

UNITED STATES PATENT OFFICE.

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SPARKING MECHANISM.

934,978.

Specification of Letters Patent. Patented Sept. 21, 1909.

Original application filed September 12, 1906, Serial No. 334,327. Divided and this application filed February 8, 1908. Serial No. 414,637.

To all whom it may concern:

Be it known that I, ROY C. MARKS, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented a new and useful Sparking Mechanism, of which the following is a specification.

This invention relates to sparking devices and apparatus for internal combustion engines, and has for its principal object to provide a special form of ignition system for the type of engine shown and described in an application for Letters Patent filed by me on September 12, 1906, under Serial No. 334,327, and of which the present application is a division.

A further object of the invention is to provide an ignition system which may be readily applied to various types of rotating explosion engines, and which will permit the ready adjustment of the spark for the purpose of increasing or decreasing the speed of the engine.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is an elevation, partly in section, of a sparking apparatus and system constructed and arranged in accordance with the invention. Fig. 2 is an enlarged detail view of the controller. Fig. 3 is a detail sectional view on the line 3—3 of Fig. 1 showing the mounting of the controller.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The engine to which the present invention is applied is provided with a stationary shaft 5 around which the several cylinders rotate, and from the cylinder structure extends a hub 14 on which the spark controller 39 is mounted.

The ignition system is designed with special reference to the type of engine under consideration. Each working cylinder is equipped with a sparking plug 34 which is preferably of the jump spark type, and each plug of the several cylinders is provided with a collector or brush 35 that is adapted once in every revolution to pass either in contact with the metallic member or contact 36, or sufficiently close thereto to form an auxiliary spark gap for the ignition system. The stationary contact 36, which is in the nature of an elongated plate curved in an arc, is of sufficient length to be in conducting relation with the brushes 35 for any adjustment of the spark timer between the maximum advanced and maximum retarded position of the latter. The stationary contact 36 is suitably supported on the yoke or supporting frame of the engine, and insulated therefrom by the block 37 of insulating material. One wire of the high tension side of the ignition system is connected with the contact member 36, as indicated at 38, and the other is suitably grounded on the engine structure. Coöperating with the mechanism for electrically connecting the sparking plugs in circuit is the timer more clearly shown in Fig. 2. This comprises a controller 39 formed of a disk of insulating material having a plurality of equally spaced metallic blocks 40 set in the periphery thereof. In a two cylinder engine, obviously two controller blocks will be employed, or, in other words, there are as many controller blocks as there are cylinders. The controller blocks 40 are grounded on the engine frame, as by means of wires 41, Fig. 2, extending from the blocks to the hub 14 of the crank casing, on which hub the controller is rigidly secured. Any suitable means for grounding the controller segments may obviously be employed. Arranged to make contact with the controller segments is an arm 42 having an anti-friction roller 43 that bears on the periphery of the controller. The arm 42 is pivoted on a lever 44 that is supported on and insulated from the side bar 1 of the supporting frame adjacent the controller. The spring 45 anchored at one end on the timer lever 44 bears at its free end on the arm 42 to maintain the metallic roller 43 in engagement with the controller. One

wire of the low tension, or primary, side of the ignition system is grounded on the lever 44 so that the primary current passes from the battery or other source and induction coil, through the wire 46, the lever 44, arm 42, roller 43, controller 39, and the engine back to the battery. Current is thus induced in the secondary circuit and as the current is broken the spark is produced. The secondary current passes through the engine structure and spark coil and then through the brush 35, contact 36, wire 38 to the induction coil. The timer lever 44 is insulated from the machine, and serves to advance or retard the spark merely by adjusting it in one direction or the other. With a current distributor of the character shown in Fig. 2, separate circuit connections for each spark plug are dispensed with, thus materially reducing the cost and complication of the ignition system.

I claim:—

1. An internal combustion engine having a plurality of rotatable cylinders, a spark plug on each cylinder, a brush carried directly by each spark plug, an elongated stationary contact with which each brush engages for a time period sufficient to include the limits of advance and retardation of the spark, means for charging each spark

plug while its brush is in engagement with the stationary elongated contact, and means for causing the advance or retardation of the spark at will.

2. An internal combustion engine having a plurality of rotatable cylinders, a spark plug on each cylinder, a brush carried directly by each spark plug and extending therefrom in a direction substantially radial to the axis of rotation of the cylinders, an elongated stationary contact curved on an arc struck from the axis of rotation of the cylinders and having its active face directed toward said axis of rotation, each spark-plug brush engaging the said active face for a time period sufficient to include the extreme limits of the advance and retardation of the spark, means for charging each spark plug while its brush is in engagement with the stationary elongated contact, and means for causing the advance or retardation of the spark at will.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ROY C. MARKS.

Witnesses:

J. McANDREW,
ERNEST T. FLEET.