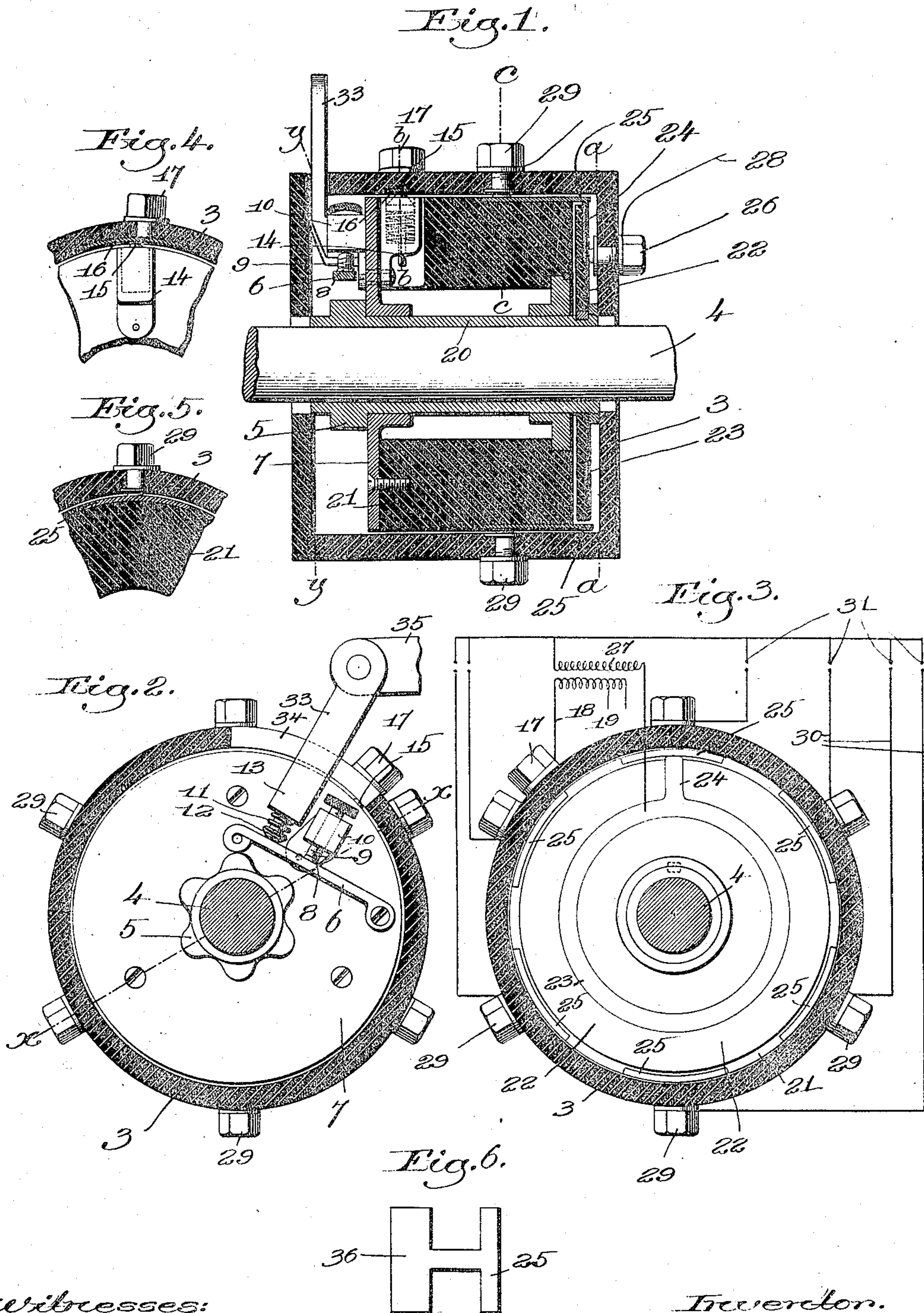


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TIMER AND DISTRIBUTER.
APPLICATION FILED AUG. 9, 1905.

923,442.

Patented June 1, 1909.



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TIMER AND DISTRIBUTER.

No. 923,442.

Specification of Letters Patent.

Patented June 1, 1909.

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To all whom it may concern:

Be it known that I, HARRY L. RADFORD, a citizen of the United States, and a resident of Orange, in the county of Franklin and State of Massachusetts, have invented an Improvement in Timers and Distributers, of which the following description, in connection with the accompanying drawing, is a specification, like numerals on the drawings representing like parts.

This invention relates to a novel timer and distributor for use in connection with sparking or igniting devices of multiple cylinder gas or gasoline engines.

The object of my present invention is to provide a novel means for advancing or retarding the time of making the spark without moving or shifting in any way the casing to which the wires of the primary and secondary circuits are connected, all as will be more fully hereinafter described and then pointed out in the claims.

In the drawings, Figure 1 is a section of my improved timer and distributor on substantially the line $x-x$, Fig. 2; Fig. 2 is a sectional view on the line $y-y$, Fig. 1, looking to the right; Fig. 3 is a section on the line $a-a$, Fig. 1, looking to the left; Fig. 4 is a section through the upper part of the device on the line $b-b$, Fig. 1; Fig. 5 is a section through the upper part of the device on the line $c-c$, Fig. 1; Fig. 6 is a view of one of the contact pieces detached from the structure.

3 designates the casing to which the terminals of the primary and secondary circuits are connected, and within which the make and break device and distributing device are received, said case preferably being made of some suitable insulating material.

The casing is mounted on a suitable shaft 4 which may be any appropriate part either of the engine with which the device is used or of the machine operated by the engine.

The make and break device may be of any suitable or usual construction, and as usual in this class of devices it is placed in the circuit including the primary winding of the spark coil.

The make and break device herein shown comprises the make and break contacts 8 and 9, 9 being a fixed contact and 8 a movable contact. These contacts are both sustained by a plate 7 and are suitably insulated from each other, this being conveniently done by insulating the contact 8 from the plate. The

contact 9 is in the form of a member screw-threaded into a projection 10 carried by said plate 7. The movable contact 8 is carried by an arm 6 which is pivoted to the plate 7 and which may conveniently be insulated therefrom and which is acted upon by a cam device 5 mounted on and rotating with the shaft 4, there being as many cam projections on this cam device as there are sparking plugs to be actuated.

The arm 6 is held against the cam 5 by a suitable spring 11 which surrounds a stud 12 slidably mounted in a projection 13 rigid with or forming part of the disk 7. The projection 10 is electrically connected with a block 14 carried by the plate 7 and sustains a spring pressed contact member 15 which is adapted to engage a contact-piece 16 carried by the casing 3. Said contact piece 16 is connected to a terminal or binding post 17 which, in turn, is connected to a wire 18 of the circuit including the primary winding 19 of the spark coil. The circuit of the primary winding is completed through the shaft 4 and cam 5.

There are as many cam projections on the cam 5 as there are cylinders or sparking plugs to be ignited, and therefore during each rotation of the shaft 5 the make and break device will be operated as many times as there are sparking plugs.

The plate 7 is loosely mounted on a sleeve 20 which is fast to the shaft 4 and which carries the cam 5, and said plate 7 is connected to an annular block 21 of insulating material.

The distributing device is shown as a disk 22 of insulating material which is mounted on the sleeve 20 to rotate with the shaft 4, and which carries a distributing ring 23 of conducting material, which ring is provided with a brush or contact-finger 24 adapted in the rotation of the disk 22 to engage a plurality of contact-pieces 25.

The casing 3 carries a terminal or binding post 26 to which the secondary winding 27 of the spark coil is connected by a suitable wire 28, said binding post extending through the casing 3 and engaging at its inner end the distributing ring 23. Each of the contact pieces 25 is electrically connected with a binding post or terminal 29, and each terminal 29 is connected to a branch 30 of the circuit including the secondary winding 27, each branch having therein a spark plug 31 to be operated. The contact pieces 25 are

herein shown as being carried by the block 21, each contact piece being of a shape to engage the inner end of the corresponding binding post or terminal 29.

5 The operation of a distributing device such as above described is familiar to those skilled in the art, and it will be sufficient to say that as the shaft 4 rotates the arm 24 is brought into contact with the various contact pieces 10 25 successively, and during the time that said finger is in engagement with each contact the make and break device is operated, thereby making and breaking the primary circuit and consequently momentarily inducing the current in the secondary winding, 15 said current being directed through the branch 30 corresponding to the contact-piece 25 with which the finger 24 is in engagement. The sparking plugs 31 in the various 20 branch circuits will therefore be operated successively.

In order to advance or retard the spark, it is now more or less common to shift the casing relative to the operating shaft, but the 25 objection to this method of retarding or advancing the spark is that the continual shifting of the casing is liable to result in breaking the insulation on the wires which are connected to the casing. To avoid this 30 difficulty I have provided for advancing or retarding the spark without shifting the casing 3, so that said casing may be stationary and all danger of breaking the insulation on the wires is avoided. In the present embodiment this advance or retard of the spark is 35 accomplished by mounting the plate 7 carrying the make and break contacts so that said plate may be shifted about the shaft 4 without moving the casing.

40 Projecting from the plate 7 is a handle or arm 33 which extends through a slot 34 in the case and to which may be connected a handle or any suitable connection 35 by which the plate 7 may be shifted. Since the 45 plate 7 is connected to the block 21, and since the latter carries the contacts 25 it is necessary to so shape said contacts and also the contact piece 16 that said contacts will not be thrown out of engagement with their 50 respective binding posts or terminals when the plate 7 and block 21 is shifted. Accordingly I propose to make the contact piece 16 in the form of a strip, as shown in Fig. 4, said strip being long enough so that it will 55 always be in engagement with the stationary binding posts 17 throughout the entire extent of movement of the plate 7. Similarly the contact-pieces 25 are provided with an extended contact-piece 36 which extends circumferentially of the block 21 so that each 60 terminal 29 is electrically connected to its contact 25 regardless of the adjusted position of the block 21.

In order that my invention may operate 65 it is not essential that the finger 24 have

actual physical contact with the contact-pieces 25 as the distributing ring rotates, because if there is a slight gap between said arm and its contact piece the high tension current of the secondary circuit will jump 70 across such gap.

The particular form of make and break device herein illustrated is not essential to my invention, nor is the particular construction of distributing device. 75

The principal advantage of having the casing 3 stationary is that all danger of breaking the wires connected to the various terminals on the casing by the shifting movement of the casing is avoided. 80

Various changes in the construction of the device may be made without departing from the invention.

Having described my invention what I claim as new and desire to secure by Letters 85 Patent is:—

1. In a timer and distributor, the combination with a stationary casing having a primary terminal and secondary terminals, and an adjustable member within the casing 90 having contacts electrically connected to the secondary terminals, a make-and-break device carried by said member, a rotary shaft, a distributing member thereon, means to operate the make-and-break device by the rotation of the shaft, and means to adjust said member and the make-and-break device carried thereby within the casing and relative to the shaft. 95

2. In a timer and distributor, the combination with a stationary casing having a 100 primary terminal and secondary terminals, of an adjustable member within the casing having contacts electrically connected to the secondary terminals, make-and-break contacts carried by said member and electrically 105 connected to the primary terminal, a rotary shaft, a distributing member carried thereby, cams mounted on the shaft for actuating the make-and-break device, and means to turn 110 said adjustable member angularly about the shaft, thereby to advance or retard the spark.

3. In a device of the class described, a casing having a plurality of secondary terminals and a primary circuit terminal, the 115 latter having an extended contact surface, a movable block within the casing, a make and break device carried by said block, a contact associated with the make and break device and engaging the extended contact surface on the casing, a rotary distributing ring having constant electrical connection with one of the secondary circuit terminals, and a contact piece electrically connected 120 to each of the other secondary circuit terminals and adapted to be engaged by a projection on the distributing ring as the latter rotates, said last named contact pieces being 125 carried by the movable member. 130

4. In a timer and distributor, the combination with a stationary casing having a primary terminal and secondary terminals, of a shaft extending into the casing, a make and
5 break device within the casing connected to the primary terminal, means on the shaft to operate the make and break device, a current-distributing device also carried by said shaft and situated within the casing and
10 adapted to be connected to the secondary terminals, and means exterior to the casing

to shift the make and break device angularly relative to the casing without causing any movement of the casing.

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

HARRY L. RADFORD.

Witnesses:

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HENRY S. AMES.