

J. D. ROBERTSON.
SPARK GAP.
APPLICATION FILED NOV. 30, 1910.

1,006,795.

Patented Oct. 24, 1911.

Fig. 1

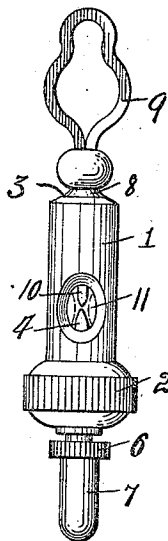


Fig. 3

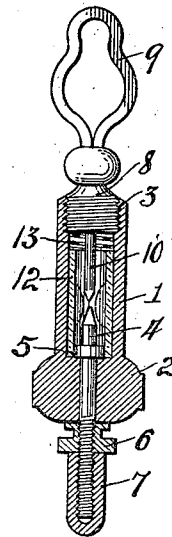
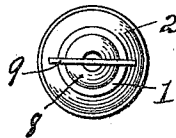


Fig. 2



WITNESSES:

L. H. Mills.
E. C. Thomas.

INVENTOR:

James D. Robertson,
By Owen & Owen,
his attys.

UNITED STATES PATENT OFFICE.

JAMES D. ROBERTSON, OF TOLEDO, OHIO, ASSIGNOR TO CHAMPION SPARK PLUG COMPANY, OF TOLEDO, OHIO, A CORPORATION OF MASSACHUSETTS.

SPARK-GAP.

1,006,795.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed November 30, 1910. Serial No. 594,920.

To all whom it may concern:

Be it known that I, JAMES D. ROBERTSON, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Spark-Gap; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to devices employed more particularly in connection with the ignition systems of internal combustion engines for detecting defects in the ignition, but is not restricted to such use as it may be used in any connection for which it may be adapted or appropriate. Several forms of devices of this character have been used, but none of the same, so far as I am aware, has been capable of adjustment by hand to vary the distance or gap between the points or electrodes while the engine is running or a current is passing through the ignition circuit. It is of very great advantage when testing out the spark to be able to adjust the gap or distance between the electrodes during a running of the engine for reasons apparent, but owing to the high tension flowing therethrough this has been impossible with the types of gaps heretofore used, as a person in taking hold of the adjusting parts will receive a severe shock even though the part which he grasps is apparently insulated from the circuit parts.

The object of my invention is the provision of a device of the character described, which is capable of being easily adjusted to vary the distance of the visible spark gap during a running of the engine without danger of shock to the person adjusting the same and which is efficient in its operation, and cheap and simple in its construction and manufacture, thus materially enhancing the practicability and commercial value of such devices.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment

in numerous forms a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is an elevation of a spark gap comprising my invention, Fig. 2 is an end view thereof, and Fig. 3 is a central longitudinal section of the same.

Referring to the drawings, 1 designates the barrel or holder of the gap one end of which is closed and preferably enlarged, as at 2, while the other end thereof is open, as at 3. The closed end 2 of the barrel 1 is axially bored to permit the projection of a point or electrode 4 therethrough. This electrode is shouldered adjacent its inner end, as at 5, to bear against the marginal edge of said bore at the inner end thereof to limit the outward movement of the electrode therein, and the outer end of such electrode is threaded to receive a nut 6 which is adapted to bear against the outer closed end of the barrel and to cooperate with the shoulder 5 to rigidly secure the electrode 4 in position therein. A jam nut 7 is also shown as being threaded on the outer end of the electrode 4 and in addition to locking the nut 6 against movement, serves as a stud with which a terminal clamp may be removably engaged.

The open end 3 of the barrel 1 has a plug 8 of suitable conductive material threaded therein and provided at its outer end with a terminal clamp 9 of any suitable form. The other electrode 10 of the device is carried by the inner end of the plug 8 and projects within the barrel 1 to a point adjacent the inner end of the companion electrode 4, the gap or distance between such electrodes being varied as desired by a relative turning of the barrel 1 and plug 8.

The barrel 1 has a plurality of sight openings 11 provided therein in register with the points of the electrodes 4 and 10 to make visible a spark passing between said electrodes. A glass tube 12 is inserted within the barrel 1 around the electrodes to insulate the vision openings 11 from the interior of the barrel, and this tube is held in position within the barrel by a coiled compression spring 13, which has its opposite ends thrust against the adjacent ends of said tube and the plug 8.

In the use of my improved device, a person, to detect a defect in the ignition of an engine, places the device in the ignition circuit as by connecting the terminal end 9, thereof to the exposed end of a spark plug and engaging the terminal wire for such plug to the end 7 of the device, as is apparent. Upon a starting of the engine, the ignition circuit, of course, being closed, the operator can see the spark by viewing the same through the sight openings 11 on the device, and can determine the strength or intensity thereof or detect a defect in the ignition circuit by grasping and turning the barrel 1 for such purpose, as the turning of such barrel, the plug 8 being fixed due to its connection with the spark plug, causes a movement of the electrodes 4 and 10 toward or away from each other as may be desired, thus varying the visible spark gap. The enlarged end 2 of the barrel provides a finger grip to facilitate the turning of the barrel, but this may be eliminated without affecting the invention.

With this form of device the operator can grasp the barrel 1 for the purpose of turning the same without danger of receiving a shock by reason of a current jumping from the circuit parts at the closed end thereof or from any point along the barrel to his fingers, as is the case with other devices of this character on the market, thus making the device perfectly safe to handle when in operation.

I wish it understood that my invention is not limited to any specific construction or arrangement of the parts except in so far as such limitations are specified in the claims. Having thus described my invention, what

I claim as new and desire to secure by Letters Patent, is,—

1. A device of the class described, comprising a barrel of non-conductive material, said barrel having one end open and one end closed, a fixed electrode carried by the closed end of the barrel and having its inner end projecting within the barrel, a plug threaded into the open end of the barrel, a terminal clamp projecting from the outer end of said plug, said plug and terminal clamp being of conductive material and a movable electrode fixedly projecting from the inner end of said plug within the barrel and adjustable relative to the fixed electrode by a relative turning of said barrel and plug.

2. A device of the class described, comprising a barrel of non-conductive material, said barrel having sight openings therein, a fixed electrode secured to one end of said barrel and projecting therein, a movable electrode threaded within the opposite end of said barrel and adjustable relative to the fixed electrode by a turning of the barrel on the movable electrode, a transparent tube fitted within the barrel around the electrodes, and yielding means coacting with a part of the movable electrode and with said tube to retain the latter seated within the barrel, substantially as described.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

JAMES D. ROBERTSON.

Witnesses:

C. W. OWEN,
M. G. GASKELL.