No. 734,456. PATENTED JULY 21, 1903.

G. E. BRETT.

AUTOMATIC BRIDGE FOR ELECTRICAL LOOP LINES.

APPLICATION FILED OCT. 23, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

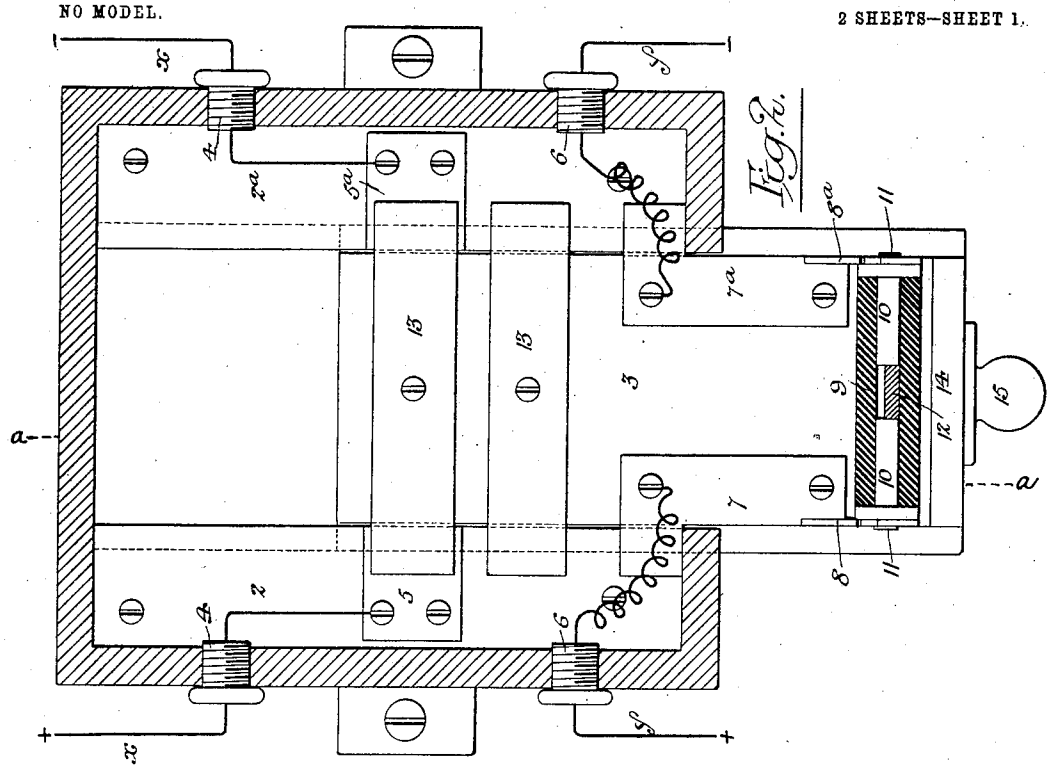


Fig. 2.

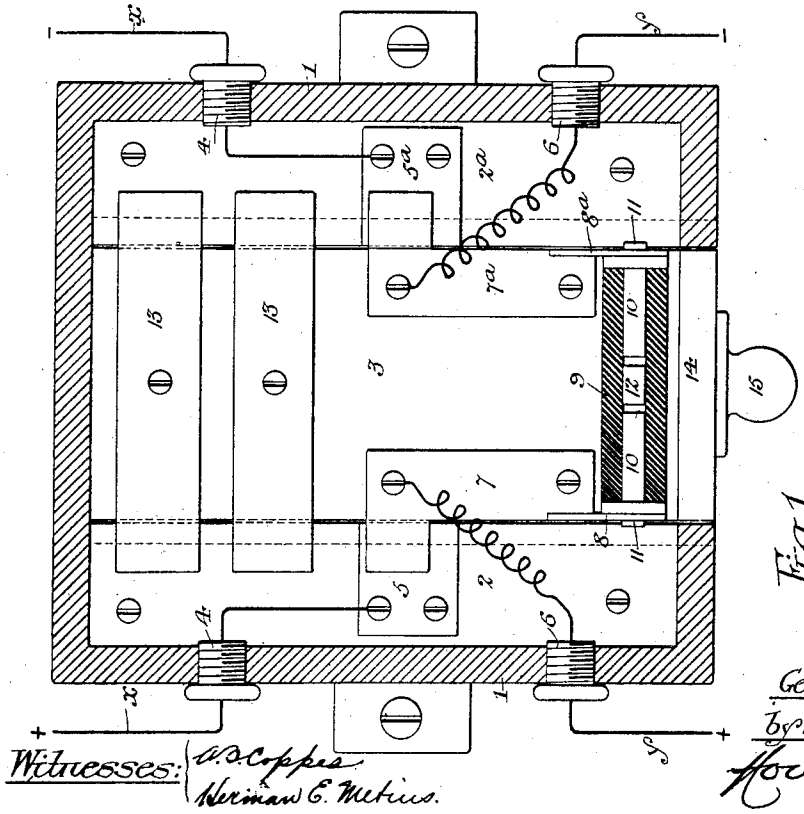


Fig. 1.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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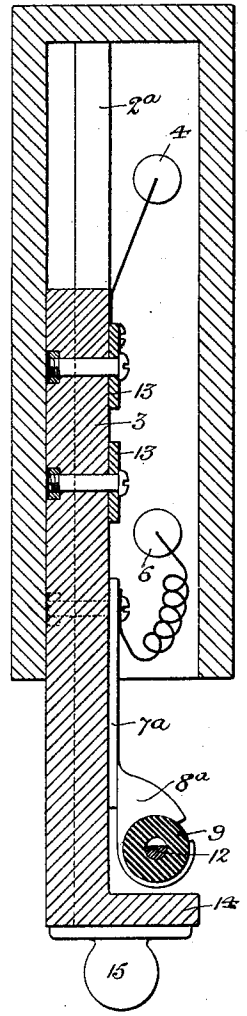
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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE E. BRETT, OF PHILADELPHIA, PENNSYLVANIA.

AUTOMATIC BRIDGE FOR ELECTRICAL LOOP-LINES.

SPECIFICATION forming part of Letters Patent No. 734,456, dated July 21, 1903.

Application filed October 23, 1902. Serial No. 128,487. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. BRETT, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Automatic Bridges for Electrical Loop-Lines, of which the following is a specification.

My invention relates to devices used in connection with looped electrical circuits and intended to automatically cut out the loop and connect the main line across the loop when from any cause the circuit through the loop is broken or meets with undue resistance, the object of my invention being to provide a simple and efficient form of main-line-circuit closer operative under the conditions named and to so combine such circuit-closer with the main and loop line terminals that it will be readily accessible to the lineman, will be out of circuit during the time that it is being removed and replaced, and when thus moved out of circuit establishes an independent main-line connection, so that it can be handled by the lineman without risk.

In the accompanying drawings, Figure 1 is a sectional plan view of my improved bridging device for loop-lines, showing the parts in operative position. Fig. 2 is a similar view showing the parts in the position assumed while the automatic main-line-circuit closer is being removed or replaced; and Fig. 3 is a section on the line *a a*, Fig. 2.

1 represents a box or casing, preferably of iron or other metal, provided with any suitable means whereby it can be secured upon a pole or other support, this box or casing containing three strips 2, 2^a, and 3 of porcelain, vulcanized fiber, or other insulating material, the strips 2 and 2^a being secured to the bottom of the box, but the strip 3 being free to slide in the box and being guided during such movement by the strips 2 2^a, which hold the strip 3 in contact with the bottom of the box, preferably by rabbeting or undercutting the meeting edges of the strips, so that the side strips will overlap the central strip, as indicated by dotted lines in Fig. 1. The terminals of the main-line wire *x* pass through insulating-bushings 4 in the sides of the box 1 and connect with terminal plates 5 and 5^a, secured, respectively, to the sides strips 2 and 2^a, and the loop-line *y* passes through similar insulating-bushings 6 in the sides of the box 1 and connects with terminal plates 7 and 7^a, carried by the sliding strip 3, said terminal plates 7 and 7^a when the parts are in the position shown in Fig. 1 overlapping and making electrical contact with the terminal plates 5 5^a, so that the current entering the box at the plate 5 passes thence to the plate 7, thence through the loop-line *y* to the plate 7^a, thence to the main-line terminal plate 5^a, and out from the box.

Projecting from the loop-line terminal plates 7 and 7^a are a pair of wing-plates 8 and 8^a, between which is inserted the automatic circuit-closer constituting one of the features of my invention. This device is in the form of a cartridge consisting of a tube 9, of glass, fiber, porcelain, or other insulating material, into each end of which fits a metallic plug 10, preferably flanged at the outer ends to bear against the ends of the tube 9 and against the wing-plates 8 8^a and also having projecting studs 11 for engagement with the slots or openings in said wing-plates, so as to prevent accidental displacement of the cartridge from its position between the plates. The plugs 10 are of such length that a space intervenes between the ends of the same, and in this space is a fusible plug 12, of lead or like metal or alloy having a comparatively low melting-point, which, however, does not completely fill the space between the ends of the plugs 10.

Secured to the central slide-strip 3 are a pair of plates 13, or, if desired, a single plate equal in width to the two, the ends of these plates overlapping the side strips 2 2^a, as shown in Fig. 1. The central strip 3 has at its lower end a flange 14, which normally closes an opening in the bottom of the box and is provided with a projecting knob or handle 15, whereby said central strip can be readily manipulated by the lineman, so as to move it either into the position shown in Fig. 1 or that shown in Fig. 2.

Supposing that the parts are in the position shown in Fig. 1, the current will follow the course before indicated, there being no tendency for the same to pass from one of the loop-terminals 7 to the other through the plugs 10 and 12 rather than through the loop-line *y*, because under normal conditions in

said loop-line the space between the plugs 10 and 12 affords a greater resistance to the passage of the current than is afforded by the line *y* and the translating devices contained therein. If, however, there should be a break in the circuit through the line *y* or any abnormal resistance to the passage of the current therethrough, the resistance afforded by the loop-bridging device is overcome, the current passes through the plugs 10 and 12, and by the heat thus generated melts said fusible plug, so that it instantly forms a good and permanent electrical connection between the plugs 10, thereby providing for the direct flow of current through the line with the minimum amount of resistance. When the abnormal conditions existing in the loop-line have been overcome and it is desired to again restore the normal conditions in the circuit-closer, the slide-strip 3 is pulled out from the box, as shown in Fig. 2, so as to expose the tube 9 and permit of the removal of the one containing the melted plug and the insertion of a fresh tube in which normal conditions exist. When the slide 3 is thus withdrawn, the plates 13 provide a direct communication between the main-line terminal plates 5 and 5^a, so that the plates 7 and 7^a and the interposed circuit-closer are out of circuit, and hence can be handled without risk of injury. The foremost plate 13 bears such relation to the overhanging portions of the terminal plates 7 and 7^a that in withdrawing the strip 3 the said plate 13 makes contact with the terminal plates 5 5^a before the plates 7 7^a pass out of contact therewith. Hence there is always good electrical connection between the terminal plates 5 5^a and no tendency to sparking either in pulling out the strip 3 or reinserting the same. The lateral projecting portions of the terminal plates 7 7^a of the slide 3 serve by contact with the bottom of the box 1 to limit the extent to which said slide can be withdrawn, so that there is no possibility of pulling said slide downward to such an extent as to break contact between the terminal plates 5 5^a through the plates 13.

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

1. An automatic main-line-circuit closer for looped lines, the same consisting of an insulating-casing having conducting-plugs whose inner ends are separated by a space which is partially filled by a plug of fusible conducting material, substantially as specified.

2. The combination in an automatic bridge for loop-lines, of a pair of main-line terminals, a pair of loop-line terminals, and an automatic circuit-closer interposed between said loop-line terminals and consisting of an insulating-casing and plugs in electrical connection with said loop-line terminals, and separated by a space which is partially filled by a plug of fusible material, substantially as specified.

3. The combination in an automatic bridge for loop-lines, of a pair of main-line terminals, a pair of loop-line terminals mounted on a slide so as to be movable into and out of contact with said main-line terminals, and an automatic circuit-closer also mounted on said slide and in electrical connection with the loop-line terminals, said circuit-closer being normally open but containing a fusible plug whereby the circuit is closed, substantially as specified.

4. The combination in an automatic bridge for loop-lines, of a casing, a pair of main-line terminals within the same, a pair of loop-line terminals, an automatic circuit-closer in electrical connection with said loop-line terminals, a supplementary main-line-circuit closer, and a slide movably mounted in said casing and carrying said loop-line terminals, their automatic circuit-closer, and the supplementary main-line-circuit closer, the parts being so disposed that when the slide is pushed into the casing the main-line terminals will be in connection with the loop-line terminals and the circuit-closer will be within the casing, but when said slide is retracted the supplementary main-line-circuit closer will be in connection with the main-line terminals, and the automatic circuit-closer will be exposed beyond the casing, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. E. BRETT.

Witnesses:
WILLIAM T. INNES,
JOHN HENIMAN.