(No Model.)

D. J. CARTWRIGHT.

THERMAL CUT-OUT.

No. 441,933. Patented Dec. 2, 1890.

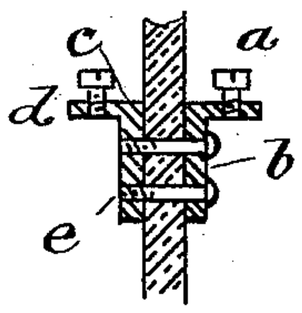

Fig. 4.

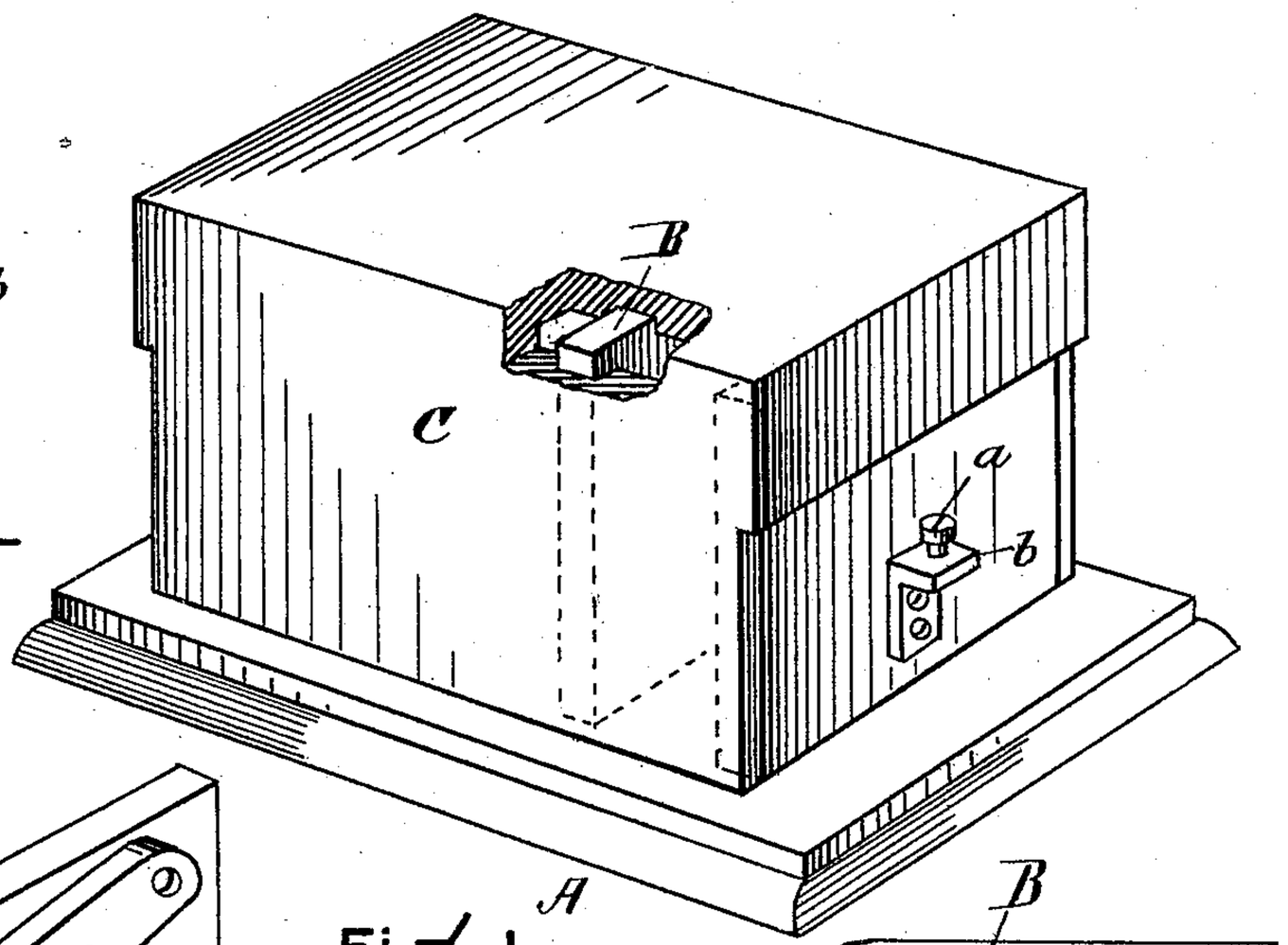

Fig. 1.

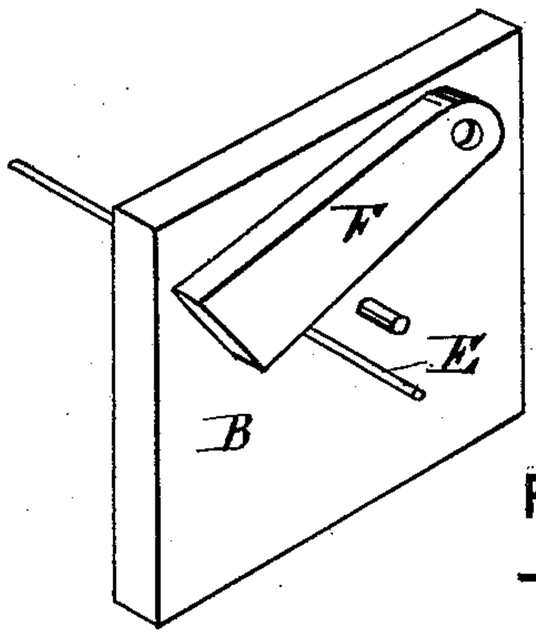

Fig. 3.

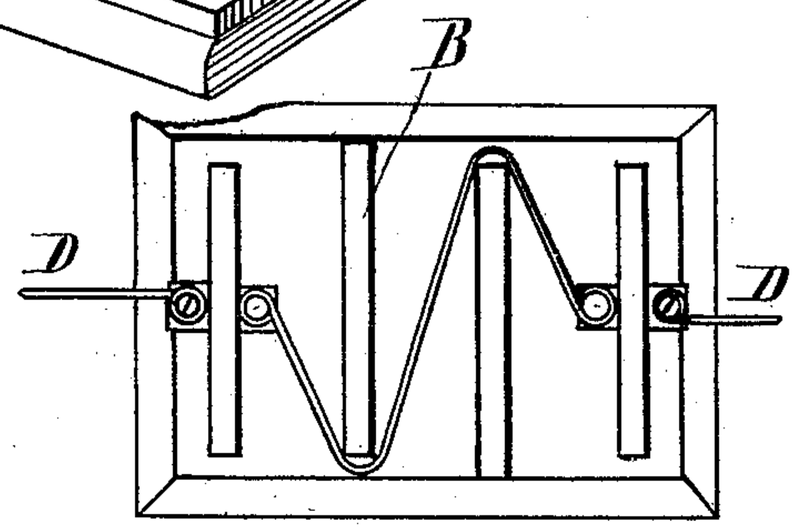

Fig. 5

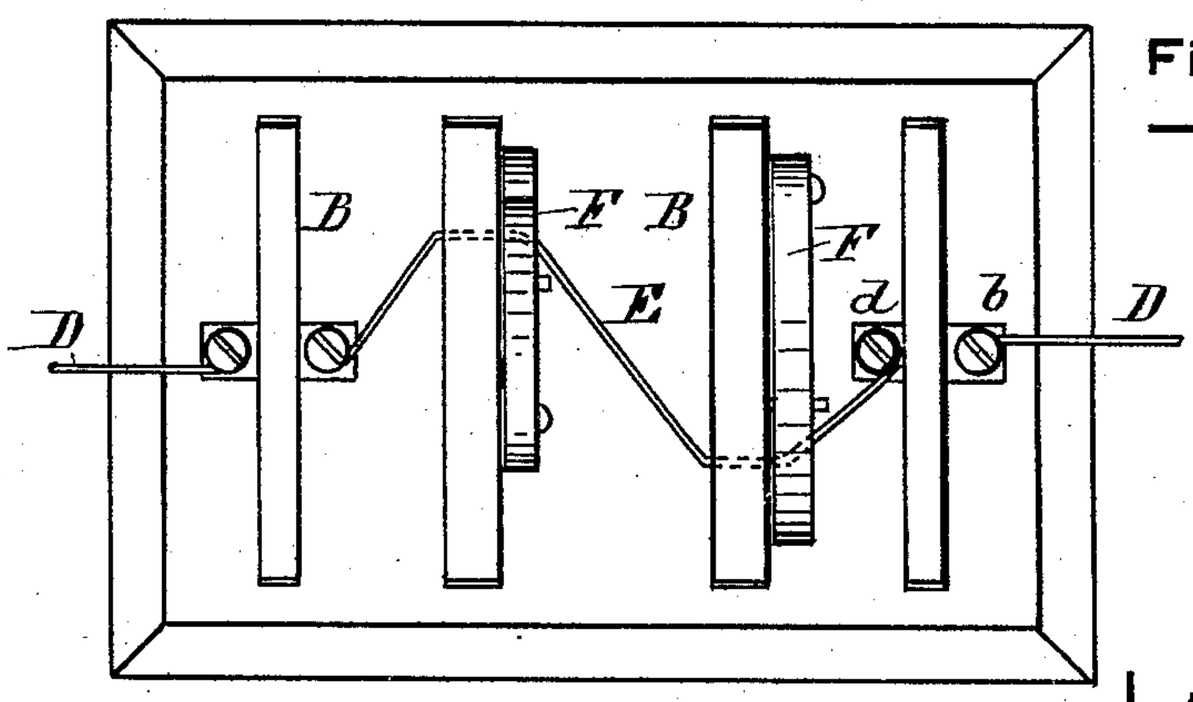

Fig. 2.

WITNESSES.

William L. Parry

Matthew M Blunt

INVENTOR.

David J. Cartwright

by his attorney

Alex L. Hays

UNITED STATES PATENT OFFICE.

DAVID J. CARTWRIGHT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE ELECTRICAL SAFETY COMPANY, OF PORTLAND, MAINE.

THERMAL CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 441,933, dated December 2, 1890.

Application filed April 26, 1890. Serial No. 349,580. (No model.)

To all whom it may concern:

Be it known that I, DAVID J. CARTWRIGHT, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Fusible Cut-Outs for Electric Circuits, of which the following, taken in connection with the accompanying drawings, is a specification.

For the purpose of protecting telephones, fire-alarm signaling-instruments, electric clocks, and other forms of electrical apparatus which are connected to an external circuit from the effect of abnormally strong currents produced by the contact of these external circuits with other circuits certain forms of protectors are used, in which there is a wire or other conductor included in the circuit, which conductor is fused or broken on the passage of the abnormal current, and thus interrupts the circuit and cuts out the telephone or other electrical instrument. It often happens that when the electro-motive force of the abnormal current is so high an arc will be formed and maintained between the terminal connections of the fusible wire or other conductor, and this arc will become a source of danger from fire.

It is the object of my invention to provide means for breaking this arc when formed between the terminals of the fusible wire; and to this end the invention consists, first, in the arrangement, substantially as and for the purpose hereinafter more fully set forth, between the terminals of the fusible wire of plates of an infusible and non-conducting material, through or around which the wire passes in a zigzag direction, so that bends are formed in the wire at its points of contact with the plates; second, in the combination, substantially as and for the purpose hereinafter more fully set forth, with these infusible and non-conducting plates, of perforations in the same, through which perforations the wire passes, and of a bar or plate of infusible or non-conducting material pivoted to the fixed plates through which the wire passes and supported above each perforation, but acting by its weight or by the action of a spring when the wire is fused or broken to cover the perforation in the plate, and thus interrupt the arc.

In the accompanying drawings is represented a device which embodies the principle of my invention.

Figure 1 is a perspective view of the protector, showing a part of the cover broken away to show a plate inside of the cover. Fig. 2 is a plan view of the protector. Fig. 3 is a view of the face of one of the plates. Fig. 4 is a sectional view of the connections for the wire; and Fig. 5 is a plan view of another form of protector embodying the principle of my invention.

In these several figures the same letters refer to the same parts.

Referring to the drawings, A is a base-plate of any material, but preferably of metal or of some non-conducting and infusible material. Upon this base-plate is suitably secured a series of vertical plates B of some infusible and non-conducting material—as, for example, slate, porcelain, or glass—and two of these plates may form the end walls of the cover C, which cover is also preferably made of an infusible non-conducting material. The cover may have in it internal recesses for receiving the top and ends of the plate for the purpose of forming air-tight compartments between the plates.

The conducting-wire D is attached, by means of a binding-screw *a* or any other suitable device, to a metallic angle-plate on the outside of each of the end plates, and to a metallic angle-plate on the inside of each of the end plates is attached by a binding-screw *d* one end of the fusible wire E. The plates *b* and *c* are connected together by the metallic screws *e*, which secure the plates to the plate B and hold the plate in position and form an electrical connection between the plates. In one form of my device each of the intermediate plates B bears against an opposite side of the cover C and the fusible wire E passes around the opposite ends of the plates B, whereby angles are formed in the wire. When this wire reaches the fusing-point, owing to the heat caused by its resistance to the passage of a current of abnormal strength, it will fuse first at the angles formed in the wire by the plates B, and these plates will interrupt the arc.

Instead of carrying the wire around the

plates, I can pass the wire through a perforation in each of the plates, which perforations are not opposite to one another, so that the wire forms an angle in the plates, as shown in Fig. 2. When the wire passes through the plates B, I prefer to provide a device which acts to automatically cover the perforations in the plates when the wire is broken, so that the arc cannot pass through the perforations. This device may consist of a bar or plate F of some infusible and non-conducting material, which bar is pivoted to the plate above the perforation and rests upon the conducting-wire, so that it is supported by the same. When the wire fuses, this bar F is caused to cover the perforation by the action of gravity or of a spring acting upon the bar F, and thus to prevent the passage of the arc. When this protecting-bar F is used, the wire can be passed through the plates B in a straight line; but I prefer to have angles in the fusible wire, for the reason that the possibility of an arc forming is thus lessened.

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

1. In a fusible cut-out for electric circuits, the combination, with a fusible wire which is fused or broken in the passage through it of abnormally strong currents, of a series of plates of infusible and non-conducting material interposed between the terminals of the fusible wire, through or around which plates the fusible wire passes in a zigzag direction, substantially as and for the purpose set forth.

2. In a fusible cut-out for electric circuits, the combination, substantially as and for the purpose set forth, of fusible wire which is fused by a current of abnormal strength, a plate of infusible and non-conducting material, through which plate the wire passes, and a bar of infusible and non-conducting material attached to the plate and supported above the perforation in the same by the fusible wire, but acting to cover the perforation in the same when this wire is fused or broken.

3. The combination, substantially as and for the purpose set forth, of the base-plate A, the series of plates B, of infusible and non-conducting material, supported on the base-plate or attached to the same, the fusible wire attached to a metallic angle-plate on the inside of each of the end plates and passing through a perforation in the intermediate plates B, the bar F, of infusible and non-conducting material, pivoted upon the intermediate plates and supported upon the fusible wire, but acting when this wire is fused or broken to cover the perforation in the plate, the metallic angle-plate C on the outside of each of the end plates B and having a terminal of the conducting-wire D secured thereto, and a metallic connection between the metallic angle-plates *b* and *c*.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 10th day of April, A. D. 1890.

DAVID J. CARTWRIGHT.

Witnesses:

FRANK G. PARKER,

ALEX. L. HAYES.