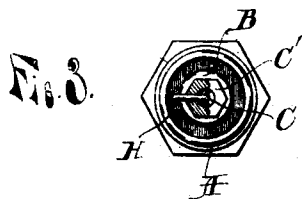
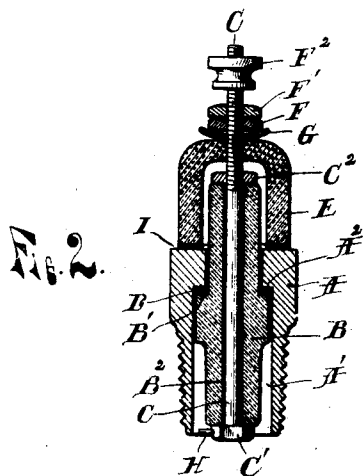
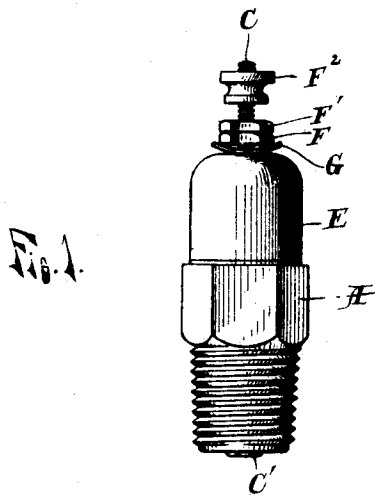


No. 868,737.

PATENTED OCT. 22, 1907.

F. J. WATT.
SPARK PLUG.

APPLICATION FILED MAR. 28, 1904.



WITNESSES.

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SPARK-PLUG.

No. 868,737.

Specification of Letters Patent.

Patented Oct. 22, 1907.

Application filed March 28, 1904. Serial No. 200,323.

To all whom it may concern:

Be it known that I, FRANK J. WATT, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in igniting devices for explosive engines, known as jump spark igniters and refers more particularly to spark plugs for such igniters.

The object of the invention is to provide a spark plug so constructed as to perfectly insulate the electrodes and obviate the danger of short circuiting by reason of the accumulation of the products of combustion etc., and also so constructed that no adjusting of the points is necessary in assembling and the distance between the points will not be changed by the turning of either.

A further object of the invention is to provide means whereby the parts, while, being firmly held, are allowed to expand and contract relative to each other and whereby the breaking of the insulation is thus prevented, and it is also an object of the invention to so construct and arrange the plug that the sparking points will be protected against accidental breaking or displacement in handling when the plug is not in use, and to provide certain other new and useful features, all as hereinafter more fully described and shown in the accompanying drawings, in which:

Figure 1, is a side elevation of a device embodying the invention; Fig. 2, a longitudinal section of the same; and Fig. 3, an elevation of the lower or inner end thereof.

A is a steel bushing or shell externally screw-threaded and provided with a hexagonal head by means of which it is turned into a suitable screw-threaded opening in the cylinder wall or head. This bushing is provided with a central chamber or bore A' which is reduced in diameter near the outer end of the bushing to form a shoulder A² and a porcelain insulating plug B fits loosely within the reduced bore of the bushing and is formed intermediate its ends with a shoulder B' to oppose the shoulder A² of the bushing. The insulating plug B is also formed with a longitudinal axial bore B² through which loosely passes a binding bolt C provided with a head or nut C' at its inner end to engage the inner end of the plug and screw-threaded at its opposite end to receive a nut C' to engage the opposite end of the plug. Interposed between the shoulder on the plug and the shoulder on the bushing is an asbestos packing ring D and a porcelain insulating cap E provided with an opening through which the bolt C passes, sits loosely over and incloses the end of the plug which projects through the bushing and rests on the outer end of said bushing, the plug being drawn into contact with the

packing by a nut F on the outer end of the bolt which engages a washer G interposed between the nut F and the end of the cap which cap is also held in place by said nut. The washer G is bent transversely so that when the parts contract or expand the washer will spring slightly and thus take the strain off the insulation and prevent it being cracked thereby. A lock nut F' is provided on the bolt in engagement with the nut F to prevent the same from coming loose and on the extreme outer end of the bolt is a binding nut F² to bind the wire conductor to the bolt, which bolt serves as one electrode, the bushing A serving as the other electrode. The porcelain cap E prevents water coming in contact with the heated plug B and cracking it and I is an asbestos ring packing preferably placed between the bushing B and cap to allow the porcelain cap to have a more even temperature. If desired another spring or asbestos washer may be interposed between the nut C' and porcelain plug B.

The bolt or electrode C may be formed with a head C' or provided with a nut to form a head thereon; and the head is bored inward at one side and into this hole is driven a short platinum wire which projects outward toward the bushing and forms a sparking point H. The sparking point extends outward from the head C' just inside the end of the bushing and therefore will not be bent or broken in handling the plug before it is attached to the engine cylinder. By using the inner end of the bushing as the other sparking point the points are always at the proper distance from each other, no matter how the parts are turned, and no adjusting of the points is required to bring them at the proper distance from each other.

Having thus fully described my invention, what I claim is:—

1. In a spark plug, the combination of an externally screw-threaded bushing provided with a central bore reduced in diameter near its upper end to form a shoulder, an insulating plug of a diameter to pass partially through the reduced portion of the bore and formed with a shoulder intermediate its ends to oppose the shoulder on the bushing and with an axial bore of uniform diameter throughout its length, a packing ring interposed between the shoulders on the plug and bushing, a binding bolt forming an electrode extending axially throughout the bore of the plug, a head on the inner end of said bolt to engage the inner end of the plug, a sparking point secured to said head and extending laterally therefrom toward and within the inner face of the wall of the bushing, a nut on the bolt engaging the opposite end of the plug, an insulating cap having an opening for the passage of the bolt inclosing the outer end of the plug and seated upon the end of the bushing, a packing ring interposed between the cap and bushing, a washer bent to form a spring sleeved on the bolt in engagement with the cap, and a nut and binding nut to engage said washer and clamp the parts together.

2. In a spark plug, the combination with an externally screw-threaded metal bushing forming an electrode and

provided with an axial internal bore formed with a shoulder, a porcelain insulating plug formed with an annular shoulder intermediate its ends to oppose the shoulder on the bushing and having an axial bore of uniform diameter, 5 an asbestos packing ring interposed between said shoulders, a porcelain insulating cap inclosing the outer end of the plug and engaging the outer end of the bushing, an elastic non-conducting packing ring interposed between said cap and bushing, a binding bolt forming the other 10 electrode and extending axially through the plug and cap, a head on the lower end of said bolt engaging the lower end of said plug, a sparking point secured to said head and extending laterally therefrom within the bushing, a nut on the bolt engaging the opposite end of the plug, a second nut on the outer end of said bolt, a spring washer 15 interposed between said nut and cap to allow for the unequal expansion of the parts and a lock and a binding nut on said bolt.

In testimony whereof I affix my signature in presence of two witnesses,

FRANK J. WATT.

Witnesses:

OTTO F. BARTHEL,

THOMAS G. LONGSTAFF.