May 12, 1925.

A. W. McCALMONT ET AL

1,537,647

TIMER

Filed May 21, 1923

Fig. 1.

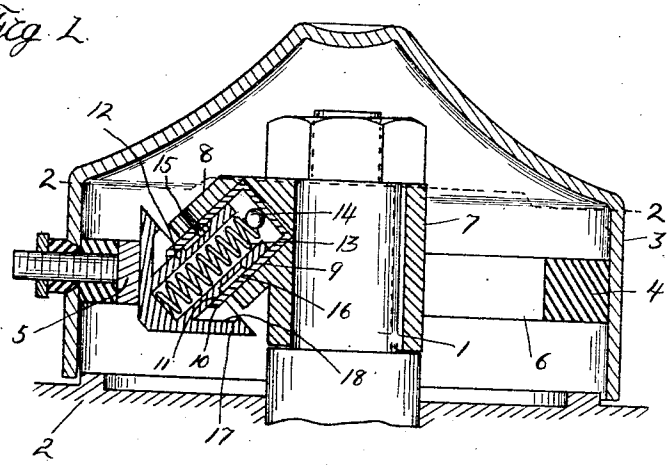
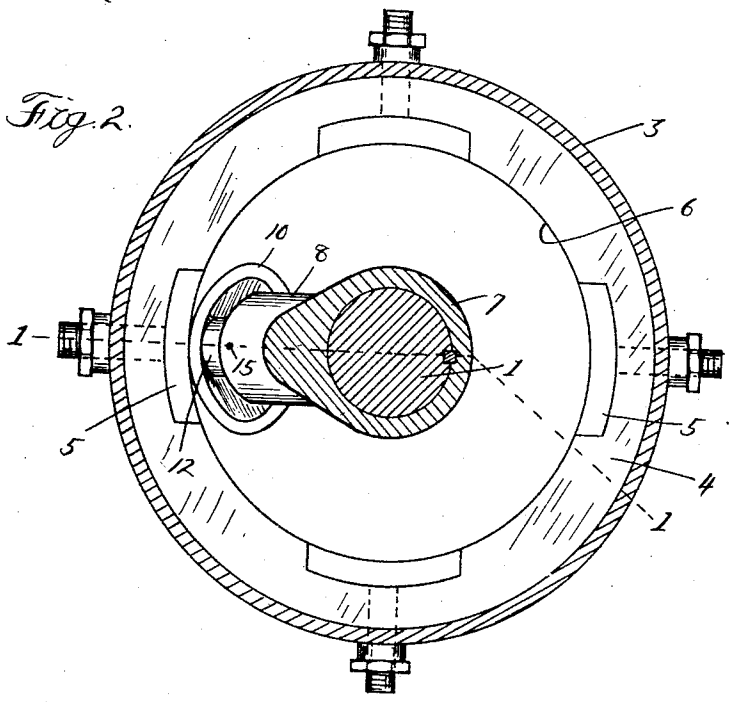


Fig. 2.



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UNITED STATES PATENT OFFICE.

ALBERTUS W. McCALMONT AND FRANK BRISCOE, OF PONTIAC, MICHIGAN; SAID McCALMONT ASSIGNOR TO SAID BRISCOE.

TIMER.

Application filed May 21, 1923. Serial No. 640,537.

To all whom it may concern:

Be it known that we, ALBERTUS W. McCALMONT and FRANK BRISCOE, citizens of the United States of America, residing at Pontiac, in the county of Oakland and State of Michigan, have invented certain new and useful Improvements in Timers, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to timers or commutators for internal combustion engines and consists in certain improvements in construction which are hereinafter fully described.

In one type of the commutator which is in common use, a roller is journaled upon a lever extending outward from a timing shaft and is yieldingly held in contact with a timing ring consisting of alternate segments of insulating and conducting material. Our invention consists of an improved construction which is adapted to form a replacement part to be attached to the timing shaft and to contact with the timing ring and by our novel arrangement of the parts, we have obtained a device in which the timing ring will have a much longer life than with the constructions heretofore used.

In the drawings:—

Figure 1 is a transverse section of the commutator on the line 1—1 of Figure 2; and

Figure 2 is a sectional plan view thereof on the line 2—2 of Figure 1.

1 represents a rotatable timing shaft suitably journaled in an engine casing 2 to which is demountably secured a cap 3 containing an insulating ring 4. Spaced around the insulating ring are the contact points 5 which are inserted in the insulating material to form a continuous annular surface 6 and the contact points 5 are electrically connected to binding posts 6 arranged on the periphery of the cap 3 but insulated therefrom. The construction, as thus far described, has been used on an engine of well known make.

7 is a sleeve suitably secured to the shaft 1 and having a boss 8 provided with a bore 9, the axis of which lies in a radial plane and forms an angle with the plane of the timing ring 4, preferably 45°. The sleeve 7 is preferably die cast and provided with a steel thimble 10 within the bore 9. This thimble contains an annular bearing surface 11 in which is journaled a hollow pin 12 having a coiled spring 13 arranged longitudinally thereof and abutting at its inner end against a ball 14. A retaining pin 15 is inserted radially of the boss 8 and engages an annular slot 16 in the pin to allow a limited longitudinal movement of the pin within the thimble.

17 is a cone shaped member which is either integral with the pin 12 or secured to the outer end thereof by suitable means, such as a screw threaded connection, the outer surface of the cone forming a contacting surface for engaging the timing ring 4. Preferably, the cone angle is such that a line contact is formed between the conical surface and the timing ring. The inner surface 18 of the cone shaped member is also conical and the sides of the cone are sufficiently long to overlap the outer end of the thimble 10. For this reason, any grease from within the thimble, which might be thrown outward by centrifugal force, is collected within the conical member and is available for the lubrication of the pin by capillary action.

With the construction as described, the cone shaped member 17 has both rolling and sliding engagement with the timing ring 4 and the spring 13 yieldingly holds the member in contact with the ring at all times. Rotation is permitted since the pin 12 is journaled within the thimble and this rotation is not retarded by the coiled spring because of its engagement with the ball 14.

We have found that this construction of timer is much more satisfactory than the commonly employed roller type for it does not have the same tendency to mutilate the ring. This is due primarily to the fact that the contacting member cannot respond as quickly to any irregularities in the annular surface because of the angular arrangement of the pin which eliminates the pounding action and the uneven wearing resulting therefrom. Furthermore, a better electrical contact is obtained due to the combined sliding and rolling action of the contacting surfaces.

What we claim as our invention is:—

1. In a timer for internal combustion engines, the combination with a ring having alternate segments of insulating and conducting material, of a concentric rotatable

shaft, an arm mounted upon said shaft, a contacting member journaled in said arm to rotate about an axis transverse to said shaft and inclined to the plane of said ring, a coil spring arranged between said member and said arm to yieldingly hold said member in contact with said ring, and a ball between said spring and said arm.

2. In a timer for internal combustion engines, the combination with a ring having alternate segments of insulating and conducting material, of a concentric rotatable shaft, an arm secured to said shaft having a bore extending transversely thereto and at an angle to the plane of said ring, a hollow pin journaled in said bore, a coil spring having one end within said hollow pin, a ball forming an abutment for the opposite end of said spring, and a head upon said hollow pin yieldingly held in contact with said ring by said coil spring.

3. In a timer for internal combustion engines, the combination with a ring having alternate segments of insulating and conducting material, of a concentric rotatable shaft, an arm secured to said shaft, a member rotatable about an axis transverse to said shaft and at an angle to the plane of said ring, a spring for yieldingly holding said member in contact with said ring, and a ball between one end of said spring and said arm to allow free rotation of said spring with said member.

4. In a timer for internal combustion engines, the combination with a ring having alternating segments of insulating and conducting material, of a concentric rotatable shaft, an arm upon said shaft having a bore extending transversely thereto and at an angle to the plane of said ring, a pin journaled in said bore, a hollow cone secured to said pin and forming a line contact with said ring, a spring between said pin and said arm for yieldingly holding said cone in contact with said ring, and a ball between said spring and said arm.

5. In a timer for internal combustion engines, the combination with a ring having alternating segments of insulating and conducting material, of a concentric rotatable shaft, an arm upon said shaft having a bore therein, the axis of which forms an angle of 45° with the plane of said ring, a pin journaled within said bore, a hollow cone upon the end of said pin forming a line contact with said ring, a spring between said pin and said arm for yieldingly holding said hollow cone in contact with said ring, and a ball between said spring and said arm to permit free rotation of said pin during the rotation of said rotatable shaft.

6. In a timer for internal combustion engines, the combination with a ring having alternate segments of insulating and conducting material, of a concentric rotatable shaft, an arm upon said shaft having a bore therein, the axis of which extends transversely to said shaft and at an angle to the surface of said ring, a pin journaled in said bore, a conical member upon the outer end of said pin arranged to form a line contact with said ring, and a spring between said pin and said arm for yieldingly holding said conical member in contact with said ring.

7. In a timer for internal combustion engines, the combination with a ring having alternate segments of insulating and conducting material, of a concentric rotatable shaft, an arm upon said shaft having a bore therein, the axis of which is transverse to said shaft and at an angle with the plane of said ring, a pin journaled in said bore, a conical member mounted on said pin to form a line contact with said ring, said conical member being hollow to form an annular space for collecting lubricant to lubricate the bearing for said pin, and means for yieldingly holding said conical member in contact with said ring.

In testimony whereof we affix our signatures.

ALBERTUS W. McCALMONT.
FRANK BRISCOE.