(No Model.)

W. R. McLAIN.

AUTOMATIC CIRCUIT BREAKER.

No. 465,046. Patented Dec. 15, 1891.

Fig. 1.

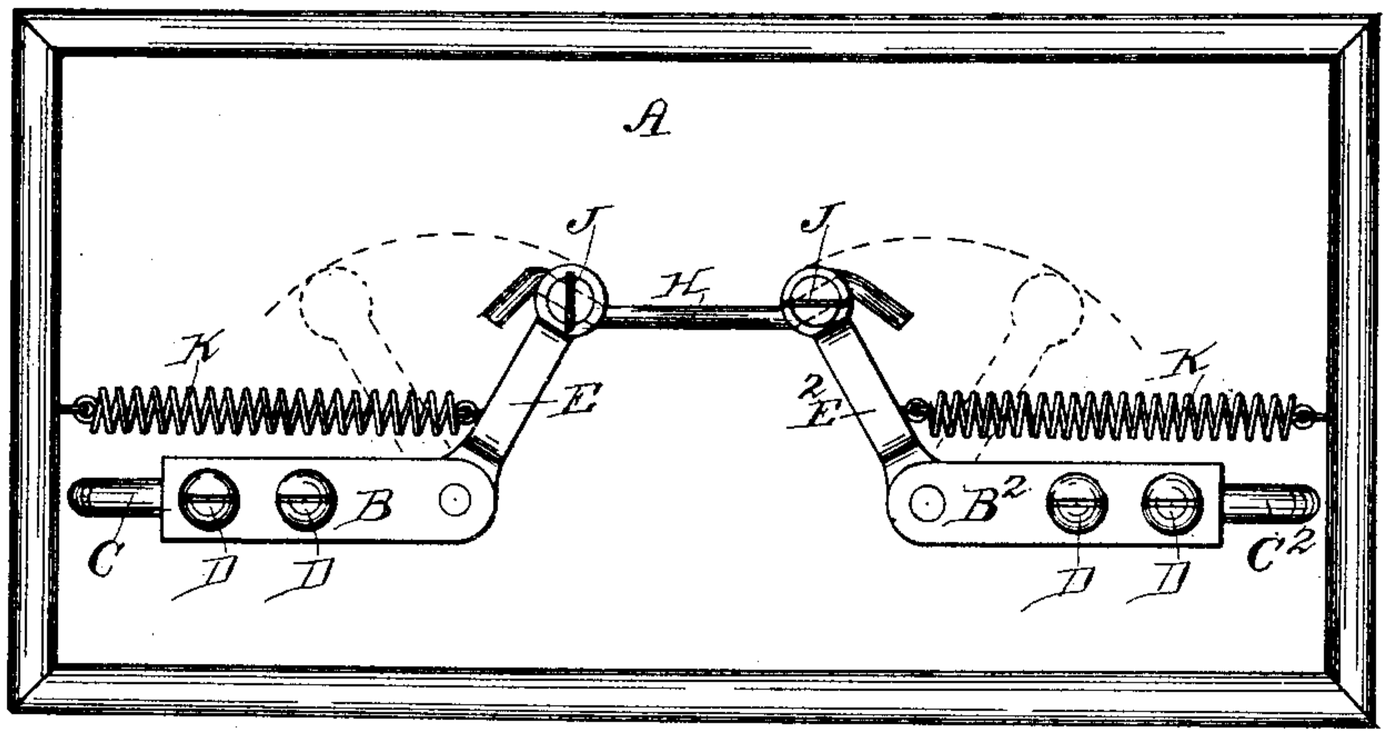
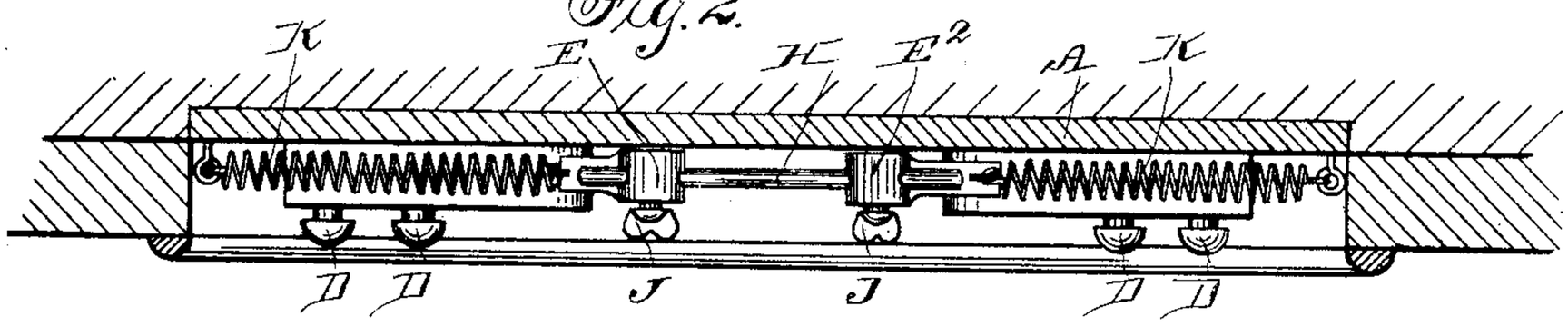


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM R. McLAIN, OF DES MOINES, IOWA.

AUTOMATIC CIRCUIT-BREAKER.

SPECIFICATION forming part of Letters Patent No. 465,046, dated December 15, 1891.

Application filed September 18, 1890. Renewed November 10, 1891. Serial No. 411,442. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. MCLAIN, a citizen of the United States of America, residing at Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Improvement in Automatic Circuit-Breakers, of which the following is a specification.

My invention relates to that class of devices which employ fusible wires interposed in an electric circuit in order to automatically break said circuit at a predetermined strength of current, and has for its object the provision of means by which an interval may be automatically established by the burning out of an interposed fuse, which shall be of such a length as that the tension of the current cannot create a spark, thus avoiding the burning out of the material, which in the present form of fuse-box as used in street-car service is in close proximity to the fuse, and also avoids the setting on fire of the wood-work or other inflammable material, and to accomplish this result by a device which shall be simple and compact in construction, adapted for attachment in such a position as to be ready of access to replace a burned fuse or to arrange the wires of the circuit, and which may be regulated to automatically act at varying predetermined strengths of the current.

My invention consists in a base-plate of non-conducting material which may be secured in the desired position, fuse-holding arms pivoted upon the base-plate of conducting material, binding-posts adapted to hold the leads, together with springs or their equivalents which normally tend to separate the fuse-holding arms when the latter are connected by a fuse.

Referring now to the accompanying drawings, Figure 1 represents a front face view of my device. Fig. 2 is a top or edge view of the same.

A designates the base-plate, which is adapted for attachment in any desired position, to which is secured the receiving-sleeves B B^2 of the leads C C^2, which latter are held in the sleeves by means of the binding-screws D D.

Pivoted to the sleeves B B^2 at one end are the fuse-holding arms E E^2, their upper and remaining ends being bossed and perforated to receive the fuse H, which is kept in place by means of the binding-screws J J, these binding-screws being employed as an extra precaution, since it will be seen that by reason of the manner of forming the perforations in the ends of the fuse-holding arms E E^2 and by bending the ends of the fuse H the latter is held in place.

K K are spiral springs fixed at one end to the fuse-holding arms E E^2 and at the other to the base-plate A. The base-plate A is of suitable non-conducting material, and the sleeve B B^2 and fuse-holding arms E E^2 of suitable conducting material.

The operation of my device is as follows: Suppose the fuse to be adjusted, as shown, of such a length or at such a distance between the ends of the fuse-holding arms as to permit the passage of a desired maximum of predetermined current. Upon the passage of an excess thereof through the leads C into and through the sleeve B and arm E to the fuse H the latter is thus burned out in the usual manner. Now, since the springs K K normally exert a tension upon the fuse-holding arms E E^2, so soon as the fuse holding the arms against the tension of the springs is burned and separated the springs immediately withdraw the arms E E^2 apart from each other upon their respective pivots into the position indicated by the dotted lines in Fig. 1, thus forming the increased interval between the upper ends of the said arms E E^2 in the severed circuit of so great a distance as that the current cannot bridge the interval or form any spark whatever. It is also apparent that the length of fuse between the holding-arms E E^2 may be adjusted and rigidly held by means of the set-screws, so that variable maximum degrees of strength of current may be permitted to pass over the circuit when it is desired to increase or decrease the working efficiency of the motor. It is further apparent that by means of a pair of pivoted arms holding the fuse, each acted upon by a spring to be retracted when the fuse is burned, separation is quickly effected, and that the interval established between the severed ends of the circuit is of greater width and the consequent danger from sparking avoided.

Heretofore, especially in street-car service, where the principle of the dissipation of the electric spark by magnetic influence is em-

ployed, considerable damage has resulted from short-circuiting and failure in establishing the magnetic field, which defect is overcome by my device, as the use of the magnet is dispensed with and a simple mechanical device substituted.

It is also obvious that my device may be employed in conjunction with a lightning-arrester, or, in fact, with any device where it is desired to automatically break the circuit.

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

In an automatic circuit-breaker, a base-plate of non-conducting material, conducting-pieces secured to the base-plate, to which the leads of the circuit are connected, a pair of arms pivotally fixed to said conducting-pieces, springs the one ends of which are rigidly fixed to the base-plate and their other ends secured to the pivoted arms, a fusible wire inserted in said arms, and set-screws removably held in the ends of the pivoted arms, adapted to adjustably secure the fusible wire, whereby the latter may be severed at predetermined strengths of current, as set forth.

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Witnesses:
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