(No Model.)

C. D. HASKINS.

STRONG CURRENT PROTECTOR.

No. 499,425. Patented June 13, 1893.

Fig. 1.

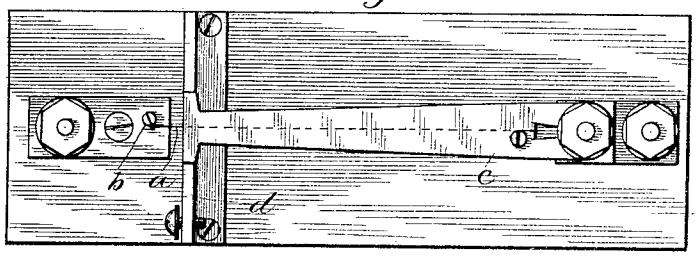


Fig. 2.

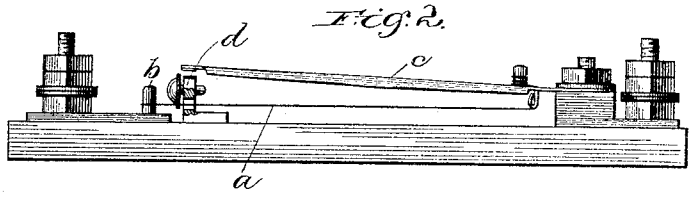
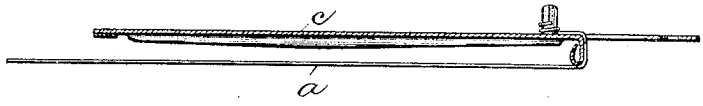


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES DARWIN HASKINS, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

STRONG-CURRENT PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 499,425, dated June 13, 1893.

Application filed September 9, 1890. Serial No. 364,455. (No model.)

To all whom it may concern:

Be it known that I, CHARLES DARWIN HASKINS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Strong-Current Protectors, (Case No. 10,) 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 is specially designed for use in circuits over which currents of abnormal strength are liable to be accidentally sent, and its object is to automatically close the circuit to ground during the time of such abnormal current to protect the instruments, as telephones, which may be included in the circuit, the ground circuit thus closed being automatically opened again when the abnormal current upon the circuit ceases.

In this invention I avail myself of the well known fact that when a wire is heated it will elongate. By interposing in the circuit a wire of such size that it will be thus heated and elongated and providing in connection with this wire a circuit closer which is adjusted to close upon a ground contact when permitted to do so by the expansion of the wire I guard against injuries which might result from such abnormal currents.

My invention consists in a wire proportioned in size to the normal current of the circuit to be protected, in combination with a ground circuit closing lever which is held by the tension of the wire under normal current away from its ground contact, but which on the wires being elongated is adjusted to close upon its ground contact piece to shunt to ground the abnormal current which caused the elongation of the wire to ground so as to protect the electrical apparatus included in the circuit. A fusible strip may be included in the incoming circuit wire in the usual manner as a protection against lightning or currents so great as to be liable to fuse the ground connection of my protector, my protector being particularly designed to guard against such currents as might injure the telephonic apparatus without being strong enough to fuse such strips as it is desirable to employ as current protectors.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a device embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a detailed view of the fusible wire and grounding strip detached.

It will be seen that the fine wire *a* which is included in the circuit is connected with an adjustable screw or stud *b* at one end and with the grounding strip *c* at the other, the arrangement being such that when the wire is drawn taut the grounding piece will be held away from the ground connection *d;* now if current above the normal to which its size and tension is adjusted shall be sent over the circuit including this wire, the wire being heated, will elongate and thus permit the ground circuit closer *c* to come upon the ground contact *d* to shunt the current to ground. The tension of the spring *c* is such that, if unobstructed, the free end thereof will press against the ground terminal *d*. Near the fixed end of the spring is an arm *c'* extending at right angles to said spring. The portion of the spring between the fixed end and the arm *c'* has the greater resiliency so that when a force is applied to the end of the arm *c'* the arm will tend to remain perpendicular to the free end of the spring. If a force be applied, therefore, to the end of the arm tending to move it to the left, the free end of the spring will move to break contact with the ground terminal. But, since the spring bends at a point near the arm *c'* the end of the spring will move through a much greater distance than the end of the arm. Thus any small increase in length of the wire *a*, normally holding the end of the spring away from the ground terminal, will permit the end of the arm *c'* to move through a considerable distance, and the length of the wire *a* for a given material is so adjusted that when any current above the normal passes through the same the end of the spring will be permitted to make contact with the ground terminal. The size of the fine wire must be so adjusted that it will be heated and elongated by current of such strength as it is desired to guard against; the size of the wire being thus attended to the adjustment of the instrument to different strengths of current may be accomplished by simply changing the

tension of the wire, that is to say, by adjusting the distance through which the grounding piece must move before it closes upon its grounding contact piece.

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

The combination with a spring fixed at one end, of a contact point against which the free end of said spring tends to press due to the resiliency of said spring, said spring being provided with a projecting arm at a short distance from the fixed end, the length of said arm being small compared to the length of the spring, an expansible wire included in an electric circuit and having one end fixed and the other end attached to the end of said projecting arm, said wire being adapted to normally hold the free end of said spring away from a contact point by bending the spring at a point between the fixed end and said projecting arm; whereby when an abnormal current passes through said wire it is elongated to permit the free end of the spring to make contact with said contact point due to the resiliency of the spring, substantially as described.

In witness whereof I hereunto subscribe my name this 31st day of May, A. D. 1890.

CHARLES DARWIN HASKINS.

Witnesses:
D. J. GALLAGHER,
C. W. CONKLIN.