

W. L. MARR.
DISTRIBUTER FOR ELECTRIC IGNITION SYSTEMS.
APPLICATION FILED AUG. 27, 1908.

995,697.

Patented June 20, 1911.

2 SHEETS-SHEET 2.

Fig. 4

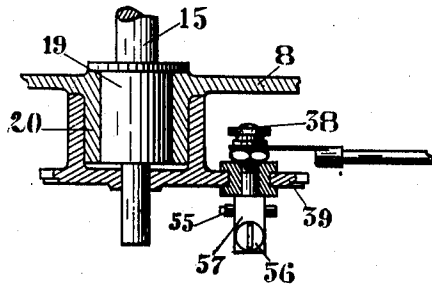


Fig. 3

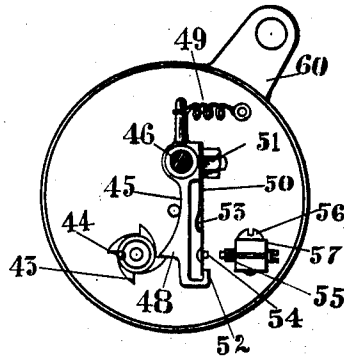


Fig. 2

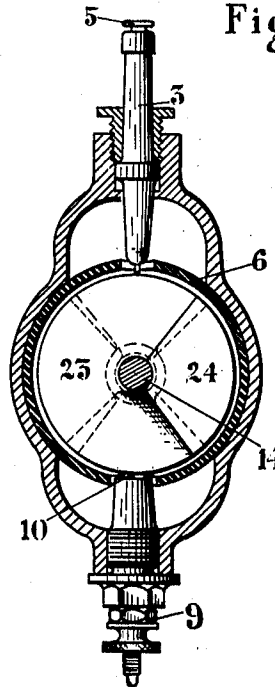


Fig. 6.

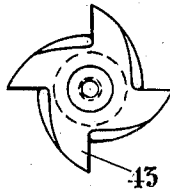
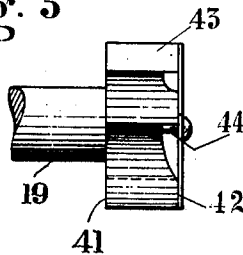


Fig. 5



WITNESSES:

C. L. ter Haar.
A. M. Dow.

INVENTOR

WALTER L. MARR

BY

Walter L. Marr
ATTORNEYS

UNITED STATES PATENT OFFICE.

WALTER L. MARR, OF FLINT, MICHIGAN.

DISTRIBUTER FOR ELECTRIC IGNITION SYSTEMS.

995,697.

Specification of Letters Patent. Patented June 20, 1911.

Application filed August 27, 1908. Serial No. 450,502.

To all whom it may concern:

Be it known that I, WALTER L. MARR, a citizen of the United States of America, residing at Flint, in the county of Genesee and State of Michigan, have invented certain new and useful Improvements in Distributers for Electric Ignition Systems, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a distributor for an electric ignition system of an internal combustion motor, whereby a single induction coil may be used for a multi-cylinder motor, and whereby the self inductive effect caused by breaking the secondary circuit is taken advantage of to produce a spark of high calorific power, thereby insuring firing of the motor charges as desired.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view in longitudinal section of a distributor embodying features of the invention, with diagram showing wiring connections with the spark-plugs of a four-cylinder motor, means for operating the moving parts by connection with a cam shaft or the like being shown in section on a plane at an angle to the plane of section of the distributor itself. Fig. 2 is a view in section on or about line $x-x$ of Fig. 1. Fig. 3 is a view in section of a circuit breaker. Fig. 4 is a view in end elevation of the circuit breaker with casing removed. Fig. 5 is a side view in detail of a safety ratchet disk. Fig. 6 an end elevation thereof.

Referring to the drawings, a substantially cylindrical casing 1 has a longitudinal hollow rib or lug 2, in which insulators 3 of suitable material and design are secured at regular intervals, one being provided for each cylinder of the motor for which the distributor is adapted. Electrodes 4 extend longitudinally through the insulators, and binding or connecting means 5 are provided on the outer ends. A cylindrical shell 6 of insulating material, with apertures through

which the lower ends of the electrodes 4 project, is removably secured in the casing, preferably by a detachable end plate 8. An insulated binding post 9 with yielding or spring-projected terminal 10 in its inner end, is secured in a hollow lug 11 of the casing, preferably diametrically opposite the insulators 3 and between two of them. A wire 12 leads from each insulator 3 to a spark plug 13 in a cylinder of the engine, and a wire from the binding post 9 leads to a secondary coil in the circuit.

A distributor shaft 14 is rotatably mounted in the casing in insulated relation thereto. Preferably the ends of the shaft are slightly enlarged and counterbored, and short spindles 15 of insulating material are non-rotatably secured therein by pins 16 or the like. One of the spindles is seated in or coupled to a stub shaft 19 journaled in a bearing boss 20 of the end plate 8. The other spindle is made fast in the elongated and enlarged hub 21 of a bevel follower pinion 22 journaled in the casing, the hub being proportioned to permit removal of the pinion as a whole through the bearing. The distributor shaft has a contact disk 23 formed or secured thereon, whose periphery has sliding contact with the yielding terminal 10. A segmental disk 24 is likewise formed on or secured to the shaft opposite each insulator terminal 4 so that the peripheries periodically pass a short distance therefrom, and form a suitable spark interval. The segments are disposed around the shaft in proper angular relation to correspond to the timing of the engine cylinders, and preferably overlap slightly.

A suitably designed housing 25 is secured to the casing over the follower pinion 22, preferably by a flange 26 telescoping over a bearing boss 27 in which the pinion is journaled, a removable cover plate 28 permitting inspection of the parts.

A tubular bearing bracket 29 in which the end 30 of the motor cam shaft is journaled parallel to the distributor shaft, is secured to the housing 25 preferably by a hollow bearing sleeve 31 telescoping with a boss 32

on the housing at right angles to the shafts. A driving bevel gear 33 keyed or otherwise secured in a reduced portion 34 of the cam shaft, and of less diameter than the shaft to permit its removal through the shaft bearing, is in mesh with an intermediate pinion 35 on a hub 36 journaled in the bracket sleeve 31 and interlocking at its end with the hub 37 of a pinion 38 meshing with the follower pinion 22, the abutting ends of the hubs being preferably squared and halved together, and a screw 39 passing axially through one into engagement with the other holding them in place.

A timer casing 40 is secured on the bearing boss on the main casing; a ratchet wheel 41 having teeth corresponding in number to the segments of the distributor shaft, is journaled in the end to the stub shaft 19 within the timer casing, and is locked to turn therewith by a spring disk 42 secured against the end of the shaft by a screw, the wheel having teeth 43 which engage a pin 44 on the disk when turned in proper direction against it, but are dished or beveled so as to ride up on and over the pin when the motion is reversed.

A lever 45 pivoted in the casing 40 to vibrate in the plane of the ratchet wheel 41, on a stud 46 to whose outer end one of the battery wires 61 may be secured by a binding nut 47, has a tooth 48 held against the ratchet wheel by a suitably disposed spring 49. A flexible arm 50 secured at one end on the lever by a nut 51 or like means and limited in its outward movement by the in-turned end 52 of the lever against which it is projected by a spring finger 53, carries a contact point 54 which is pressed by the outward movement of the lever against an adjustable terminal 55 held by a clamping screw 56 in the split head 57 terminating a binding post 58 that is secured in the cover 59 of the timer and may be connected to the other lead of the primary circuit. A handle 60 permits the angular adjustment of the timer for obtaining desired "lead" of the spark, in the usual manner.

The distributor may be arranged for any number of motor cylinders by proper disposition of the segments.

In operation, the primary circuit is closed at regular intervals by the timer ratchet wheel and lever, and sharply broken, all during the time one of the selector shaft segments is passing close to an insulator terminal, so that in addition to the induction of the secondary current through the regular interrupter and coil of standard type, there is the self-induction effect due to the momentary retardation at the gap in the distributor. This insures a spark at the plug of high calorific effect, and a consequent certainty of firing the motor charge.

Another feature of the invention is the ar-

range of the parts so that the mechanism is readily inspected, or taken down and reassembled when necessary.

Obviously, changes in the details of construction may be made without departing from the spirit of the invention, and I do not limit myself to any particular form or arrangement of parts.

What I claim as my invention is:—

1. A distributor for an internal combustion motor having an electric ignition system including a primary and a secondary circuit comprising a substantially cylindrical casing, a shell of insulating material secured in the cylinder, insulated terminals each electrically connected to a sparking terminal of the motor secured in the casing wall with their inner ends extending radially through apertures into the shell, an insulated distributor shaft journaled in the casing concentric with the shell, radial segmental arms on the shaft each adapted to swing into register with the end of a stationary terminal, a disk secured on the shaft, an insulated terminal of a limb of the secondary circuit of the system secured in the casing in yielding contact with the disk periphery, a timer on the casing adapted to periodically close the primary circuit of the system in synchronism with the successive registrations of the segments with the stationary terminals, means operatively connecting the timer with the distributor shaft adapted to release the timer when the motor reverses, and means operatively connecting the distributor shaft with the motor adapted to rotate the shaft in timed relation to the motor.

2. A distributor for an internal combustion motor having an electric ignition system having a primary and secondary circuit comprising a substantially cylindrical casing, a shell of insulating material secured in the cylinder, insulated terminals each electrically connected to a sparking terminal of the motor secured in the casing wall with their inner ends extending radially through apertures into the shell, an insulated distributor shaft journaled in the casing concentric with the shell, radial segmental arms on the shaft each adapted to swing into register with the end of a stationary terminal, a disk secured on the shaft, an insulated terminal of one limb of the secondary circuit of the system secured in the casing in yielding contact with the disk periphery, a stub shaft journaled in the casing end and rigidly coupled to the distributor shaft in insulated relation thereto, a disk journaled on the stub-shaft, a pin on the disk, a ratchet wheel secured on the shaft having teeth adapted to lock with the pin when the shaft is turning in one direction and to pass the pin when the shaft is rotating in the opposite direction, a casing angu-

larly adjustable on the directing means
about the ratchet wheel, a lever os-
cillatory in the casing in the plane of the
ratchet wheel, a tooth thereon, a spring
5 adapted to hold the tooth yieldingly against
the ratchet, an insulated stationary contact
point in the casing connected to a limb of
the primary circuit of the system, a contact
point yieldingly mounted on the lever adapt-

ed to engage the fixed point when the lever 10
is oscillated, and means operatively connect-
ing the directing means and motor.

In testimony whereof I affix my signature
in presence of two witnesses.

WALTER L. MARR.

Witnesses:

A. H. GOSS,

N. D. HASKIN.