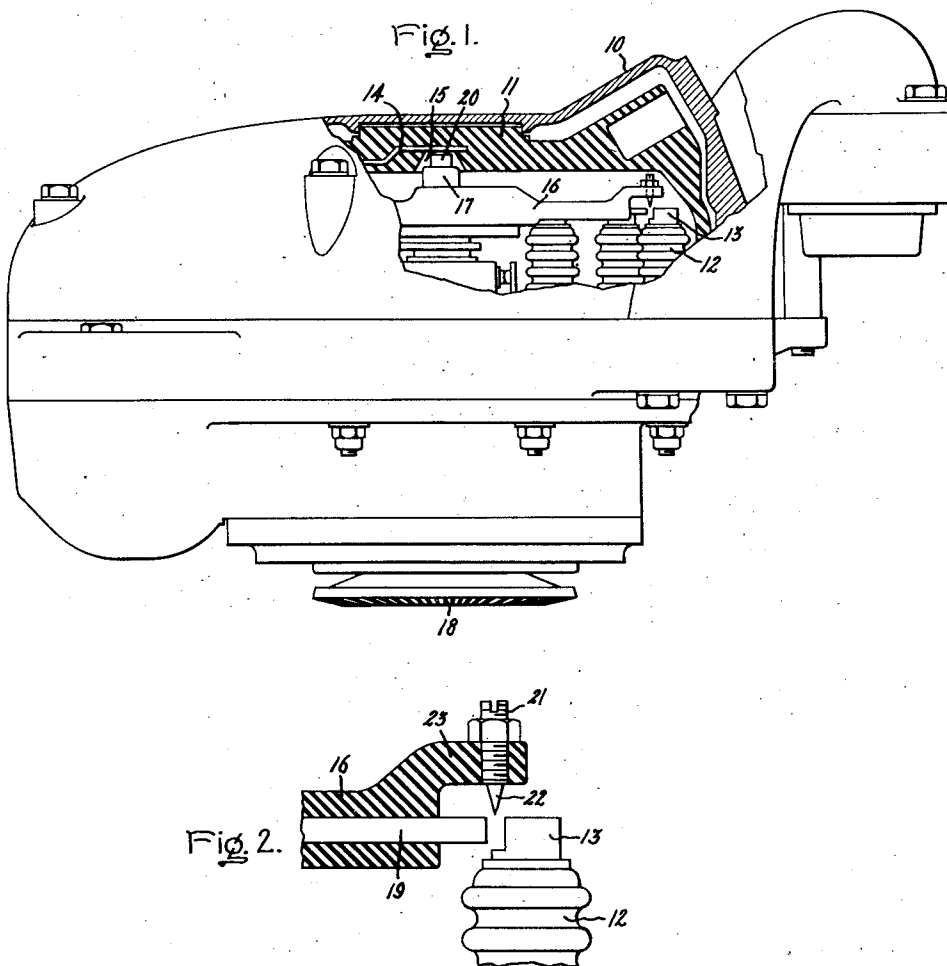


April 23, 1946.

J. R. HARKNESS
IGNITION DISTRIBUTOR
Filed Nov. 23, 1942

2,399,023



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UNITED STATES PATENT OFFICE

2,399,023

IGNITION DISTRIBUTOR

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New York

Application November 23, 1942, Serial No. 466,609

11 Claims. (Cl. 200—19)

My invention relates to ignition distributors of the jump-spark type.

An object of my invention is to provide an improved ignition distributor.

Further objects and advantages of my invention will become apparent and my invention will be better understood from the following description referring to the accompanying drawing, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

In the drawing, Fig. 1 is a side elevational view of an ignition distributor, partly broken away, illustrating an embodiment of my invention; and Fig. 2 is an enlarged view, partly in section, of the jump-spark terminals shown in Fig. 1.

Referring to the drawing, I have shown an ignition distributor of the jump-spark type including a housing 10 within which an insulating mounting member 11 is arranged. The insulating member 11 is provided with an insulating supporting plate on which a plurality of circumferentially spaced apart electrodes 12 is mounted. Each of these electrodes 12 is formed of insulating material and provided with a terminal 13 of electrically conductive material adapted to be connected to a distributor lead for connection to ignition devices, such as spark-plugs. The electrode terminals 13 receive an electrical charge from a suitable source of electrical power supply, such as magneto, through a magneto coil terminal connector 14 arranged within the insulating mounting member 11 and extending through a central opening 15 in the upper cap portion thereof. A rotatable distributor arm 16 of insulating material is adapted to be driven by a shaft 17 through a gear 18 at a predetermined speed relative to the speed of the engine in the ignition system to which the distributor is connected. The distributor arm 16 is provided with a terminal 19 which extends through the arm 16 and forms an electrical contact with the magneto conductor terminal 14 through a contact button element 20 which is insulated from the shaft 17. The magneto is an alternating current source of electrical power supply and, therefore, provides for the sequential distribution of current of opposite electrical potential to adjacent electrode terminals 13, and under certain atmospheric conditions, it has been found difficult to obtain the proper breakdown of the gap between the distributor arm terminal 19 and the electrode terminals 13. In order to assure the proper discharge between these terminals

under varying pressure conditions, I provide an auxiliary electrode 21 having an exciter point 22 arranged radially spaced substantially within the gap between the distributor arm terminal 19 and the electrode terminals 13. In order to obtain the desired discharge between these terminals 19 and 13, the auxiliary electrode 21 is made to have a small amount of electrostatic capacity such that the discharge through the spark gap between the terminals 19 and 13 charges the electrode 21 at the potential of the discharge. The auxiliary electrode 21 is arranged to be rotated substantially in synchronism with the distributor arm 16 by being mounted on an insulating finger 23 formed on the end of the arm 16. Thus, the auxiliary electrode 21 is charged to a given potential by a spark discharge through the gap between the terminal 19 and a terminal 13, and this charge on the auxiliary electrode is of opposite electrical potential to the potential of the distributor arm terminal 19 when it is rotated to a position adjacent the next electrode terminal 13. This reduces the effective gap through which the spark is required to discharge from the distributor arm terminal 19, as the ignition discharge is required initially to jump only the gap between the terminal 19 and the exciter point 22 of the auxiliary electrode 21. This provides for sequentially initiating an electrical discharge between the distributor arm terminal 19 and the electrode terminals 13, thereby assuring the discharge through the spark gap at the desired instant.

While I have illustrated and described a particular embodiment of my invention, modifications thereof will occur to those skilled in the art. I desire it to be understood, therefore, that my invention is not to be limited to the particular arrangement disclosed, and I intend in the appended claims to cover all modifications which do not depart from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An ignition system distributor having a plurality of spaced apart electrode terminals, means including a rotatable arm including an insulating portion and having a terminal for sequentially distributing current of opposite electric potential to adjacent electrode terminals, and means mounted on said arm insulating portion and insulated thereby from ground and from said arm terminal and having electrostatic capacity for reducing the effective gap and for initiating

an electrical discharge between said arm terminal and said electrode terminals.

2. An ignition distributor having a plurality of spaced apart electrode terminals, rotatable means having a terminal for sequentially distributing current of opposite electrical potential to adjacent electrode terminals, and means including an auxiliary electrode arranged to be rotatable substantially in synchronism with said rotatable means terminal for sequentially initiating an electrical discharge between said rotatable means terminal and said electrode terminals.

3. An ignition distributor having a plurality of circumferentially spaced apart electrode terminals, means including a rotatable arm having a terminal for sequentially distributing current of opposite electrical potential to adjacent electrode terminals, and means including an auxiliary electrode arranged to be rotatable substantially in synchronism with said distributor arm terminal for sequentially initiating an electrical discharge between said arm terminal and said electrode terminals on rotation of said arm.

4. An ignition system distributor having a plurality of circumferentially spaced apart electrode terminals, means including a rotatable arm having a terminal for sequentially distributing current of opposite electric potential to adjacent electrode terminals, and means including an auxiliary electrode having electrostatic capacity and being carried by said arm for initiating an electrical discharge between said arm terminal and said electrode terminals.

5. An ignition distributor having a plurality of circumferentially spaced apart electrode terminals supported by an insulating element, means including a rotatable arm including an insulating portion and having a terminal for sequentially distributing current of opposite electrical potential to adjacent electrode terminals, and means mounted on said arm insulating portion and insulated thereby from ground and from said arm terminal and arranged to be rotatable substantially in synchronism with said distributor arm terminal for reducing the effective gap and for sequentially initiating an electrical discharge between said arm terminal and said electrode terminals on rotation of said arm.

6. An ignition distributor having a plurality of spaced apart electrode terminals, means including a rotatable arm having a terminal for sequentially distributing current of opposite electrical potential to adjacent electrode terminals, and means including an auxiliary electrode arranged to be rotatable substantially in synchronism with said distributor arm terminal between said arm terminal and said electrode terminals for sequentially initiating an electrical discharge between said arm terminal and said electrode terminals on rotation of said arm.

7. An ignition jump-spark type distributor having a plurality of circumferentially spaced apart electrode terminals supported by an insulating element adapted to distribute an alternating current from a source of electrical power supply, means including a rotatable arm including an insulating portion and having a terminal for sequentially distributing current of opposite electrical potential to adjacent electrode terminals from said alternating current source of elec-

trical power supply, and means mounted on said arm insulating portion and insulated thereby from ground and from said arm terminal and arranged to be rotatable substantially in synchronism with said distributor arm terminal for reducing the effective gap and for sequentially initiating an electrical discharge between said arm terminal and said electrode terminals.

8. An ignition system distributor having a plurality of circumferentially spaced apart electrode terminals adapted to distribute an alternating current from a source of electrical power supply, means including a rotatable arm having a terminal for sequentially distributing to ignition devices connected to said electrode terminals current from said alternating current source of electrical power supply of opposite electrical potential to adjacent terminals, and means including an auxiliary electrode for sequentially initiating an electrical discharge between said arm terminal and said electrode terminals.

9. An ignition system distributor having a plurality of circumferentially spaced apart electrode terminals adapted to distribute an alternating current from a source of electrical power supply, means including a rotatable arm having a terminal for sequentially distributing to ignition devices connected to said electrode terminals current from said alternating current source of electrical power supply of opposite electrical potential to adjacent terminals, and means including an auxiliary electrode carried by said arm and insulated from said arm terminal for sequentially initiating an electrical discharge between said arm terminal and said electrode terminals on rotation of said arm.

10. An ignition system distributor having a plurality of circumferentially spaced apart electrode terminals adapted to distribute an alternating current from a source of electrical power supply, means including a rotatable arm having a terminal for sequentially distributing to ignition devices connected to said electrode terminals current from said alternating current source of electrical power supply of opposite electrical potential to adjacent terminals, and means including an auxiliary electrode having electrostatic capacity and being carried by said arm insulated from said arm terminal and radially between said arm terminal and said electrode terminals for initiating an electrical discharge between said arm terminal and said electrode terminals.

11. An ignition system distributor having a plurality of circumferentially spaced apart electrode terminals adapted to distribute an alternating current from a source of electrical power supply, means including a rotatable arm having a terminal for sequentially distributing to ignition devices connected to said electrode terminals current from said alternating current source of electrical power supply of opposite electric potential to adjacent terminals, and means including an auxiliary electrode having electrostatic capacity and being carried by said arm insulated from said arm terminal and radially between said arm terminal and said electrode terminals for initiating an electrical discharge between said arm terminal and said electrode terminals.

JOSEPH R. HARKNESS.