Feb. 13, 1923. 1,445,066.

R. F. BRACKE.

ELECTRICAL CONTACT AND METHOD OF OPERATING SAME.

FILED MAY 8, 1919.

Fig. 2

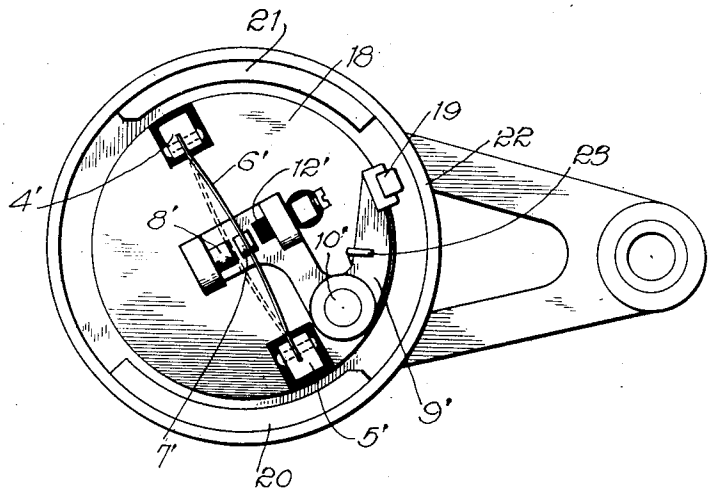


Fig. 1

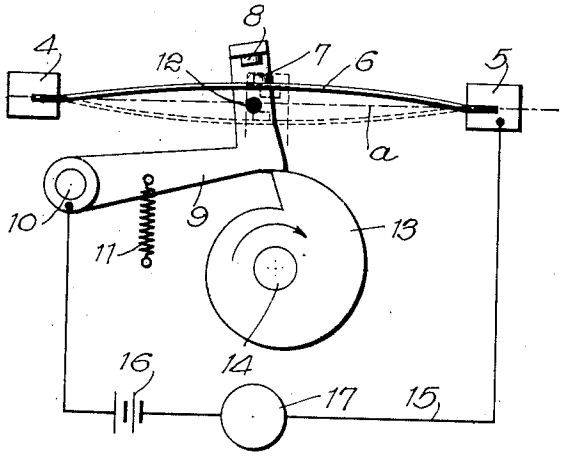
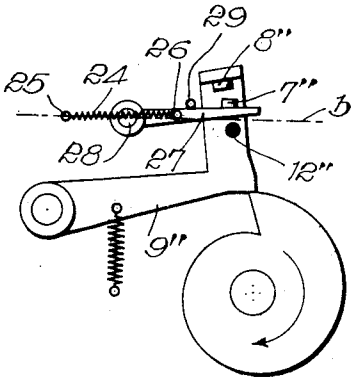


Fig. 3



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Patented Feb. 13, 1923. 1,445,066

UNITED STATES PATENT OFFICE.

ROBERT F. BRACKE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO CHARLES L. STOKES, OF LOS ANGELES, CALIFORNIA.

ELECTRICAL CONTACT AND METHOD OF OPERATING SAME.

Application filed May 8, 1919. Serial No. 295,616.

To all whom it may concern:

Be it known that I, ROBERT F. BRACKE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electrical Contact and Methods of Operating Same, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to contact mechanism and method of operating said mechanism to open and close an electric circuit.

Broadly, the objects of the present invention reside in the provision of contact mechanism in which the time interval of contact is constant regardless of the speed of operation of the controlling element, and in which the contacts are never permanently closed even though the operation of the controlling element be discontinued.

Further objects reside in providing a good wiping, and a quick make and break contact mechanism.

These and other objects of the present invention will be pointed out in detail in connection with the accompanying drawings, in which—

Figure 1 is a diagrammatic view of one form of contact mechanism constructed and operated in accordance with my invention;

Figure 2 is a detailed view of an interrupter provided with the contact mechanism shown in Figure 1; and

Figure 3 is a view similar to Figure 1 showing a modified arrangement.

Similar characters of reference refer to similar parts throughout the several views.

Referring first to Figure 1, 4 and 5 indicate suitable fixed supports carrying a flat spring 6, which is bulged so that it lies on either side of a dead center line shown at *a*. Carried by the flat spring 6 is a contact 7 arranged to co-operate with a contact 8, carried by a lever 9, pivoted at 10 to any suitable support. A spring 11 is interposed between the lever 9 and a support, and tends to rotate the lever in a clockwise direction in this figure. Carried by the lever 9 and extending under the flat spring 6 is a lug 12, which is insulated from the lever 9 carrying the contact 8. If desired this lug may be made of insulating material, as shown in the drawings.

Co-operating with the under side of the lever 9 is a cam 13 mounted on a shaft 14. The shaft 14 is arranged to be driven by the device with which the contact mechanism is associated. For example, the contact mechanism of my invention may be utilized in connection with gas, water, or electric meters, with interrupter mechanism for internal combustion engines, or in connection with any form of mechanism in which an electric circuit is opened and closed. In Figure 1 I have shown an electric circuit at 15, including the spring 6, the contacts 7 and 8, lever 9, battery 16, and translating device 17. The translating device may be anything arranged to operate upon the passage of a current therethrough, as for example a recording or printing device.

The operation of the mechanism shown in Figure 1 is as follows:

The cam 13, mounted on the shaft 14, is rotated in a clockwise direction, and as the cam moves from under the lever 9, the spring 11 is permitted to move the lever downwardly, causing engagement between the contacts 7 and 8. As the lever 9 continues in its downward movement, the spring 6 which carries the contact 7 is moved downwardly past the dead center line *a*, causing the spring 6 to snap into the position shown in dotted lines, and thereby producing separation of the contacts 7 and 8. As the cam 13 continues to rotate, the lever 9 is gradually moved upwardly, causing the insulated lug 12 to engage the under side of the spring 6 and move the spring upwardly past the dead center line. When the spring in its upward movement passes the dead center line, it snaps to the position shown in full lines, but the contacts 7 and 8 do not engage at this time, for the reason that the contact 8 has been moved upwardly far enough to prevent such engagement. As the cam 13 continues to rotate, the operation above described is repeated. It will be seen from the description thus far given that under a certain maximum speed the length of time during which the contacts 7 and 8 are in engagement is constant, regardless of the speed of the operating element 14. Attention is also directed to the fact that an exceptionally good wiping contact is made by the contact 8 when it is moved downwardly to force the spring 6 beyond the dead center line.

In Figure 2 I have shown the mechanism just described applied to an interrupter for use in connection with an internal combustion engine ignition circuit. In this figure, 18 designates a rotating plate carrying the two posts 4′ and 5′, in turn supporting the spring element 6′. The plate 18 carries the lever 9′, pivoted at 10′ and carrying the contact 8′ and insulated lug 12′, the contact 8′ being arranged to co-operate with the contact 7′ carried by the spring. The lever 9′ in this arrangement forms a bell crank and carries an extension 19 adapted for engagement with one or more cams 20 and 21, carried by the stationary element 22. In the operation of the device disclosed in this figure, the plate 18 is rotated in a clockwise direction, causing the lever 9′ to move in a counter clockwise direction when engaged by the cams 20 and 21, the return of the lever 9′ to its original position being accomplished by the spring 23.

In Figure 3 I have shown diagrammatically what is probably the preferred form of my invention. In the arrangement here shown, I provide a coil spring 24, which takes the place of the flat springs 6 and 6′ in the other devices. The coil spring 24 is fixed at 25 to a support, and is attached at its opposite end 26 to a lever 27, pivoted at 28 to a suitable support. The tendency of the spring 24 is to move the lever 27 away from the dead center line shown at *b*. The lever 27 carries a contact 7″, adapted to co-operate with the contact 8″ mounted on the lever 9″. The under side of the lever 27 is adapted to be engaged and lifted by the insulated lug 12″. Movement of the lever 27 in a counter clockwise direction in this figure is limited by a stop 29. The operation of the device just described is identical with that described in connection with Figure 1. When the lever 9″ is permitted to move downwardly, the contacts 7″ and 8″ come into engagement, and the lever 27 is moved downwardly past the dead center line *b*. The spring 24 is thus moved below the pivot 28, with the result that the lever 27 is moved suddenly in a clockwise direction against the lug 12″, and the contacts 7″ and 8″ are separated. As the cam associated with the lever 9″ continues its rotation, the several parts are returned to their original positions, with the contacts separated.

Attention is directed to the fact that at no time is it possible to move the contacts 7 and 8 into engagement and to keep them in such engagement for an indefinite length of time. If the rotation of the shaft 14 is discontinued immediately after the lever 9 is released, the contacts 7 and 8 are permitted to close but are also separated by the continued downward movement of the lever 9.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. Electric contact mechanism comprising a pair of normally separated contacts, means for moving one of said contacts into engagement with the other of said contacts, and means actuated by the first contact for moving the last mentioned contact away from the first.

2. Electric contact mechanism comprising a pair of normally separated contacts, means for moving one of said contacts into engagement with the other of said contacts, and spring means actuated by the first-mentioned contact for moving the last-mentioned contact away from the first.

3. Electric contact mechanism comprising a lever, a contact mounted thereon, spring means associated with said lever for moving the lever either way from a dead center line, and a second contact adapted for engagement with the first contact and for moving the first contact and lever beyond the dead center line.

4. Electric contact mechanism comprising a lever, a contact mounted thereon, spring means associated with said lever for moving the lever either way from a dead center line, a second contact adapted for engagement with the first contact and for moving the first contact and lever beyond the dead center line, and mechanism for returning the contacts separated to their original positions.

5. Electric contact mechanism comprising a lever, a contact mounted thereon, spring means associated with said lever for moving the lever either way from a dead center line, a second lever and contact mounted thereon, spring means tending to move the second lever and contact toward the first contact and for moving the first contact and lever beyond the dead center line, and cam mechanism for releasing the said second lever.

6. Electric contact mechanism comprising a lever, a contact mounted thereon, spring means associated with said lever for moving the lever either way from a dead center line, a second lever and contact mounted thereon, spring means tending to move the second lever and contact toward the first contact and for moving the first contact and lever beyond the dead center line, cam mechanism for releasing the said second lever, and means for returning the levers with the contacts separated to their original positions.

In witness whereof, I hereunto subscribe my name this 2nd day of May, 1919.

ROBERT F. BRACKE.

Witnesses:
MARY FAE PETRIE,
EDNA V. GUSTAFSON.