

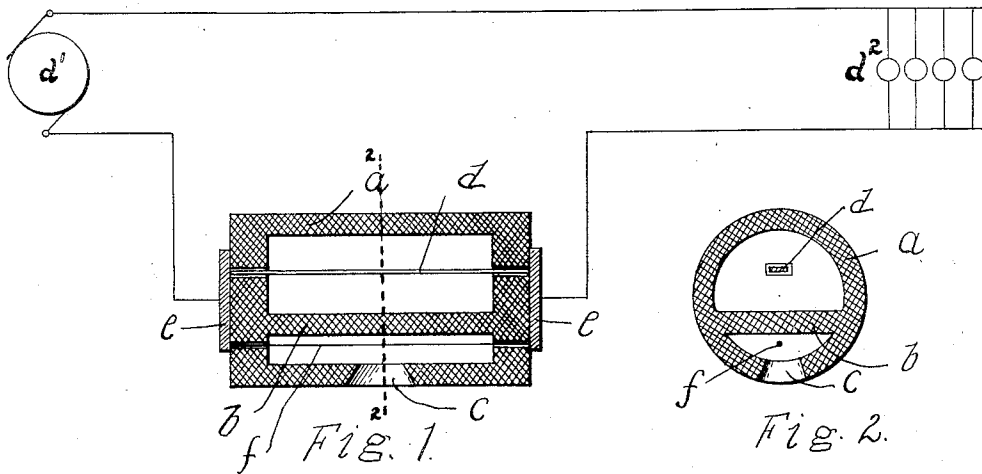
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O. FEUERLEIN.
THERMAL CUT-OUT OR FUSE.

(Application filed Sept. 9, 1899.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

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THERMAL CUT-OUT OR FUSE.

SPECIFICATION forming part of Letters Patent No. 661,241, dated November 6, 1900.

Application filed September 9, 1899. Serial No. 729,897. (No model.)

To all whom it may concern:

Be it known that I, OTTO FEUERLEIN, a subject of the Emperor of Germany, residing at Charlottenburg, Germany, have invented a certain new and useful Improvement in Thermal Cut-Outs or Fuses, (Case No. 237,) 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 thermal cut-outs or fuses, and has for its object the provision of means whereby it is possible to ascertain the physical condition of a concealed or inclosed fuse.

Where safety-fuses are wholly surrounded by insulating material or are otherwise concealed, it frequently is difficult to ascertain by inspection thereof whether or not the fuse is intact. Especially is this the case when the fuse is burned as the result of a protracted heavy overload instead of a violent short circuit, since under the former circumstances no marked disturbance at the fuse results. In such a case the circuit would be opened without warning. To overcome this difficulty, I provide a small accessible supplemental test-wire connected parallel with the main fuse wire or strip. In practice I preferably include both wires in the same inclosure, but separate the same by an insulating-wall. The supplemental wire is visible from the exterior of the inclosure.

I will explain my invention more particularly by reference to the accompanying drawings, in which—

Figure 1 represents a longitudinal cross-section through a fuse device constructed in accordance with the invention, its association with a circuit being indicated diagrammatically. Fig. 2 is a vertical cross-section on line 2 2 of Fig. 1.

Like letters of reference indicate like parts in both views.

A cylindrical box *a* is preferably made of suitable insulating material and is divided into two compartments of unequal size by an insulating-wall *b*. The smaller chamber or compartment may be provided with an opening *c*. The main fuse portion being larger

is disposed and concealed within the larger chamber. The fuse *d* is provided with any suitable terminal portions or strips *e*, which serve to include the fuse in the circuit to be protected. These plates may also serve to seal the fuse-chamber. The fuse *d* is shown connected in circuit with a source of current *d'* and translating devices or means *d''*. The auxiliary wire or fuse portion *f* is also connected with the terminal strips or portions *e*, whereby the fuse portions *d* and *f* are connected in parallel. Upon the burning of fuse *d* the auxiliary fuse also burns. As this wire *f* has relatively a much larger radiating-surface than the fuse *d*, however, it will not heat so quickly, and hence will melt later than the fuse *d*. The wire *f* may also be constructed of a more refractory material than the fuse *d*, the object being to provide a supplemental fuse that will melt after the main fuse.

I am aware that it is old to provide main and supplemental fuses in parallel relation with each other and to arrange the supplemental fuse so that it may be seen from the exterior of a single inclosure containing both fuses, these fuses being designed to burn at the same time. The difficulty, however, with fuses of this character of the prior art lay in the fact that there was no absolute provision made for preventing the auxiliary fuse from melting before the main fuse. The auxiliary or supplemental fuses were liable to burn before the main fuses, and, in fact, the premature burning of supplemental fuses was not always likely to be followed by the burning of the main fuses, so that the function of the auxiliary or supplemental fuse would sometimes not be performed. In accordance with my invention the supplemental fuse is of such a nature that it cannot possibly burn before the main fuse or at the same time therewith; but it must burn after the main fuse, so that if the supplemental fuse is burned it is positively known that the main fuse is also burned. I accomplish this result by so constructing the supplemental fuse that an abnormal flow of current in the protected circuit that will cause a rupture of the main fuse when divided between the same and the sup-

plemental fuse would not cause a rupture of the supplemental fuse if the path closed by the main fuse were left intact, or, in other words, the same proportion of this abnormal current initially flowing through the supplemental fuse would not in itself be sufficient to burn the same, the said supplemental fuse not being burned until the main fuse is burned.

As the supplemental fuse *f* must melt if the main fuse has burned, it is evident that by simply examining the auxiliary or supplemental fuse one is enabled to judge correctly of the condition of the main fuse *d*.

I do not wish to be limited to the location of the supplemental fuse in an inclosed casing, as it may be located elsewhere and secure the same result.

While I have herein shown and particularly described one embodiment of the invention, it is evident that departures may readily be made therefrom without departing from the spirit thereof, and I therefore do not wish to be limited to the precise features shown; but,

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

1. The combination with the main and supplemental fuses, of a casing forming the walls of a hollow structure, and having a partition dividing its interior into two chambers, the main fuse being contained in one chamber and the supplemental fuse in the other, the said fuses being included in parallel relation with each other in the circuit, and the chamber for the supplemental device being construct-

ed so as to permit the latter to be seen, substantially as described.

2. The combination with the main and supplemental fuses, of an inclosed casing containing the fuses, a partition forming a part of the casing and arranged between the two fuses, the said fuses being included in parallel relation with each other, and the casing being constructed so as to permit the supplemental fuse to be seen, substantially as described.

3. The combination with the main and the supplemental fuses, of a cylindric casing having closed ends, and also having a longitudinally-extending partition dividing it into two longitudinal chambers, the main fuse being arranged longitudinally in one of these chambers and the supplemental fuse in the other, and the casing being provided with an aperture opening into the chamber containing the supplemental fuse, whereby the latter can be seen from outside the casing, and a pair of terminal strips, one arranged at each end of the casing and each connected with the ends of the fuses terminating at the end of the casing at which it is situated, the said terminal strips being adapted for connection in the circuit to be protected, substantially as described.

In witness whereof I hereunto subscribe my name this 30th day of June, A. D. 1899.

OTTO FEUERLEIN.

Witnesses:

HENRY HASPER,
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