Aug. 4, 1931. E. A. DEMONET ET AL 1,817,737

POTENTIAL DISTRIBUTING BLOCK

Filed July 19, 1930 3 Sheets-Sheet 1

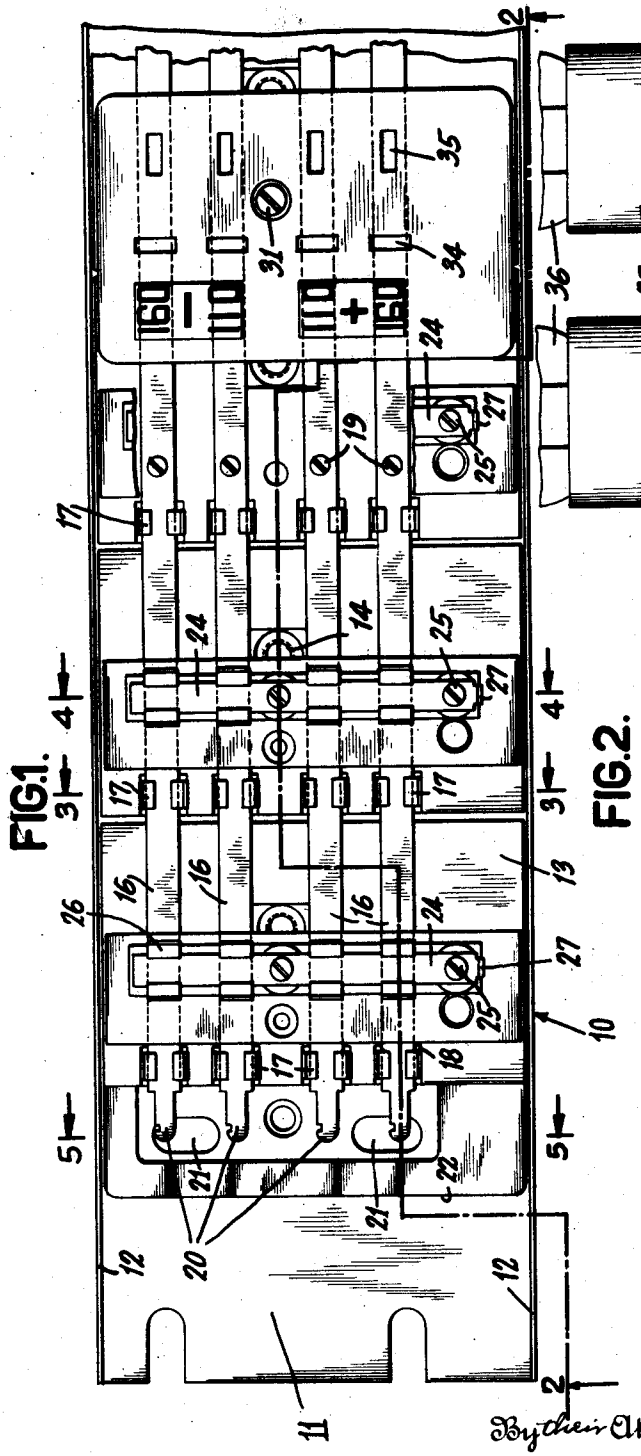


FIG.1.

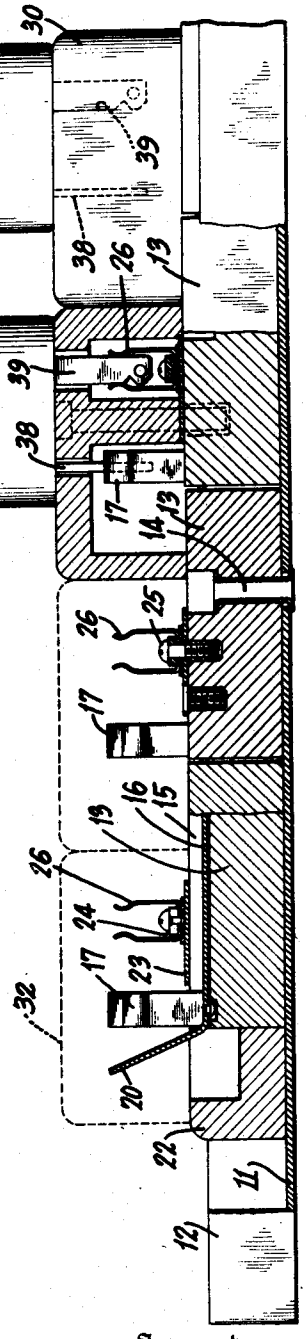


FIG.2.

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POTENTIAL DISTRIBUTING BLOCK

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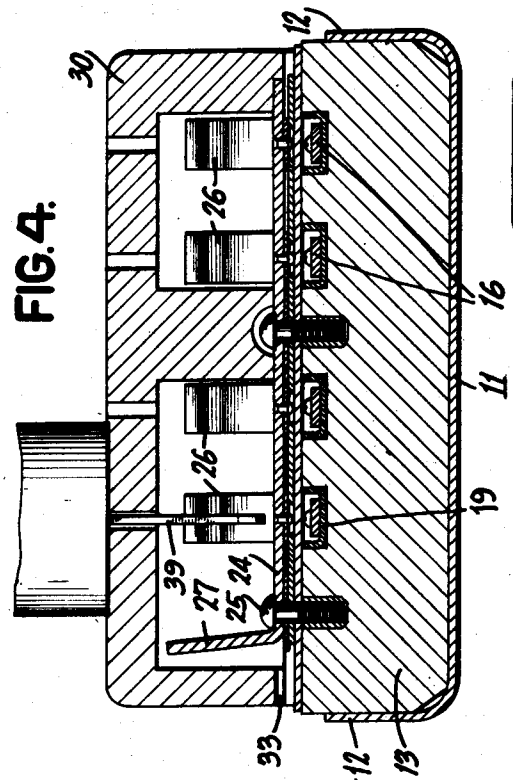


FIG. 4.

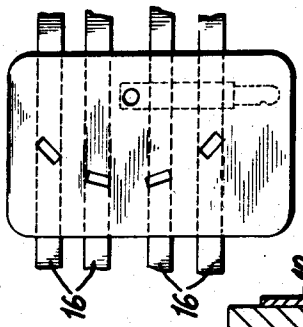


FIG. 7.

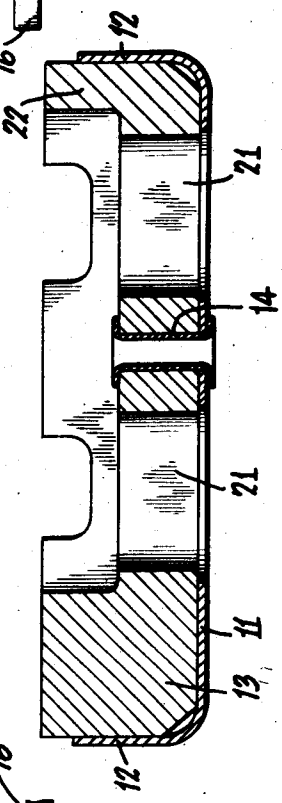


FIG. 5.

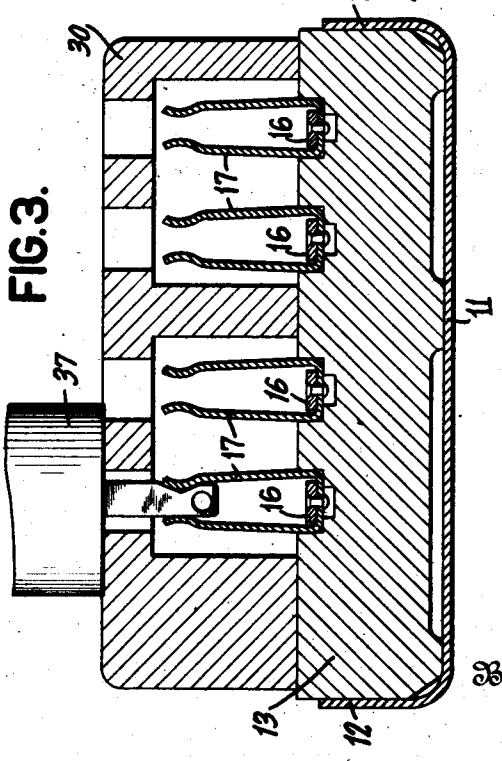


FIG. 3.

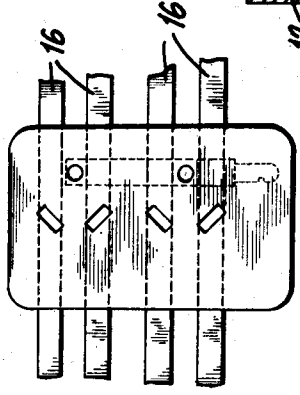


FIG. 6.

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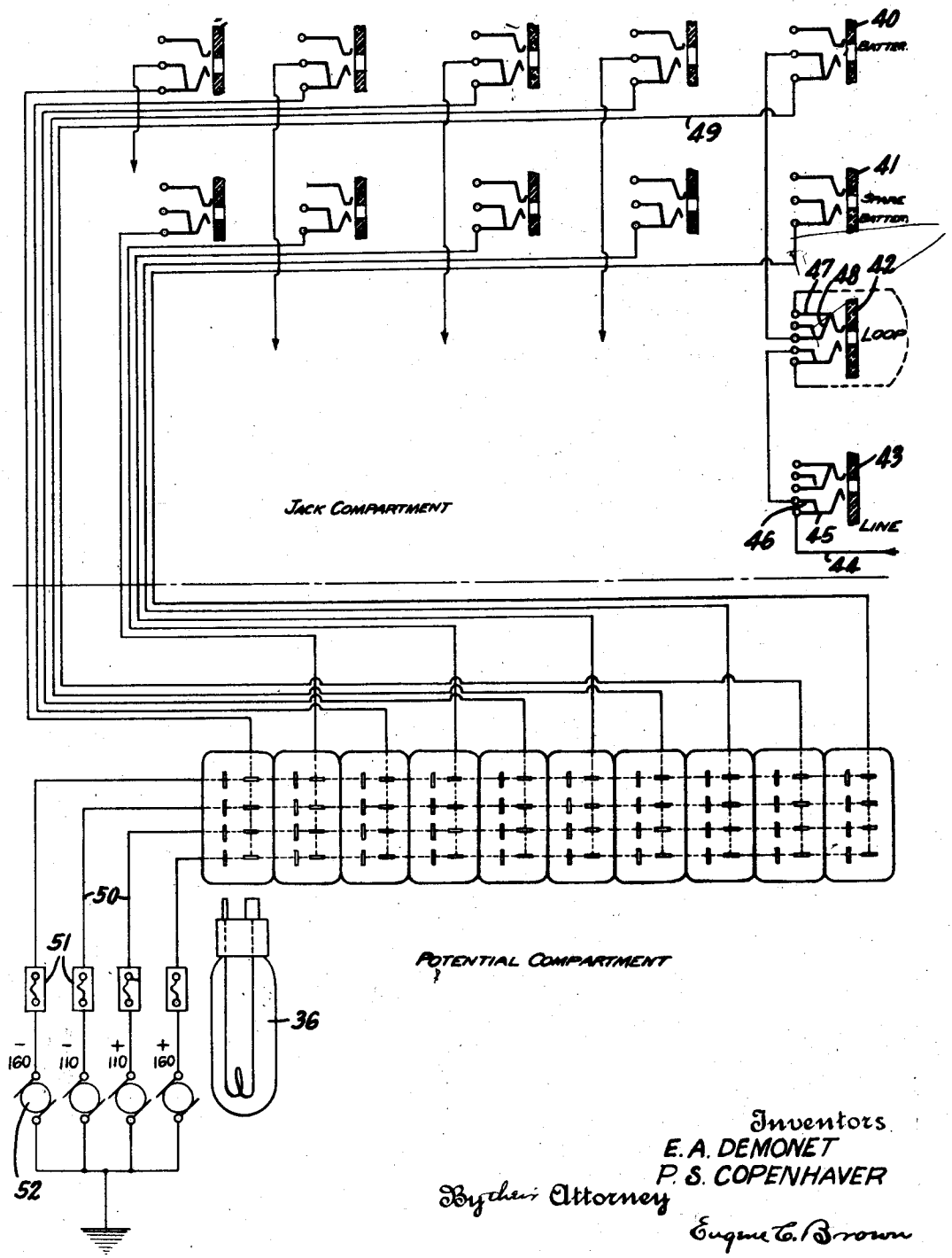
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FIG. 8.



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UNITED STATES PATENT OFFICE

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POTENTIAL DISTRIBUTING BLOCK

Application filed July 19, 1930. Serial No. 469,129.

This invention relates to potential distributing blocks particularly for use in telegraph switchboards and other equipment where main line potential taps are required.

In telegraph switchboard construction as heretofore ordinarily employed, each single line circuit terminating at the switchboard receives its battery through a limiting resistance lamp arranged at the top of the switchboard and serving as a visible indication when grounds or other faults cause an excessive flow of current in the line circuit. The cross connections between the distributing block and the lamp sockets are made by loose wires which have to be moved whenever the normal assignments of the battery are changed, thus necessitating soldering the conductors to terminals carrying raw potential.

It is one of the objects of the present invention to avoid this difficulty and to provide improved potential distributing means which will enable the polarity and potential of battery applied to each line to be quickly and readily changed.

Another object is to provide a potential distributing block in which no parts carrying current are exposed and with respect to which all operations involving cross connections or changes in potential assignments are accomplished by elements which are electrically dead.

Other objects and advantages of the invention will hereinafter appear.

In accordance with the present invention the distributing block is provided with a number of bus bars having different potentials and polarities connected thereto, each bus bar being provided with terminal clips for engaging a two prong resistance unit. The resistance unit, when inserted into the appropriate terminal clips of the distributing block, applies the potential of one of the bus bars, through the resistance to the line circuit, thus performing in one operation the establishment of a cross connection to the bus bar having the desired potential and polarity, and the insertion in the circuit of a current limiting resistance.

The resistance may comprise an incandescent lamp which may also serve as a visible signal but preferably the entire potential distributing means is enclosed in a separate compartment of the switchboard to eliminate fire hazards, and the signaling function is accomplished by other means, as is more fully described in a copending application, Serial Number 467,343, filed July 11, 1930, and entitled "Switchboard signal system."

Insulating cover means is provided for the bus bars and terminal clips so as to permit all of the live parts of the block to be enclosed, the covering means being provided with suitable apertures to permit the prongs of the resistance units to be inserted therethrough into the bus bar clips. Changes in the potential assignment of any particular line may be made by merely changing the position of the resistance unit in the cover openings.

In order that the invention may be more fully understood, reference will be had to the accompanying drawings, wherein,

Figure 1 is a plan view of a portion of a potential distributing block having a part of the cover means removed and a portion of the device cut away to show the construction thereof;

Figure 2 is a sectional view on the line 2—2 of Figure 1;

Figure 3 is a sectional view on the line 3—3 of Figure 1;

Figure 4 is a sectional view on the line 4—4 of Figure 1;

Figure 5 is a sectional view on the line 5—5 of Figure 1;

Figures 6 and 7 illustrate modified arrangements of the terminal clips; and

Figure 8 is a circuit diagram showing the manner in which the potential distributing blocks are associated with telegraph circuits.

The potential distributing block comprises a channel 10 having a base 11 and vertical side walls 12. A number of insulating blocks 13, extend transversely of the channel 11 and are secured to the base thereof by means of tubular rivets 14. The blocks 13 have longitudinal grooves or recesses 15 therein, in alignment with each other, through which bus bars 16 extend. Adjacent the left hand

edge of each block 13, as shown in Figures 1 and 2, each of the bus bars is provided with a terminal clip 17 riveted thereto, the recesses 15 being enlarged and deepened, as at 18, to accommodate the base of the clips. The bus bars are secured in the recesses 15 by screws 19 disposed at suitable intervals along their lengths. A terminal lug 20 is provided for each of the bus bars for connection to a suitable source of potential, access to the terminal lug being obtained through the alined openings 21 formed in the base of the channel 10 and in an insulating block 22 arranged beneath the terminal lugs.

A sheet of insulating material 23 extends transversely across the recesses 15 adjacent each transverse row of terminal clips 17 and has a cross bus bar 24 secured thereto as by screws 25, the cross bus bars being provided with terminal clips 26 corresponding to each of the clips 17 and having the contact springs thereof disposed at an angle to the springs of the clips 17. A soldering lug 27 is provided for each of the cross bus bars 24.

A substantially rectangular insulating cover 30 is disposed over each transverse row of clips 17 and 26 and is secured to the box 13 by a centrally disposed screw 31. The cover members 30 abut each other so as to entirely cover the bus bars 19 and they are offset longitudinally with respect to the insulating base members 13 so as to extend over a portion of two of such base members. The end cover member, shown in dotted lines at 32, extends over the terminal lugs 20 of the bus bars. Each of the cover plates has an opening 33 therethrough for a conductor to be secured to the soldering lug 27.

The cover members are provided with two rows of rectangular openings 34 and 35 disposed at an angle to each other directly over the terminal clips 17 and 26 through which the prongs of a resistance unit may be inserted to connect the cross bus bar 24 with the desired one of the bus bars 16. In the embodiment shown, the resistance unit comprises an incandescent lamp 36, the base 37 of which is provided with two prongs 38 and 39 arranged at right angles of each other for reception in the clips of the distributing block.

While a separate terminal clip 26 has been shown secured to the cross bus bar 24, corresponding to each of the longitudinal bus bars 16, it is to be understood that various other arrangements of the terminal clips may be provided, as for instance, a single clip for each pair of bus bars as indicated by the apertures in the cover plate shown in Figure 6, or a single clip for the cross bus bar may be provided with the clips on the longitudinal bus bars spaced equally therefrom, as indicated in Figure 7.

In Figure 8 is shown diagrammatically the method of associating the potential distributing block with a telegraph switchboard. The switchboard is indicated as having a number of main line circuits A, B, C, D and E, each circuit being provided with a battery jack 40 and a spare battery jack 41. A loop jack 42 and a line jack 43 is shown associated with the main line circuit E, and it is to be understood that similar switchboard facilities are provided for each of the remaining circuits.

The incoming line 44 terminates at the tip contact 45 of the line jack 43, the circuit being continued through the tip normal contact 46 to the tip normal contact of the loop jack 42, thence through the loop circuit to the sleeve contact 47 of jack 42 and thence through the sleeve normal contact 48 to the tip normal contact of the battery jack 40. The circuit continues from the tip contact of the battery jack by conductor 49 to one of the cross bus bars of the potential distributing block P. Similarly, the battery and spare battery jacks of each of the line circuits is connected to an individual cross bus bar of the distributing block. The longitudinal bus bars are connected by conductors 50 through suitable fuses 51 to different potential sources, such as the grounded generators 52, which may be arranged to apply the desired potentials and polarities to the bus bars. In commercial telegraph practice, it is customary to employ both positive and negative battery of 110 and 160 volts.

By inserting one of the current limiting resistance lamps 36 in the appropriate openings of the distributing block, any of the available potentials or polarities of the generators may be applied to any of the telegraph circuits terminating at the switchboard.

It will be obvious, of course, that in place of using individual insulating blocks 13 and separate covers 32 for each cross bus bar, a single insulating base and insulating cover may be employed. It is preferred to employ the individual unit covers and base members, however, so that the entire potential distributing block may be built up to any desired length, depending upon the number of circuits terminating at the switchboard, to which it is desired to apply a source of potential.

Various modifications and changes in the construction will occur to those skilled in the art and therefore, it is desired that the foregoing description be considered in an illustrative sense, rather than a limiting sense.

What is claimed is:

1. A potential distributing block comprising an insulating block having a number of bus bars extending longitudinally therealong, a plurality of cross bus bars extending transversely across said longitudinal bus bars and insulated therefrom, corresponding terminal clips secured to said longitudinal and cross bus bars, and insulating cover means for said bus bars having apertures in line with said

clips, whereby means may be inserted through said cover means to connect any of said longitudinal bus bars to any of said cross bus bars.

2. A potential distributing block comprising an insulating block having a number of bus bars extending longitudinally therealong, a plurality of cross bus bars extending transversely across said longitudinal bus bars and insulated therefrom, corresponding terminal clips secured to said longitudinal and cross bus bars, cover means enclosing said bus bars and said clips, and terminals for said bus bars disposed beneath said cover means.

3. A potential distributing block comprising a plurality of insulating blocks disposed side by side in substantial abutment, a number of bus bars extending longitudinally therealong, a plurality of cross bus bars extending transversely of said longitudinal bus bars and insulated therefrom, each of said cross bus bars being supported on a separate insulating block, and a terminal clip secured to each longitudinal bus bar adjacent each cross bus bar, at least one terminal clip being secured to each of said cross bus bars to cooperate with each of said first clips, whereby any one of said longitudinal bus bars may be connected to any one of said cross bus bars.

4. A potential distributing block comprising a plurality of insulating blocks disposed side by side in substantial abutment, a number of bus bars extending longitudinally therealong, a plurality of cross bus bars extending transversely of said longitudinal bus bars and insulated therefrom, a terminal clip secured to each longitudinal bus bar adjacent each cross bus bar, at least one terminal clip being secured to each of said cross bus bars to cooperate with each of said first clips, whereby any one of said longitudinal bus bars may be connected to any one of said cross bus bars, and an individual cover arranged to enclose each of said cross bus bars and the terminal clips associated therewith.

5. A potential distributing block comprising a plurality of insulating blocks disposed side by side in substantial abutment, a number of bus bars extending longitudinally therealong, a plurality of cross bus bars extending transversely of said longitudinal bus bars and insulated therefrom, a terminal clip secured to each longitudinal bus bar adjacent each cross bus bar, at least one terminal clip being secured to each of said cross bus bars to cooperate with each of said first clips, whereby any one of said longitudinal bus bars may be connected to any one of said cross bus bars, and an individual cover for each of said cross bus bars and the terminal clips associated therewith, said covers being in substantial abutment whereby said bus bars are completely enclosed.

6. A potential distributing block, comprising an insulating block having a number of bus bars extending longitudinally thereof, a plurality of cross bus bars extending transversely of said longitudinal bus bars and insulated therefrom, said longitudinal bus bars having a clip secured thereto adjacent each of said cross bus bars, each of said cross bus bars having at least one clip secured thereto and arranged to cooperate with the adjacent clip on a plurality of the longitudinal bus bars whereby any one of said longitudinal bus bars may be connected to any one of said cross bus bars.

7. A potential distributing block comprising a base, an insulating block secured thereto, a plurality of channels extending longitudinally along said block, a bus bar in each of said channels, a plurality of cross bars extending transversely of said longitudinal bus bars at intervals and insulated therefrom, and a cover for enclosing said bus bars and apertured to receive means for connecting any of said longitudinal bus bars with any of said cross bus bars.

8. A potential distributing block comprising a base, an insulating block secured thereto, a plurality of bus bars extending longitudinally of said block, a plurality of cross bus bars extending transversely of said longitudinal bus bars at intervals and insulated therefrom, and a cover for enclosing said bus bars and apertured to receive means for connecting any one of said longitudinal bus bars with any one of said cross bus bars.

9. A potential distributing block comprising a base, an insulating block secured thereto, a plurality of bus bars extending longitudinally of said block, a plurality of cross bus bars extending transversely of said longitudinal bus bars at intervals and insulated therefrom, a cover for said bus bars having apertures therein and a resistance unit having terminals insertable through said apertures into contact with said bus bars to join desired of said cross and longitudinal bus bars through said resistance.

10. In combination, a potential distributing block comprising a plurality of longitudinal bus bars and a plurality of cross bus bars, terminal clips for said bus bars, and resistance means insertable in said clips to join desired of said cross and longitudinal bus bars, through said resistance.

11. In a telegraph switchboard, a plurality of line circuits terminating at the board, potential connections for each of said circuits at the board comprising a potential distributing block and means associated therewith for simultaneously connecting desired of said circuits to a desired potential condition and inserting a current limiting device in said line circuits.

12. In a telegraph switchboard, a plurality of line circuits terminating at the board, potential connections for each of said circuits comprising a potential distributing

block having a plurality of bus bars and means associated with said block for simultaneously connecting desired of said circuits to a desired bus bar and inserting current limiting means in said line circuits.

13. In a telegraph switchboard, a plurality of line circuits terminating at the board, potential connections for each of said circuits comprising a potential distributing block having a plurality of longitudinal bus bars connected to different potential conditions, an individual cross bus bar connected to each of said line circuits, quick detachable means associated with said block for connecting any one of said longitudinal bus bars with any one of said cross bus bars, a loop circuit, and means independent of said potential distributing block for completing each of said line circuits through said loop circuit.

14. In a telegraph switchboard, a plurality of line circuits terminating at the board, potential connections for each of said circuits comprising a potential distributing block having a plurality of longitudinal bus bars connected to different potential conditions, an individual cross bus bar connected to each of said circuits, and quick detachable means associated with said block for simultaneously connecting any one of said longitudinal bus bars with any one of said cross bus bars, and connecting a resistance in any of said line circuits.

In testimony whereof we affix our signatures.

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