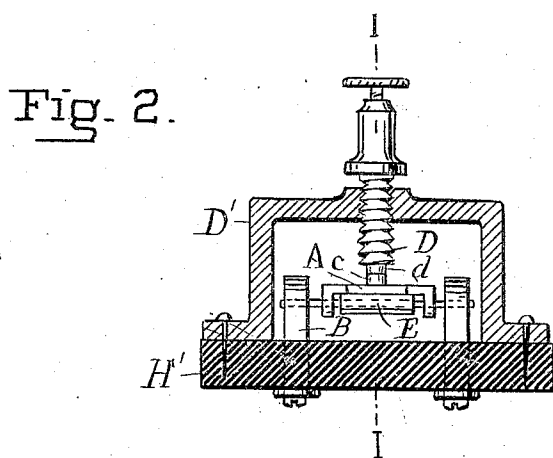
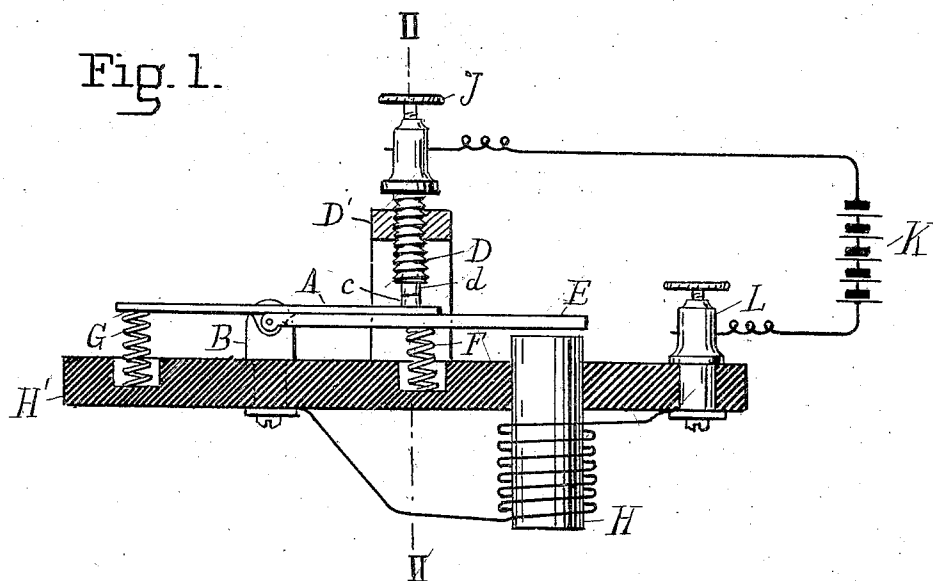


No. 848,720.

PATENTED APR. 2, 1907.

V. H. BROO.
AUTOMATIC CURRENT INTERRUPTER.
APPLICATION FILED SEPT. 5, 1906.



Witnesses:

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UNITED STATES PATENT OFFICE.

VICTOR HENRI BROC, OF NEW YORK, N. Y., ASSIGNOR TO BROC-BARBIER
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AUTOMATIC CURRENT-INTERRUPTER.

No. 848,720.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed September 5, 1906. Serial No. 333,289.

To all whom it may concern:

Be it known that I, VICTOR HENRI BROC, a subject of the Republic of France, residing at No. 246 West Thirty-eighth street, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Automatic Current-Interrupters, of which the following is a specification.

My invention relates to certain novel improvements in automatic current-interrupters; and its object is to provide a high-frequency "make and break" in a battery-circuit.

To this end my invention consists in the construction and arrangement of a current maker and breaker double hinged and with springs acting in opposition, so that in case the points or rivets shown stick together or "freeze" and in that way prevent the immediate breaking of the circuit when the current flows and magnetic attraction is induced then the free detached portion of the lever will be drawn to the magnet, one spring compressed, and the detached portion of the lever held in place until the pressure of the other spring shall have released the second portion of the lever and so broken the circuit.

In describing this invention reference is had to the accompanying drawings, forming part of this specification, the same reference characters indicating the same parts of the invention upon each.

Figure 1 is a detailed sectional side view on the line I I of Fig. 2, and Fig. 2 is a detailed sectional end view on the line II II of Fig. 1.

In the drawings, A is a light electrically-conductive strip or piece of magnetically-inert metal, which may be made of any convenient size or shape, pivoted or hinged at or near the middle on an axle or support B, with a point or rivet *c* of metal or any suitable electrically-conductive material, preferably platinum, or any other operative means of conductive contact fastened or arranged at any convenient point thereon or otherwise provided. *d* is another platinum point or other suitable means of contact, made of the same size as *c* or otherwise adapted to make and break a circuit together with *c*, and is held in position by a screw D, set in a bracket D' or fastened in any convenient adjustable

manner so that the point *d* will be directly over or opposite to the point *c* and adapted to meet and be separated from said point as the lever A is moved up and down upon the axle or support B. E is another strip or piece of metal, conveniently made of Swede or other suitable soft non-magnetic iron, pivoted or hinged at one end on the axle or support B independently of the hinging or pivoting of the metal A, so that it is held up by a spring F in such manner that it will rest against the metal A and compress the spring G, which by thrust against the strip A tends to throw down the end of that metal bar or strip carrying the rivet *c*, the pressure of the spring F in this manner holding the iron E against the strip or bar A, thus compressing the spring G, raising the end of the bar or strip A, and bringing the rivet or contact-point *c* into conjunction with the contact-point *d*.

H is a soft-iron core surrounded by a coil or helix of insulated electrically-conductive wire in such manner that when an electrical current is passed through the same such core will become magnetically active and draw toward itself the soft-iron strip or bar E.

The strips or bars A and E and their supports, springs, and connections are mounted upon an insulating-support consisting of a table, plate, or strip H' of suitable insulating material, and likewise the point *d* and its support D and bracket D' are separately mounted upon said insulating-support H', and the said two sets of parts are separated electrically by said insulating-support or otherwise suitably mounted and insulated from each other in such manner that there is no electrically-conductive connection between the one group, composed of *d*, D, D', and J, and the other, composed of A, B, E, G, and F, when said points *c* and *d* are separated each from the other.

The point or rivet *d* and its supports D and D' are so mounted and connected together that a current of electricity will pass over and through said parts, and the same are by the binding-post J or by any suitable means connected to one of the poles of an electric battery K, such as is usually employed for sparking and similar purposes. The other pole of said battery K is by a binding-post L or any suitable means elec-

trically connected with the coil surrounding the core H and with the point *c* through its support A.

When the points *c* and *d* are in contact, the electrical current flows between said points into the circuit and through said coil. The core H being magnetized, as stated above, attracts part E and releases the upward pressure upon one end of the lever or part A, so that the spring G, placed under the other end of part A, pressing upward throws down the other end, thus separating the points or rivets *c* and *d* and breaking the circuit.

In case the mechanism is operating in its usual or normal manner the strip E is attracted by the magnetic core H and passes over toward it, followed instantly by the strip A and the strips or parts A and E operate together as a single vibrating lever, the pressure of the springs F and G being so counterbalanced that the rivets or points are normally and in the absence of electric current in contact. Upon the passage of the current the circuit is immediately broken and then made and broken again and again with great rapidity; but in case said points *c* and *d* should become fixed or "frozen" together in any manner, so that the strip or part A is not free to operate and the contact-points are held fixed together, then the part or strip A alone remains in position, while the part or strip E is drawn down by the attraction of the magnet, and so held as long as the points *c* and *d* remain in contact, thus allowing the spring G to exert its full and continuous pressure against whatever occasions the adhesion of the one point to the other until such adhesion is overcome, whereupon the circuit is broken and the points being released from the attraction of the magnetic core are again forced into contact by the action of the springs and levers.

From this description the operation of my current-interrupter is readily understood and its advantage over similar devices can be appreciated, in that the spring G works against the tendency of the points or rivets to adhere together, so that the possibility of the freezing of the points, preventing the interruption of the current, is overcome and the operation of the current-breaker is made much more rapid, while remaining certain and effective.

A fine adjustment is readily had without sacrificing certainty, the means employed tending in no way to interfere with or limit the speed and overcoming each occasional freezing in an incalculably short period of time, so permitting much greater rapidity in the making and breaking of the circuit than has heretofore been possible.

In the construction shown, when the platinum points return to contact a full electrical connection is at once made and the full magnetic attraction to break the circuit is

immediately exerted, insuring rapidity of operation and great effectiveness in sparking, these results being obtained to much greater degree than in the old and well-known current-interrupters or such as have been devised heretofore for the purpose of improving their operation. In the present construction the lower or magnetically-attractable arm may vibrate slightly, while at the same time the upper arm remains firmly in contact to close the circuit, while also the arrangement of the spiral springs tends directly to stop vibration. In the present construction, moreover, certainty of action is secured without the necessity for added motion and consequent loss of speed experienced in devices allowing free play of a lever followed by a clash or hammer-blow in some form to produce the separation of the contact-points.

It is obvious that the strips A and E may be held together by a C-spring, an elastic band, or any similar simple device, and adjusted by springs or otherwise to bear normally against the rivet *d*, though speed and effectiveness would be somewhat impaired by such method.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts held together by opposing springs, substantially as described.

2. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts held in place by opposing springs, substantially as described.

3. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, one hung between its ends, and the other at one end, substantially as described.

4. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, the strip supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

5. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts held together and in place by two springs, substantially as described.

6. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts held together and in place by opposing springs, substantially as described.

7. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts held together and in place by opposing springs, pivoted, or flexibly hung on the same line of support, substantially as described.

8. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, flexibly hung on the same line of support, held together by spiral springs, one

hung between its ends and the other at one end, substantially as described.

9. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts held together by springs, the strip supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

10. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts held together by opposing springs, the strip supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

11. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts held in place by opposing spiral springs, pivoted or flexibly, hung on the same line of support, one between its ends and the other at one end, substantially as described.

12. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, pivoted or flexibly, hung on the same line of support, one hung between its ends and the other at one end, substantially as described.

13. In an interrupter for electrical currents, a vibrating arm, or lever, composed of two parts pivoted, or flexibly, hung on the same line of support, the strip supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

14. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, one hung between its ends, and the other at one end, the strip supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

15. In an electrical-current interrupter, a vibrating arm or lever, composed of two parts, one magnetically attractable, and one magnetically inert, held in place by spiral springs, substantially as described.

16. In an electrical-current interrupter, a vibrating arm or lever, composed of two parts, one magnetically attractable, and one magnetically inert, held in place by opposing spiral springs, substantially as described.

17. In an electrical-current interrupter, a vibrating arm or lever, composed of two parts, one magnetically attractable, hung at one end and one magnetically inert, hung between its ends, substantially as described.

18. In an electrical-current interrupter, a vibrating arm or lever, composed of two parts, one magnetically attractable, hung at one end, and one magnetically inert, the strip magnetically attractable being adapted to be attracted away from the other by a magnet, substantially as described.

19. In an electrical-current interrupter, a vibrating arm or lever, composed of two

parts, one magnetically attractable, and one magnetically inert, held together and in place by two springs, substantially as described.

20. In an electrical-current interrupter, a vibrating arm or lever, composed of two parts, one magnetically attractable, and one magnetically inert, held in place by springs, pivoted or flexibly, hung on the same line of support, substantially as described.

21. In an electrical-current interrupter, a vibrating arm of lever, composed of two parts, one magnetically attractable, hung at one end, and one magnetically inert, hung between its ends, both held in place by spiral springs, substantially as described.

22. In an electrical-current interrupter, a vibrating arm or lever, composed of two parts, one magnetically attractable, and one magnetically inert, held together by opposing springs, the arm supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

23. In an electrical-current interrupter, a vibrating arm or lever, composed of two parts, one magnetically attractable, and one magnetically inert, held in place by opposing springs, the arm supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

24. In an electrical-current interrupter, a vibrating arm or lever, composed of two parts, one magnetically attractable, and one magnetically inert, one hung between its ends, and the other at one end, the arm supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

25. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, pivoted or flexibly, hung on the same line, the one between its ends, and the other at one end, held together and in place by spiral springs, substantially as described.

26. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, pivoted or flexibly, hung on the same line, the one between its ends, and the other at one end, held together and in place by spiral springs, the arm supported at one end being adapted to be attracted away from the other by a magnet, substantially as described.

27. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, pivoted or flexibly, hung on the same line, the one between its ends and the other at one end, held together and in place by springs, the arm supported at one end being adapted to be attracted away from the other by a magnet, being attracted as the current flows and released when the current is broken, substantially as described.

28. In an interrupter for electrical currents, a vibrating arm or lever, composed of two

parts, pivoted or flexibly, hung on the same line, the one between its ends and the other at one end, held together and in place by springs, the arm supported at one end being
5 adapted to be attracted away from the other by a magnet, being attracted as the current flows and released when the current is broken, and adapted to operate together, or to be drawn apart, substantially as described.
10 29. In an interrupter for electrical currents, a vibrating arm or lever, composed of two parts, pivoted or flexibly, hung on the same line, the one between its ends and the other at one end, held together and in place by
15 springs, the arm supported at one end being adapted to be attracted away from the other by a magnet, in case the first becomes frozen or fixed, being attracted as the current flows

and released when the current is broken, and so constructed that the parts approaching to
20 form a contact will meet and remain together without recoil or vibration, substantially as described.

30. In an interrupter for electrical currents, a vibrating arm or lever, composed of two
25 parts, held together and in place by springs and so constructed that the parts approaching to form a contact will meet and remain together without recoil or vibration, substantially as described.
30

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

VICTOR HENRI BROU.

Witnesses:

FRANK COCHRANE,
P. T. W. RUTHER.