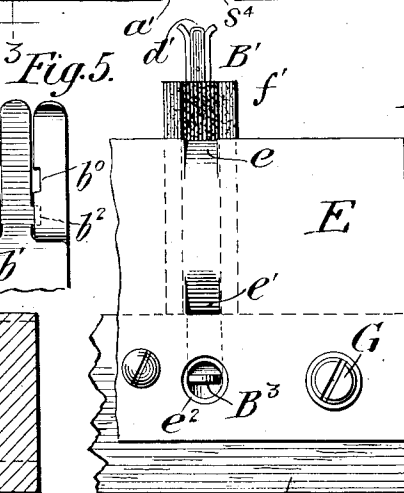
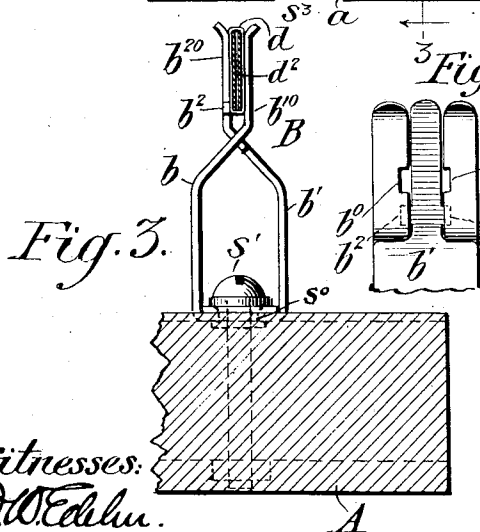
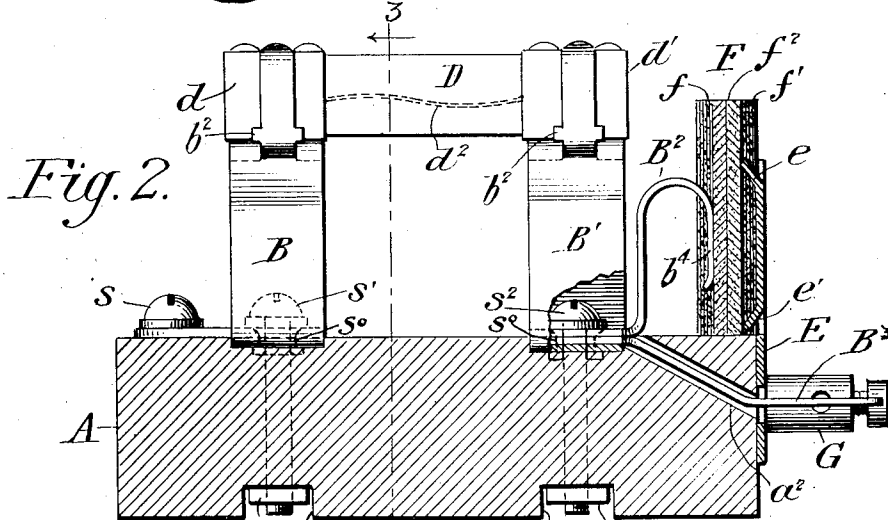
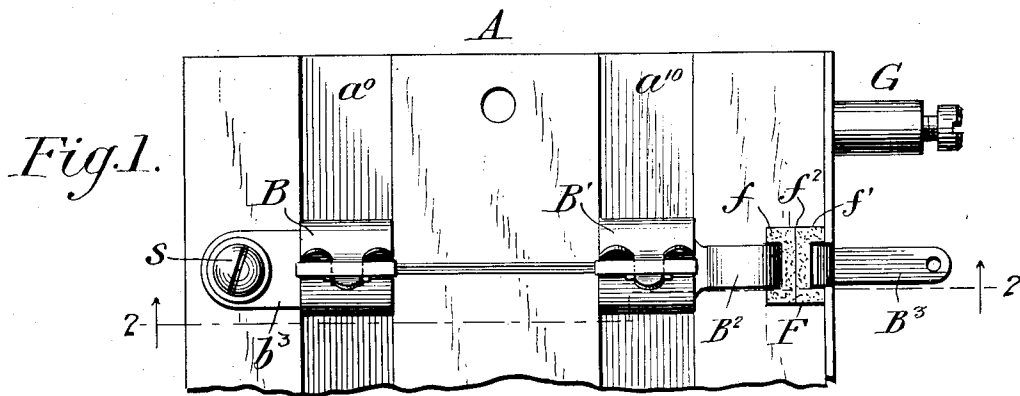


R. H. MANSON.
 PROTECTIVE DEVICE.
 APPLICATION FILED SEPT. 9, 1905.

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Patented May 17, 1910.



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UNITED STATES PATENT OFFICE.

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PROTECTIVE DEVICE.

957,977.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, RAY H. MANSON, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Protective Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to protective devices for electric circuits, and particularly to those employed in connection with telephone and telegraph lines. In systems of this character it is customary to insert at one or more points in each line a fusible device or devices, and upon one side or other thereof to connect each line through a very high normal resistance to earth. This resistance in the earth-branch is commonly a small air gap, and the fusible devices are either so called heat coils or fusible links. It is with the latter that my invention has to do particularly, its object being to increase the efficiency of the mounting device employed on the fuse panels, to simplify and cheapen the associated apparatus, and to render the assembling and connections easy and withal accurate.

Briefly stated my invention comprises a vertical grooved panel having two rows of clips bolted opposite each other in the grooves on transverse lines, parallel pairs being thus formed up and down the panel. Each clip is formed with inter-locking fingers, so that its resilience is never lost and its grip with the consequent given contact is never impaired. A convenient ground plate is run up one side of the panel, and has provision for separating spark-gap arresters, connected on their other sides to line clips, the same clip of each pair having a tail brought out through the hole in the ground plate for easy connection. With this arrangement great facility, economy and efficiency are attainable. The clips are easily made, and by means of a staggered notch and pair of ears on the fingers of the clips, they are constantly maintained in inter-locked position, while by slightly tilting the clip one way they may be unlocked for adjustment or removal.

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

Figure 1 is a plan view of a portion of a panel carrying fuse clips and lightning ar-

rester made and arranged according to my improved method. Fig. 2 is a transverse section on the line 2—2 of Fig. 1, looking in the direction of the arrow. Fig. 3 is a section transverse to Fig. 2 taken on the line 3—3 of that figure looking in the direction of the arrow. Fig. 4 is a side view, showing the ground plate, and, Fig. 5 is a detailed view of the inter-locked spring fingers.

Referring to the drawing, A is a wooden panel or strip supposed to be of considerable length and to contain any desired number of pairs of fuse clips B, B'. For convenience of illustration I have shown a single pair and its associated apparatus, only. The panel A has two longitudinal grooves a^0 , a^{10} , separated by a space equal to the length of a fuse. In each of these grooves is mounted a series of clips B or B' set at intervals so as to form pairs B—B'. The ground plate E extends the entire length of the panel, and is provided with a ground post G, or other terminal by which it can be properly earthed. Having explained this much of the collective aspect of the invention, I will now describe the unitary set of pairs appertaining to one line, which I have illustrated. It will then be understood that the rest of the panel is merely a multiplication of the parts thus described.

The clip B and the clip B' are identical in their construction. Each is formed of a blank punched and bent up so that when the two sides b and b' are brought parallel the fingers b^{10} and b^{20} will inter-mesh, and lie upon opposite sides of each other to their respective stems b and b' . Heretofore clips of this kind have been made with two up-standing spring arms b and b' , having terminal tips uncrossed and receiving the fuse terminals between their inner faces. In other words when a fuse was inserted it would tend to spread apart the whole clip, the parts b^{20} and b being unitary on one side, and the parts b^{10} and b' unitary on the other. With such a construction any temporary wide expansion of a clip would result in loss of resilience and consequent loss of efficiency. With my clip, it will be observed the spreading of the fingers b^{10} and b^{20} is accompanied by a compression strain on the body parts b and b' , so that no strain not great enough to destroy the entire structure will ever spread or bend the side members so as to destroy their efficiency and the

contact which they make. The clip B is secured in the groove a^0 by a screw-bolt s' , said bolt being held in place by a suitable nut s^3 lying in a groove a on the back of the panel. A terminal plate b^3 is secured to the clip B by a hollow rivet s^0 and both are held in place on the panel A by the bolt s' . This terminal plate extends out to the left of the groove a^0 where it receives a binding screw s , by which the circuit connection is made on that side. The clip B' is formed the same as the other so far as its fingers are concerned, and is clamped down in the groove a^{10} by a screw-bolt s^2 having a nut s^4 lying in a groove a' on the back of the panel; but instead of the single terminal plate b^3 , this clip has two terminals, B² and B³, both having their ends secured to the clip by a similar rivet s^0 . The first of these, B² is bent upwardly and then down to form a goose-neck with a contact face b^4 . This member b^4 rests against one of a pair of carbon blocks F, the other one of which lies against the ground plate E. In order to prevent lateral displacement of this carbon arrester, each block is grooved, as clearly shown in Figs. 1, 2 and 4. The block f is slid down with the goose-neck contact b^4 lying in its groove, while within the groove of the twin block f' are inserted the fingers e, e' , formed up out of the body of the metal ground plate E. I thus avoid the necessity for any separate fastening devices, and attain the greatest simplicity as well as rigidity. Between the two blocks f and f' is placed a strip of mica f^2 , preferably perforated to form open air places between the inner faces and the carbons. The second terminal, B³, is bent down and passed through an oblique opening a^2 drilled in the panel, and has its end brought out through a somewhat enlarged opening e^2 in the ground plate. The purpose of this enlargement of the opening in the ground plate is to prevent any accidental contact between the member B³ and the plate. It is best shown in Fig. 4.

The type of fuse best adapted for use with my structure thus described is the flat mica fuse, shown at D in the drawings in which a fine fuse wire d^2 is supported on or between thin mica plates provided with terminals d and d' of metal foil. The terminals of the fuse are slipped between the fingers of the respective clips B and B', as shown in Figs. 1, 2 and 3, and a circuit is then completed from the line to the binding screws s , to the clip B, through the fuse to the clip B', and by the tail B³ to the soldered wire connection with whatever apparatus is protected. I have shown the end of the member B³ perforated for ready soldering in the usual way.

The operation of this type of protective devices is well understood and need not be explained in detail. It remains, however, to

describe the means for holding the spring fingers of my clip in the operative position I have described.

Before attachment to the panel, the jaws of each clip are opened, and in assembling the device the nuts s^3 and s^4 are placed in the grooves on the back, being preferably made to fit tightly therein so as to be held from turning and against displacement while the bolts are being inserted; the clips are then put in position, the bolts s' and s^2 put down through and screwed home, and the terminals b^3 etc. adjusted. The screw-driver or other tool employed in this part of the work can readily be inserted between the members b, b^{10} and b', b^{20} , while these are open. After the parts are assembled, the jaws are closed, and the fingers sprung together as shown in Figs. 1, 2 and 3, being held in that position thereafter by the means shown in Fig. 5. These consist of a pair of ears b^2 formed on the member b^{20} , and wider than the opening between the fingers b^{10} . In order to intermesh the fingers, I cut a notch b^0 on the inside edge. These notches are made higher up in the fingers b^{10} than the ears b^2 on the other fingers, so that with the parts in the normal position they will not register. By forcing the entire device to the right in Fig. 3, the two members will bend about their respective points of attachment to the base, and the tongues b^2 will travel up the surface of the fingers b^{10} until they reach the notch b^0 , through which they will snap, whereupon the two halves of the clip can be separated. To replace them in normal position, the operation is reversed, that is, the member b is bent over until the tongues b^2 can be passed through the notches b^0 , and then the device is allowed to come over to the left in Fig. 3.

I do not wish to limit myself to the specific details, such as the fastening devices herein shown, nor do I limit myself to the use of a carbon block arrester, for it will be at once apparent to those skilled in the art that the carbon might be omitted and the goose-neck B² formed with a saw-toothed edge to coöperate with the ground plate. Other changes might be made without alteration of the essential features, and all such are included in the scope of my invention.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. A contact device for electrical apparatus formed from a strip of metal into two side springs having flat smooth ends normally retained in crossed position against the tension of each of said springs tending to separate them, the ends adapted to be brought into crossed position by simple bending motion, retaining means holding said springs in crossed relation, an electric conductor, the ends of said springs receiving

between them in contacting engagement said electric conductor and gripping the same between flat smooth surfaces, the insertion of such conductor serving to separate such ends, increase the tension of such springs and transfer such tension from the retaining means to such conductor, and an electric terminal attached to said springs.

2. A contact device for electrical apparatus comprising a pair of side springs having crossed and intermeshing ends, a projection formed upon the end of one side spring, and a notch in the end of the other, the arrangement being such that the parts are normally maintained in crossed relation, with outward tension on each of the side springs.

3. A clip for fuse holders comprising a pair of side springs having terminal fingers crossed and intermeshed, a pair of ears on one finger normally caught and resting upon the surface of the other or others, whereby the fingers are maintained crossed against the outward tension of both the side springs, and a notch or notches normally displaced with regard to said ears, but adapted to be brought into registry therewith, so as to permit the separation of the fingers and the side springs.

4. In protective apparatus for telephone lines, the combination of a pair of spring

clips for holding the fuse, a line terminal for one clip, and a pair of terminals for the other clip, one of said terminals being carried up from the base and supporting a carbon lightning arrester, while the second terminal is carried down through the base for the continuation of the operating circuit.

5. A protective apparatus for telephone lines comprising a grooved insulating panel, spring fuse clips arranged in pairs in the grooves of said panel, securing devices for said clips, a line terminal attached to one clip of each pair brought out from the groove to the edge of the panel, a pair of terminals for the other clip, one bent up to form a spring support for lightning arrester blocks, and the other bent down and carried through the insulating base to form the instrument or switch board terminal, together with a ground plate secured along the edge of the panel, and common to a plurality of the pairs, said ground plate formed with integral fingers opposite the respective spring terminals for the reception and maintenance of carbon blocks.

In testimony whereof I affix my signature in presence of two witnesses.

RAY H. MANSON.

Witnesses:

A. D. T. LIBBY,
WM. W. DEAN.