

W. A. STILES.
CIRCUIT MAKING AND BREAKING DEVICE.
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1,020,522.

Patented Mar. 19, 1912.

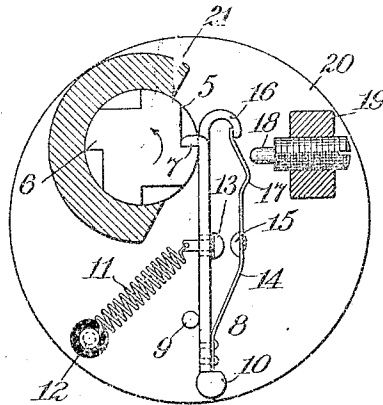


Fig. 1.

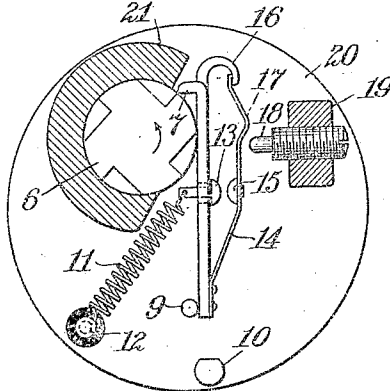


Fig. 2.

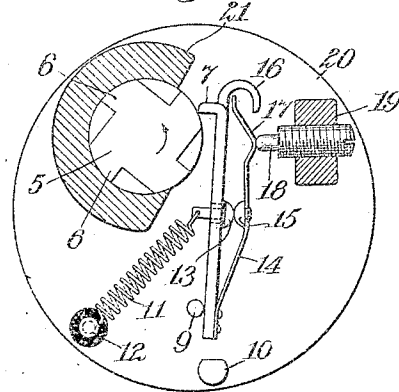


Fig. 3.

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UNITED STATES PATENT OFFICE.

WINTHROP A. STILES, OF PHILADELPHIA, PENNSYLVANIA.

CIRCUIT MAKING AND BREAKING DEVICE.

1,020,522.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WINTHROP A. STILES, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Circuit Making and Breaking Devices, of which the following is a specification.

This invention relates to improvements in circuit making and breaking devices and particularly to such devices as used in ignition apparatus for internal combustion engines, and the object is to provide a device of this class which shall be capable of instantly making and breaking the circuit so that the circuit shall be closed during an exceedingly short period of time which is irrespective of the speed of the engine and thus effecting a great saving in current consumption which is a great factor where batteries are used to furnish the current.

The object is further to provide a device of this class which shall have the smallest possible number of parts and which shall be durable and reliable in its action.

While the device of my invention is capable of general use, it is particularly intended and adapted to be used as a means for making and breaking the primary circuit of induction coils of ignition apparatus for internal combustion engines and when used in such connection a rotatable element of the device is connected to and driven by the engine at a rate of speed in direct proportion to the engine speed and imparts a forward movement to a second element which when released by the first at a certain point returns to its initial position at a predetermined and constant rate of speed independently of the rotatable element. It is during this return movement of the second element that it acts upon two contact points carried thereby to close the circuit during the shortest possible interval of time. In the attainment of this object I have produced a device which is exceedingly simple and inexpensive yet durable in construction and which is unlikely to get out of order.

The invention consists in the novel features of construction and in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims.

Referring to the drawings: Figure 1 is a

plan section of a circuit making and breaking device embodying my invention showing the driven element in its initial position. Fig. 2 is a plan showing the driven element at the extreme forward end of its movement and about to be released by the driving element. Fig. 3 is a plan in which the driven element is shown during its return movement and at the point where the contact points are in contact with each other.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 5 is a driving element consisting of a notched shaft having one or more teeth 6 which are adapted to successively engage a lug 7 upon a driven element 8, the direction of rotation of the driving element being indicated by an arrow thereon. The driven element 8 when in its initial position rests against two stops 9 and 10 and is held in engagement therewith by a helical tension spring 11 connected at one end to an insulated post 12 and at its other end to a rivet 13 constituting a contact point insulated from the element 8. In practice, one of the circuit wires will be connected to the post 12 and thus the spring 11 will also constitute a conductor for the current.

The driven element 8 is provided with a resilient portion 14 formed on or secured thereto and on this portion is mounted a second contact point 15. In practice, the points 13 and 15 will be formed of some suitable material such as platinum. The driven element 8 is provided with a stop 16 which is normally engaged by the free end of the resilient portion 14 and which thus limits its movement in one direction.

The resilient part 14 is bent to form a cam 17 which in moving from the position shown in Fig. 1 to the position shown in Fig. 3 passes by a stationary abutment 18 without touching the same or without touching the same sufficiently to cause the contacting points 13 and 15 to be forced into contact with each other. The abutment 18 is preferably adjustable and may consist of a screw having screw-threaded engagement with a projection 19 extending from a suitable base 20.

The shaft 6 is journaled in a suitable bearing 21. In practice, where the device is used in connection with ignition apparatus for internal combustion engines, the post 12

will be connected to one of the wires of the primary winding of an induction coil, while the other end of the primary winding will be grounded upon some part of the frame with which the base 20 will also be electrically connected.

The general operation of the circuit making and breaking device hereinbefore specifically described is as follows: The initial position of the driven element is shown in Fig. 1. Assuming the driving element 5 to be rotating counterclockwise, the tooth 6 which is in engagement with the lug 7 carries the driven element forward from the position shown in Fig. 1 to the position shown in Fig. 2 and during this movement the cam 17 does not touch the abutment 18 or at any rate it does not touch it sufficiently to cause the contact points 13 and 15 to come into contact with each other. The abutment 18 will be adjusted in practice so that the cam 17 will just clear the same in passing by on its forward movement. When the lug 7 is released by the tooth 6 at the point shown in Fig. 2, said lug rides outwardly toward the right upon the cylindrical part of the tooth and is drawn very rapidly backward by the spring 11 and during this movement the cam 17 engages the abutment 18, as shown in Fig. 3, thereby carrying the contact point 15 into contact with the contact point 13 for a very brief interval of time and it will be seen that this interval of time is always the same irrespective of the speed of the driving element 5 since the return movement of the driven element is accomplished by means of the spring 11 independently of the driving element. Continued movement of the driven element from the position shown in Fig. 3 results in the same arriving in its initial position, as shown in Fig. 1, ready to be engaged by the next tooth upon the driving element.

Where the device is used in connection with internal combustion engines, the driving element 5 will be provided with a number of teeth corresponding to the number of cylinders of the engine.

The interval of time during which the contact points are in contact with each other is just sufficient to cause the ignition of the explosive charge in the engine cylinder cylinders and consequently a great saving in the current consumption is effected, this being a matter of great importance where batteries are employed to furnish the current.

Having thus described my invention, what I claim and desire by Letters Patent to secure is:

1. A circuit making and breaking device having, in combination, a driving element, an element driven by said driving element in one direction and released therefrom at a certain point; a spring connected to said

driven element and adapted to return the same to its initial position after being released, a pair of cooperating contact points carried by said driven element, and means cooperating with said driven element on its return movement to move one of said contact points into contact with the other.

2. A circuit making and breaking device having, in combination, driving means, means driven by said driving means in one direction and released therefrom at a certain point, a spring connected to said driven means and adapted to return the same to its initial position after being released, said driven means including a pair of cooperating contact points, and means cooperating with said driven means on the return movement thereof to move one of said contact points into contact with the other.

3. A circuit making and breaking device having, in combination, driving means, means driven by said driving means in one direction and released at a certain point, said driven means including two cooperating contact points, a spring connected to said driven means and adapted to return the same to its initial position after being released, and means cooperating with said driven means on the return movement thereof to move one of said contact points into contact with the other.

4. A circuit making and breaking device having, in combination, driving means, means driven by said driving means in one direction and released at a certain point, a spring connected to said driven means and adapted to return the same to its initial position after being released, said driven means having two relatively movable parts carrying cooperating contact points, and means to engage one of said parts during its return movement thereby to move the said contact point carried thereby into contact with the other.

5. A circuit making and breaking device having, in combination, driving means, means driven by said driving means in one direction and released at a certain point, a spring connected to said driven means and adapted to return the same to its initial position after being released, said driven means including two relatively movable parts one of which is resilient, said parts having thereon two cooperating contact points, and means acting on said resilient part during its return movement thereby to move the contact point carried thereby into contact with the other.

6. A circuit making and breaking device having, in combination, driving means, means driven by said driving means in one direction and released at a certain point, a spring connected to said driven means and adapted to return the same to its initial position after being released, said driven

means including two relatively movable parts, one of which is resilient and is provided with a cam, said parts having thereon two cooperating contact points, and means
5 to engage said cam during the return movement thereof, whereby said contact points are moved into contact with each other.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WINTHROP A. STILES.

Witnesses:

LOUIS A. JONES,
SADIE V. MCCARTHY.