May 22, 1928. 1,670,440

F. F. DORSEY

IGNITION CIRCUIT CONTROLLER

Filed May 9, 1927

Fig. 1

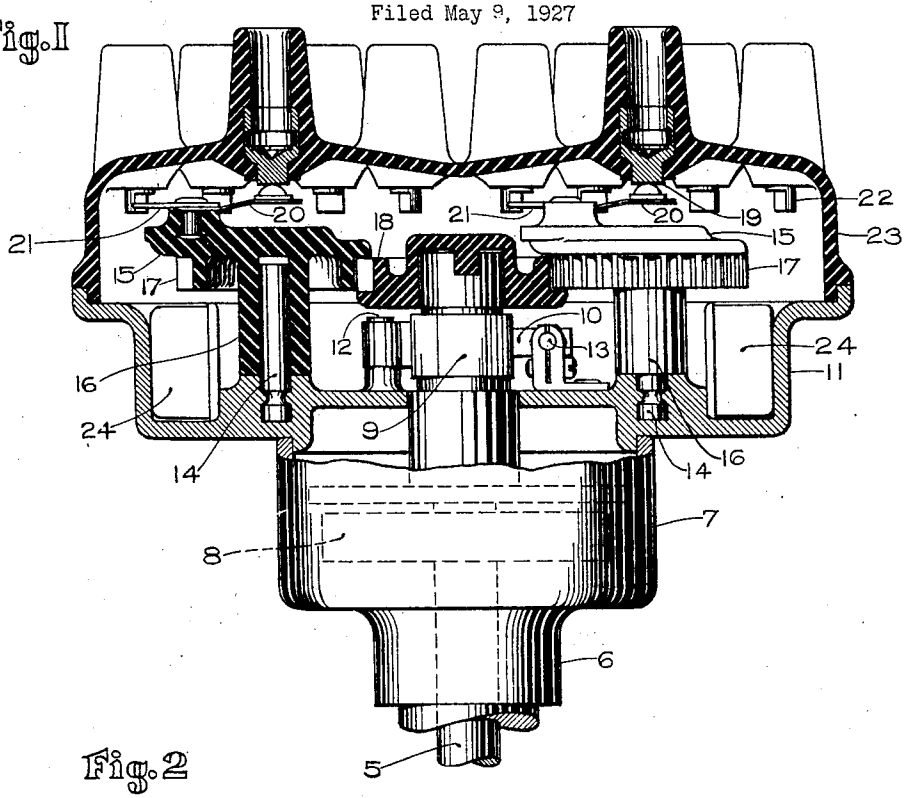


Fig. 2

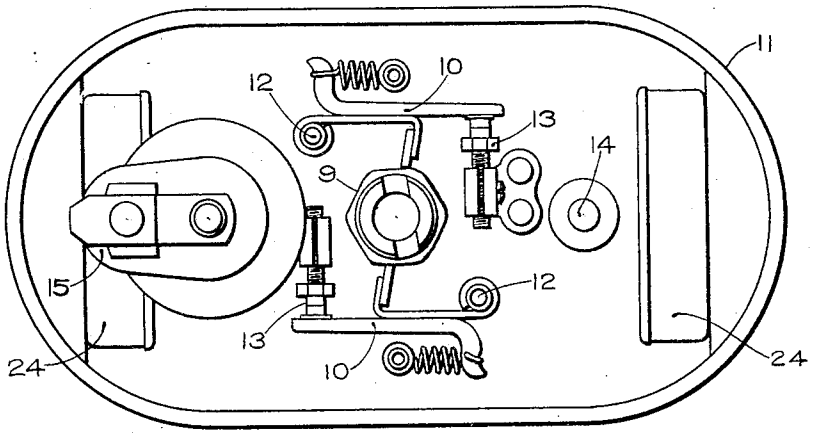
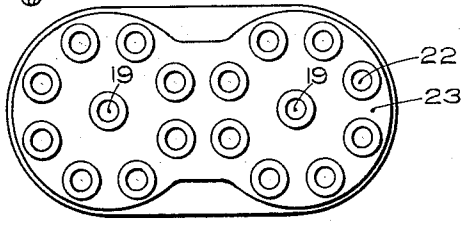


Fig. 3



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Patented May 22, 1928. 1,670,440

UNITED STATES PATENT OFFICE.

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IGNITION-CIRCUIT CONTROLLER.

Application filed May 9, 1927. Serial No. 189,955.

This invention relates to ignition apparatus of the type in which the circuit through the primary winding of an electric ignition coil or transformer is controlled by a vibratory circuit breaker or "timer", while the secondary discharges of the coil are controlled by means of a rotary circuit controller or "distributor", by which they are communicated to the spark plugs of the several engine cylinders in the proper order.

In ignition apparatus of the type referred to, the timer and the distributor are usually combined in a single compact assembly, and operated by an upright shaft driven by the mechanism of the engine. In cases where the engine has a large number of cylinders, however, or where it is desired to energize two spark plugs simultaneously in each cylinder of an engine having six or more cylinders, the number of distributor terminals becomes so large that it is difficult to arrange them in a single circle or series without rendering the distributor inconveniently large in diameter and complicated in the arrangement of its contact members.

The object of the present invention is to produce a timer-distributor assembly in which a large number of distributor terminals may be employed, while, at the same time, the assembly is compact in form and simple and inexpensive in construction. To this end it is proposed to divide the distributor terminals into two or more circular series arranged side by side, and to use a plurality of rotary distributor members, geared to a single central timer shaft by which a plurality of timers may be operated either simultaneously or successively, as the case may require.

The invention is more particularly set forth in the following description of the apparatus illustrated in the accompanying drawings.

In the drawings, Fig. 1 is a side elevation, partly in section, of an ignition circuit controller embodying the present invention. Fig. 2 is a plan view of the apparatus, with some of the upper parts removed, and Fig. 3 is a plan view of the distributor cap, on a reduced scale.

The illustrated embodiment of the invention comprises the usual upright drive shaft 5, journalled in a stem 6 by which the apparatus may be attached to an engine in the usual manner. A shell or housing 7, surmounting the stem, may contain an automatic spark advancer or timing device 8, of any ordinary or suitable form, although this is not essential to the present invention. Mounted on or connected with the upper end of the shaft 5 is a cam 9 which operates the primary circuit controllers or timers, the latter being shown as arms 10, cooperating with adjustable fixed contacts 13. The timer members are supported by, and enclosed within, a metal housing 11 provided with pivot studs 12 upon which the timer arms are supported. The timers may be of any ordinary or suitable form, and the electrical connections with the other parts of the apparatus are not shown, as they will be well understood by those skilled in the art.

On each side of the cam 9 an upright bearing stud 14 is fixed in the housing 11, and upon these studs two distributor rotors 15 are journalled, the rotors being provided, for this purpose, with bearing sleeves 16. Each rotor is provided also with a gear 17, while a pinion 18, meshing with the two gears, is mounted above and concentric with the cam 9, so as to drive the rotors in timed relation with the operation of the cam and the timer arms. The rotor, the sleeve 16 and the gear 17 are preferably made integrally in each case, being moulded from bakelite or similar insulating material. The pinion 18 is also preferably made from moulded insulating material, and it is shown as having a key-and-slot connection with the cam, by which it is rotated, while freely removable, however, to afford convenient access to the timer parts beneath.

Axially above each distributor rotor is located the usual central secondary contact 19, and each rotor is provided with the usual contact strip or spring 20, engaging the corresponding contact 19. Each rotor is also provided with the usual terminal 21, adapted to cooperate successively with a circular series of stationary terminals 22. The contacts 19 and the terminals 22 are all preferably mounted in a single moulded cap of suitable insulating material, and the several terminals may be connected in the usual manner with the spark plugs which they are to control. Near each end of the housing 11 space is afforded for a condenser 24, to cooperate in the usual manner with one of the respective pairs of timer contacts.

It will be evident that in one direction

the diameter of the timer-distributor need be no greater than that required by one of the two circles of distributor terminals, no greater, that is, than in the case of a distributor having only eight terminals. This permits the apparatus to be placed close alongside the cylinder block or other parts of an engine, with a compactness which is, in many cases, very useful.

In the illustrated apparatus the parts are arranged particularly with a view to double ignition in an eight cylinder engine, the two timer arms being arranged for simultaneous operation. It will be evident, however, that by slight changes in the adjustment or timing of the parts, and in the number of secondary terminals in each circle, the apparatus may be adapted to a variety of conditions; such, for example, as double ignition in a four or six cylinder engine, or single ignition in an engine of eight, twelve or sixteen cylinders.

The invention claimed is:

1. An ignition circuit controller comprising: a timer-cam and a pinion, coaxially supported and rotated, with the pinion located above the cam, circuit-breaker arms actuated by the cam, a plurality of bearing studs fixed alongside the cam, distributor rotors rotatable upon the bearing studs and provided with gears meshing with the pinion, and circles of distributor terminals supported concentric with the respective distributor rotors.

2. An ignition circuit controller comprising: a base, an upright shaft journalled in the base; a cam and a pinion supported and rotated by said shaft, circuit-breaker arms actuated by the cam, bearing studs located alongside the cam and fixed, at their lower ends, to the base, distributor rotors rotatable upon the bearing studs and provided with gears meshing with the pinion, and a cap, of insulating material, covering the circuit-controlling members and supporting circles of distributor terminals concentric with the respective rotors.

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