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1,947,588

FUSE AND MOUNTING THEREFOR

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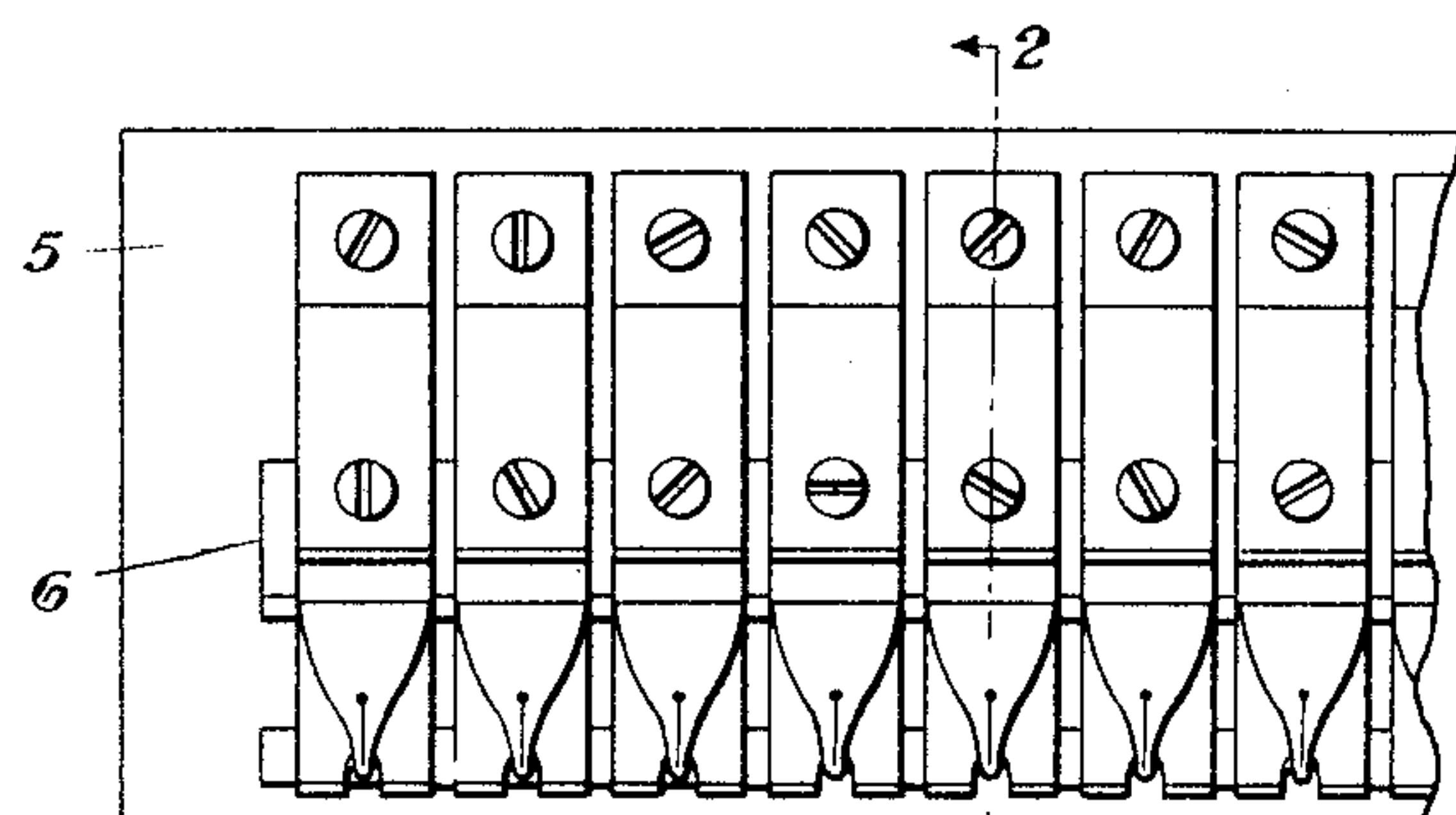


Fig. 1

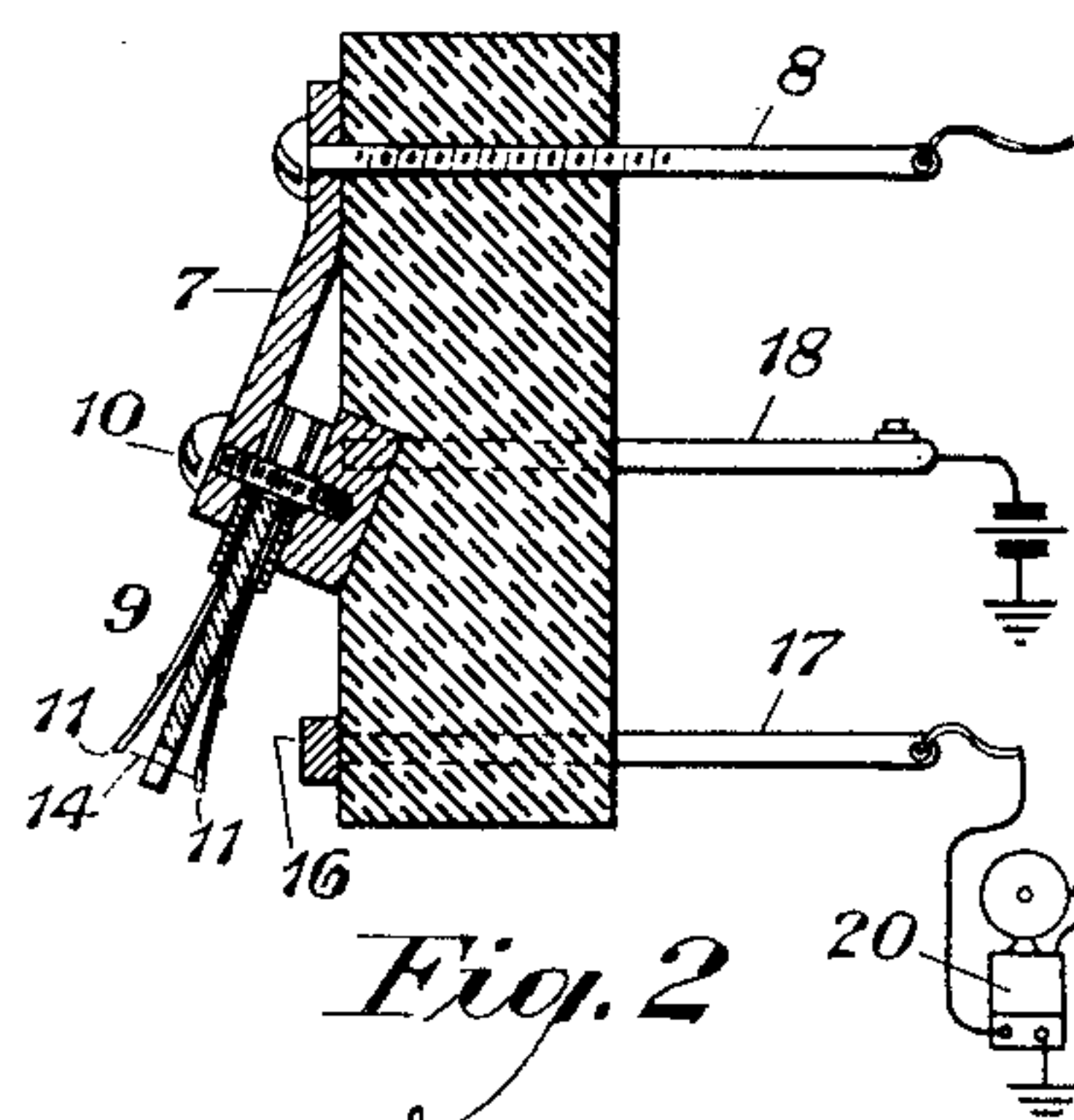


Fig. 2

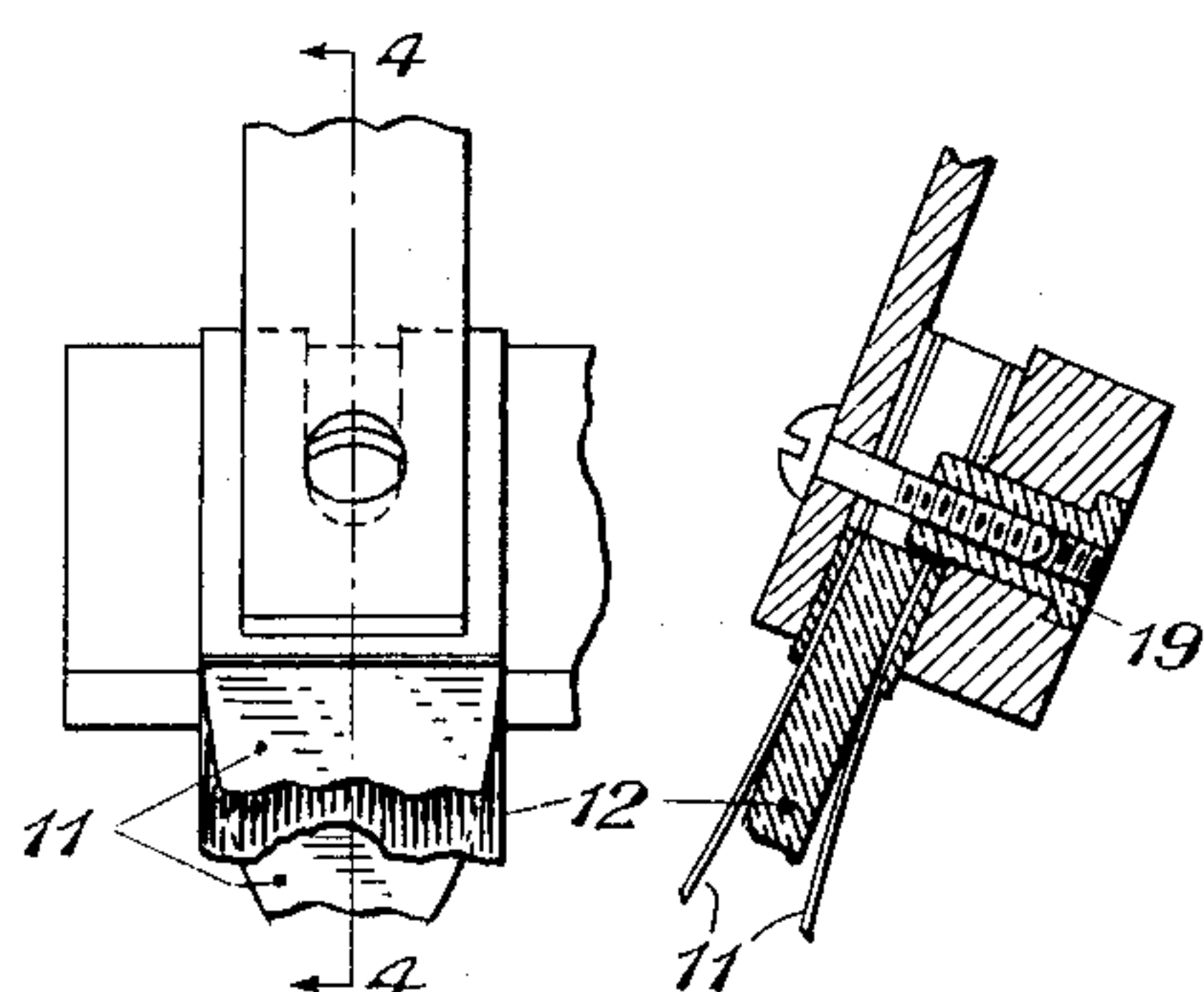


Fig. 3

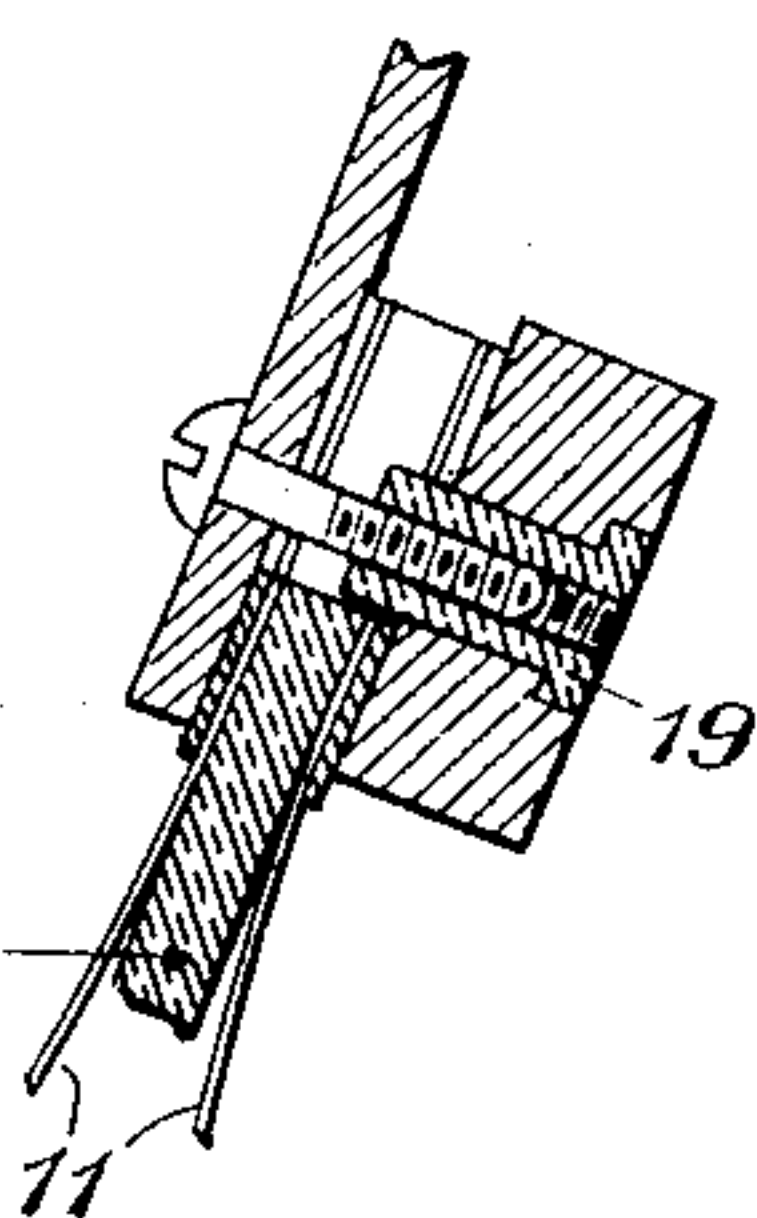


Fig. 4

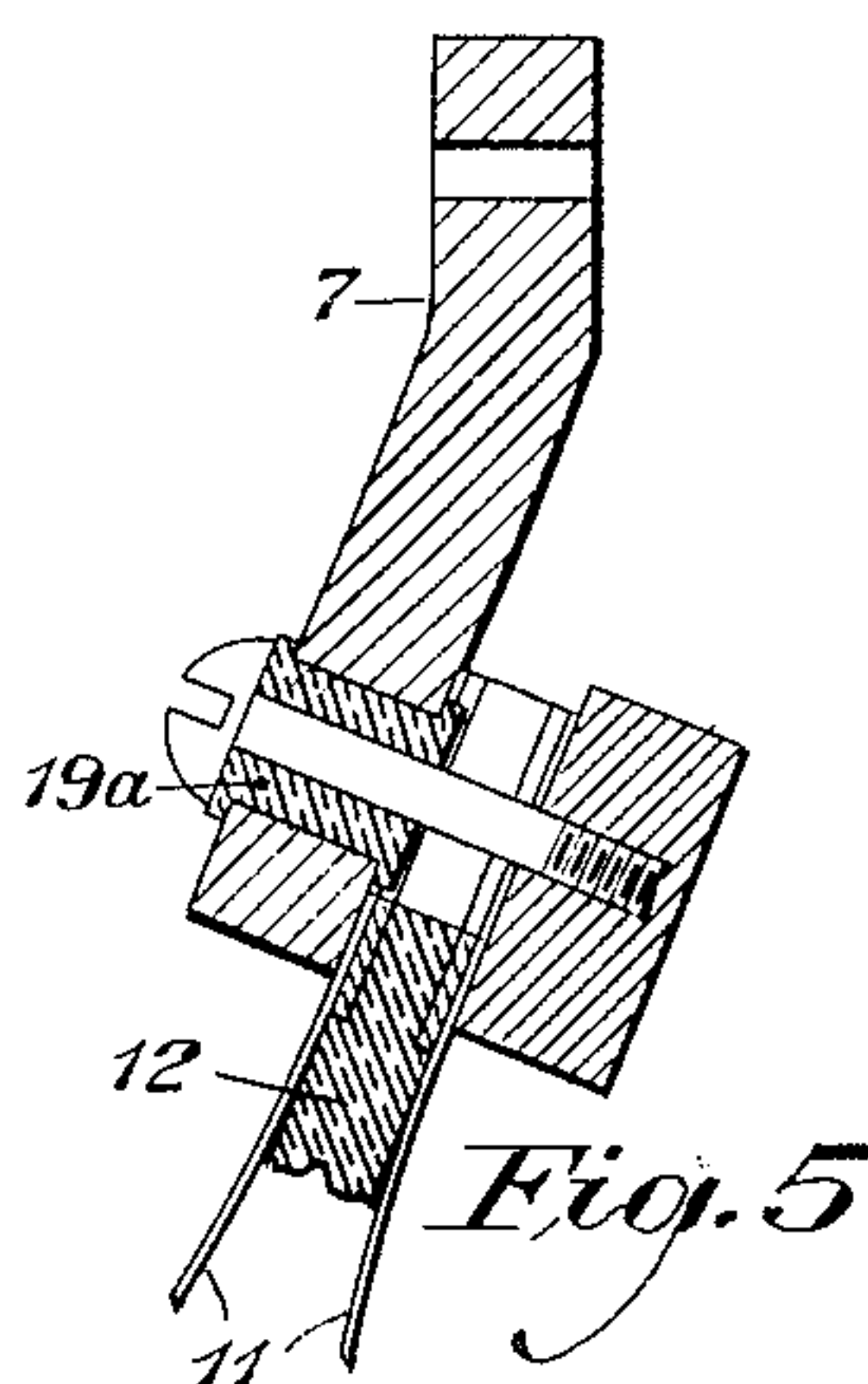


Fig. 5

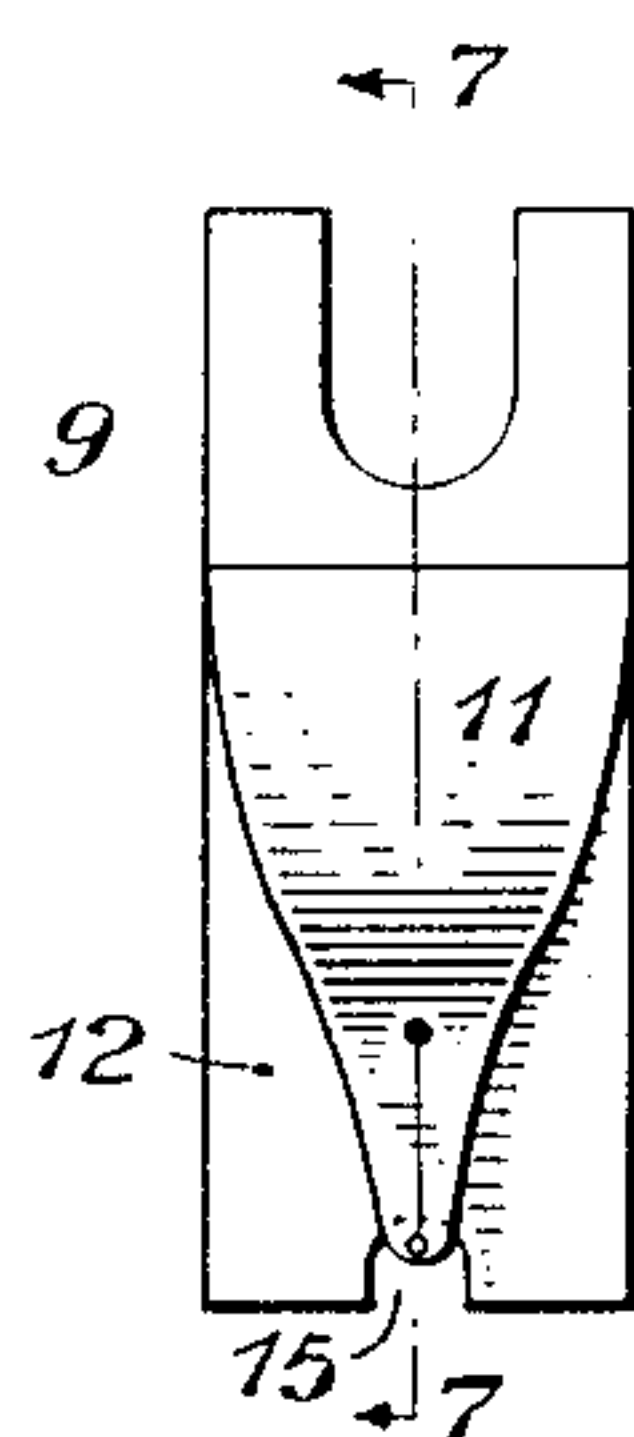


Fig. 6

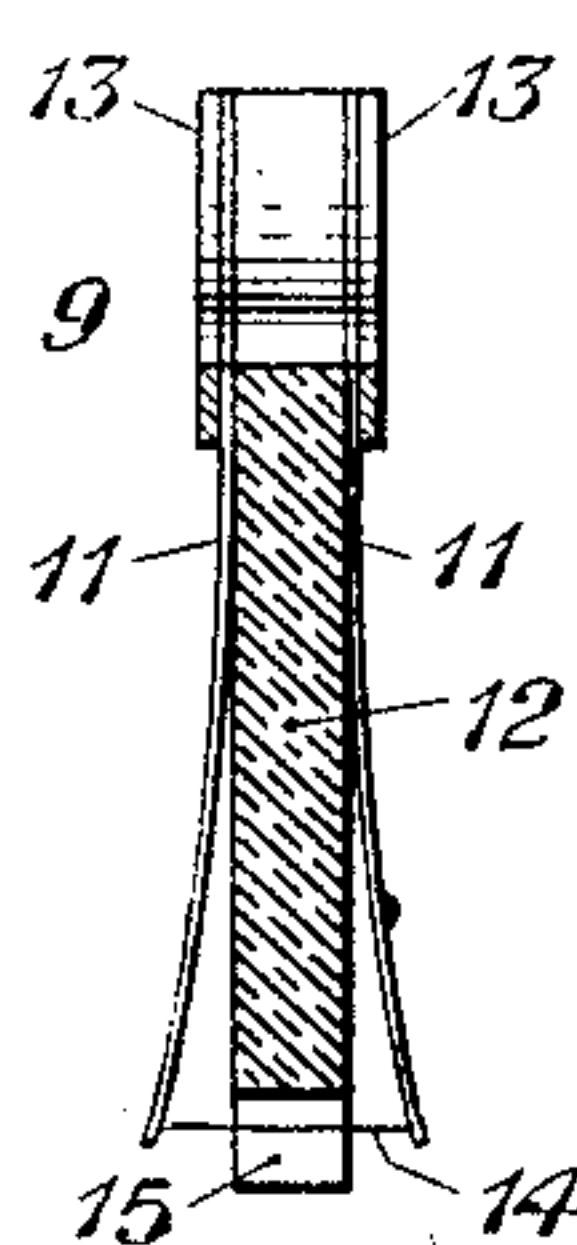


Fig. 7

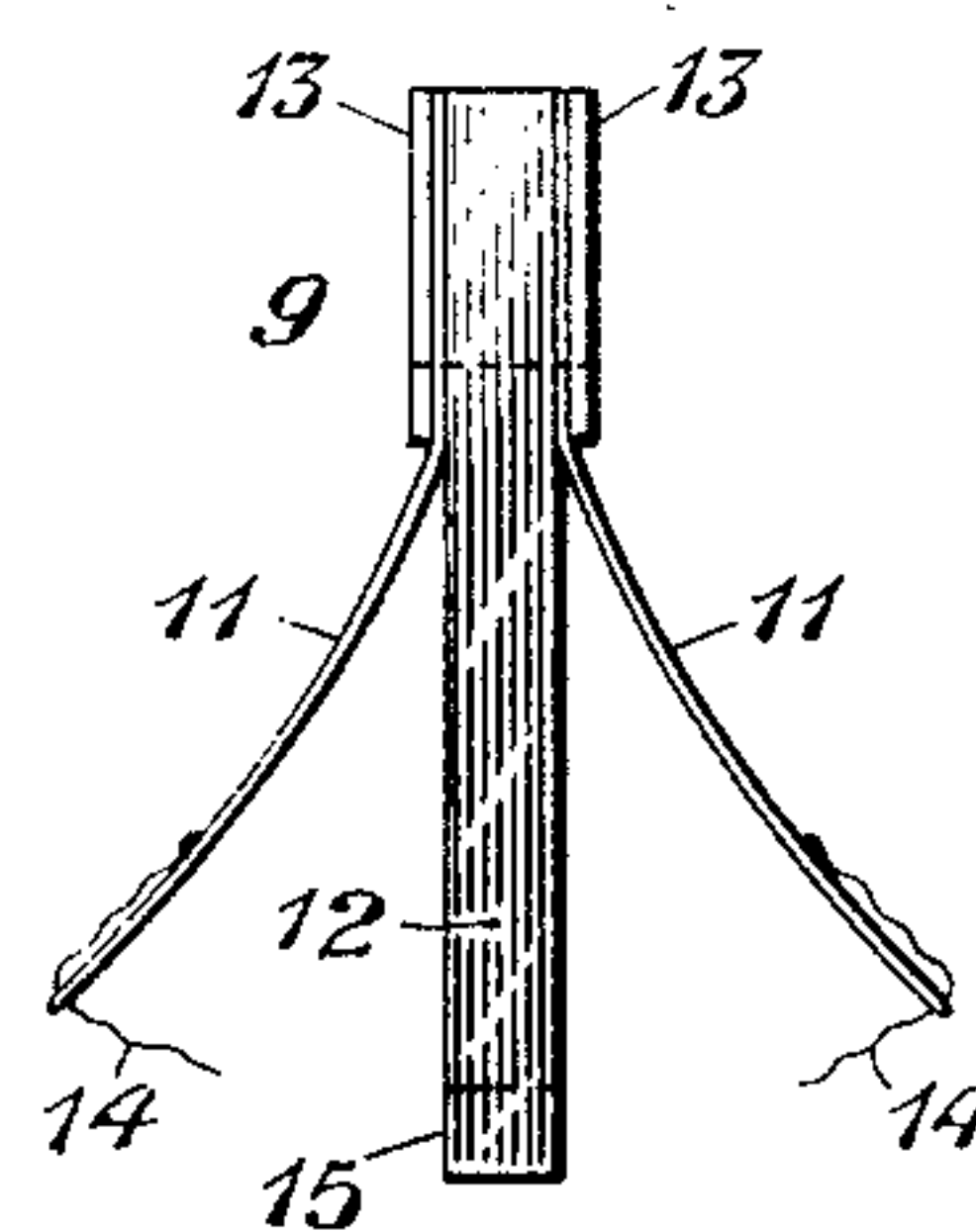


Fig. 8

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FUSE AND MOUNTING THEREFOR

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Serial No. 643,500

1 Claim. (Cl. 177—311)

This invention relates to fusing of electrical transmission circuits, and more particularly to fuses and fuse mountings which form a protection for such circuits.

5 It is customary where the protection of battery or other power supply is distributed to comparatively large numbers of circuits, to provide each circuit with fuses of a so-called alarm type designed to give audible and visual indication for
10 each individually fused circuit in case of blowing of the fuse. As the number of such fused circuits in an installation is frequently large, it is necessary to conserve space and mount these fuses as compactly as possible.

15 In replacing fuses of the types commonly used in the telephone plant, particularly where the alarm feature is provided, it frequently happens that short-circuits occur between the circuit in trouble and adjacent circuits on the fuse board
20 so that trouble is introduced in other circuits by such replacement. Also, it sometimes happens that in removing a fuse or in inserting a new one, an adjacent fuse is damaged mechanically so as to require its replacement or to leave
25 a circuit in service which is not adequately fused with a possible resultant service interruption at a later time.

The time element involved in replacing fuses, particularly on important circuits, may be a factor of considerable moment in the rendering of
30 satisfactory service. There is, furthermore, a certain hazard introduced at a fuse panel by having the battery or live bus bars exposed, as in commonly used designs.

35 The cardinal object of this invention is to provide a fuse and mounting therefor which will overcome the above mentioned defects.

Another object is to provide compact mountings for the fuses.

40 These and further objects will be apparent from the following detailed description, when considered in connection with the accompanying drawing in which certain forms of the invention are illustrated.

45 Referring to the drawing in which the improved arrangement is illustrated, Figure 1 is an elevation of a portion of a panel which provides a mounting for a series of fuses and their associated equipment;

50 Fig. 2 is a section taken on the line 2—2 of Fig. 1;

Fig. 3 is an elevation illustrating one form of bushing mounting for the fuses;

55 Fig. 4 is a section taken on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view showing another form of bushing mounting for the fuses;

Fig. 6 is a front elevational view of a fuse and showing it in its normal unoperated condition;

Fig. 7 is a section taken on the line 7—7 of
60 Fig. 6; and

Fig. 8 is a similar view showing the fuse in its operated condition.

The improved fuse and its mounting and associated equipment are carried by a fuse board 5
65 consisting of a panel, which may be made of slate or other suitable insulating material. A battery or live bus bar 6 extends longitudinally of the panel 5, to which it is suitably affixed in an inclined position. The bus bar 6 is so ar-
70 ranged that it is very largely shielded by a series of individual lugs 7 from accidental short-circuiting. Each of the lugs 7 has an upper portion which lies flatly on the vertical panel 5, and has an opening therein coinciding with an opening
75 in said panel through which a bolt 8 passes. The end of this bolt provides a terminal to which a conductor for an individual circuit is soldered. The other portion of the lug 7 has an inclined extension which corresponds to the inclination of
80 the bus bar 6 and extends downwardly to a position adjacent to said bus bar and in spaced relation therefrom. Designations may be applied to this inclined portion of the lug 7 to identify the particular circuit connected therewith. A
85 fuse 9 is interposed in the space between the inclined portion of the lug 7 and the inclined face of the bus bar 6, and these fuses partake of the angle of inclination of these members. A screw
90 10 passes through openings in the inclined portions of the lugs and fuses, and is threaded into the bus bar to hold the fuses in position. The fuses 9 have a U-shaped opening provided in their top portions, as may be seen by reference
95 to Fig. 6, through which the screw 10 extends. This screw when applied through the lug 7 and into the bus bar, as above outlined, clamps the fuse between these elements, and a single operation only is necessary to remove or replace said
100 fuse.

The fuse 9 includes a pair of spring members 11, 11 which are mounted at one end on opposite sides of a rectangular block of insulation 12, such as hard rubber, bakelite or the like. The
105 upper portions of the fuses are enveloped in a sheet of conductive material 13, such as aluminum, copper or other suitable metal, which is pressed about their surfaces and forms a band which is secured to the insulation block 12. The
110 other ends of the spring members 11, 11 are

held together by means of a fuse link 14. This fuse link passes through a groove 15 provided in the lower edge of the block 12, and through openings in the ends of the springs. The ends of the link are soldered to the outer sides of the springs and provide a metallic connection between the two springs 11, 11. The resilience of these spring members is such that when the fuse link 14 becomes melted, due to excess current flowing over the line or from other causes, the front spring snaps outwardly and serves as a flag or target to attract visual attention to the particular fuse which has operated (Fig. 8). The rear spring, under this condition, functions similarly to the front spring and moves into contact with the alarm bus bar 16, which is positioned on the panel 5 (Fig. 2). The bar 16 extends longitudinally of said panel and a bolt 17 is provided for each individual bar. These bolts pass through the panel and are connected to an alarm circuit to ground in a well understood manner. Similar bolts 18 are connected to the battery bus bar 6, and secure it to the panel 5. When the springs 11, 11 of the fuse 9 fly out and assume a tapered position with respect to each other, as previously explained, the inner spring makes contact with the alarm bus bar 16, thus providing a direct metallic connection from the battery through the bolt 18, battery bus bar 6, inner spring of the fuse, alarm bus bar 16 and bolt 17, over an alarm circuit to ground. The closure of this circuit causes a gong 20 or other alarm to be sounded. As the rear spring and front spring operate at the same time visual and audible indications are given simultaneously that a particular fuse has been operated.

The set screws 10 which hold the individual fuses in position are shown in Figs. 3 and 4 as being threaded into an insulating bushing 19. These bushings may be drilled and tapped and inserted in the bus bar 6 to engage with the set screws 10. These bushings project above the

bus bar sufficiently to serve as a stop for placing the fuses in the proper position. In the modification shown in Fig. 5 the insulating bushing 19a is embedded in the individual circuit lug 7. In this modification the lug is drilled so that the set screw 10 is adapted to turn in the bushing and this bushing similarly to that shown in Figs. 3 and 4, forms a stop for the mounted fuses.

It will be obvious from the foregoing description that by means of this invention a compact fuse and mounting are provided, and that the removal and replacement of such fuses requires the loosening of only one screw. It will be further noted that the fuses slide downwardly in an angular direction when being removed and may be replaced by other fuses without interference with adjacent fuses positioned on either side, and by this arrangement any tendency to damage or disturb the adjacent fuses is eliminated.

What is claimed is:

A protective device for electric transmission circuits including a panel, a pair of bus bars mounted thereon, one of which is connected to a power source, conductive lugs each connected to an individual circuit and overlying but spaced from said power bus bar, a series of fuses mounted between said power bus bar and said lugs, a pair of resilient members for each of said fuses, and a fusible link for normally holding the free ends of said resilient members in restrained position against the tension exerted thereby to complete connections from the power bus bar to said individual circuits, said free ends snapping outwardly from each other upon their release by the melting of said fusible link, when so operated, one of said members providing a visual signal and the other of said members closing a circuit from said power bus bar to the other bus bar.

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