

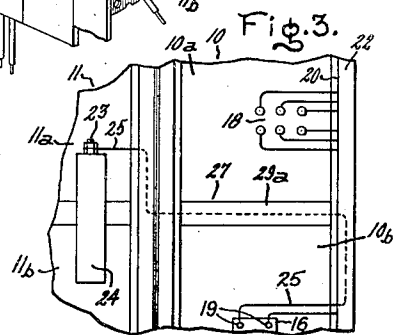
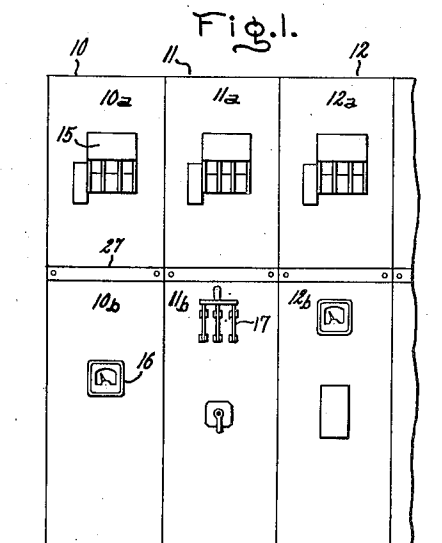
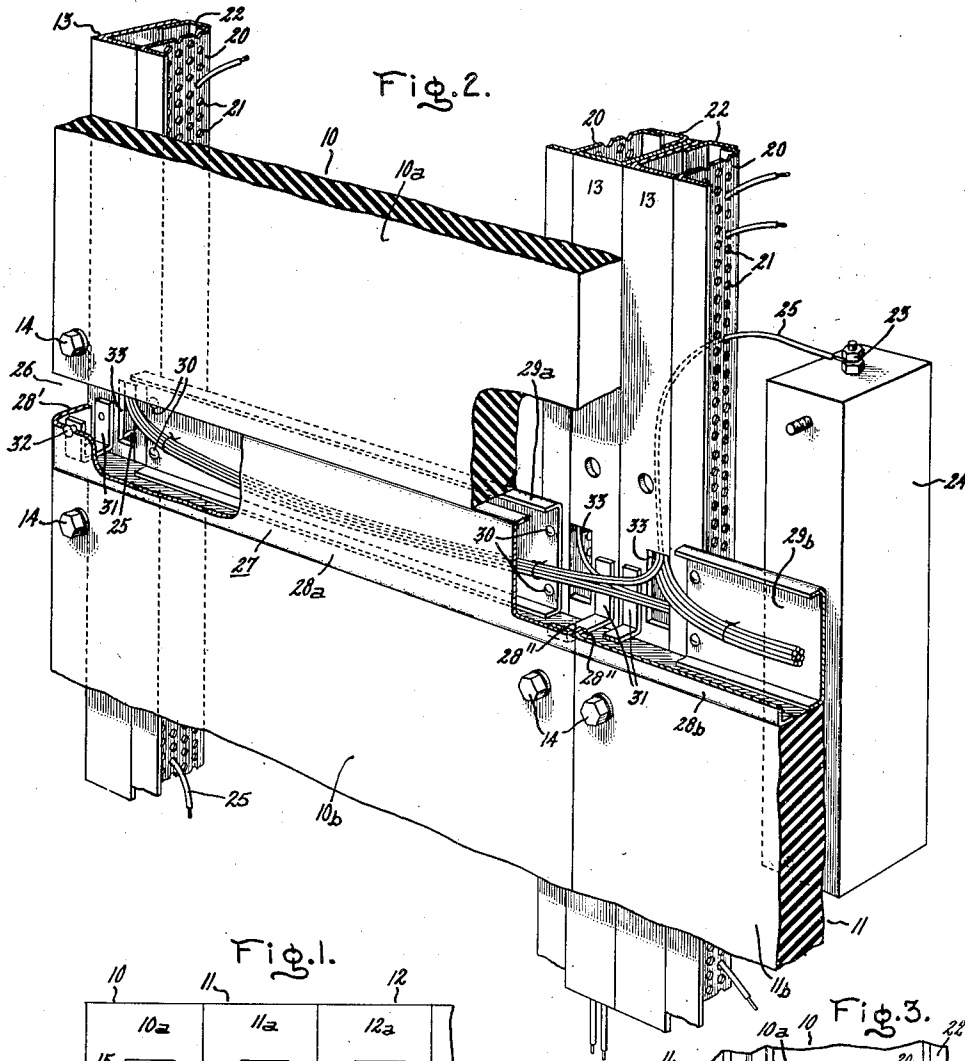
Nov. 21, 1944.

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2,363,327

ELECTRIC PANEL BOARD

Filed Oct. 4, 1943



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UNITED STATES PATENT OFFICE

2,363,327

ELECTRIC PANEL BOARD

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Application October 4, 1943, Serial No. 504,950

7 Claims. (Cl. 175—371)

Our invention relates to electric panel boards and more particularly to the wiring thereof. Specifically, our invention is an improvement on Anderson Patent 2,140,376, granted December 13, 1938, and assigned to the same assignee as the present application.

Electric panel boards upon which are mounted various electric devices such as indicating and recording instruments and meters, control means, relays, rheostats, terminal and fuse blocks, terminals, etc., are generally wired on the rear side as contrasted with the instrument side. Where the number of devices and corresponding terminals necessitate a considerable number of circuit wires the wiring on the rear face of the board may become complicated, difficult to trace, and even unsightly, particularly where a large number of vertical and horizontal runs of appreciable length are involved. The above-mentioned Anderson patent discloses an improved and simplified wire arrangement for panel boards carrying a large number of devices and terminals which is readily adaptable to horizontal or vertical runs and to both single and multiple panel boards. Furthermore, the panel board constructed in accordance with the Anderson invention is neat, less expensive than previous installations, and flexible with respect to factory construction, shipment and reassembly. The so-called cross wiring trough of the Anderson patent is mounted on the back of the panel in spaced parallel relationship with the panels. To do maintenance work on the wiring in the so-called cross trough it is necessary for the personnel to work at the back of the panel near the exposed power connections.

It is an object of our invention to provide a new and improved panel board.

It is another object of our invention to provide a new and improved cross trough for electric panel boards which provides for greater safety to maintenance personnel than was heretofore possible.

Still another object of our invention is to provide an interpanel wiring trough that is an integral part of the panel board so as to improve the appearance of the back of a panel board and to permit devices to be mounted on the back of the panel board without in any way obstructing the mounting of such devices.

A further object of our invention is to provide a trough for small wiring comprising a front cover and a back cover placed between two sections of a panel board.

Further objects and advantages of our invention will become apparent as the following description proceeds and the features of novelty which characterize our invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of our invention reference may be had to the accompanying drawing in which Fig. 1 is a partly diagrammatic elevational view of the front face of a multiple unit panel board illustrating an application of our invention; Fig. 2 is an enlarged perspective view partly in section of a portion of the multiple panel board shown in Fig. 1; and Fig. 3 is a partly diagrammatic elevational view of a portion of the rear face of the panel including the portion of the panel board shown in Fig. 2.

The multiple unit panel board shown by Fig. 1 of the drawing comprises in the present instance a plurality of single panel units 10, 11 and 12, which are suitably supported in a vertical position and are aligned so as to constitute a substantially continuous board. Each of the single panel units is comprised of two sections, the purpose of which will become apparent as the following description proceeds. For example, the single panel unit 10 comprises an upper section 10a and a lower section 10b. The same arrangement is also true of single panel units 11 and 12. The individual panel units have generally flat surfaces for mounting the various electrical devices and may be composed of sheet metal, as is disclosed in the Anderson patent, or of suitable insulating material such as slate or the like. We have chosen to illustrate our invention, in which the sections 10a, 10b, and the like of the multiple unit panel board each comprise a flat surface of insulating material.

In order to support the panel units 10, 11 and 12 in a vertical position, there is provided at each end of each single panel unit a vertically extending angle iron 13 which is suitably supported in the vertical position by a framework or the like, not shown. The flat panel surfaces of insulating material, such as 10a, 10b, etc., are suitably bolted to the vertical angle iron members, as indicated at 14.

For the purpose of simplifying the disclosure, comparatively few devices and instruments are indicated on the panel board, it being necessary merely to illustrate the general arrangement of a circuit wire or two actually connected to the various terminals. As illustrated, the devices indicated on the panel board, such as the circuit breaker 15, the meter or instrument 16, the switch 17, and other devices, which may be either on the front or rear face of the board, are provided with terminals disposed on the rear side of the board, as best shown in Fig. 3. For example, the circuit breaker 15 is indicated as having terminals 18, while the meter 16 is indicated as having terminals 19. Circuit wires connected to the terminals on the back of the panel board indicated diagrammatically in Fig. 3 extend laterally from the terminals, such as 18 and 19, to the sides of the panel board.

For the purpose of providing for the vertical runs along the sides of the board, vertical wiring troughs are formed in the manner shown by Fig. 2. In this arrangement vertical perforated wiring strips 20 are secured to the panel board so as to form with the angle irons 13 troughs or channels for the vertical wire runs. The circuit wires enter and leave the vertical troughs by way of perforations 21 in the wiring strips 20, as clearly indicated in Fig. 2. These perforated wiring strips 20 are wired before they are mounted on the panel boards such as 10, 11 or 12. The vertical troughs so formed are enclosed by detachable L-shaped covers 22. The wiring arrangement for the vertical runs so far described, which permits the center of the board to be substantially clear of vertical wiring, forms no part of the present invention and is described and claimed in Reed and Paxton Patent 2,006,150, granted June 25, 1935, and assigned to the same assignee as the present application. It should be understood, however, that the method of wiring by templet as described in the above patent may also be applied to the present invention.

In installations of this character it is often necessary to interconnect devices on different individual panels, such for example as the wiring between the terminals 19 of meter or instrument 16 on panel unit 10, and the terminal 23 of device 24 on panel unit 11, best shown in Fig. 3. In order to simplify the disclosure, only a single wire interconnecting device 16 and 24 is shown, which wire is designated as 25. Where a large number of such interconnections are necessary, it is clear that the problem of horizontal runs between the various panels becomes increasingly difficult. If, for example, the vertical troughs alone were employed for solving this problem, it would be necessary to run wires from intermediate points on the panel board all the way to the bottom or top of the board. This would locate so much wire in the vertical troughs that some of the advantages thereof, such as ease of tracing, would be nullified. In the above-mentioned Anderson patent, horizontal wiring troughs were provided and our invention is specifically concerned with an improved horizontal wiring trough, although it will be obvious from the following description that our invention might be used for vertical wiring troughs as well.

In accordance with our invention, the horizontal wiring between panels is carried in a gap 26 between the upper and lower panel boards such as 10a and 10b of a panel unit such as 10. The panel boards 10a and 10b are mounted on angle irons 13 so as to be spaced from one another a sufficient amount to define the gap 26 in which space the horizontal wiring trough is contained. Thus it will be seen that the horizontal troughs to be described hereinafter may be contained within the gap 26 without in any way interfering with the vertical wiring troughs described above. Although we have disclosed only a single gap 26 for a single cross trough for panel unit 10, it should be understood that the number of horizontal cross troughs, as well as the size of the trough, would be determined by the size and number of panel units and by the number of devices to be wired.

As illustrated by Fig. 2, a horizontal cross trough 27 is defined by a front and rear cover member, such as 28a and 29a, for the panel unit 10, and 28b and 29b, for the panel unit 11, etc. The rear cover members 29a and 29b are similar for all of the panel units. These rear cover mem-

bers actually comprise a channel member which is detachably fastened to the flange of the vertical wiring grill 20 as indicated at 30. The front cover members 28a and 28b differ somewhat insofar as the end construction thereof is concerned, depending upon whether or not the cover is for an intermediate panel unit such as 11 or an end panel unit such as 10 of a multi-panel board. As may be clearly observed from Fig. 2, the front cover member 28a is a channel member similar to the rear cover member 28b, except that the ends thereof are provided with flanges 28' and 28''. The flange 28' is of sufficient length to completely close the opening at the edge of the panel unit which exists by virtue of the spacing between panel boards such as 10a and 10b. Intermediate front cover plates such as 28b are provided with an upturned flange 28'' at each end which does not extend for the full depth of the gap 26 but merely provides a neat appearing joint with the adjacent flange 28'' of the adjacent front cover section such as 28a.

The front cover plates 28a, 28b, etc., for the horizontal wiring trough 27 are held in place by being bolted to U-shaped supporting members, 31, as indicated at 32, which members 31 are suitably bolted to vertical angle irons 13. It will be observed that with this construction the horizontal wiring trough is defined by the upper and lower insulating boards of the panel such as 10a and 10b and by the front and rear cover plates such as 28a and 29a. It will furthermore be observed that if the upper and lower insulating boards 10a and 10b are of the same thickness, the cross wiring trough is flush with the panel board both at the front and the rear. This has a very decided advantage in that devices such as 24 may be mounted flush against the rear of the panel without the horizontal wiring trough interfering with such mounting in any way.

The circuit wires which pass through the horizontal cross trough, which may be in the form of a prewired harness if desired, may extend into the vertical wiring trough through openings 33 cut in the angle irons 13. As is best shown in Fig. 3, the device 16 on panel unit 10 is electrically connected to the device 24 on panel unit 11 by means of conductor 25. This conductor 25 extends from device 16 laterally to the edge of the panel, then up the vertical wiring trough, through opening 33 in angle iron 13, through cross trough 27, through opening 33 in angle iron 13 at the edge of panel unit 11, through the vertical wiring trough and out through one of the perforations 21 to terminal 23 of device 24. The circuit which has just been traced has been chosen as a very simple circuit in order to illustrate our invention. It will be understood, however, that this circuit might equally well extend across several panel units through the horizontal wiring trough 27.

From the above description, it will be obvious that at least the front cover plate of the horizontal wiring trough 27 is removable at all times without disturbing the wires. The flanges on the front cover plates provide a finished appearance between the cover plate and the panel board sections such as 10a and 10b. If one of the panel board sections such as 10a or 10b were thicker than the other, the front cover plate could be provided with a deeper flange to fill in this extra space and provide a finished appearance. Although the back cover plates are removable, in general they would not be re-

moved since the wiring is accessible from the front of the panel and maintenance personnel would not be subjected to the live terminals which appear on the back of the panel board. Since the back cover plate of horizontal wiring trough 27 is substantially flush with the back of the panel, its entire area is available for mounting auxiliary equipment, such as the device 24 in Figs. 2 and 3. Another advantage of our invention is that the interpanel wiring trough is an integral part of the switch board or panel board and such appearance is given to an observer. Still another advantage of our invention is that assembly routine is facilitated since power connections may be made without waiting for or interfering with the wiring trough assembly and the back of the panel which is required for power connections is not obstructed by a wiring trough.

By the term "panel board," as used in the specification and claims, is meant a plane surfaced board or panel generally vertically positioned on which are mounted a number of electrical devices, such as switches, meters, instruments, etc., comprising a self-contained wired unit. The devices are generally mounted on one side of the board and the terminals thereof extend through to the opposite side where they are connected to the circuit wiring.

It will be apparent to those skilled in the art that our invention is not limited to the particular construction shown, but that changes and modifications may be made without departing from the spirit and scope of our invention and we aim in the appended claims to cover all such changes and modifications.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A panel board comprising a pair of flat surfaced panels mounted in a common plane so as to define a small horizontally extending gap between said panels, electric devices mounted on said panels, terminals for said devices on one side of said panels, a horizontal wiring trough extending across said panel in the gap between said panels so as to fill said gap and give said panel board a unitary appearance, and circuit wires extending from terminals on said panels through said horizontal wiring trough, said wiring trough comprising a removable cover providing access thereto from the front of said panel board.

2. A panel board comprising a pair of flat surfaced panels mounted in a common plane so as to define a small gap between said panels, electric devices mounted on said panels, terminals for said devices on one side of said panels, a wiring trough extending along said panel in the gap between said panels so as to fill said gap and give said panel board a unitary appearance, and circuit wires extending from terminals on certain of said panels through said wiring trough, said wiring trough comprising removable covers providing access thereto from the front of said panel board.

3. A panel board comprising a pair of flat surfaced panels mounted in a common plane so as to define a small gap between said panels, electric devices mounted on said panels, terminals for said devices on one side of said panels, a wiring trough extending along said panel in the gap between said panels so as to fill said gap and give said panel board a unitary appearance,

circuit wires extending from terminals on certain of said panels through said wiring trough, said wiring trough comprising removable covers providing access thereto from the front of said panel board, said wiring trough being flush with at least one side of said panel board so that said electric devices may be mounted on said panel board without any interference from said wiring trough.

4. A panel board comprising a pair of flat surfaced panels mounted in a common plane so as to define a small gap between said panels, electric devices mounted on said panels, terminals for said devices on one side of said panels, a wiring trough extending along said panel in the gap between said panels so as to fill said gap and give said panel board a unitary appearance, and circuit wires extending from terminals on certain of said panels through said wiring trough, said wiring trough comprising removable covers providing access thereto from the front or rear of said panel board.

5. A panel board comprising a pair of flat surfaced panels mounted in a common plane so as to define a small horizontally extending gap between said panels, electric devices mounted on said panels, terminals for said devices on one side of said panels, a horizontal wiring trough extending across said panel in the gap between said panels so as to fill said gap and give said panel board a unitary appearance, and circuit wires extending from terminals on said panels through said horizontal wiring trough, said wiring trough comprising removable covers providing access thereto from the front of said panel board, said wiring trough being flush with at least one side of said panel board so that said electric devices may be mounted on said panel board without any interference from said wiring trough.

6. A panel board comprising a pair of flat surfaced panels mounted in a common plane so as to define a small gap between said panels, electric devices mounted on said panels, terminals for said devices on one side of said panels, a wiring trough extending along said panel in the gap between said panels so as to fill said gap and give said panel board a unitary appearance, and circuit wires extending from terminals on said panels through said wiring trough, said wiring trough comprising removable covers providing access thereto from at least one side of said panel board.

7. A panel board comprising a pair of flat surfaced panels mounted in a common plane so as to define a small horizontally extending gap between said panels, electric devices mounted on said panels, terminals for said devices on one side of said panels, a horizontal wiring trough extending across said panel in the gap between said panels so as to fill said gap and give said panel board a unitary appearance, and circuit wires extending from terminals on said panels through said horizontal wiring trough, said wiring trough comprising removable covers providing access thereto from at least one side of said panel board, said wiring trough being flush with at least one side of said panel board so that said electric devices may be mounted on said panel board without any interference from said wiring trough.

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