

A. STROMBERG.
CIRCUIT PROTECTOR.

(Application filed Oct. 11, 1900.)

(No Model.)

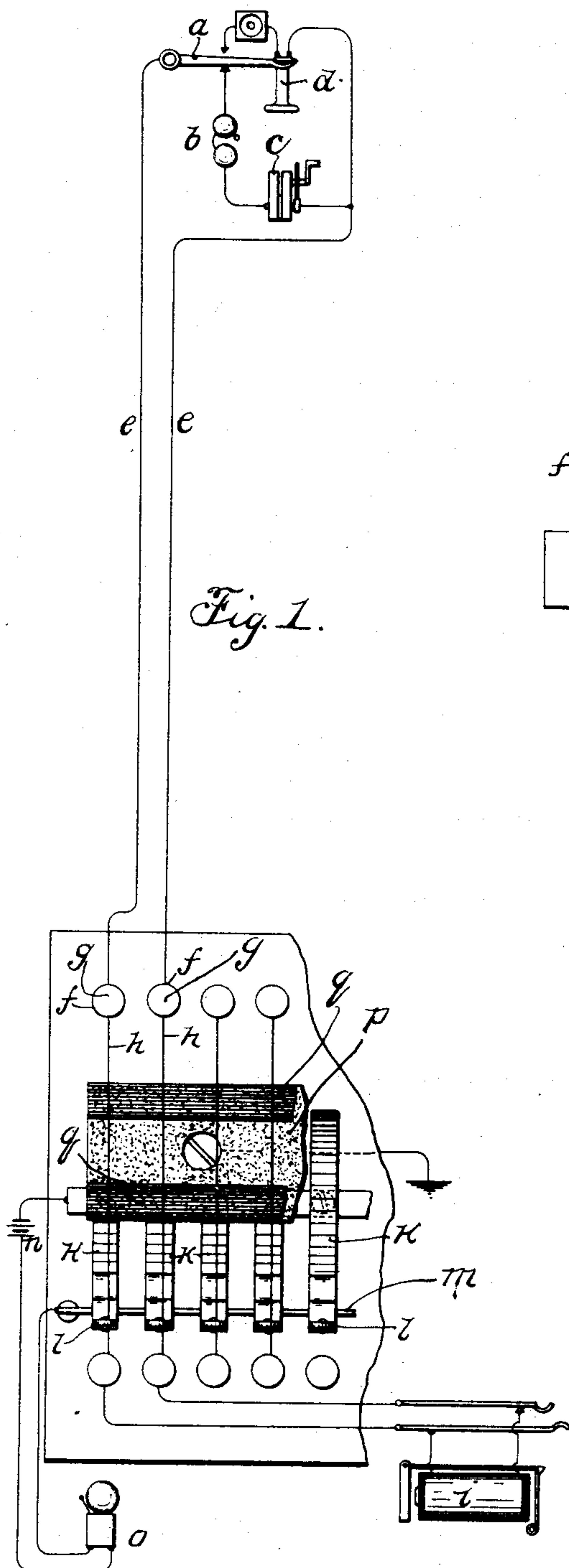


Fig. 1.

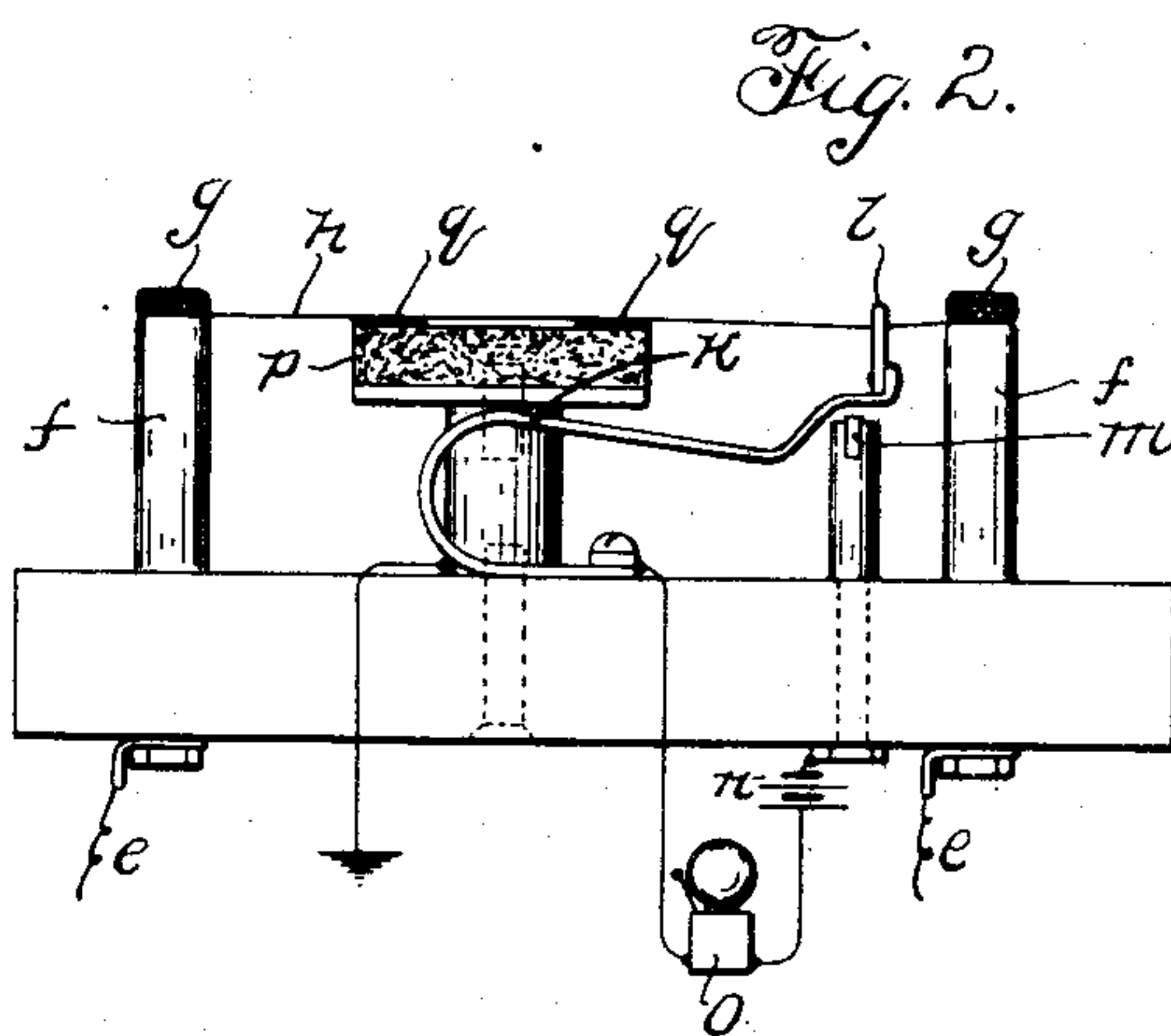


Fig. 2.

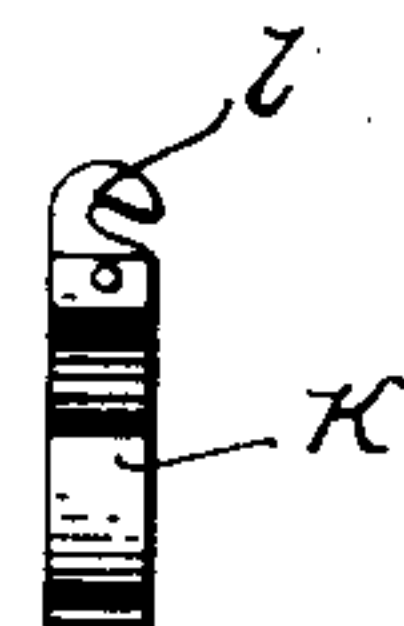


Fig. 3.

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UNITED STATES PATENT OFFICE.

ALFRED STROMBERG, OF CHICAGO, ILLINOIS.

CIRCUIT-PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 684,007, dated October 8, 1901.

Application filed October 11, 1900. Serial No. 32,731. (No model.)

To all whom it may concern:

Be it known that I, ALFRED STROMBERG, 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 Circuit-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 relates to devices for protecting circuits against abnormal currents, and has for its object the provision of an improvement upon the safety appliance that forms the subject-matter of my application, Serial No. 21,878, filed June 28, 1900, wherein I have disclosed a device that is capable of acting as a lightning-arrester and at the same time is also capable of effecting the rupture of a protected circuit upon the flow of an abnormally large current. My present invention may be used in either or both of these capacities.

In the preferred embodiment of my invention I include a fuse under tension in a protected circuit and associate a grounded plate or terminal with the fuse in position to conduct discharges from the fuse to the ground.

In the preferred embodiment of the invention a grounded carbon plate is employed, partially faced with insulating material, preferably mica, which serves to permit the fuse to lie very close to the carbon plate without having actual contact therewith. I preferably maintain the fuse under tension through the agency of a spring acting transversely with respect thereto, whereby the fuse is maintained very close to the grounded lightning-arrester plate, the said spring being also preferably capable of controlling the continuity of an alarm-circuit that may be associated with the protected circuit to indicate when the fuse is ruptured.

I will explain my invention more fully by reference to the accompanying drawings, illustrating the preferred embodiment thereof, in which—

Figure 1 is a diagrammatic view of a telephone-line with the protective device of my invention associated therewith. Fig. 2 is an

end view of the device. Fig. 3 is a detail view of a spring controlling the alarm-circuit.

Like parts are indicated by similar characters of reference in the views.

I have shown in Fig. 1 a telephone-line extending between a substation and an exchange. At the substation a well-known subscriber's apparatus is illustrated, comprising in this instance a switch-hook *a*, having a normal contact constituting a terminal of a branch including a call-bell *b* and a signaling-generator *c*, and an alternate contact constituting a terminal of a branch including a telephone *d*. The telephone-line illustrated is a metallic-circuit line extending by its limbs *e e* to the exchange, these limbs terminating in this instance in the posts *f f*. These posts are preferably provided with binding-screws *g g*, fuse-wires *h h* being engaged between the binding-screws and the posts. A line-indicator *i* is in this instance connected between the line-springs and is also shown in series with the two fuses *h h*. A spring *k*, preferably of the form shown, is preferably provided with a hooking recess *l* at its free end, which engages the fuse-wire, one spring being preferably associated with each fuse-wire. By this construction the fuse-wire is maintained under tension by being pressed downwardly or in a direction transverse to its length. The fuse-wire should be sufficiently taut in the first instance to maintain the spring *k* out of contact with a contact-anvil *m*, which constitutes one terminal of a local alarm-circuit, the spring *k* constituting the other terminal. The local alarm-circuit may include a battery *n* and the bell *o*, although I do not wish to be limited to the character of the alarm apparatus employed.

I may employ the fuses *h h* as the terminals of lightning-arrester circuits, preferably by providing a grounded terminal *p*, composed, preferably, of carbon, immediately beneath the fuse-wires. This grounded terminal has its side or surface that is opposed to the fuses partially faced with insulating material, strips *q q*, preferably of mica, extending transversely across the terminal plates, which permit the fuse-wires to approach the carbon block *p* very closely. The spring *k*

acts to maintain the engaged fuse-wire very close to the lightning-arrester terminal *p*, pressing the said wire toward the block *p*, the strips of insulating material, however, preventing the said wire from coming in contact with the said block. By maintaining the fuse under tension the portions thereof intervening between the strips of mica or other insulating material are prevented from sagging into contact with the terminal *p*. I find that when carbon is employed as the material of which the terminal *p* is composed a very effective lightning-arrester may be produced that will permit of the repeated use of said terminal, as upon the formation of arcs the carbon will not be blistered, as in the case of metal, but will be changed at the point of arcing to powder, which may be readily brushed away.

I prefer to form the spring *k* of strip metal, but springs of other forms may be substituted without departing from the spirit of the invention.

It is obvious that changes may be made in the device by my invention herein shown and particularly described, and I do not, therefore, wish to be limited to the precise disclosure of the invention herein set forth; but,

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

1. The combination with two circuit-terminals of a fuse stretched between the same, a third terminal arranged between the first-mentioned terminals and adjacent to the fuse and a spring holding the fuse close to the intermediate terminal but at a slight distance therefrom, substantially as described.

2. The combination with two circuit-terminals of a fuse extended between the same, a third terminal arranged between the aforesaid terminals and adjacent to the fuse, a spring tending to draw the fuse toward the intermediate terminal and the means for preventing the fuse from coming into contact with said terminal, substantially as described.

3. The combination with two circuit-terminals of a fuse extended between the same, a third terminal arranged between the aforesaid terminals and located adjacent to the fuse, a spring engaging the fuse and tending to draw the same toward the intermediate terminal and insulating material on the said intermediate terminal whereby the fuse is prevented from making contact therewith, substantially as described.

4. The combination with a pair of circuit-terminals of a fuse extended between the same, a third terminal arranged between the aforesaid terminals and adjacent to the fuse, the said intermediate terminal having its side adjacent the fuse provided with insulating material, a spring tending to draw the fuse against the said intermediate terminal, a contact against which the spring can strike when

the fuse blows, and an alarm-circuit adapted to be operated by the connection of the spring with said contact, substantially as described.

5. The combination with a fuse for inclusion in a circuit to be protected thereby, of a grounded lightning-arrester terminal opposed to the said fuse, the said fuse being a second lightning-arrester terminal, the surface of the grounded terminal that is opposed to the fuse being partially faced with insulating material, and means acting transversely of the fuse to depress the same toward the grounded lightning-arrester terminal, substantially as described.

6. The combination with a fuse for inclusion in a circuit to be protected thereby, of a grounded lightning-arrester terminal opposed to the said fuse, the said fuse being a second lightning-arrester terminal, the surface of the grounded terminal that is opposed to the fuse being partially faced with insulating material, and a spring acting transversely of the fuse to depress the same toward the grounded lightning-arrester terminal, substantially as described.

7. The combination with a fuse for inclusion in a circuit to be protected thereby, of two fixed binding-posts between which the fuse is secured, a grounded lightning-arrester terminal opposed to the said fuse, the said fuse being a second lightning-arrester terminal, the surface of the grounded terminal that is opposed to the fuse being partially faced with insulating material, and a spring acting transversely of the fuse to depress the same toward the grounded lightning-arrester terminal, substantially as described.

8. The combination with a fuse for inclusion in a circuit to be protected thereby, of an electric terminal opposed to the said fuse, the surface of the terminal that is opposed to the fuse being provided with insulating material, the said fuse forming an opposing terminal for said first aforesaid terminal, and a spring acting transversely of the fuse, to depress the same toward the said first aforesaid terminal, substantially as described.

9. The combination with a fuse for inclusion in a circuit to be protected thereby, of an electric terminal opposed to the said fuse, the surface of the terminal that is opposed to the fuse being partially provided with insulating material, the said fuse forming an opposing terminal for said first aforesaid terminal, and a spring provided with a hooking recess acting transversely of the fuse to depress the same toward the said first aforesaid terminal, substantially as described.

In witness whereof I hereunto subscribe my name this 29th day of September, A. D. 1900.

ALFRED STROMBERG.

Witnesses:

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HARVEY L. HANSON.