

Sept. 1, 1959

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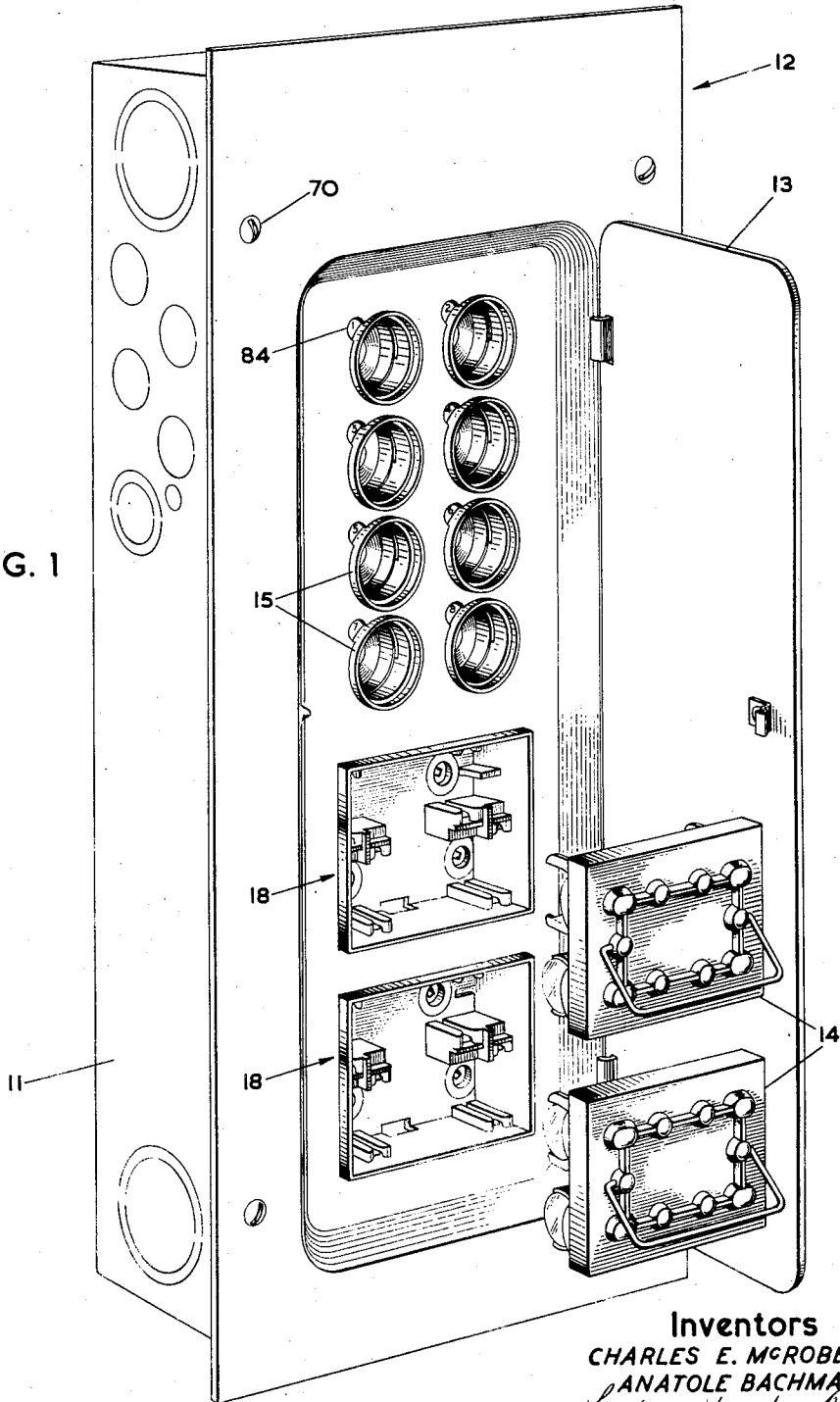
2,902,631

PANEL BOARD ASSEMBLY

Filed May 29, 1956

4 Sheets-Sheet 1

FIG. 1



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4 Sheets-Sheet 2

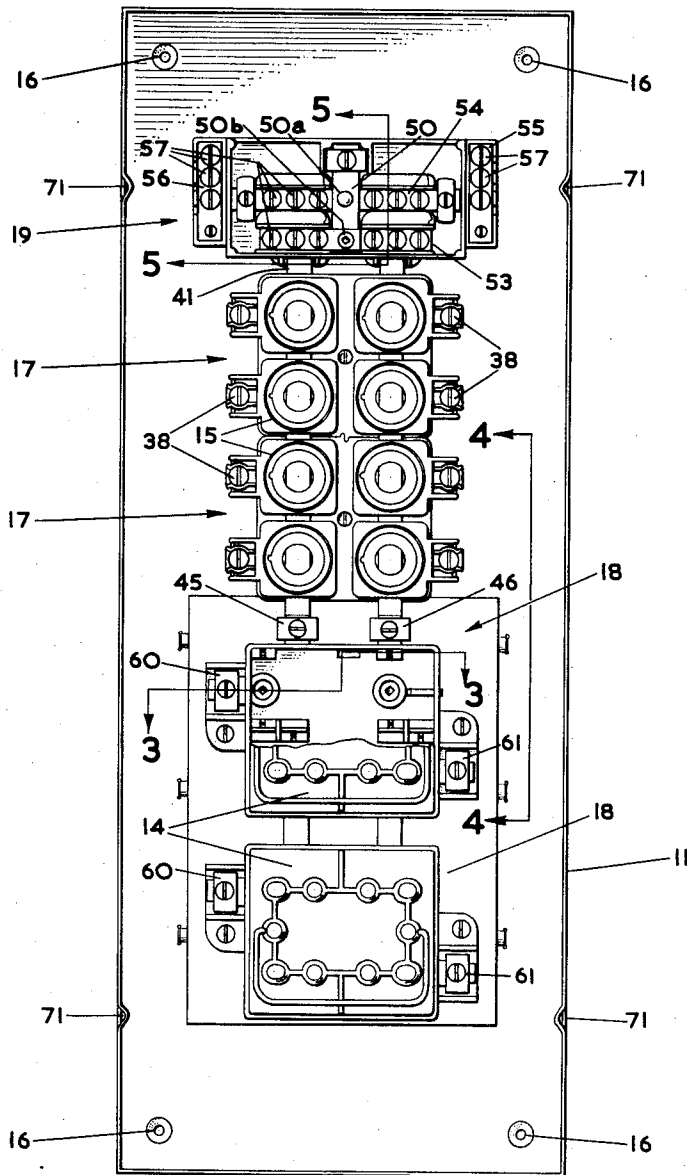


FIG. 2

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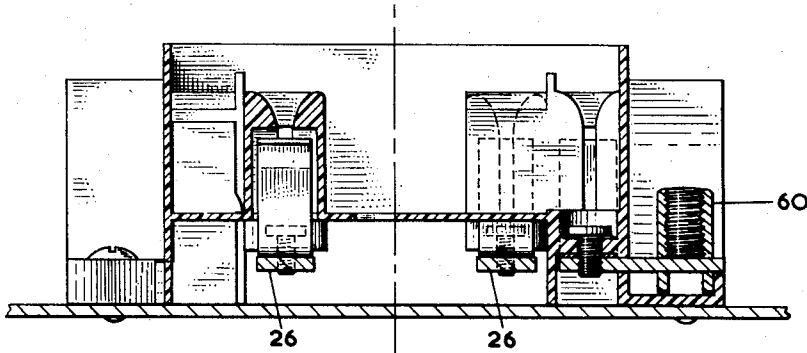


FIG. 3

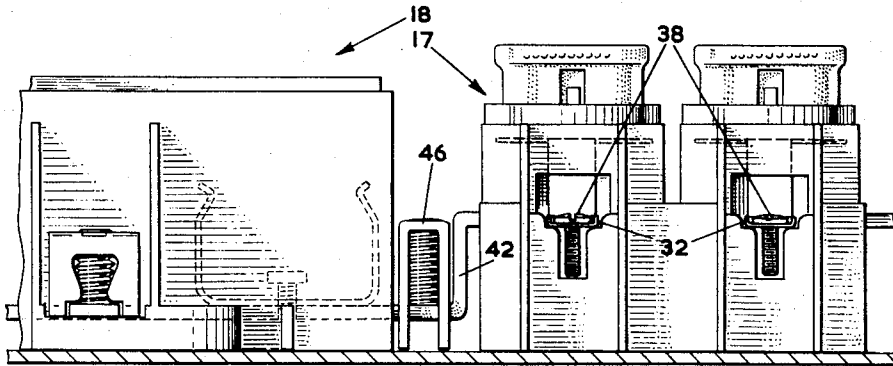


FIG. 4

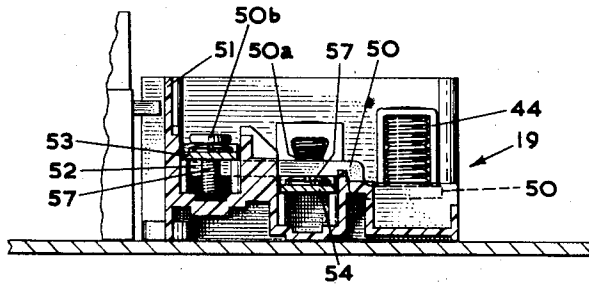


FIG. 5

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FIG. 6

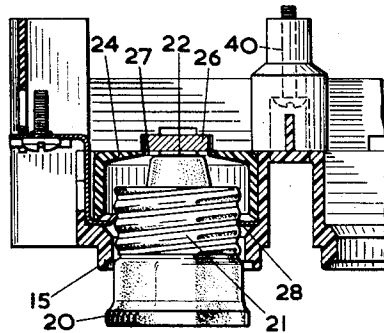
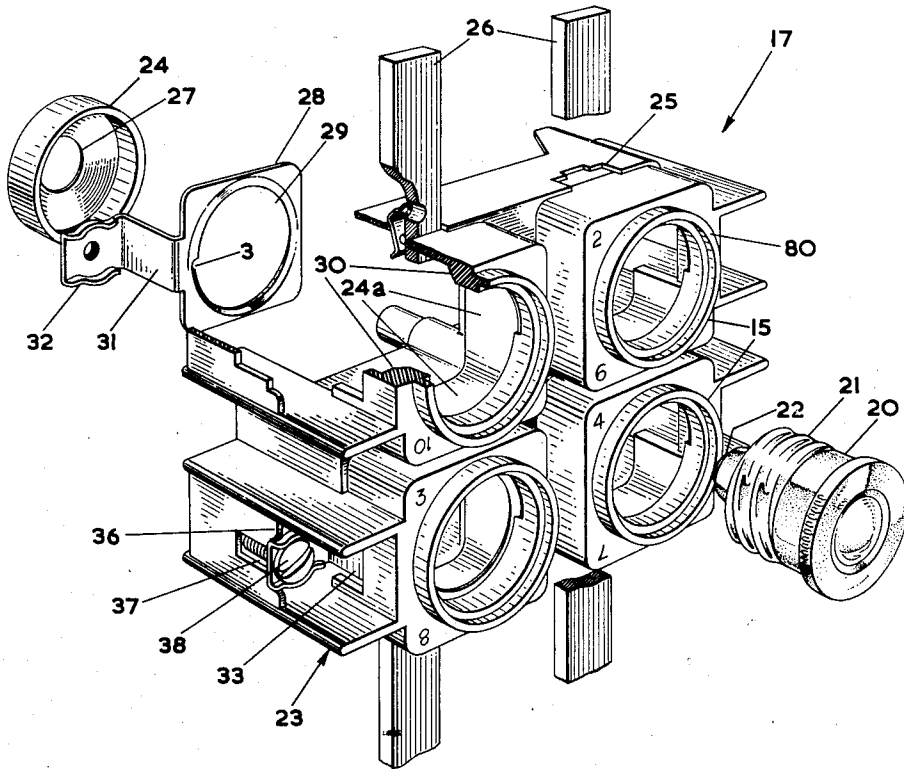


FIG. 7

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PANEL BOARD ASSEMBLY

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7 Claims. (Cl. 317—116)

This invention relates to the electrical connection of an electrical component such as a fuse into an electrical circuit and to a panel board assembly.

In the wiring of houses it is common to terminate all of the individual circuits, in a panel board assembly, to which the electricity supply from the utility is conducted. This application is concerned with the connection of elements such as plug fuses into such an assembly and with the assembly in general.

It is an object of the invention to provide a panel board construction that is economical to manufacture and efficient in use.

The assembly has a terminal block of an insulating material formed with sockets to receive the plug fuses. A first contact in the terminal box underlies the sockets and is accessible therefrom through a hole in the bottom thereof. The second contact which engages the shell of the plug fuse or like electrical component is carried by the wall of the socket.

The contact carried by the wall of the socket can be formed from a plate having a hole therethrough, the marginal edges of which are formed with a pitch to receive the threaded shell of a fuse or like electrical component. Terminals are, of course, provided for making exterior contacts to the block.

In addition, a numbering system for the sockets on the blocks is provided wherein the cover for the box in which the block is mounted is formed with holes through which the sockets are accessible. The marginal edges of the holes being formed with windows through which identifying marks related to the sockets carried by the box are visible. By means of placing the blocks that go to make up a complete assembly in different positions relative to each other, various series of numbers can be caused to be exposed through the windows and the series can be arranged to be continuous.

The invention will be clearly understood after reference to the following detailed specification in conjunction with the drawings.

In the drawings:

Figure 1 is a perspective view of a panel board assembly of the type commonly used in the wiring of houses and the like.

Figure 2 is a view of the same assembly with the cover removed.

Figure 3 is a sectional view along 3—3 of Figure 2

Figure 4 is a view along the line 4—4 of Figure 2.

Figure 5 is a view along the line 5—5 of Figure 2, and

Figure 6 is an exploded perspective view of a block of a multiple plug fuse receptacle of the panel board assembly illustrated.

Figure 7 is a sectional view of one of the sockets of the block of Figure 6 when assembled.

Referring to the drawings:

The numeral 10 generally indicates a panel board assembly of the type commonly used. It comprises a box 11 having cover means generally indicated by the numeral 12 and provided with a door 13 through which

cartridge fuse cutout units 14 and plug fuse sockets 15 (and, of course, plug fuse when inserted), are accessible. The cover means will be referred to in further detail later.

In Figure 2 the box 11 with the cover means removed is illustrated. The box in use is adapted to be mounted on a wall or the like by means of screws that pass through holes 16 in the usual manner.

An electrical assembly is mounted within the box which in the illustration of the drawings comprises two multiple receptacles generally indicated by the numeral 17 each of which has four sockets 15 adapted to receive the threaded shells of plug fuses of the standard type, two pull fuse cutout receptacles generally indicated by the numeral 18 each adapted to receive a cartridge pull fuse cutout unit 14 of the type generally employed to limit the flow of current in heavier household circuits, and a neutral block assembly generally indicated by the numeral 19, for terminating the neutral side of each of the circuits wired into the box according to standard practice. The interconnection of the various units comprising the assembly will be referred to later.

The receptacles for the plug fuses are of considerable interest and perhaps best illustrated in Figure 6 of the drawings. These receptacles are each formed with four sockets 15 that are adapted to receive therein plug fuses 20.

Plug fuses 20 are of standard design and have a threaded shell 21 which serves as one electrical contact therefor and a plug 22 which serves as the other electrical contact therefor, whereby electricity is conducted therethrough in use. A current overload causes rupture of the passage through the fuse as is well known.

The receptacle, generally indicated by the numeral 17, comprises a shell-like block generally indicated by the numeral 23 made from an electricity insulating material such as plastic and formed with four sockets 15 adapted to threadedly receive the plastic fuse members 20 therein as aforesaid.

The bottom portion of each socket 15 of the block 23 is formed separately as a cup member 24.

The block 23 is formed also with aligned through holes such as the one 25, to permit the passage of the bus bars 26 (to be referred to in more detail later) which are supported thereby and act as contact means.

The sides of cup members 24 are engaged by the walls 24a of the shell and the bottom of the cup members are engaged by the bus bars 26 whereby they are held in position. It will be noted that the cup members 24 are formed with holes in their bottoms through which the bus bars 26 over which they lay are accessible.

The bus bars 26, accessible through the holes 27 in the bottoms of the cup members 24 of each the sockets 15 functions as the first contact member for their respective sockets. A second contact member is carried by the wall of each socket and in the embodiment of the invention illustrated comprises a plate 28 formed with a hole 29 and retained in position between the shoulder 30 of the block and the edge of the cup member 24.

The marginal edge portion of the hole is formed with a notch as at 3 and is given a pitch, extending in both directions therefrom, so that it can threadedly engage with the threaded shell 21 of the plug fuse 20 and make electrical connection therewith. The base contact of the fuse 20 extends into the socket to pass through the hole 27 and make electrical connection with bus bar 26. This will be referred to in more detail later. It will be noted that the edge of the cup member 24 and the shoulder 30 are formed with complementary pitches corresponding to the pitch given to the marginal edge portions of the plates 28.

The plate 28 is formed integrally with a strip 31 which extends therefrom and terminates in an electrical termi-

nal member 32. The block 23 is formed with openings 33 that communicate with the socket openings 15 and permit the conducting strip 31, and hence the terminal 32 of the plates to be accessible from the exterior of the block 23.

All four sockets 15 of the block 23 are similar and an assembly detail is shown in Figure 7, which is a partial sectional view of one of the sockets 15 of the block 23.

In Figure 6, the block 23 has been illustrated with no cup members 24 in place. It will be appreciated that there is a cup member and a contact member for each of the four sockets 15 illustrated.

To assemble the block the bus bars 26 are withdrawn from the position illustrated in Figure 6. The contact plate 28 is then inserted from the back of the block into the opening defined by the walls 24A and is located thereby whereby the pitched marginal portion of the hole 29 thereof projects inwardly of the wall of the socket opening 15. It will be noted that the terminal 32 on the free end of the strip 31, is accessible from the side exterior of the block by reason of its extension through the side hole 33. Terminal 32 rests upon the seat 36, which is undercut as at 37, to permit the terminal connecting screw 38 to be tightened thereagainst in use. The cup 24 also inserted into the hole defined by internal walls 24a, is retained in position with its edges against plate 28 by means of the bus bar 26 which is reinserted into aligned holes 25 in the block 23 as illustrated in Figure 6 to abut with the underside of the cup member and urge its edges into contact with the plate as illustrated in Figure 6.

In the Figure 7, we have illustrated a fuse 20 in the socket 15 of the receptacle from which it will be noted that the pitch given to the marginal edges of the plate contact 28 corresponds to the pitch on the threaded shell 21 of the fuse 20 and that the base contact 22 of the fuse 20 extends through the opening 27 in the bottom of the cup member 24 to make electrical contact with the bus bar 26.

The screw 40 passes through the block to mount it rigidly within the box 11.

In the assembly illustrated two four-socket blocks have been mounted on the parallel spaced apart bus bars 26. In addition, as indicated above, a neutral block 19, and two pull fuse cutout receptacles 18 have been mounted in the box. Figures 3 to 5 inclusive illustrate the manner of mounting these components in the assembly. Bus bars 26 extend from the insulated neutral block as at 41, through the two plug fuse receptacles 17, are bent as indicated at 42 in Figure 4 and continue to extend through the pull fuse cutout receptacles 18, within which they terminate on the insulated casings thereof. In effect, two bus bars serve all receptacles.

In use, with the usual incoming electricity supply from a utility wherein three wires are provided (one being a neutral and the other two being say 220 volts different in potential and each 110 volts different in potential with respect to the neutral wire), the neutral wire is securely connected to the terminal contact 44 of the neutral block 19, one of the other two wires is connected to the terminal contact 45 and the remaining wire is connected to the terminal contact 46.

Neutral block 19 is suitably mounted in the box 11 and is made from an electrical insulating material such as plastic on which is mounted a central bus bar 50, one free end of which seats in the plastic body 51 thereof as at 52 and the other free end of which is disposed in a pocket at the forward end thereof. A rivet 50a holds it in place on the body 50. Connection of the neutral supply wire is effected by means of the standard U-shaped clamp connector 44, which unites with the latter mentioned free end of the bus 50. Two transverse bus bars 53 and 54 are provided, which are both in electrical connection through contact with the bus 50. Screw 50b holds bus 53 in position. At each side of the casing longitudinally extending buses 55 and 56 are mounted.

It is electrically connected, and hence grounded, to the box 11, by its mounting bolt. All of the buses 50, 53 and 54 carried by the neutral block 19 then, are electrically connected with each other and at the same potential. Buses 55 and 56 are grounded. The buses 53 to 56 inclusive, have a plurality of terminal screws 57, by means of which circuit wires can be electrically connected to the neutral block.

It will be apparent that a difference in electrical potential of 110 volts exists between either of the bus bars 26 and any terminal 57 on the neutral block 19, and, according to standard practice, in order to obtain current for a circuit requiring 110 volts, the two ends of the circuit are connected between a terminal 57 on the neutral block and terminal 38, connected with one of the sockets of the assembly 17. It will be apparent that when a fuse 20 is inserted into such a socket that electrical connection between the bus bar 26 and the terminal 32 can be established if the fuse is operable.

With the terminal block it is, of course, possible to have as many individual circuits as there are receptacles, and a neutral terminal 57 is provided for each of the sockets of the multiple assembly 17 and for each of the pull out fuse units 14.

Pull out fuse units 14 are designed for circuits requiring 220 volts. It will be noted that terminals 60 and 61 are provided on each side of each assembly. These terminals each connect with the bus bars 26 electrically, through a fuse of the pull out fuse unit 14, in a manner well known in the art. In such a fashion, a 220 volt supply is obtained. All 220 volt circuits should, of course, be appropriately grounded and a terminal 57 is provided on the neutral block 19 for each pull fuse circuit. The manner of wiring such circuits and the electrical connections made in the assembly box are well known in the art and need not be referred to in further detail in this specification.

The cover 12 of the box 11 is secured thereto by means of screws 70, which pass through and thread into threaded formations 71 of well known design, in the side of the box.

Cover 12 in combination with the plug fuse units 17 is of considerable interest in so far as the numbering method for the sockets 15 is concerned.

It is common to number each circuit wired into the box for example the circuit passing through the upper left socket, would be circuit number 1, the circuit passing through the upper right socket, might be circuit number 2. Circuit number 3 would be the circuit passing through the socket below number 1, and circuit number 4 would be the circuit passing through the circuit below number 2, and so on, as illustrated in Figure 1 of the drawings.

The terminals 57 on the neutral block are also numbered so that if the box is correctly wired originally one can, by comparing numbers, determine which wires in the box refer to which particular circuit.

We have devised a novel manner of numbering the sockets 15 of the unit.

Each of the sockets 15 is formed with an upstanding flange 80, that extends from the front surface of the block 23. Block 23 carries two series of numbers, one of which can be read when the block is held in one position, and the other of which can be read when the block is turned through 180° with its face in the same plane. The cover 12 is formed with a series of holes through which the flanges 80 extend, when it is in position, and it is also formed with a series of notches or windows 84, through which the numbers carried by the block are visible. It will be apparent that when two blocks 23 are used on an assembly, that if one block is inserted such that the series of numbers 1, 2, 3, 4, is visible through the opening 24, that the other block can be turned through 180° such that the series 7, 8, 9, and 10, are visible through the openings 84. In this fashion,

It is possible to provide a box having 8 numbered sockets with only one system of numbering for the blocks. In other words, it is not necessary to stock blocks carrying numbers 1 to 4 only, and 5 to 8 only, since all numbers can be put on all blocks.

It would, of course, be possible to provide for numbering higher than 8 where more than two blocks 17 are included in an assembly. In such a case, the cover 12 would be made with openings such as the openings 84, but such additional openings would not be in the same position on the edge of the cover hole whereby to expose a different marginal portion of the hole of the socket 15. A different series of numbers would, of course, be carried by the block for view through the second series of notches similar to the notches 84. Again the blocks would carry two series of numbers which read correctly when the blocks are in positions 180° apart but in the same plane.

We claim:

1. In a panel board assembly for fuses or the like, a mounting means, a block carried by said mounting means of an insulating material, said block having a plurality of sockets therein adapted to threadedly receive fuses or the like, said sockets being arranged in a series, the sockets of said series being in alignment with each other, a bus bar for said series, said block being formed with an opening having its longitudinal axis underlying said series of said sockets, said opening having a cross section to slidably receive said bus bar whereby said bus bar can be caused to enter said opening and underlie a series of said sockets and be restrained against all movement at right angles to its longitudinal axis, said bus bar extending through said opening to underlie said series of sockets, means for restraining said bus bar against sliding movement within said opening with respect to said block, said sockets each being formed with a bottom opening through which said bus bar is directly accessible to make electrical contact therewith, wall contact means for each of said sockets formed separately from said block for mounting therein, said wall contact means each being mounted in said block with a wall contact disposed on the side wall of its respective sockets, terminal means for said bus bar, terminal means for the wall contact means of said sockets, said block comprising a plurality of sections, the side wall of each socket of said series of sockets being comprised of two sections of said block, said two sections of said block being adapted jointly to hold said wall contact captive supported in said block as aforesaid with the wall contact thereof on the side wall of its respective socket as aforesaid.

2. An assembly as claimed in claim 1 in which the plurality of sections of said block includes at least one main body portion and a cup for each of said sockets, each cup co-operating with a main body portion to form its respective socket, the bottom of each cup being the bottom of its respective socket, said bus bar underlying said series of sockets as aforesaid in engagement with the bottom of said cups to maintain them in position with respect to a main body portion, said wall contact means of said sockets each being held captive as aforesaid between the edge of the cup of its respective socket and a main body portion.

3. An assembly as claimed in claim 1 in which the plurality of sections of said block includes at least one main body portion and a cup for each of said sockets, each cup co-operating with a main body portion to form its respective socket, the bottom of each cup being the bottom of its respective socket, said bus bar underlying said series of sockets as aforesaid whereby to engage with the bottom of said cups and maintain them in position with respect to a body portion, said wall contact means of said sockets each being held captive as aforesaid by the opposed edge of the cup of its respective socket and a main body portion, and in which said wall contact and said terminal for said wall contact of

each of said sockets are portions of an integral formation, said wall contact portion of said integral formation being a plate with a hole formed therein, said hole being substantially round and having a notch in its marginal edge, the marginal edge on each side of said notch being formed with a pitch whereby to threadedly receive the threaded shank of a fuse or the like.

4. A panel board assembly as claimed in claim 1 in which said two sections of said block that hold said wall contact means captive each having an edge that extends entirely around the side wall of said socket, said wall contact means being held captive as aforesaid between the marginal portions of said two sections of said block adjacent said edges.

5. In a panel board assembly for fuses or the like, a mounting means, a block carried by the mounting means of an insulating material, said block having a plurality of sockets therein adapted to threadedly receive fuses or the like, said sockets being arranged in a plurality of series, the sockets of each of said series being in alignment with each other, a bus bar for each of said series, said block being formed with a plurality of openings, one for each of said series of sockets, each opening having its longitudinal axis underlying its respective series of sockets, each of said openings having a cross section to slidably receive one of said bus bars whereby said bus bars can be caused to enter one of said openings to underlie its respective series of sockets and be restrained against all movement at right angles to its longitudinal axis, said bus bars extending through their respective openings to underlie a series of sockets, means for restraining said bus bars against sliding movement within their respective openings with respect to the block, said sockets each being formed with a bottom opening through which one of said bus bars is directly accessible to make electrical contact therewith, wall contact means for each of said sockets formed separately from said block for mounting therein, said wall contact means each being supported in said block with a wall contact disposed on the wall of its respective socket, terminal means for said bus bars, terminal means for said wall contact means of said sockets, said block comprising a plurality of sections, the side wall of each socket of said series of sockets being comprised of two sections of said block, said two sections of said block being adapted jointly to hold said wall contact captive supported in said block as aforesaid with the wall contact thereto on the said wall of its respective socket as aforesaid.

6. An assembly as claimed in claim 5 in which the plurality of sections of said block includes at least one main body portion and a cup for each of said sockets, each cup co-operating with a main body portion to form its respective socket, the bottom of each cup being the bottom of its respective socket, said bus bar underlying said series of sockets as aforesaid in engagement with the bottom of said cups to maintain them in position with respect to a main body portion, said wall contact means of said sockets each being held captive as aforesaid between the edge of the cup of its respective socket and a main body portion.

7. A panel board assembly as claimed in claim 5 in which said two sections of said block that hold said wall contact means captive each having an edge that extends entirely around the side wall of said socket, said wall contact means being held captive as aforesaid between the marginal portions of said two sections of said block adjacent said edges.

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