A. SCHMIDT.

WATERPROOF CONNECTION FOR SPARK PLUGS.

APPLICATION FILED NOV. 30, 1917.

1,350,470. Patented Aug. 24, 1920.

Fig. 1.

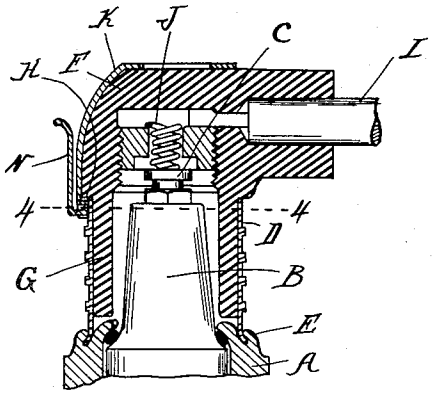


Fig. 2.

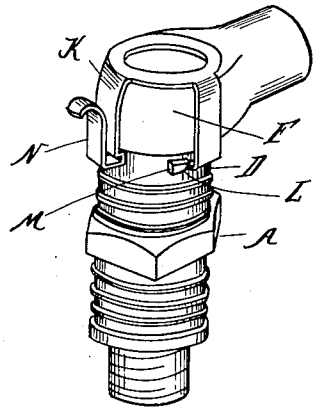


Fig. 3.

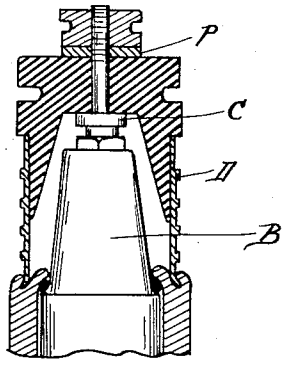
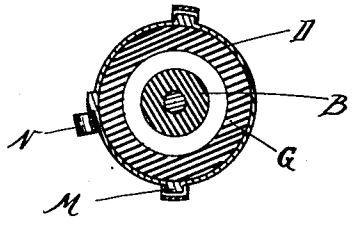


Fig. 4.



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WATERPROOF CONNECTION FOR SPARK-PLUGS.

1,350,470. Specification of Letters Patent. Patented Aug. 24, 1920.

Application filed November 30, 1917. Serial No. 204,550.

To all whom it may concern:

Be it known that I, ALBERT SCHMIDT, a citizen of the Republic of France, residing at Flint, in the county of Genesee and State of Michigan, have invented certain new and useful Improvements in Waterproof Connections for Spark-Plugs, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to spark-plugs and has for one object the protection of the insulator from accidental shocks which might cause a fracture or breaking thereof. Another object is to provide means coöperating with the guard or protecting means for inclosing and weather-proofing the insulator and its electrical connection.

In the drawings:

Figure 1 is a longitudinal section through a spark-plug to which my improvement is applied;

Fig. 2 is a perspective view thereof;

Fig. 3 is a view similar to Fig. 1 showing a modified construction; and

Fig. 4 is a cross section on line 4—4 of Fig. 1.

In the construction of spark-plugs it is usual to provide a metallic casing for engagement with the engine casing and an insulator which projects from the casing a sufficient distance to prevent danger of short-circuiting. In attaching or detaching the spark-plug it frequently occurs that the wrench or other tool employed for this operation may strike against the insulator and as the latter is very fragile it is easily fractured so as to destroy its insulating property. It is possible to guard the insulator either by extending the casing so as to surround the same or by shortening the projecting portion, but with either of these constructions the space between the insulated terminal and the grounded casing would be diminished to an extent that would endanger short-circuiting.

With my improved construction I provide a guard which will mechanically protect the insulator, together with means for insulating said guard so as to avoid short-circuiting. As shown in Figs. 1 and 2, A is the spark-plug casing, B the insulator and C the electrical terminal at the outer end of the insulator. D is a metallic tube which is secured at the outer end of the casing A, preferably by engaging a turned flange E thereon, said tube being arranged concentrically about the projecting portion of the insulator and forming a guard therefor. To avoid short-circuiting I provide a hood or cap member F of insulating material, which has a sleeve portion G for fitting within the tube D and a shoulder portion H for bearing against the outer end thereof. This hood has connected thereto the insulated conductor I, which is connected by suitable means, forming no part of the present invention, with a contact member J for cooperating with the contact C. The hood F may be locked in position by any suitable clamping means, such as the member K embracing the hood and having inwardly-extending hooks L for engaging projecting lugs M on the tube D. The lugs M may be cammed or wedge shaped, and thus by slightly turning, the hood may be engaged with the hooks L and at the same time will exert a drawing pressure thereon. N is a spring catch for engaging one of the lugs and locking the hood from rotative movement.

With the construction as described, when the hood is in position, it not only incloses the insulator and electrical terminal thereon, but also interposes an insulator guard between the terminal and the guard casing D. Whenever it is desired to engage or remove the plug this may be accomplished with perfect safety, as the tube D will guard the insulator from any contact with the wrench or tool and will therefore avoid danger of breakage.

In the construction shown in Fig. 3 in place of a hood for inclosing the terminal an insulator is provided for insertion between the tube D and the insulator B, said insulator having a contact member P mounted thereon and extending inward into electrical connection with the contact C.

What I claim as my invention is:

1. The combination with a spark plug comprising a casing, an insulator therein and projecting beyond the outer end thereof, an electric terminal at the outer end of said insulator, and means at the outer end of said casing for securing said insulator therein, of a metallic tube secured to said casing and projecting outward to surround said insulator, a detachable hood for inclosing said insulator and terminal, having a sleeve portion for fitting within said tube and sep-

arating the same from said terminal, and a coöperating electrical contact for said terminal mounted on said hood.

2. The combination with a spark plug, comprising a casing, a one-piece insulator therein and projecting outward beyond the outer end thereof, an electric terminal at the outer end of said insulator, and a turned flange at the outer end of said casing for securing said insulator therein, of a tube secured to said casing and projecting outward to surround said insulator, a hood for inclosing said insulator and terminal having a sleeve portion fitting within said tube and separating the same from said terminal, a coöperating electrical contact for said terminal mounted on said hood, and clamping means for securing said hood engaging said tube.

3. In a spark plug, the combination with a casing, an insulator therein and projecting therefrom and an electrical terminal at the outer end of said insulator, of a tube upon said casing and projecting therefrom to surround said insulator, a detachable hood for inclosing said insulator, a member embracing said hood and coöperating cammed clamping members upon said member and tube for securing said hood to said tube.

4. In a spark plug, the combination with a casing, an insulator therein and projecting therefrom and an electrical terminal at the outer end of said insulator, of a tube upon said casing and projecting therefrom to surround said insulator, a detachable hood for inclosing said insulator, a member embracing said hood, relatively rotatable cooperating clamping members upon said member and tube for securing said hood to said tube, and means for locking said members from relative rotative movement.

5. In a spark plug, the combination with a casing, an insulator therein projecting therefrom and an electrical terminal at the outer end of said insulator, of a metallic tube secured to said casing and projecting outward to surround said insulator, spaced lugs upon said tube, a detachable hood for inclosing said insulator and terminal, having a sleeve portion for fitting within said tube and separating the same from said terminal, and a member embracing said hood and having inwardly-extending hooks rotatably engageable with said lugs for clamping said hood to said tube, said member embracing the hood being rotatable about the axis of said insulator to permit of engagement of said hooks with said lugs.

In testimony whereof I affix my signature.

ALBERT SCHMIDT.