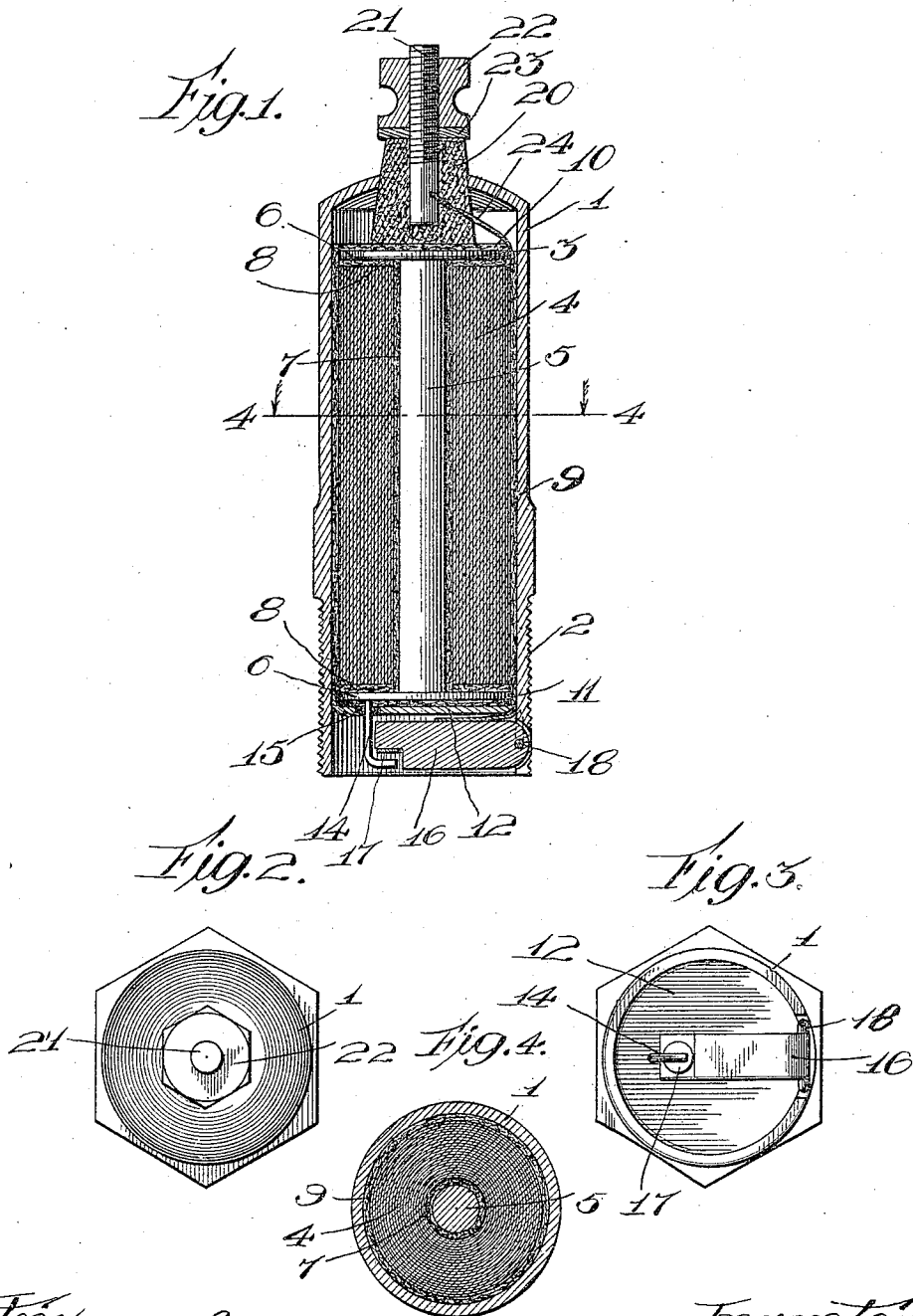


F. A. THURSTON.
SPARK PRODUCING DEVICE.
APPLICATION FILED OCT. 17, 1904.

950,214.

Patented Feb. 22, 1910.



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UNITED STATES PATENT OFFICE.

FREDUS A. THURSTON, OF CHICAGO, ILLINOIS.

SPARK-PRODUCING DEVICE.

950,214.

Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed October 17, 1904. Serial No. 228,816.

To all whom it may concern:

Be it known that I, FREDUS A. THURSTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Spark-Producing Devices, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to spark plugs for explosive engines for use in motor vehicles, launches and the like.

Prominent objects of the invention are to provide a simple, practical and inexpensive form of spark plug; to secure reliability and effectiveness of action; to prevent injury of any kind to the operating parts of the device either by heat, gas or water or otherwise; to secure a large and bright flash; to procure very high efficiency of action, and to secure the foregoing and other desirable results in a simple, practical and effective manner.

In the accompanying drawings, Figure 1 is a longitudinal section of a spark plug embodying my invention. Figs. 2 and 3 are respectively a top and bottom plan view of the device, and Fig. 4 is a cross section taken on line 4, 4, in Fig. 1.

The spark plug shown in the drawings for carrying out my invention comprises a shell or casing 1 conveniently of cylindrical form and made closed at one end and open at its other end. The open end is preferably threaded as at 2 to permit the device to be readily screwed into and out of the cylinder of the engine or other device in which the plug is to be used. Within the shell or casing 1, which is desirably formed of metal such as brass, is a spool or bobbin 3 on which is wound a coil of fine wire 4. The bobbin 3 is desirably made of metal, as for example, of iron, and consists of a central spindle 5 and a pair of end flanges 6, 6, which are but very little smaller than the interior of the shell or casing 1. The layer 7 of insulating material, preferably fire-proof also, as for example asbestos, is arranged immediately outside of the spindle 5 of the bobbin, and layers 8, 8, of the same or similar material are arranged inside of the flanges 6, 6, of the bobbin. A layer 9 of the same or similar material is arranged between the coil of wire and the shell 1, and layers 10 and 11 at the upper and lower ends

of said bobbin. Thus the entire bobbin with this coil of wire is inclosed in asbestos or similar material, thereby insulating it both electrically and thermally from the shell 1 and at the same time the coil of wire 4 is similarly insulated from the bobbin.

A metallic cap 12 is fitted into the shell 1 and outside of the asbestos at the lower end of the spool, thereby forming a metallic covering or protection for the asbestos at the open end of the plug. The spool with this asbestos covering fits tightly within the interior of the shell or casing 1 and the cap 12 fits tightly at the lower end of the spool, whereby the parts are held in position and a tight and compact structure is formed, and at the same time the coil of wire is thoroughly protected from gases, water and heat in the cylinder to which the plug may be attached. A pin 14 is secured to the lower flange 6 of the bobbin 3, being desirably made integral therewith. The cap 12 is provided with insulation 15 surrounding the pin 14. An armature 16 is pivotally connected with the lower portion of the shell and arranged to extend across the lower end of the bobbin 3, whereby the latter when magnetized or energized by the coil 4 will attract the armature. The pin 14 has its end bent, and the armature 16 has a contact 17 adapted to make connection with the bent end of the pin 14, whereby a make and break action can take place as a result of the energization and deenergization of the metallic bobbin forming as it were the core of an electromagnet. This make and break action produces a spark which is effective in igniting the gas or other material to be exploded in the engine cylinder. The pivotal connection for the armature 16 is conveniently provided by driving a staple 18 into the lower end of the shell 1. The upper closed end of the shell is provided with an aperture which is filled with insulating material 20 such as lava, cement or the like, and in this is embedded a threaded pin or spindle 21 provided with nuts 22 and 23. One end 24 of the wire forming the coil 4 is connected with the pin 21, and the other end of said coil is connected with the metal bobbin 3. One side of the battery is connected with the pin 21 by the nuts 22 and 23, and the other is connected with the engine cylinder or some other part of the engine. Thus the circuit is made from the pin 21 to the coil 4, thence by the bobbin 3 to the pin 14 and thence by the

armature 16 to the shell 1 and engine cylinder to battery. When the armature 16 is attracted by the energization of the coil 4 the armature 16 is separated from the pin 14, thereby opening the circuit and allowing said armature to fall back against the pin 14 to thereby close the circuit again. Thus a continual vibratory action of the armature is set up with the result of formation of sparks due to the self induction at make and break.

The device is very simple and practical, and in addition to the above mentioned advantages of being thoroughly protected from heat, gases and water and being well insulated electrically, it is very efficient requiring but a small percentage of the usual amount of battery employed in devices of this kind.

It will be understood that changes and modifications can be made without departing from the invention.

What I claim is:—

1. A spark plug, comprising a tubular metal casing, having one of its ends closed and its other end open, a coil confined within said casing and surrounded by an insulating sheath, a core for said coil, an armature confined within the open end of the metal

casing but separated from the core and the coil by insulation and also by a metal wall, a terminal at the closed end of the casing, and insulating material in which said material is embedded, said insulating material being extended through the closed end of said casing.

2. A spark plug comprising a metallic shell or casing having an open end and adapted for insertion into and bodily removable from an engine cylinder, a spark coil confined within said casing, insulating material surrounding said spark coil, said coil having a metallic bottom adapted to act as a magnet, an armature pivoted at the end of said plug which is to be inserted in the cylinder, a contact carried by said armature, said armature and contact being in the open end of said shell or casing, and a metallic connection extending through and insulated from the other end of said casing and connected with said spark coil.

In witness whereof, I hereunto subscribe my name this 7th day of October A. D., 1904.

FREDUS A. THURSTON.

Witnesses:

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