Nov. 4, 1952 E. HEDINGER 2,617,063

SPARK GAP DEVICE

Filed April 3, 1951

Fig. 2

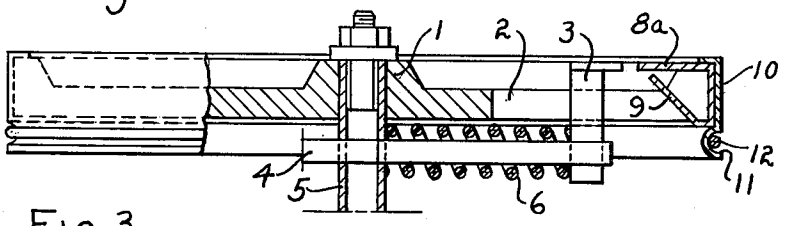


Fig. 3

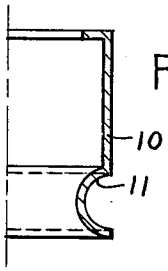


Fig. 1

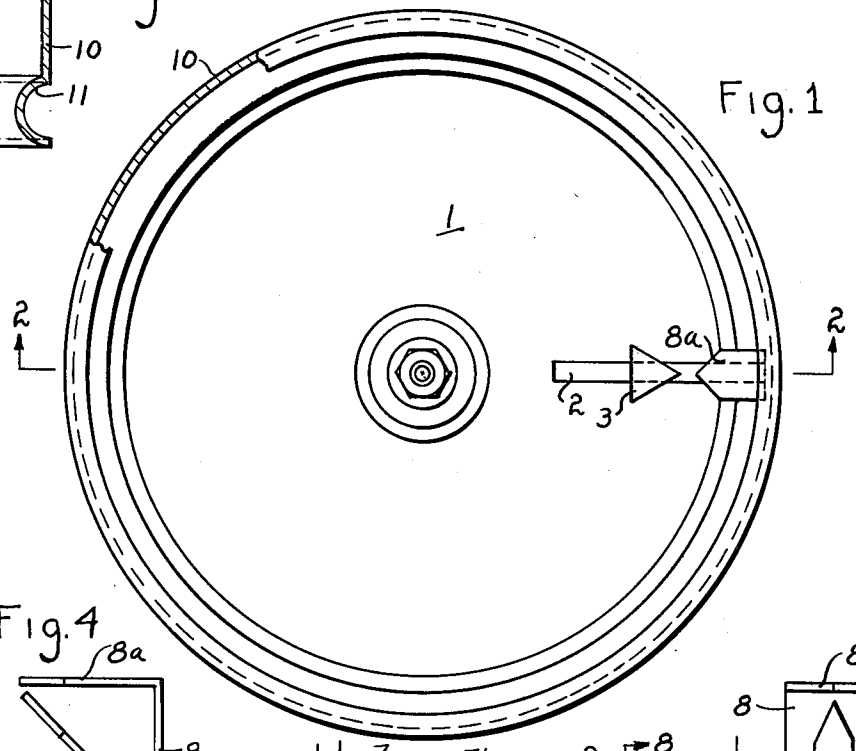


Fig. 4

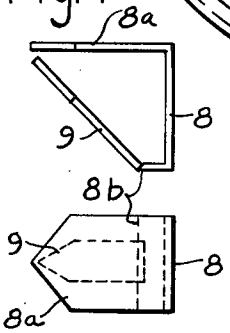


Fig. 5

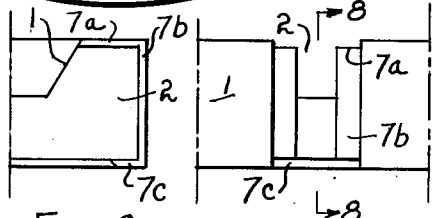


Fig. 8

Fig. 7

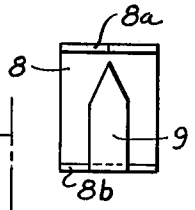


Fig. 6

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UNITED STATES PATENT OFFICE

2,617,063

SPARK GAP DEVICE

Ernst Hedinger, Schlieren, Switzerland, assignor to Joseph Weidenhoff, Incorporated, Algona, Iowa, a corporation of Illinois

Application April 3, 1951, Serial No. 218,938
In Switzerland January 6, 1951

7 Claims. (Cl. 313—147)

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The object of my copending patent application Serial No. 212,328, filed February 23, 1951, for Device for Determination and Diagnosing of Disturbances During Operation of Motor Vehicles, which discloses a device for the determination and diagnosis of disturbances during operation of motor vehicles, which is characterized by a spark gap device attached to the ignition device, which spark gap device is provided with a ring-shaped and a rod-shaped electrode, which latter is disposed slidably for alteration of the spark gap in axial and radial direction and is rotatably disposed for observing ignition sparks following one another in rapid succession independently in a plane lying within the ring-shaped electrode.

The present invention relates to a device of the type shown in my copending application provided with a ring-shaped electrode, which latter is disposed slidably for the purpose of alteration of the spark gap between the two electrodes in axial and radial direction and is rotatably disposed within a plane. This device, according to the invention, is characterized by the fact that the rod-shaped electrode is in operative connection with an electric non-conducting disc-shaped member and it carries a head-piece lying within a radial slot of the member. Furthermore, the ring-shaped electrode is disposed on the edge of the disc-shaped member and is in electrically conducting connection with a body disposed above the head-piece in radial direction, the entire assembly being of such type that the head-piece and the body constitute the two poles of the spark gap, and the latter remains always in radial relation during rotation of the member independently of the number of rotations.

In the drawing, an embodiment of the object of the invention is illustrated.

Fig. 1 shows a plan view of the rotatable part of the device containing the two electrodes, and,

Fig. 2 shows a section according to line 2—2 of Fig. 1.

Fig. 3 shows a section through the edge of the ring-shaped electrode on a larger scale.

Fig. 4 shows a contact body pertaining to the ring-shaped electrode in front view.

Fig. 5 is a plan view of the contact body.

Fig. 6 is a side view of the contact body.

Fig. 7 shows a part of the disc-shaped carrier of the ring-shaped electrode in front view and on a larger scale, and

Fig. 8 shows a section according to line 8—8 of Fig. 7.

Numeral 1 designates a disc consisting of an electric non-conductor which has a slot 2 for receiving and guiding a head-piece 3 of a rod-shaped electrode. The electrode 4 extends through a sleeve 5 and is slidable in axial direction for the purpose of radial sliding of the head-piece 3. It is brought into operative connection with a control device (not shown), by means of which this sliding movement is attained. Between the sleeve 5 and the head-piece 3 of the electrode 4 there is a helical spring 6 disposed on the latter, which is disposed to move the electrode 4 to the right in Figure 2.

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The sleeve 5 is in operative connection with an operating device, not shown, and it is in engagement through a bore in the axis of the disc-shaped member 1 with which it is connected upon rotation.

The radial slot 2 opens at a point on the raised edge of the disc 1 on which is disposed an edge groove 7a, 7b and 7c which stretches to three sides (Figs. 7 and 8). In this groove, there is a U-shaped member 8 made of sheet metal which is provided with two non-uniform legs 8 and 8b (Figs. 4 to 6). The longer one of the legs 8a lying within the depression of the groove 7a terminates into a point. On the lower, shorter leg 8b lying within the depression 7c, there is a tongue 9 constituting an extension thereof whose width corresponds to the slot 2 in which it engages. This tongue 9 ends in a point, which for the purpose of forming an ionization spark gap is located below the point of the part 8a, leaving a space for an air gap. The base of the U-shaped sheet metal body 8 is held tightly in the edge groove 7b by means of the ring-shaped electrode 10 which is pressed on the edge of the disc or connected with the latter in a known manner. The edge of the electrode 10 which is bent below the lower edge of the disc is formed into a groove 11 extending over the entire circumference in which a conductor loop 12 is inserted forming the current supply member.

A current conductor, not shown, consists, in addition to the wire loop 12, of the rod-shaped electrode 4. As soon as the necessary voltage is applied to the circuit in which the two electrodes are connected, sparks are created between the points of the head-piece 3, and the part 8a of the sheet metal body 8.

Both electrodes are connected into a high tension circuit of the ignition system of a motor vehicle or a combustion engine, and the disc 1 is rotated directly or indirectly by the parts connected therewith, whereby the number of revolutions is adjusted to one between the minimum and maximum value, according to requirement.

The ignition device effects the periodical production of electric sparks between the two points of the electrodes, which sparks relatively to the disc 1 during the rotation of the latter are always correctly directed radially.

In the disclosed example, there is provided for the establishment of a conductive connection between the ring-shaped electrode 10, 11 and the supply line a wire loop 12 loosely placed into the groove 11, which wire loop does not rotate when the disc rotates. In place of this wire loop 12, there may also be provided another current transmission device, for instance, a sliding device which is in engagement with the part 11 of the annular electrode which is bent over the lower edge of the disc.

What I consider to be new and desire to protect by Letters Patent of the United States of America is:

1. In an apparatus of the kind described, the combination of a rotor of insulating material, a first electrode fixedly mounted on the rotor, a second electrode slidably mounted on said rotor for movement toward and away from said first electrode and means for adjusting said second electrode toward and from the first, including means for urging said second electrode toward the first.

2. In an apparatus of the kind described, the combination of a disc of insulating material having a groove therein, a first electrode fixed to the disc adjacent one end of the groove and a second electrode movably mounted in the groove to form a spark gap with said first electrode.

3. In an apparatus of the kind described, the combination of a disc of insulating material having a substantially radial slot therein extending to the periphery of the disc, a fixed electrode mounted in the outer end of the slot, a peripheral band mounted on the disc for holding said electrode in place and a second electrode mounted in said slot for movement relative to the first electrode.

4. In an apparatus of the kind described, the combination of a disc of insulating material having a substantially radial slot therein extending to the periphery of the disc, a fixed electrode mounted in the outer end of the slot, a peripheral band mounted on the disc for holding said electrode in place and a second electrode mounted in said slot for movement relative to the first electrode, said first electrode comprising a point adapted to form a gap with said second electrode and a second point disposed adjacent the first point for making a gap therewith.

5. In an apparatus of the kind described, the combination of a disc of insulating material having a substantially radial slot therein extending to the periphery of the disc, a fixed electrode mounted in the outer end of the slot, a peripheral band mounted on the disc for holding said electrode in place, said band having a groove and a brush mounted therein, and a second electrode mounted in said slot for movement relative to the first electrode, said first electrode comprising a point adapted to form a gap with said second electrode and a second point disposed adjacent the first point for making a gap therewith.

6. In an apparatus of the kind described, the combination of a disc of insulating material having a substantially radial slot therein extending to the periphery of the disc, a fixed electrode mounted in the outer end of the slot, a peripheral band mounted on the disc for holding said electrode in place, said band having a groove and an annular brush slidably mounted therein, and a second electrode mounted in said slot for movement relative to the first electrode.

7. In an apparatus of the kind described, the combination of a disc of insulating material having a substantially radial slot therein extending to the periphery of the disc, a fixed electrode mounted in the outer end of the slot, a peripheral band mounted on the disc for holding said electrode in place and a second electrode mounted in said slot for movement relative to the first electrode, said first electrode comprising a point adapted to form a gap with said second electrode and a second point disposed below and at an intersecting angle with the first point for making a gap therewith.

ERNST HEDINGER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
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