W. ELLIS.

SPARK PLUG.

APPLICATION FILED MAR. 28, 1914.

1,125,988.

Patented Jan. 26, 1915.

Fig. 1

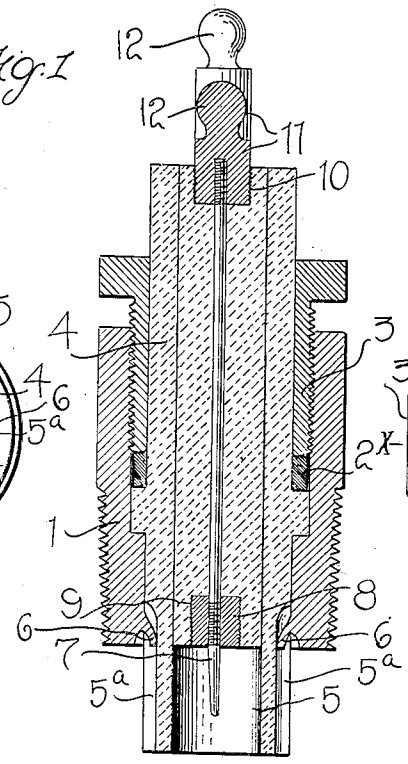


Fig. 2

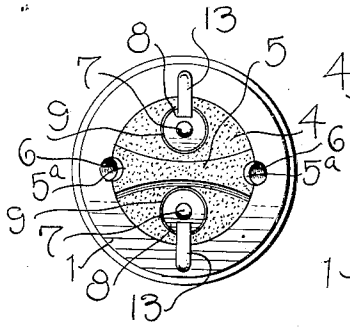


Fig. 3

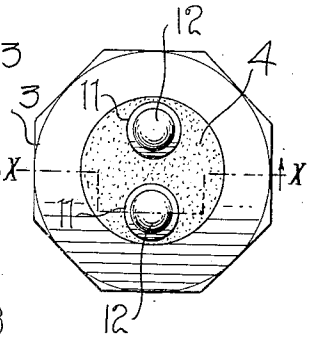


Fig. 4

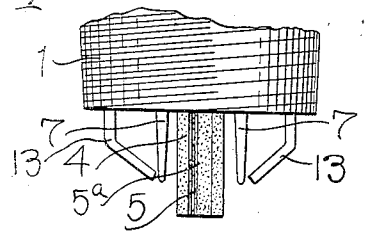


Fig. 5

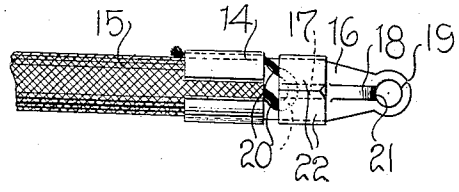
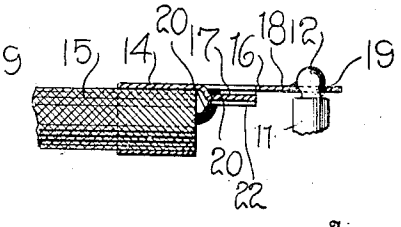


Fig. 6



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SPARK-PLUG.

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Application filed March 28, 1914. Serial No. 828,007.

To all whom it may concern:

Be it known that I, WILLIAM ELLIS, a citizen of the United States, residing at Kenton, in the county of Hardin and State of Ohio, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to spark plugs.

The object of the invention is, in a ready and practical manner, to adapt a single spark plug for use in connection with two different systems of wiring, that is to say magneto and battery, whereby in the event of the failure of one system to act the other may be instantly cut into active service.

A further object of the invention is to dispense with the employment of a binding post for establishing connection between the timer wire and the plug, in lieu thereof to employ a novel form of snap clip, the terminals of the electrodes on the plug being so formed as to adapt the clip to be connected therein in such manner as to insure positive contact and thus transmission of current, and at the same time preclude the possibility of disconnection in use.

With the above and other objects in view, as will appear as the nature of this invention is better understood, the same consists, generally stated, in a spark plug embodying the usual casing, porcelain plug and packing gland for maintaining the plug rigidly seated within the casing. The insulating plug has extending through it two electrodes, the upper end of each of which carries a ball-shaped terminal that is designed to be engaged by a snap clip carried by the timer wire, the connection between the parts being such as to permit of ready assemblage and disconnection as occasion may require. As a matter of further and specific improvement, the lower end of the casing is provided with two inward projecting fins or lugs that are designed to engage in grooves formed in a shield projecting from the lower end of the plug and beyond the casing, the coaction between the fins and the grooves serving to hold the plugs against turning when the packing gland is being tightened.

Further and more specific details of construction will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts: Figure 1 is a view in vertical longitudinal section through a spark plug constructed in accordance with the present invention, the section being taken on the line x—x, Fig. 3. Fig. 2 is a bottom plan view thereof. Fig. 3 is a top plan view. Fig. 4 is an enlarged detail view, in side elevation, of the lower portion of the plug. Fig. 5 is a bottom plan view of the form of snap clip employed for connecting the timer wire either from the battery or magneto with the spark plug. Fig. 6 is a view in side elevation, partly in section, of the snap clip, showing it combined with the terminal of one of the electrodes.

The structure comprises a casing 1, which as usual, is externally threaded at its inner end, and is provided at its outer end with an internally threaded chamber to receive a packing 2 that is borne upon by a gland 3, in order to insure a tight juncture between the packing and the core or plug 4, the latter being of porcelain. This plug projects at its outer and inner end beyond the plug and gland respectively, the inner end constituting a shield 5 which will operate to prevent any interference between the two electrodes later to be described, the sides of the shield being incurved to render it self-cleaning, and the edge of the shield being provided with longitudinal grooves or channels 5^a that are designed to be engaged by fins or lugs 6 projecting inward from the lower end of the casing, whereby when the gland is tightened, the plug will positively be held against turning.

Extending longitudinally through the plug are two electrodes 7, the inner and outer ends of each of which are threaded, and disposed upon the inner end of each electrode is a nut 8 that is disposed within the socket 9 formed in the inner end of the plug, the outer end of the plug being provided with similar sockets 10, one only being shown in Fig. 1, to receive nuts 11, the object of the two nuts being to prevent the electrodes from being blown out in use. Each of the nuts 11 carries a ball-shaped terminal 12 to constitute a substitute for the ordinary binding post usually employed in connection with the electrode. The inner end of the casing is provided with two electrodes 13 that coact with the electrodes 7 in the usual manner to produce a spark. As will be noted by reference to Fig. 1, the two

balls are of different height, the object of this arrangement being to permit two timer wires entering in the same direction to be connected with the ball terminals without interference, it being of course understood that at no time will both of the timer wires be connected with the terminals. One of the essential features of the invention resides in the novel means for connecting the timer wires with the ball terminals, and this consists, in connecting with each wire, that is to say to the one leading to the battery and the other leading to the magneto, a collar 14 that is clasped or clamped around one end of a timer wire 15, and is provided with a tongue 16, the metal of which is struck out to provide two longitudinally disposed fingers 17 and 18, the former being arranged in the collar and the latter in the outer end of the tongue, and projects into an opening 19 that is designed to receive the ball terminal. These fingers are resilient, and the finger 17 serves effectively to clamp the strands 20 of the timer wire against the inner surface of the tongue, and also operates to prevent the strands from becoming disconnected from the collar when longitudinal strain is applied to the timer wire. These strands, as shown in Fig. 6, are passed over the fingers 17 and then rearwardly between one member of the collar, which is a split structure, and the outer surface of the insulation of the timer wire. The finger 18 is provided at its outer end with a curved notch 21 which will permit it to pass readily over the ball terminal when the snap clip is to be connected therewith. In order to prevent any strain on the timer wire from causing the strands 20 to deflect the finger 17 and thus loosen its hold on the strand, the tongue is provided with two inturned clamps 22 which will serve to act as guards to prevent any outward movement of the finger.

From the foregoing description it will be seen that by the provision of the two electrodes, and the employment of the snap clips, that ready connection between the source of electricity whether it be magneto or a battery, may be easily accomplished, and in a manner that will insure effective electrical contact between the parts.

While it will generally be preferred to thread the lower ends of the electrodes for the reception of the nuts 8, it is to be understood that if preferred these latter may be integral with the electrodes, in which case the electrodes will be inserted from the inner end of the plug, and the nuts 10 then turned upon the upper ends thereof.

The improvements herein defined while simple in character will be found thoroughly efficient for the purposes designed, and will coact in the production of a spark attachment for internal combustion engines that will be durable and thoroughly practical in operation and will require no change whatever in the construction and arrangement of the engine to combine the same therewith.

I claim:

A spark plug comprising a casing having lugs extending within the casing at its inner end, an insulating core carried within the casing, electrodes extending longitudinally through the core, said core having a longitudinally projecting web extending from its inner end between the inner ends of the electrodes, the edges of said web being formed with grooves to receive the lugs on the casing, whereby to hold the core against turning relative to the casing, and the outer ends of said electrodes extending different distances beyond the core.

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

WILLIAM ELLIS.

Witnesses:
MYRA SHICK,
H. L. WILLIAMS.