate or gas-tight contact with said seating, the distance of said seating from the inner end of the plug body being such that when the parts are in the assembled position the head of the inner central element is contained within the body of the plug whereby the length of said inner central element exposed to attack by the flames of combustion is reduced.

2. A sparking plug for internal combustion engines as claimed in claim 1, in which that part of the metal sleeve on the inner central element between the flange surrounding the inner end thereof and the screw threaded portion on the outer end thereof is adapted to make contact with the body of the plug, said sleeve and body being made of metals having dissimilar coefficients of expansion and the dimensions of the respective parts being such that the inner central element is easily removable from the body when cold but is held firmly in contact therewith at working temperatures.

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