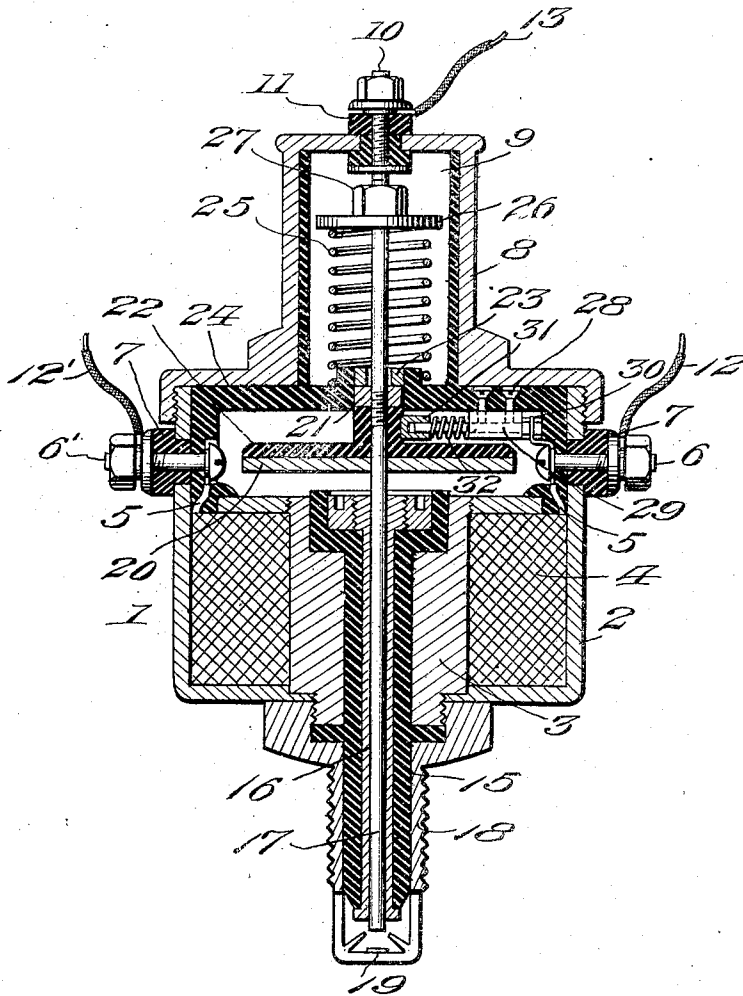


W. H. R. MILDEBRATH.
ELECTRIC SPARKING DEVICE.
APPLICATION FILED JAN. 20, 1906.

902,427.

Patented Oct. 27, 1908.



Witnesses

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WILLIE H. R. MILDEBRATH, OF JACKSONVILLE, FLORIDA.

ELECTRIC SPARKING DEVICE.

No. 902,427.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIE H. R. MILDEBRATH, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented new and useful Improvements in Electric Sparking Devices, of which the following is a specification.

This invention relates to electric sparking devices designed especially for use in connection with explosive engines, and has for its objects to provide a comparatively simple, inexpensive device of this character combining the advantages of the make-and-break and jump spark plugs, one wherein the spark will be positively produced at appropriate intervals, and one in which the movable sparking member will be effectually operated.

With these and other objects in view, the invention comprises the novel features of construction and combination of parts more fully hereinafter described.

In the accompanying drawing the figure is a central vertical section of the spark plug.

Referring to the drawings, 1 designates the sparking plug comprising in its organization a metal casing 2 in which is housed an electro-magnet 3, the coil 4 of which is electrically connected as at 5 with binding posts 6 and 6' extended through the side walls of the casing within suitable insulation 7, there being provided on the casing 1 a hollow extension 8 forming a chamber 9 through the end wall of which there is extended a binding post 10 surrounded by insulation 11. Attached to the posts 6 and 6' are wires 12 and 12' which, together with a wire 13 attached to the post 10, connects the plug in an electric circuit 14.

Extended through a central bore in the magnet core 3 is a tubular insulating member 15 containing a tubular metal contact piece 16, which in turn receives a movable contact member or rod 17, which, together with the insulation 15 and contact piece 16 extends through a tubular externally threaded neck 18 provided on the casing 1 for attaching the latter to an engine cylinder and having at its outer end a metal piece or electrode 19 with which the adjacent end of the rod 17 comes in contact when the rod is moved in one direction.

Fixed upon the rod or electrode 17 for movement therewith and to be attracted by the core 3 is a metal disk or armature 20 and

a contact block 21 separated from the disk 20 by means of an insulating member 22 and adapted to normally lie in contact with a metal contact piece or washer 23, which, together with the block 21, is separated from the casing by means of a lining 24 of insulating material, the parts being maintained in normal position by means of a compressible spring 25, applied around the rod 17 and bearing at one end upon the lining 24 and at its other end against a head 26 fixed upon the rod by means of a nut 27, said spring serving to hold the rod in position with its upper end in contact with the binding post 10 and with the armature 20 out of contact with the core 3 and the block 21 in contact with the washer 23.

Fixed in the casing by means of screws 28 extended through the insulating lining 24 is a contact member 29 electrically connected as at 30 with the adjacent binding post 6 and having a movable contact portion 31 adapted to be pressed to active position by means of a spring 32, said movable portion 31 being normally in contact with a portion of the insulating piece 22.

In practice when the spark plug is operating on a high tension circuit whereby the sparks are produced by the current jumping from one electrode to the other, the secondary current of the ignition system passes through the spark plug by means of a path consisting of the wire 13, binding post 10, rod of electrode 17, electrode 19 and air gap between them to the metal casing of the spark plug which is grounded on the engine cylinder in the usual manner. If for any reason the induction coil or high tension system should be rendered inoperative it is merely necessary to connect the spark plug in a low tension system. In this instance the current flows through the wire 12, binding post 6, winding 4 of the electro magnet, binding post 6' and wire 12'. The electro magnet consequently attracts the armature 30 so as to thereby bring the movable electrode 17 into contact with the fixed electrode 19 at which time the brush 31 engages the metal piece or washer 21 on the movable electrode so as to connect the latter in circuit. A by-pass or shunt is thus created whereby current flows from the binding post 6 through the wire 30, contact member 29, part 31, block or washer 21, electrodes 17 and 19, casing of the spark plug and back to the source of current by the frame of the engine

on which the spark plug casing is grounded. This flow of current is but momentary as the circuit is opened by any suitable means, such as a timing device, usually employed in connection with explosive engines. By the opening of this circuit the electro magnet loses its attraction so that the armature moves way under the expansion of the spring 25, thus separating the electrodes so that a spark will be produced. This operation is repeated at frequent intervals so as to generate the sparks for producing the explosions in the engine equipped with the spark plug.

From the foregoing it is apparent that I produce a simple device admirably adapted for the attainment of the ends in view, it being understood that in attaining these ends minor changes in the details herein set forth may be resorted to without departing from the spirit of the invention.

Having thus described my invention, what I claim is:

1. A spark plug comprising a stationary electrode, a rod mounted for longitudinal movement, one end constituting a movable electrode normally separated from the other electrode, a body of metal fixed on the rod and forming an armature, an electro-magnet surrounding the rod and operating on the armature to bring the electrodes into contact, a yielding element arranged to hold the electrodes separated, a binding post against which the rod is held by the said element and adapted to be connected with a high tension circuit, and means for connecting the electro magnet with a low tension circuit, said rod and binding post forming a path for high tension current when the electro magnet is out of service.

2. A spark plug comprising a casing, a core therein, a magnet winding around the core, a stationary electrode carried by the casing, a rod insulated from the casing and forming a movable electrode, an insulating lining fitted in the casing and disposed above the magnet, an armature secured to the said rod in coöperative relation with the electro magnet, means operating on the rod to hold the electrodes apart, a current conductor with which the rod is normally in contact when the electrodes are separated, and means within the casing for connecting the rod in circuit when the electro magnet is energized.

3. A spark plug comprising a grounded casing, a fixed electrode thereon, a movable electrode mounted in the casing, means for normally connecting the movable electrode in a high tension circuit, an electro magnet connected with the low tension circuit and arranged to bring the electrodes into contact, and means for connecting the movable electrode into the low tension circuit when the electro magnet is energized.

4. A spark plug comprising a casing, a core therein having a threaded portion extending out of the casing, a neck threaded on the core and exteriorly threaded for attachment to the cylinder of an engine, a stationary electrode on the neck, a rod forming a movable electrode extending through the core and neck, an insulating bushing extending around the rod for insulating the same from the core and neck, means for connecting the movable electrode normally in a high tension circuit, a magnet winding on the core, means for connecting the winding in a low tension circuit, an armature on the said rod for bringing the movable electrode into contact with the stationary electrode when the magnet is energized, and means for connecting the said rod in the low tension circuit when the said winding is energized.

5. A spark plug comprising a casing, a neck thereon for attaching the plug to an engine cylinder, a stationary electrode on the neck, a movable electrode in the form of a rod insulated from the neck and casing, an electro magnet within the casing, an armature on the rod arranged in coöperative relation with the magnet, a cover for the casing having a tubular extension, a lining of insulation arranged in the casing above the electro magnet, binding posts on the lining for connecting the electro magnet in a low tension circuit, a spring-pressed element mounted on and insulated from the said casing and electrically connected with one of the binding posts, a contact on the said rod normally insulated from the element and adapted to contact therewith when the electro magnet is energized, a spring housed in the tubular extension of the cover and connected with the rod for holding the latter separated from the stationary electrode, and a binding post on the extension for connecting the rod in a high tension circuit and with which the rod is normally held in engagement by the spring.

6. A spark plug comprising relatively movable electrodes, means for normally holding the electrodes apart, a contact normally connected with one of the electrodes for supplying high tension current thereto, an electro magnet adapted to actuate the movable electrode to make and break a circuit, and means for connecting and disconnecting the electrodes and circuits by the actuation of the movable electrode.

7. A spark plug comprising a pair of relatively movable electrodes, a binding post for connection with a high tension circuit, an electro magnet having an armature connected with the movable electrode, and adapted for connection with a circuit to supply low tension current thereto, and relatively movable contacts for connecting the electrode in the low tension circuit by the actuation of the armature.

8. A spark plug comprising a grounded casing, a stationary electrode carried thereby, a movable electrode mounted in the shell and insulated therefrom, a binding post adapted to be connected in a high tension circuit, means for holding the movable electrode in conducting relation with the binding post and separated from the fixed electrode, means for actuating the movable electrode to make and break contact with the fixed electrode, and means dependent upon the movement of the said electrode for supplying low tension current to the electrodes.

9. A spark plug comprising a casing suitably grounded, a fixed electrode thereon, a movable electrode in the casing insulated therefrom, a binding post adapted to be connected in a high tension circuit, means for

yieldingly holding the movable electrode in contact with the binding post and separated 20
from the fixed electrode, an electro magnet coil in the casing; an armature for the coil mounted on the movable electrode, binding posts for connecting the coil in a low tension circuit, a contact on the movable electrode, 25
and a contact connected with one of the binding posts in the low tension circuit and arranged to periodically engage and disengage the contact on the electrode to supply low tension current to the latter. 30

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

WILLIE H. R. MILDEBRATH.

Witnesses:

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