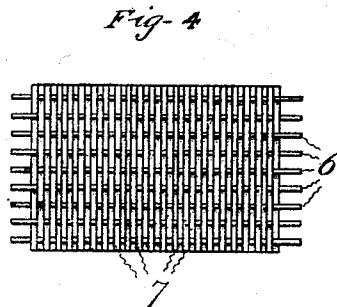
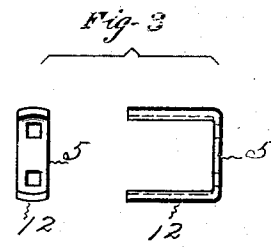
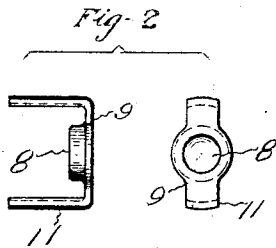
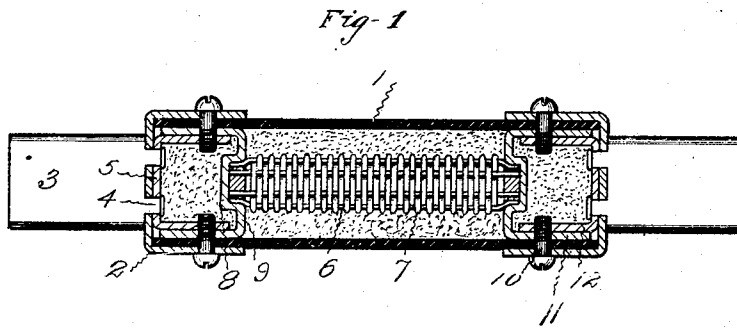


H. R. WILLIAMS.
INCLOSED FUSE.
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1,054,068.

Patented Feb. 25, 1913.



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INCLOSED FUSE.

1,054,068.

Specification of Letters Patent.

Patented Feb. 25, 1913.

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To all whom it may concern:

Be it known that I, HARRY R. WILLIAMS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Inclosed Fuses, of which the following is a specification.

This invention relates to an electric safety fuse which has a multiple fusible strip link that is inclosed within a casing to protect surrounding objects from the flash incident to, and the molten metal dispersed by, the blowing of the fusible elements on the flow of an excess or abnormal electric current through the circuit in which the fuse is placed.

The object of this invention is to provide a very simple, cheap, safe and efficient organization that is particularly adapted for fuses of large capacity, and which has such a construction that links of different capacities can be easily and cheaply produced, and readily assembled in the protecting casing, so as to act in accordance with the predetermined required conditions, and blow with a minimum amount of disturbance.

Figure 1 of the accompanying drawings shows a central longitudinal section of a fuse which embodies the invention. Fig. 2 shows a side and a face view of a preferred form of interior terminal for the link. Fig. 3 shows a face and an edge view of a preferred form of anchor for the exterior terminal. Fig. 4 shows a plan of the link opened out to illustrate the method of its manufacture.

The casing 1 of this fuse may be made as usual of a section of the required diameter and length of the ordinary insulating fiber tube. Upon the ends of this tube are the common end caps 2. The exterior terminals 3 which are shown are the common copper knife-blade contact type. These exterior terminals have lugs 4 that extend through openings in the end caps and openings in the conducting anchors 5, which are desirably provided for strengthening the connection between the exterior terminals and the end caps and tube. These knife blade terminals could be omitted, in which case the end caps would be utilized as the exterior terminals, in the common manner.

The link of this fuse is formed of a fabric woven of small round fusible wires or flat fusible strips 6, preferably zinc, or rapidly

oxidizable, non-arcing metal of the zinc class, and yarn or threads 7 of suitable insulating and heat resisting material, such as asbestos. This fabric may be woven in sheets or lengths of any suitable size, and a section cut off across the yarn in such manner that it will have the proper number of fusible strips to give the element the required capacity, that is, so that the total areas of the fusible strips in the severed section will be sufficient to safely carry the required number of amperes. The section is cut the other way so that the strips of fusible metal will be of sufficient length to meet the requirements of distance between the interior terminals for the designed voltage. The section of this fabric with the wires or strips of a length depending on the voltage, and the proper number of wires or strips for the required amperage, is rolled or folded into compact form to make the link. The ends of the fusible metal strips bundled together and yet separated and insulated by the yarns or threads in the manner described, are soldered or otherwise fastened into cups 8 that may be stamped in the interior conducting terminals 9. This link is inserted into the tube, and after the end caps have been placed in position, screws 10 are passed through openings in the caps, the tube, the legs 11 of the interior terminals and the legs 12 of the anchor strips, and turned up so as to tightly clamp the legs of the interior terminals between the tube and the anchor strips, forming a close electrical connection between the conducting parts. Before one of the end caps is applied, it is desirable to fill the tube and entirely surround the link with the commonly used pulverized or granular insulating material. In constructing a fuse in this manner it is unnecessary, although it may be advantageous, to solder the joints between the interior terminals and the anchor strips. When the parts are not soldered, it simplifies assembling the structure and permits the parts to be readily disassembled for the substitution of an active link for one that has been blown.

The described method of forming a link is simple, for the reason that the fabric of metal strips and insulating yarn can be made in large sheets and pieces cut off the required length to conform to the requirements as to voltage, and the desired width to have the proper number of strips to meet the re-

quirements as to amperage. A section thus cut from such a sheet can be quickly rolled or folded and attached to the interior terminals in any suitable manner. The path for the current is sub-divided by the multiple strips or wires so that on the flow of an excess or abnormal current the fusible metal is melted with a minimum amount of disturbance, even in fuses of large size, and as a result of the use of a number of small strips a relatively small amount of metal will answer for a given amperage. The fusible wires or strips bundled in this manner are firmly held so that they are not liable to become broken or damaged during manufacture or transportation, and although thus bound they are not so completely inclosed by the binding yarns that they will become excessively hot. Much of the surface of the fusible metal is exposed to the filling material so that heat will be readily radiated, and so that the molten metal can quickly disperse itself throughout the filling material when the strips or wires are melted, and not be held in place in a molten state and thus cause the fuse to hang or be sluggish in action.

The invention claimed is:

1. An inclosed electric safety fuse link consisting of a plural number of fusible metallic strips interwoven with and bound together but separated and insulated from each other for the greater portion of their length by strands of insulating material.

2. An inclosed electric safety fuse link consisting of a woven fabric having a warp and woof one of which is insulating material and the other is fusible metal.

3. An inclosed electric safety fuse having conducting terminals, and a roll of woven fabric having warp and woof respectively of insulating material and zinc strips connecting said terminals.

4. An inclosed electric safety fuse having conducting terminals and a fabric woven with warp and woof of fusible metallic strips and insulating material, said metallic strips connecting said terminals.

5. An inclosed electric safety fuse link composed of a fabric woven with warp and woof of insulating material and fusible metallic strips, said metallic strips extending longitudinally of the link.

6. An inclosed electric safety fuse link formed of a roll consisting of a plural number of fusible metallic strips with their ends projecting beyond the roll, and strands of insulating material interwoven with and while holding the strips apart binding them together.

7. An inclosed electric safety fuse link comprising a plural number of fusible zinc strips interwoven with and bound together but separated by strands of asbestos.

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