

W. S. WITTER.
SPARK PLUG.
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1,008,935.

Patented Nov. 14, 1911.

Fig. 1.

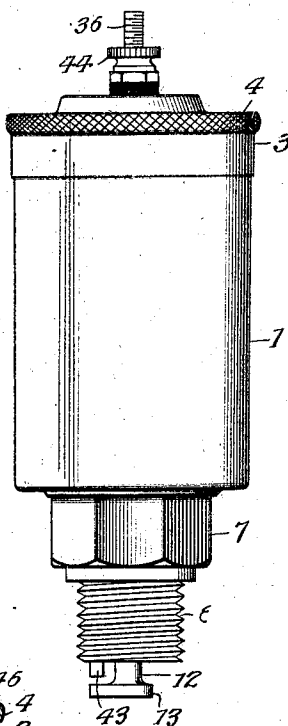


Fig. 4.

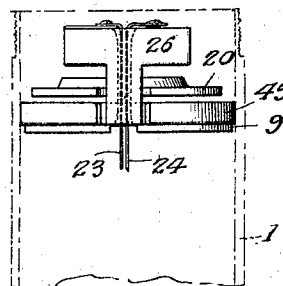


Fig. 2.

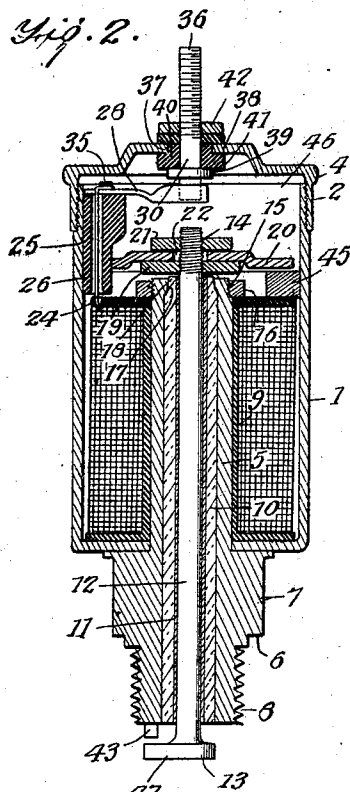
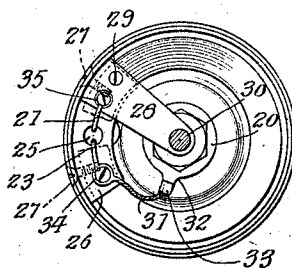


Fig. 3.



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SPARK-PLUG.

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To all whom it may concern:

Be it known that I, WILLIAM S. WITTER, a citizen of the United States, residing at Julesburg, in the county of Sedgwick and State of Colorado, have invented a new and useful Improvement in Spark-Plugs, of which the following is a specification.

My invention is an improvement in spark plugs, and consists in certain novel constructions, and combinations of parts, hereinafter described and claimed.

Referring to the drawings forming a part hereof, Figure 1 is a side view of the improved plug. Fig. 2 is a vertical section. Fig. 3 is a plan view of the plug with the cover removed, and Fig. 4 is a diagrammatic partial side view.

In the embodiment of the invention shown, a case 1 is provided of suitable material, and cylindrical in form, and the upper end of the case is threaded externally at 2, to receive an internally threaded cap 3, having a corrugated annular rib 4, for convenience in removing or replacing the cap.

A supporting tube 5 is provided with an enlargement 6 at one end, an annular shoulder 7 being formed between the main portion and the enlarged portion, and the tube is arranged axially of the case, with the shoulder 7 abutting the outer face of the lower-end of the said case. The lower end of the enlargement is reduced and threaded at 8 to engage a threaded opening in the cylinder. That portion of the supporting tube within the case is encircled by a bobbin 9, upon which is wound the wire in the usual manner, and an insulating tube 10 is arranged within the supporting tube. A steel shell or sleeve 11 is arranged with the insulating tube, and forms a bearing sleeve or shell for the sparking pin 12.

The lower end of the pin 12 is enlarged to form a head 13, and the upper end extends above the shell 11 and is threaded at 14. The upper end of the supporting tube or base 5 extends above the bobbin and is threaded at 15, and is engaged by a nut 16, the nut holding the bobbin in place against the lower end of the case.

The upper end of the insulating tube 10 is reduced or beveled at 17, and the upper end of the supporting tube or base is enlarged internally at 18 to fit the bevel. A nut 19 is threaded on to the portion 14 of the pin, and the armature 20 encircles the pin above the nut, and is held in place by a

second nut 21, the armature having an opening 22 for receiving the pin.

The terminals 23 and 24 of the wire on the bobbin pass from the bobbin upwardly through a passage 25 in a fiber support 26 secured in the case by screws 27. A spring 28 is secured to the fiber support by screws 29, and the free end of the spring extends radially inward into position for engagement by the lower end of a contact bolt 30.

A rope 31 composed of a plurality of fine wires twisted together, is connected at one end by means of a threaded clamping cap 32 with a lug 33 on the armature, and the opposite end of the rope is provided with a ring 34, to which the terminal 23 is connected. The terminal 24 is connected to the spring 28, by means of a screw 35.

The upper end of the bolt 30 is threaded at 36, and extends through an opening 37 in the cap. The opening is of greater diameter than the bolt, and a bushing 38 of fiber or other insulating material is arranged between the bolt and the edge of the opening. The bolt is provided with an annular rib 39, spaced apart from its lower end, and the said rib abuts against the lower end of the bushing. An insulating washer 40 encircles the bolt and engages the upper face of the cap and the upper end of the bushing, and the bushing is provided with an annular rib 41 for engaging the under face of the cap. The bolt is thus insulated from the cap and a nut 42 is threaded on the bolt above the washer. The head or annular rib 13 of the contact pin forms one of the terminals of the plug, and a lug 43 forms the other, the lower end of the lug extending below the support or base 6 of the plug.

When the plug is placed on the cylinder, the lug 43 is grounded through the support to the cylinder, in the usual manner. A thumb nut 44 is threaded onto the contact bolt, and the usual ring on the flexible conductor from the magneto is arranged on the bolt between the nut 42 and the thumb nut 44. A magnet 45 roughly of horse shoe shape is arranged with the chamber 46 formed between the inner face of the cap and the upper end of the bobbin. The armature as shown more clearly in Fig. 3 is circular in form, and the outer edge thereof is directly above the magnet, and spaced apart slightly therefrom. The support 26 is arranged between the ends of the magnet (Fig. 4) and the sparking pin is moved longitudi-

nally in one direction by the attraction of the magnet exerted on the armature. The rib or enlargement 18 at the upper end of the supporting tube, prevents the insulation blowing out.

In operation, the plug is connected with a low tension magneto and the usual timing lever. When the charge is compressed in the cylinder of the engine, the pin is forced outwardly by the pressure on the head 13 of the said pin. The head 13 of the pin is extended laterally at 47, toward the lug 43, to contact therewith when moved outwardly. The circuit is thus completed, from the magneto through bolt 30, spring 28 and terminal 24 to the winding on the bobbin, through the same to terminal 23, armature 20, pin 12, lug 43, supporting tube, and engine to ground, energizing the magnet 45. The magnet attracts the armature forcibly, moving the pin downwardly and breaking the circuit, producing a fat hot spark.

It will be evident that the improved plug consists of a case provided with means for engaging an engine cylinder and having a plunger acted upon by the compression and moved in one direction thereby, and in the opposite direction by a solenoid coil of which the plunger forms the case.

I claim—

A spark plug comprising a supporting

tube of conducting material having means for engaging an engine cylinder, a solenoid encircling the tube and supported thereby, a core of conducting material reciprocable in the tube, said core having a head at the end of the tube adjacent to the cylinder to be acted upon by the compression in the cylinder to move the core outwardly, the tube having a pin cooperating with the head to form a spark gap, an insulating tube within the supporting tube, an armature secured to the core at the opposite end from the head and upon which the solenoid acts to move the core inwardly to break the circuit through the solenoid, means for connecting the plug with a source of electrical energy, said means comprising a casing for the tube having an opening at its outer end, a bolt extending through the opening, said bolt having means outside of the casing for connection with the source of energy, and having a head within the casing, a block of insulating material adjacent to the bolt, a spring connected with the block and engaging the head of the bolt, and a connection between the spring and the solenoid.

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