

Nov. 19, 1929.

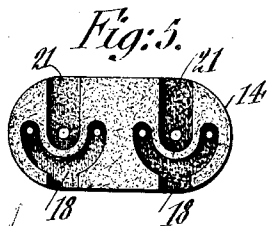
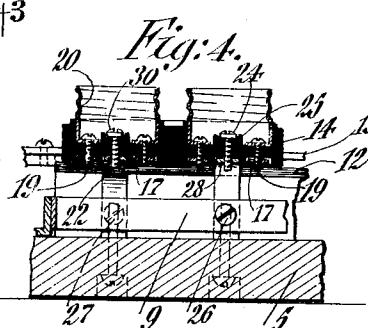
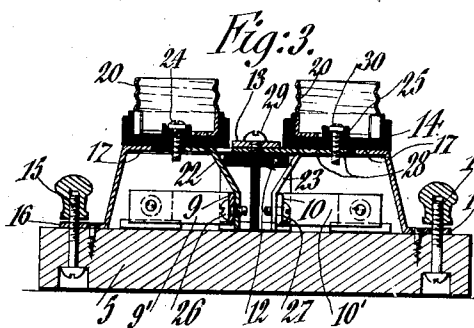
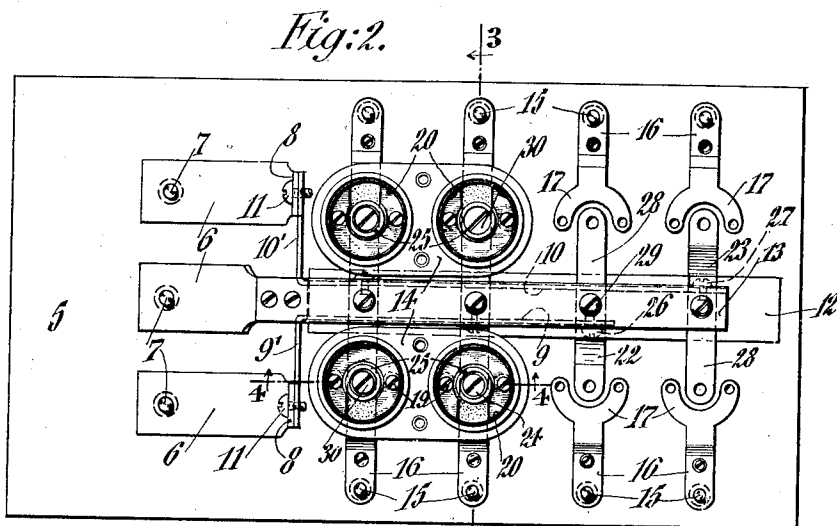
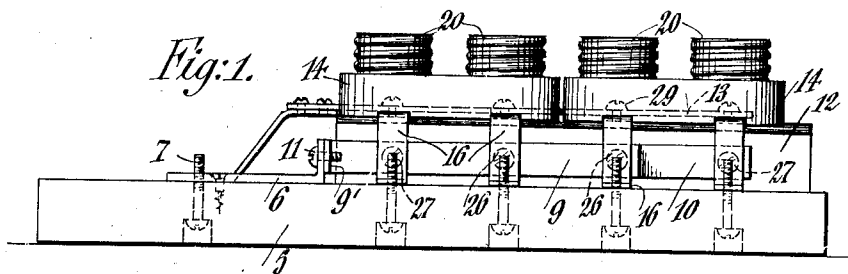
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1,736,028

ELECTRIC PANEL OR DISTRIBUTION BOARD

Filed Oct. 21, 1922

2 Sheets-Sheet 1



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Fig. 6.

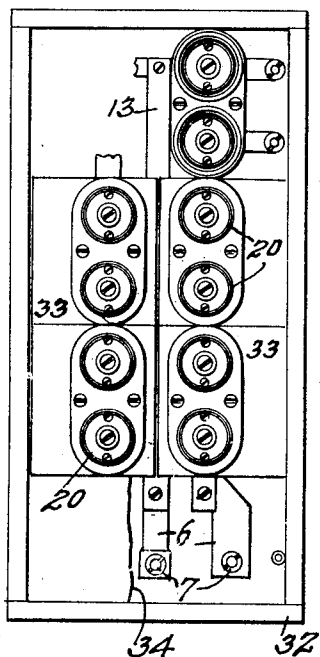


Fig. 7.

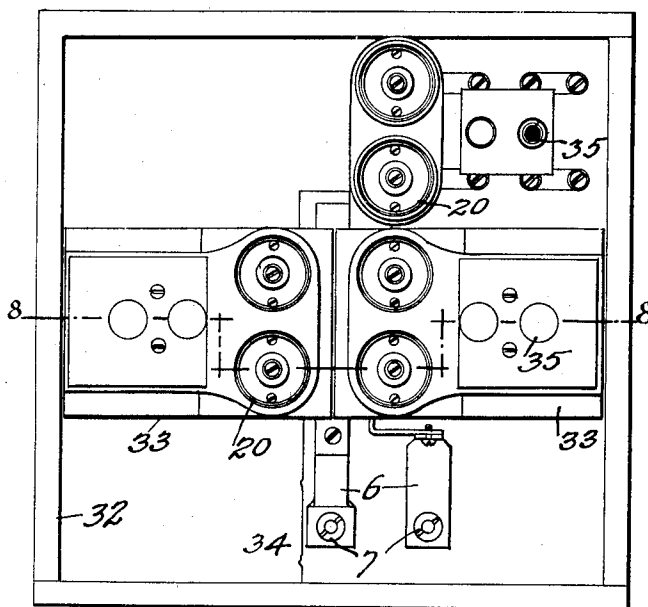
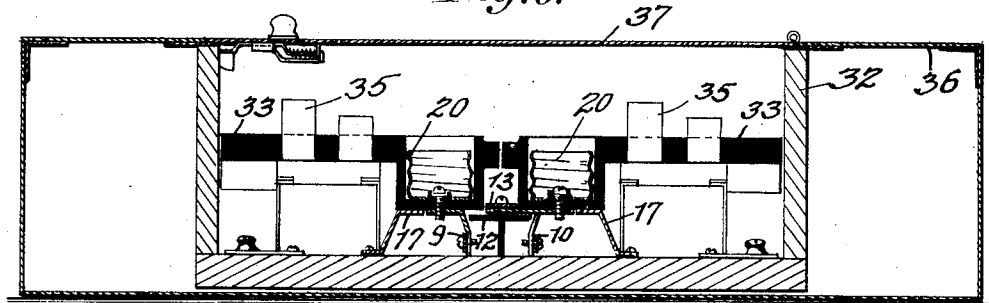


Fig. 8.



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ELECTRIC PANEL OR DISTRIBUTION BOARD

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This invention relates to electric panel or distribution boards and has for its primary object to provide an improved arrangement of the bus-bars and circuit connections between said bus-bars, the fuse plug receptacles and the branch line terminals in a device of this character.

More particularly, my present invention comprehends an improved arrangement of the fuse plug receptacles whereby the circuit connections between the bus-bars and the branch line terminals are utilized for the purpose of supporting the receptacles in an elevated position with respect to the base of the panel board and above the plane of the bus-bars.

It is also another object of the invention to provide simple and thoroughly effective means for insulating the several bus-bars of a three-wire distributing system and their connections to the fuse plug receptacles from each other.

As a detail item of improvement, I provide a double or single insulating base for the fuse plug receptacles having certain novel structural features whereby the mounting and connection of said receptacle bases upon the circuit connections with the bus-bars and branch line terminals or their disconnection therefrom may be facilitated.

In general, I aim to provide an electric panel or distribution board wherein the several parts are substantially constructed and very compactly arranged in such manner as to provide for the mounting of a board of maximum capacity in a relatively small space and with a minimum possibility of short-circuiting.

With the above and other objects in view, the invention consists in the improved panel board construction and in the form, construction and relative arrangement of the several parts thereof as will be hereinafter more fully described, illustrated in the accompanying drawings and subsequently incorporated in the subjoined claims.

In the drawings wherein I have shown one simple and satisfactory embodiment of the invention and in which similar reference

characters designate corresponding parts throughout the several views:

Figure 1 is a side elevation of a panel board constructed in accordance with the present invention;

Figure 2 is a plan view thereof;

Figure 3 is a section taken on the line 3—3 of Fig. 2;

Figure 4 is a section taken on the line 4—4 of Fig. 2;

Figure 5 is an inverted plan view of one of the base members for the fuse plug receptacles;

Figure 6 is an elevation showing my present invention assembled for use as a metering panel, certain parts being omitted;

Figure 7 is a similar view showing another installation of a metering panel wherein suitable switches are included; and,

Figure 8 is a sectional view taken on the line 8—8 of Figure 7.

In the accompanying drawing wherein I have illustrated the present invention as applied to a three-wire electrical distribution system, the base 5 of the panel may be of slate or other suitable insulating material and may be of any desired dimensions, in accordance with the required capacity for the particular installation. Upon this insulating base the spaced metal terminal members 6 for the main line wires are arranged and suitably secured, each of said members having associated therewith a suitable binding post 7. The two outer terminal members 6 terminate at one of their ends in upstanding ears 8 to which the angularly disposed end portions 9' and 10' of the bus-bars 9 and 10 respectively, are rigidly fixed, as by means of the screws or analogous fastening element 11. Heretofore, it has been customary to arrange these bus-bars which are connected to opposite poles of the circuit in parallel relation to the panel base and in contact with the upper surface thereof. In my present construction, however, I dispose said bus-bars in parallel relation to each other but in vertical planes at right angles or on edge with respect to the surface of the base 5 and preferably, slightly spaced at their lower edges from said base. These bus-bars are spaced

apart a suitable distance so that there is no danger of short-circuiting, but as a further precaution, I dispose between the spaced bus-bars a strip or bar of insulating material 12. This insulating strip is preferably of T shaped form, as clearly seen in Figure 3 of the drawing, and the horizontal head portion thereof is disposed beneath a third neutral bus-bar 13, positioned above and between the spaced bus-bars 9 and 10 and disposed in a horizontal plane parallel with the surface of the base 5. This third bus-bar is connected at one of its ends to the intermediate main line terminal member 6.

The fuse plug receptacles are preferably arranged in pairs, each pair of receptacles being mounted in a common base member 14 of insulating material. These fuse plug receptacles are connected to the branch line terminals 15 arranged in series on opposite sides of the bus-bars by means of the terminal pieces 16. From reference to Figure 3 it will be seen that each of these terminal pieces is in the form of a metal strip which is angularly bent at its opposite ends, one end portion of the strip being engaged with the branch line terminal or binding post 15. The other angular end portion of the terminal piece 16 is of substantially semi-circular form, as shown at 17, and is adapted for engagement in a channel or groove 18 of corresponding form which is provided in the under side of the receptacle base 14 at its end. The extremities of the portion 17 of the terminal piece are apertured and threaded to receive screws 19 extending through the bottom plate of the metal receptacle shell 20 and through the insulating base 14, whereby said shell is electrically connected with the terminal piece. The insulating base 14 is further provided in its underside and in opposed relation to each of the semi-circular grooves or recesses 18 with a transversely extending groove or channel 21, the purpose of which will be presently described.

Preferably, though not necessarily, the alternate branch line terminals 15 on each side of the panel board will be of one polarity, while the remaining terminals in the series will be of the opposite polarity. Accordingly, one of the receptacles in each pair on one side of the board is connected to the bus-bar 9 and one receptacle in each pair at the opposite side of the board is connected to the bus-bar 10. The remaining receptacles are connected to the third bus-bar 13. In the present instance I have shown the connections with the bus-bars 9 and 10 in the form of metal bars or straps 22 and 23, respectively. The intermediate portions of these metal bars extend outwardly above the bus-bars at an oblique angle. Each connecting bar or strap is engaged at one of its ends in one of the transverse channels or grooves 21 of a receptacle base 14, said end of the strap hav-

ing a threaded opening to receive a central contact screw 24 extending through a raised boss 25 on the receptacle base 14 which insulates said screw from the metal shell 20. The other ends of the straps 22 are engaged against one side of the bus-bar 9 and secured thereto by means of screws 26, while the corresponding ends of the straps 23 are similarly engaged with the bus-bar 10 and secured by means of screws 27.

It will be noted from reference to Figure 3 of the drawing that the head of the T shaped insulation bar 12 is interposed between the bus-bar 13 and the connections 22 and 23, thus effectively insulating said bus-bar from the bus-bars 9 and 10. Metal straps 28 are fixed at one of their ends to the bus-bar 13 by the screws 29, said straps extending in opposite directions from the bus-bar and being engaged at their other ends in the second transverse groove or channel 21 in each receptacle base 14. The latter ends of these straps have threaded openings to receive the contact screws 30 of the remaining receptacles.

From the above it will be seen that when a fuse plug is threaded in one of the receptacles connected for instance, to the bus-bar 9, so that a connection is made between the metal shell of the receptacle and the screw 24, a circuit is closed from the bus-bar through the connection 22 through the screw 24, the fuses in the plug, the shell 20, screws 19, to the branch line terminal piece 16. The circuit is also closed through the other bus-bar 10 in a similar manner, and when a plug is inserted in one of the receptacles connected to the bus-bar 13, the circuit is closed from said bar through the strap 28, screw 30, the fuses in the plug, the receptacle shell, the screw 19 to another of the branch line terminal pieces 16. However, it is to be understood that while I have in this instance described the invention as used in connection with a three-wire distribution system, it may nevertheless be also advantageously used in a two-wire system and also that the number of fuse plug receptacles might be increased ad-infinitum to the extent required for any particular installation. It will be appreciated from the foregoing description that while I obtain a compact arrangement of the fuse plug receptacles, I have at the same time so arranged or positioned the receptacles relative to the bus-bars that connections of a relatively simple character can be employed. It will be observed that these connections serve as the immediate means of support for the receptacles and permit of the detachment of the receptacles and their insulating bases without necessitating also the removal or detachment of the conductor elements from the bus-bars or the panel base.

It will also be observed that the insulating bases for the fuse plug receptacles constructed

as herein described provides for the effective insulation of the branch line terminal pieces and the bus-bar connections from each other. By reason of the arrangement herein disclosed, maximum separation between the terminals of different polarity is obtained so that danger of short-circuiting by accumulation of dust or moisture upon the current conducting elements is reduced to a minimum.

In Figures 6, 7 and 8 of the drawings I have illustrated several embodiments of the present invention designed for use as metering panels. In Figure 6 the bus-bars and fuse plug receptacles are mounted within a box or casing 32 which is provided with the usual hinge door or cover (not shown). With each pair of fuse plug receptacles there is associated a section or slab of insulation material 33 and a similar slab of insulation material 34 extends over the main line terminals of the bus-bars. These insulating sections or slabs are closely engaged with the box walls so that they completely cover the bus-bars, branch line terminals and all other live parts. Thus any one of the fuses may be removed without liability of the hand coming in contact with electrically charged elements of the device. It will be noted that in the arrangement shown in Fig. 6 a metering panel of minimum width is provided so that it will occupy a relatively small area in the wall of the building.

In Figures 7 and 8 of the drawing I have illustrated another installation of my present invention wherein a switch 35 of the push button type is provided for each of the circuits, said switch being mounted beneath the insulating slab or section 33 and the push buttons projecting through openings provided therein. In this embodiment of the device the box or casing 32 is mounted within an outer metallic casing 36 having a hinged door 37 which, when in its closed position, covers the open side of the panel.

While I have herein shown and described one simple, practical and efficient construction of my present invention, it is nevertheless to be understood that the device is susceptible of embodiment in many alternative structures and I accordingly reserve the privilege of resorting to all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. In a panel board, bus-bars, a plurality of fuse plug receptacles disposed at opposite sides of the bus-bars and positioned out of the horizontal and vertical planes of the bus-bars, current distributing connections between each series of receptacles and one of the bus-bars, and branch line terminal pieces connected to the receptacles, said terminal pieces and the bus-bar connections constituting supporting means for the receptacles.

2. In a panel board, a base, spaced bus-bars extending over said base in planes at right angles to the surface thereof, a plurality of fuse plug receptacles positioned at the outer side and above the upper edge of each bus-bar, current distributors connected to each bus-bar and branch line terminal pieces connected to and supporting the receptacles.

3. In a panel board, a base, spaced bus-bars extending over said base in a plane at right angles to the surface thereof, a plurality of fuse plug receptacles positioned at the outer side and above the plane of each bus-bar, current distributors connected to each bus-bar, means insulating the spaced bus-bars and their current distributors from each other, and branch line terminal pieces connected to and supporting the receptacles.

4. In a panel board for three-wire distribution systems, a base, spaced bus-bars extending over said base, a third bus-bar mounted upon the base in superposed spaced relation to the first mentioned bus-bars, a plurality of fuse plug receptacles at opposite sides of said bus-bars, current distributing connections from each of the first named bus-bars to certain of the receptacles in one series, connections between the third bus-bar and the remaining receptacles in each series, and branch line terminal pieces connected to the receptacles, said terminal pieces and the current distributing connections supporting the fuse plug receptacles in an elevated position above the plane of the first named bus-bars.

5. In a panel board for three-wire distribution systems, a base, spaced bus-bars extending over said base, a third bus-bar mounted upon the base in superposed spaced relation to the first named bus-bars, a plurality of fuse plug receptacles at opposite sides of said bus-bars, current distributing connections from each bus-bar to certain of the receptacles in one series, connections between the third bus-bar and the remaining receptacles in each series, a longitudinally extending strip of insulating material interposed between the first named bus-bars, the current distributing connections thereof and the said third bus-bar, and branch line terminal pieces connected to the receptacles, said terminal pieces and the current distributing connections supporting the fuse plug receptacles in an elevated position above the plane of the first-named bus-bars.

6. In a panel board, a bus-bar, a fuse plug receptacle having a base of insulating material and a threaded shell seated therein, a distributor bar connected to the bus-bar, a branch line terminal piece, the underside of the receptacle base being recessed to receive parts of the distributor bar and of the branch line terminal piece whereby they are insulated from each other, means securing said shell in the base and electrically connecting the same

with said branch line terminal piece, and a fuse plug engaging contact extending through the receptacle base and connected to said distributor bar, said bar and the branch line terminal piece supporting the fuse plug receptacle in an elevated position on the panel board and out of the plane of the bus-bar.

7. A panel board comprising a base of insulating material, spaced bus bars extending across said base and separated therefrom, terminals carried by the base on the outside of the bus-bars, terminal pieces connected to the terminals and extending upwardly above the plane of the bus-bars, fuse plugs supported by the terminal pieces and current distributors connected to the bus-bars, and metal straps connecting the bus-bars and the fuse plug receptacles.

8. A panel board for three wire distributing systems, comprising a base, two spaced bus-bars extending over said base, a third bus-bar mounted upon the base in superposed relation to the first mentioned bus-bars, terminals carried by the base, terminal pieces connected to the terminals and extending upwardly substantially in a plane with the superposed bus-bars, a series of fuse plug receptacles supported by the terminal pieces on each side of said bus-bars, current distribution connections from the third bus-bar to certain plug receptacles in each series, connections between the first mentioned bus-bars and the remaining receptacles in each series whereby the fuse plug receptacles are supported above the first mentioned bus-bars in an elevated position in spaced relation from the base.

9. A panel board comprising a base, a pair of bus bars disposed on edge with respect to the base and relatively close together, extending along the base, fuse plug receptacles disposed above the bus bars, the receptacles being relatively close to each other, connections between the receptacles and the bus bars, a third bus bar on said panel but spaced therefrom and disposed substantially between the receptacles at the sides of the first-named bus bars, and insulation between the bus bars and connections, the bus bars, receptacles and connections being in proximity over the extent of said panel board.

10. A panel board comprising a base, bus bars extending along the base and all disposed relatively close together, one of said bars being farther from the panel than the remainder, and the remainder being on edge with respect to the base, fuse plug receptacles at each side of the bus bars, the receptacles on one side of the bus bars being relatively close to those on the other side, connections between the bus bars and the receptacles and insulation between the bus bars and said connections, the bus bars, receptacles and connections thus being in proximity over the extent of said board.

11. A panel board comprising a base, bus bars all disposed relatively close together extending along the base, one of said bars being farther from the panel than the remainder, and the remainder being on edge with respect to the base, receptacles supported on the base and spaced therefrom, said receptacles being disposed at both sides of said bus bars, the receptacles at one side being relatively close to those on the opposite side, connections between the bus bars and receptacles and insulation between the bus bars and connections.

12. A panel board comprising a base, a pair of bus bars extending along the base and arranged on edge with respect to the base and relatively close together, a third bus bar adjacent the first named bus bars, receptacles at both sides of said bus bars, the third bus bar and said receptacles being spaced from the base, the other bus bars lying between the panel and the receptacles and third bus bar, the receptacles at one side of the bus bars being relatively close to those on the opposite side, connections between the bus bars and receptacles and insulation between said bus bars and said connections.

In testimony that I claim the foregoing as my invention, I have signed my name hereunder.

FREDERICK O. WINKLEHAUS.