No. 642,167. Patented Jan. 30, 1900.

F. R. SIMMS.

ELECTRIC SPARKING PLUG FOR EXPLOSIVE ENGINES.

(Application filed July 7, 1899.)

(No Model.)

Fig. 1.

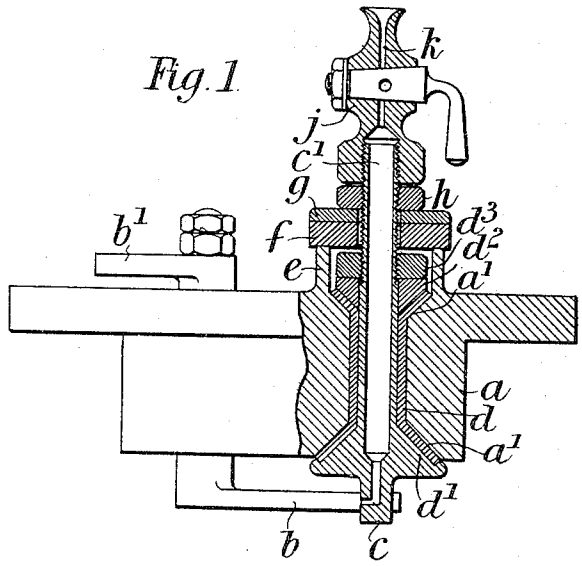
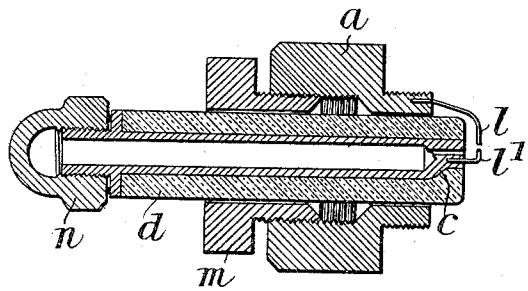


Fig. 2.



Witnesses.
J. D. Kingsbury
B. W. Brownell.

Inventor.
Frederick R. Simms/
By Whittaker & Wood Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FREDERICK RICHARD SIMMS, OF LONDON, ENGLAND.

ELECTRIC-SPARKING PLUG FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 642,167, dated January 30, 1900.

Application filed July 7, 1899. Serial No. 723,071. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK RICHARD SIMMS, a subject of the Queen of Great Britain, residing at London, England, have invented new and useful Improvements in Electric-Sparking Plugs for Explosion-Engines, of which the following is a specification.

This invention relates to electric-sparking plugs for explosion engines or motors, the object being to provide a better and more effectual spark at starting than hitherto to insure the heavy vapor in the combustion-chamber being properly ignited in a cold cylinder, to provide good insulation, and also to avoid the liability of the terminals breaking or becoming short-circuited.

According to the invention to produce better sparking at starting than usual and to insure the heavy vapor in the combustion-chamber being properly ignited when the cylinder is cold I arrange in connection with the contact-breaker a cock, through which is injected a small quantity of a light oil, such as benzene, onto the sparking-points. To this end the cock is advantageously screwed upon one of the terminals, which is made hollow, so as to enable the oil to be injected therethrough onto the contact-breaker. To provide good insulation, the terminal is insulated from the usual plug by being coated with a hard enamel of a non-conducting substance and by being inclosed in asbestos packing, which is held in place at the outer end by a conical washer and a lock-nut screwed upon the said terminal, the lock-nut and washer being shielded from damage by an inclosing cylindrical portion of the plug, the open end of which is closed by a porcelain or other suitable washer held in position by a metal washer and nut. The inner end of the asbestos packing may also be held in position by a cone upon the terminal and be provided, if required, with a shield.

In the accompanying drawings, Figure 1 is a longitudinal section through a sparking-plug, such as is usually used with a low-tension current, having my improvements applied thereto; and Fig. 2 is a longitudinal section of a sparking-plug, such as is usually used with a high-tension current, having my improvements applied thereto.

Referring to Fig. 1, a is the body of the sparking-plug. b is the movable contact-lever, which is operated by the external arm b', and c is the fixed terminal, coated with enamel, (except at the point where the movable contact-lever b makes contact,) which passes through the plug a and is insulated therefrom. This terminal c is made hollow. d is the insulating asbestos packing which incloses the terminal c and which is held in position by forming conical recesses a' upon each face of the plug a and by holding the ends of the asbestos tube d in the said recesses a' by means of the cone d', formed upon the terminal c at its inner end and the loose conical washer d^2 at its outer end, the said cone d' and washer d^2 being held in position by the lock-nut d^3, which is screwed upon the outer screw-threaded end of the terminal c and bears against the base of the conical washer d^2. This lock-nut may be of any suitable material, such as metal or porcelain. e is the cylindrical extension of the plug a, which shields the lock-nut d^3 and washer d^2 from damage and prevents any moisture from entering and forming a short circuit, and f is the washer, of porcelain or other suitable material, which closes the open end of the cylindrical shield e, the said washer being held in position by the metal washer g and nut h. Where any considerable amount of vibration is experienced, such as in motor-vehicles, an asbestos washer may be inserted on either side of the porcelain washer in order to better preserve it from fracture. j is the injection-cock, the said cock being of ordinary construction and being screwed upon the projecting screw-threaded end of the insulated hollow terminal c, the passage-way c' of which at its outer end is in communication with the through passage-way k of the cock and which opens at its inner end into the ignition-chamber of the engine in such a manner that when the plug of the cock is turned, so as to open the passage-way k, a light oil, such as benzin, can be injected through the cock and into the passage c' and thence onto the sparking-points of the terminals, thereby facilitating the ignition of the heavy vapor in the combustion-chamber in a cold cylinder—for example, when starting the engine. Previous to starting the engine the cock is closed.

Fig. 2 shows a sparking-plug wherein both sparking-points are fixed. The body *a* of the plug, which is screwed into the cylinder, carries the fixed point *l*, and the other point *l'* is carried by the hollow terminal *c*. This terminal is inclosed in a jacket *d*, of insulating material, fitting into the neck of the plug *a*, and held in position therein by packing compressed by the gland *m*, which is screwed into the plug *a*, as shown. The outer end of the hollow terminal *c* has a cap or cover *n* screwed upon it, which cap is in communication with the oil-supply controlled by the cock, if required, or the cock itself may be screwed directly upon the outer end of the terminal *c*.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination with an electric igniting device provided with electric terminals, of means, independent of the means for introducing the explosive charge for the cylinder, for introducing a quantity of highly-inflammable liquid adjacent to the igniting-point of said terminals, for the purpose of insuring the explosion of the cylinder charge, substantially as described.

2. An electric igniting device provided with electric terminals for igniting the cylinder charge, and having a passage, independent of the means for introducing the explosive charge for the cylinder, extending to the outside of the ignition-chamber, for introducing a quantity of highly-inflammable liquid adjacent to the igniting-point of said terminals for insuring the explosion of the cylinder charge, substantially as described.

3. An electric igniting device provided with electric terminals for igniting the cylinder charge, and having a passage, independent of the means for introducing the explosive charge for the cylinder, extending to the outside of the ignition-chamber, for introducing a quantity of highly-inflammable liquid adjacent to the igniting-point of said terminals for insuring the explosion of the cylinder charge, and means for closing said passage outside of the ignition-chamber, substantially as described.

4. An igniting device comprising among its members, a plug provided with two electric terminals, said plug having a passage extending through it and terminating adjacent to said terminals for supplying an inflammable liquid to said terminals and a closing device for the outer end of said passage, substantially as described.

5. An igniting device comprising two electric terminals, one of said terminals being provided with a passage extending through the same from the outside of the plug to a point adjacent to the other terminal for supplying a highly-inflammable material to said terminals, substantially as described.

6. An igniting device comprising among its members two electric terminals adapted to produce a spark between them within the ignition-chamber of an explosive-engine, one of said terminals extending outside of the engine and being provided with a passage extending longitudinally through it for an inflammable liquid, said passage extending from a point outside the engine to a point adjacent to the other terminal, substantially as described.

7. An igniting device for explosive-engines comprising among its members a stationary electrode provided with a passage through it for a highly-inflammable fluid, a movable electrode adapted to engage said stationary electrode adjacent to the delivery end of said passage, and a closing device for the outer end of said passage, substantially as described.

8. In an igniting device, the combination with the plug, provided with a passage for the stationary electrode, and a cylindrical extension on the outside of said plug surrounding the end of said passage, the said electrode being provided with an enlarged portion engaging the plug on its inner side, an insulating-packing in said passage surrounding the electrode, a securing-nut on said electrode within said cylindrical extension, an insulating-cover surrounding said electrode and closing the outer end of said extension and means for securing said cover in position and a movable electrode mounted in said plug, substantially as described.

9. In an igniting device the combination with the plug, provided with a passage for the stationary electrode, a conical recess at each end of said passage and a cylindrical extension surrounding one of said recesses, on the outside of the plug, of a stationary electrode provided with a cone for engaging the inner of said recesses, a conical washer on said electrode engaging the outer recess, an insulating-packing surrounding said electrode, a nut on said electrode within said extension engaging said washer, an insulating-cover for said extension surrounding said electrode, a nut on said electrode for holding said cover in place and the movable electrode mounted in said plug, substantially as described.

10. In an igniting device the combination with the plug, of a movable electrode mounted therein, the stationary electrode extending through said plug and provided with a passage for inflammable fluid extending through the electrode from a point outside the plug to a point adjacent to the point of contact between said electrodes on the inner side of said plug, and a cock for controlling said passage, substantially as described.

FREDERICK RICHARD SIMMS.

Witnesses:
W. M. HARRIS,
JOSEPH LAKE.