

G. L. LANG.
 TIMER DISTRIBUTER.
 APPLICATION FILED OCT. 28, 1914.

1,267,671.

Patented May 28, 1918.

3 SHEETS--SHEET 1.

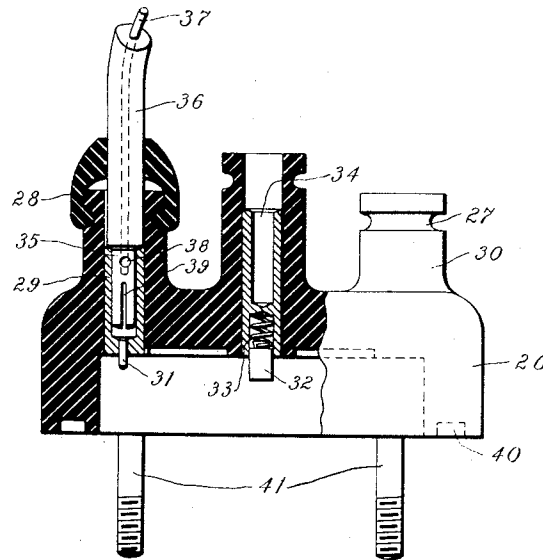


Fig. 1.

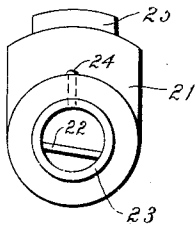


Fig. 4.

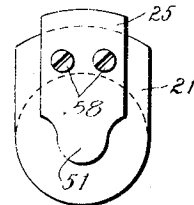


Fig. 3.

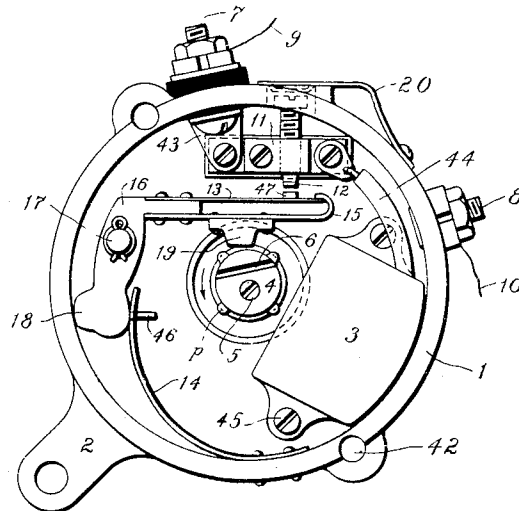


Fig. 2.

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INVENTOR.

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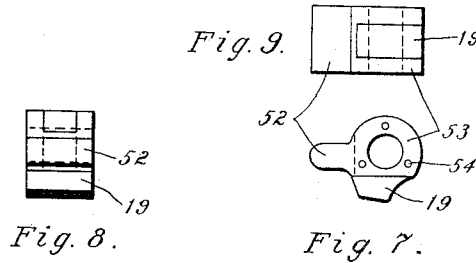
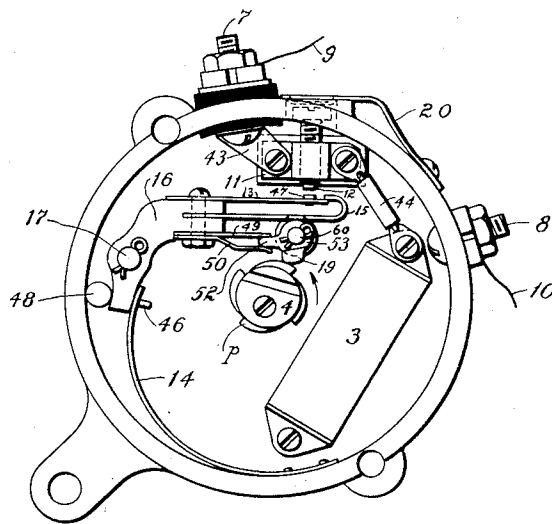
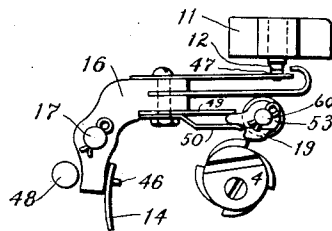
BY

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WITNESSES:

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TIMER-DISTRIBUTER.

1,267,671.

Specification of Letters Patent.

Patented May 28, 1918.

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To all whom it may concern:

Be it known that I, GEORGE L. LANG, a citizen of the United States, residing at Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Timer-Distributors, of which the following is a specification.

My invention relates to means for making and breaking an electrical circuit for the purpose of producing current impulses, which follow each other in rapid succession, and means for distributing the current impulses thus produced.

My invention relates more particularly to a device used in connection with internal combustion engines where the current impulses must be regular and uniform in order to produce uniform results in the operation of said engine.

In starting internal combustion engines, "back-fires" are sometimes produced and it is one of the objects of my invention to provide means in my timer for eliminating "back-fires" on a reverse motion of the engine.

In order to carry out the objects of my invention I will describe briefly a distributor which may be used in connection with the timer, but which forms the subject of a separate application.

My invention consists of other novel features which will be apparent to anyone skilled in the art.

Figure 1 is a part sectional and plan view of my distributor block, with one of the secondary leads attached thereto and showing the water proof construction. Fig. 2 is a view of one form of my timer with the distributor block removed. Fig. 3 is a top view of the distributor finger, which distributes the current to the various connections of the distributor block. Fig. 4 is a bottom view of Fig. 3. Fig. 5 is another form of a timer, to be used in connection with the distributor block shown in Fig. 1. Fig. 6 is a view of the movable parts of Fig. 5, but in a little different position. Fig. 7 is an end view of the cam engaging element of Fig. 5. Fig. 8 is an end view of Fig. 7. Fig. 9 is a top view of Fig. 7. Fig. 10 is a modified form of a timer.

The various parts will now be described, in which similar numerals of reference indicate corresponding parts in the various figures of the drawings.

Referring now to the drawings, 1 is the timer casing, which has a lever 2, for the purpose of connecting thereto the timing rod, running to the steering wheel. 3 is a condenser, one end of which is connected by screw 45 to the case 1, the other end connected by an insulated connector 44, to the terminal block 11, on which is mounted a screw carrying a contact 12. This screw is adjustable from the exterior of the case by moving aside the spring member 20. Attached to the driving shaft by some means, such as a screw 5, is a cam 4, having projections *p*. Attached to the case is a stud 17, upon which is pivoted a member 16, to which is fastened a member 15 and a resilient member 13, upon which is mounted a contact 47, adapted to engage the contact 12.

Attached to the member 15 is a friction wearing element 19, as shown in Fig. 2. One end of the member 16 is enlarged at 18, which enlargement engages the side of the case 1. Attached to the case 1 is a resilient member 14, which presses against the member 16 and is guided thereon by pin 46. The block 11 is connected to an insulated stud 7 by member 43. It is readily seen that a circuit through the timer is provided as follows: from wire 9, stud 7, connector 43, block 11, contact 12, contact 47, member 13, member 16 to the case 1, and stud 8 to conductor 10. It is to be understood that the conductors 9 and 10 respectively lead to a source of current and primary of an induction coil, one end of the secondary being grounded and the other end brought to the center electrode 34 of the distributor block. These parts and their functions are so well known, that for the sake of brevity, they are not shown nor further described.

The distributor finger 21 has a metal ring 23 held in position by rivet 24. Ring 23 is adapted to slip over the end of cam 4 and the cross member 22 is adapted to enter the slot 6 in the cam, thus providing means for rotating the finger 21. Mounted on one side of the finger 21 is a metal strip 25, being held in place by screw 58. When the distributor block 26 is in place, the studs 41 pass through the holes 42 in the timer case, and the groove 40 engages the edge of the case 1; at the same time brush 32 which is held in the metal insert 34 is pressed by the spring 33 against the small end 51 of

the member 25. Arranged in a suitable manner around the center electrode 34 are a number of electrodes 29, corresponding to the number of engine cylinders. These electrodes are embedded in the insulating projections 30, which have the tops grooved as shown by 27. 37 is a conductor covered by insulation 36 over which is slipped a flexible insulator 28, which is adapted to snap over the top of the projections and engage the grooves 27. Since the insulator 28 is flexible, it has a gripping effect on the insulation 36 as well as on the top of projections 30, thereby holding the conductor securely in place on the distributor block. The conductor 37 is connected to the terminal 35 being soldered thereto through the hole 38. The lower end of the terminal 35 is slotted at 39, so that the terminal can be spread to securely engage the hollow electrode 29, the end of which terminates in a pin 31.

It will be readily seen that when the distributor block 26 is in place on the timer case 1, the secondary current which comes in at the center electrode 34 is conveyed by brush 32 to the member 25. This current being high tension in character, passes or jumps from the member 25 to the pins 31, whenever the primary circuit is broken by contacts 12 and 47. The member 25 is not adapted to touch the pins 31, as it is rotated on the finger 21 but passes in close proximity thereto, so that the current or "spark" jumps across the small intervening gap and goes out on the conductors 37.

Referring now to Fig. 5, the member 16 carries in addition to the members 13 and 15, the additional member 49 and a flexible member 50. Mounted on the pivot 60, attached to the case 1, is a cam engaging member 53 which has a nose or projection 52 adapted to work between the two members 49 and 50. The member 53 has a lower portion 19 made of friction wearing material, such as fiber, the same being held in place on the member 53 by some means such as rivets 54. The other parts of the timer are substantially the same as previously described except that in Fig. 5 a pin 48 is substituted for the enlarged portion 18 of the member 16.

In the operation of this form of my invention, the cam 4 is adapted to rotate normally in the direction of the arrow and the projections *p* engage the wearing element 19 of the rotatable member 53 in such a manner that the element 53 is rotated and the nose 52 engaging the element 49 which tends to rotate the member 16 on its pivot 17 and the contacts 12 and 47 are closed the same as shown in Fig. 6. As soon as the projections *p* pass from under the element 19, the member 16 returns to its normal position under the action of the spring 14 and the end of the member 15 engages the

resilient member 13 suddenly to open the circuit which is readily traced as previously described.

Should on starting or stopping, the engine "rock-back" the cam projections *p* will engage the element 19 and the member 53 will be rotated about its pivot in reverse direction and the nose 52 will bend the resilient member 50 downward and no movement of the lever 16 will take place, consequently the primary circuit will not be disturbed.

Fig. 10 is a further modified form in which the movable member 15 is pivoted of itself on pivot 50 and a resilient member 55 holds it in place on its pivot. Under normal working conditions, the member 15 is operated up and down by the cam 4 and the spring 14 in a manner that is readily understood. In the case of reverse rotation of the cam, the movable member 15, guided by stop pin 57, is pushed horizontally against the resilient member 55 and as soon as the cam projections *p* leave the member 15, the resilient member 55 returns it to its normal position, without closing the contacts 12 and 47.

While I have shown certain details of my invention, it will be apparent that numerous changes and modifications can be made by anyone skilled in the art; therefore I do not wish to be limited to the exact construction shown and described.

Having thus described my invention, what I claim is:

1. In a device of the character described, the combination of a distributor block having secondary electrodes mounted therein, a timer case, a cam adapted to rotate within said case, a distributing finger mounted on said cam, a rotatable member pivoted on said timer case, said rotatable member having a wearing element adapted to engage said rotatable cam and also having a horn like projection, a second rotatable member having two elements mounted thereon and adapted to receive said horn projection of the first rotatable member therebetween, whereby the operation of said first rotatable member by said cam causes the second rotatable member to close and open a primary electrical circuit thereby causing secondary electrical impulses to pass from said distributing finger to said secondary electrodes mounted in said block, substantially as described.

2. In a device of the character described, the combination of a distributor block having secondary electrodes mounted therein, a timer case, a cam adapted to rotate within said case, a distributor finger mounted on said cam, a stationary contact, a movable member pivoted to said case and carrying the following members, a flexible member having a contact adapted to coöperate with said stationary contact, a rigid member hav-

ing a hook at one end to engage said flexible member whereby said contacts are quickly separated after being closed, a second rigid member below the first and a flexible member adjacent the second rigid member; a rotatable member pivoted to the case and having a part adapted to be engaged by said cam and a part extending between the last mentioned rigid and flexible members, whereby when the rotatable member is operated by said cam in one direction said contacts are closed and opened to cause electrical impulses to pass from said distributor finger to said second electrodes and when said cam is operated in the reverse direction said contacts are not closed.

3. In a device of the character described, the combination of a distributor block having electrodes mounted therein, a timer case, a driving shaft projecting into said case, a rotatable cam mounted on the end of said shaft, a distributing device mounted on said cam, and adapted to distribute current impulses to said electrodes in said distributor block, a rotatable member rotated by said cam and a second rotatable member operated by said first rotatable member, an adjustable contact mounted within said timer case, a second contact carried on said second rotatable member, said contacts being closed and opened by said rotatable member through the movement of said cam, whereby current impulses are sent out from the electrodes mounted in said distributor block, substantially as described.

4. In a device of the character described the combination of a distributor block having electrodes mounted therein, a timer case, a driving shaft projecting into said case, a rotatable cam mounted on the end of said shaft, a distributing device mounted on said cam and adapted to distribute current impulses to said electrodes in said distributor block, a rotatable member having a projection of friction wearing material and also a second projection thereon, a second rotatable member, operating elements attached thereto and adapted to be operated on by said second projection on said first rotatable member, an adjustable contact mounted in said case, a second contact carried by said second rotatable member, said contacts being operated by the rotation of said cam, whereby current impulses are sent out from the said distributor block, substantially as described.

5. In a device of the character described, the combination of a distributor block having electrodes mounted therein, a timer case, a driving shaft projecting into said case, a rotatable cam mounted on the end of said shaft, a distributing device mounted on said cam, and adapted to distribute current impulses to said electrodes in said distributor block, a rotatable member adapted to be engaged by said cam, a second rotatable mem-

ber, an adjustable contact mounted within said timer case, a second contact carried by said second rotatable member and adapted to engage the first mentioned contact and means carried by said second rotatable member and engaged by the said first rotatable member tending to pull the second rotatable member away from the adjustable contact on the reverse direction of rotation of said cam, whereby the said contacts are prevented from being operated and current impulses are prevented from passing out of said distributor block, substantially as described.

6. In a device of the character described, the combination of a distributor block having electrodes mounted therein, a timer case, a driving shaft projecting into said case, a rotatable cam mounted on the end of said shaft, a distributing device mounted on said cam and adapted to distribute current impulses to said electrodes in said distributor block, a rotatable member adapted to be engaged by said cam, a second rotatable member, an adjustable contact mounted within said timer case, a second contact carried by said second rotatable member and adapted to engage the first mentioned contact, a resilient member carried on said second rotatable member and engaged by said first rotatable member, whereby movement of the second movable member is prevented on the reverse direction of the rotation of said cam and current impulses are prevented from passing from said distributor block, substantially as described.

7. In a device of the character described, the combination of a distributor block, having electrodes mounted therein, a timer case, a driving shaft projecting into said case, a rotatable cam mounted on the end of said shaft, a distributing finger mounted on said cam and adapted to distribute current impulses to said electrodes in said distributor block, a fixed contact mounted within said case, a movable member having a resilient element carrying a second contact adapted to engage the first, operating elements attached to said movable member, another movable member held in operative position by said operating elements on said first member, said second mentioned movable member being adapted to be moved by said cam, whereby said contacts are operated and current impulses are sent out from said distributor block, substantially as described.

8. In a device of the character described, the combination of a distributor block and a timer associated therewith and having the following instrumentalities, a case, a driving shaft projecting into said case, a rotatable cam mounted on the end of said shaft, a distributing device mounted on the top of said cam and adapted to co-act with said distributor block, a movable member, a tension device therefore, a fixed contact, second con-

tact carried on said movable member and adapted to co-act with the first contact, a second movable member mounted directly on said case and flexibly engaged with the first movable member, said second movable member adapted to be engaged by said cam, whereby said contacts are closed and opened, substantially as described.

9. In a device of the character described, the combination of a distributor block and a timer, said timer having the following instrumentalities, a casing, a cam adapted to rotate within said casing, a distributing finger mounted on said cam, a fixed contact, a movable member carrying a co-acting contact, a second movable member directly mounted on said casing and adapted to be operated by said cam, two elements directly

attached to said first movable member, one of said elements being non-flexible and the other flexible, a projection on said second movable member and engaging the first movable member between the non-flexible and flexible elements whereby said movable member is moved and said contacts are closed and opened, when said cam rotates in one direction and not closed when said cam rotates in a reverse direction, substantially as described.

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

GEORGE L. LANG.

Witnesses:

H. B. POOLE,

M. W. BARTLETT.