United States Patent [19]

Clement

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[54] **PANELBOARD WITH PROVISION FOR OPTIONAL USE WITH MAIN BREAKER OR MAIN LUGS WITH SPACED INSULATORS SUPPORTING MAIN BUS BARS**

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[21] Appl. No.: **394,442**

[52] **U.S. Cl.** ..... **317/119,** 174/70 B, 339/198 N

[51] **Int. Cl.** **H02b 1/04**

[58] **Field of Search** ..... 174/70 B; 317/118–120; 339/22 B, 198 G, 198 N

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Primary Examiner—Robert K. Schaefer
Assistant Examiner—Gerald P. Tolin
Attorney, Agent, or Firm—Ostrolenk, Faber, Gerb & Soffen

[57] **ABSTRACT**

A panelboard is constructed so that at the option of the installer either a main circuit breaker or main lugs may be utilized, with the lugs occupying the same location that would be occupied by the circuit breaker. The main lugs as well as the main circuit breaker may be mounted at either end of the main bus bars in the space between the insulators that support the bus bars.

6 Claims, 7 Drawing Figures

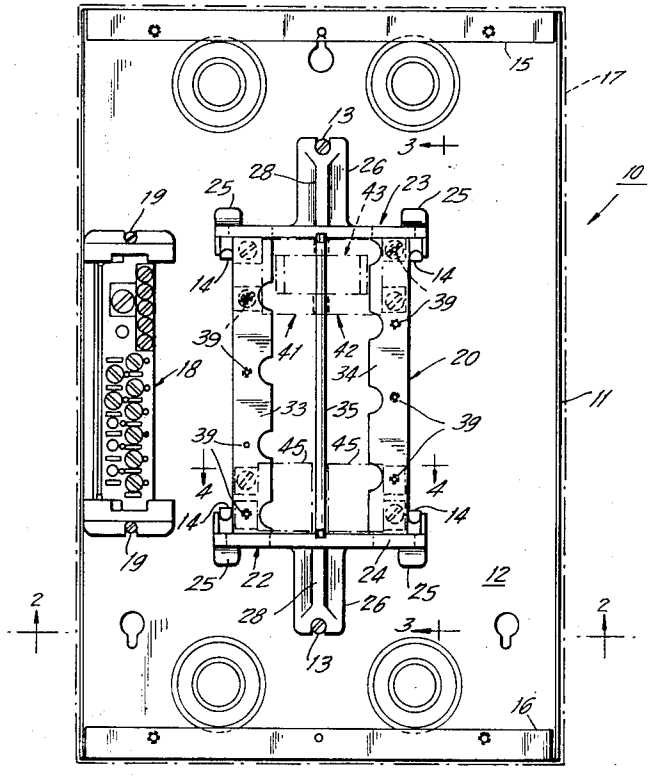


FIG. 1.

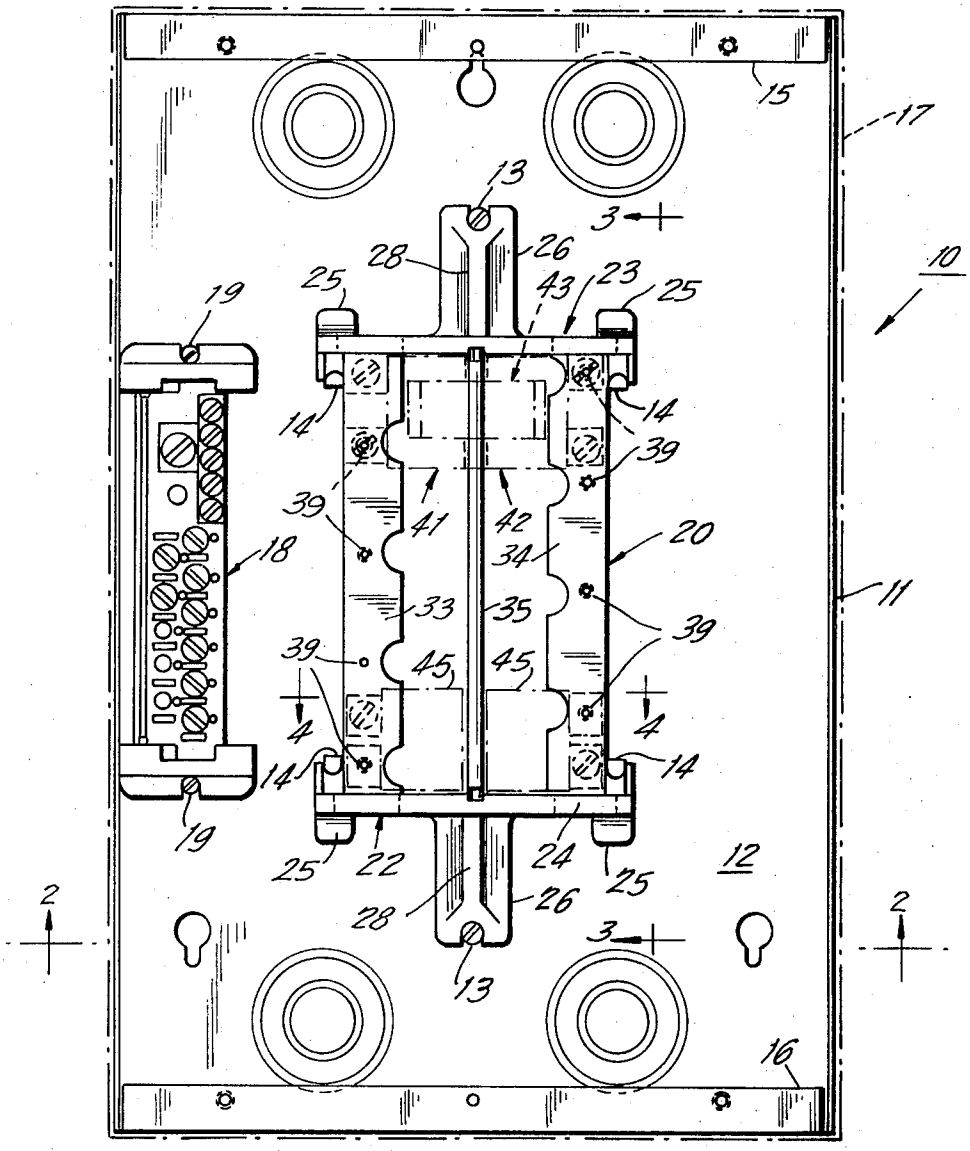
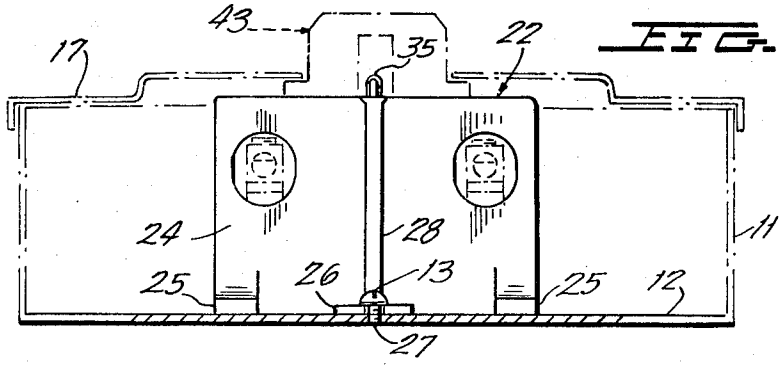

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FIG. 2.


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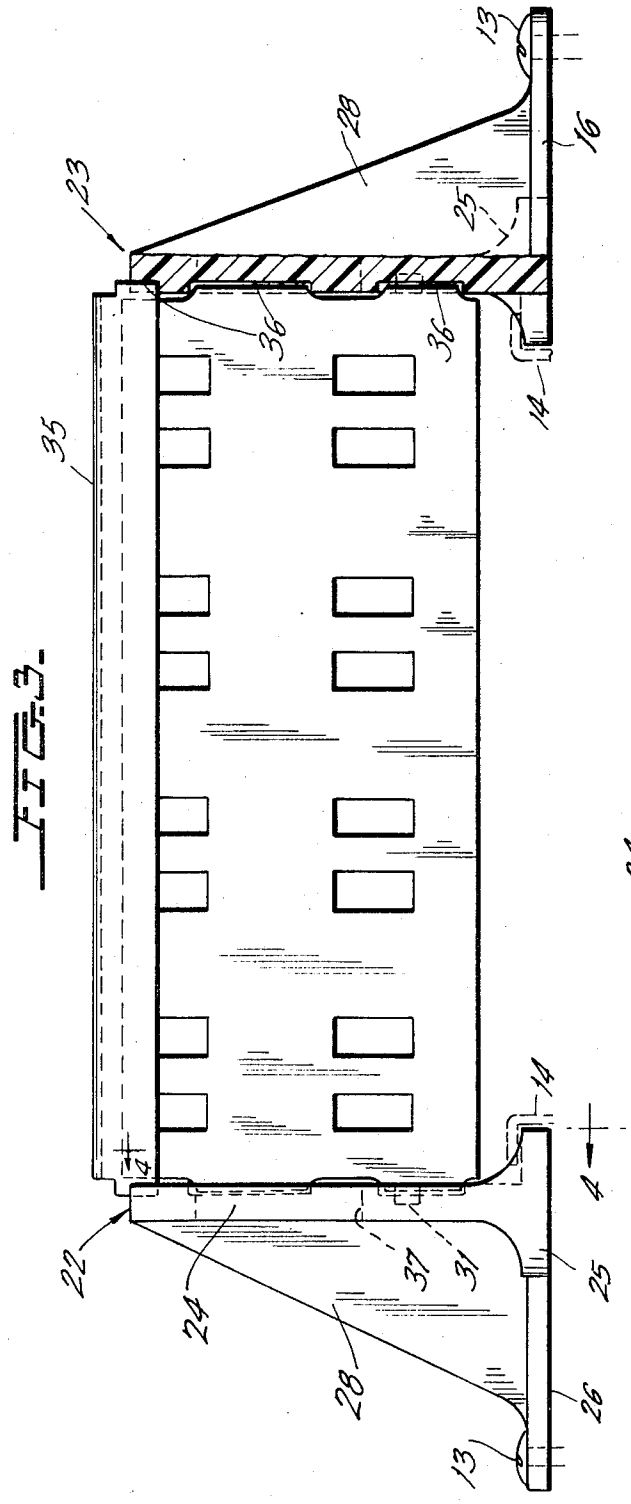

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FIG. 3.

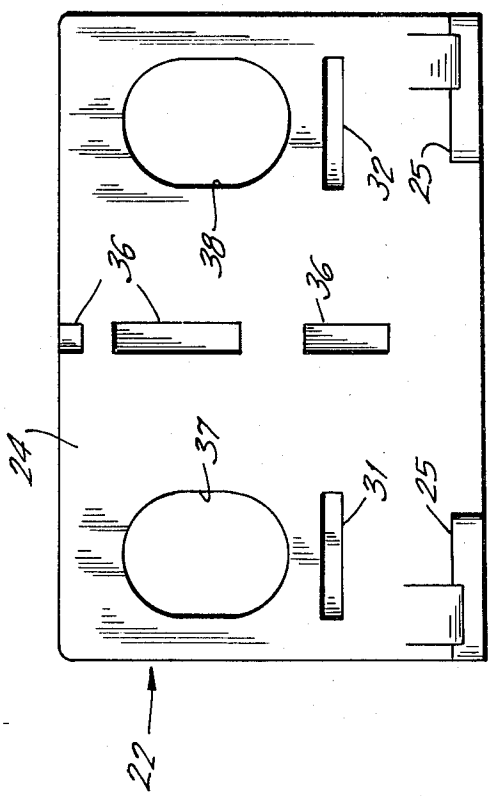

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FIG. 4.

FIG. 7.

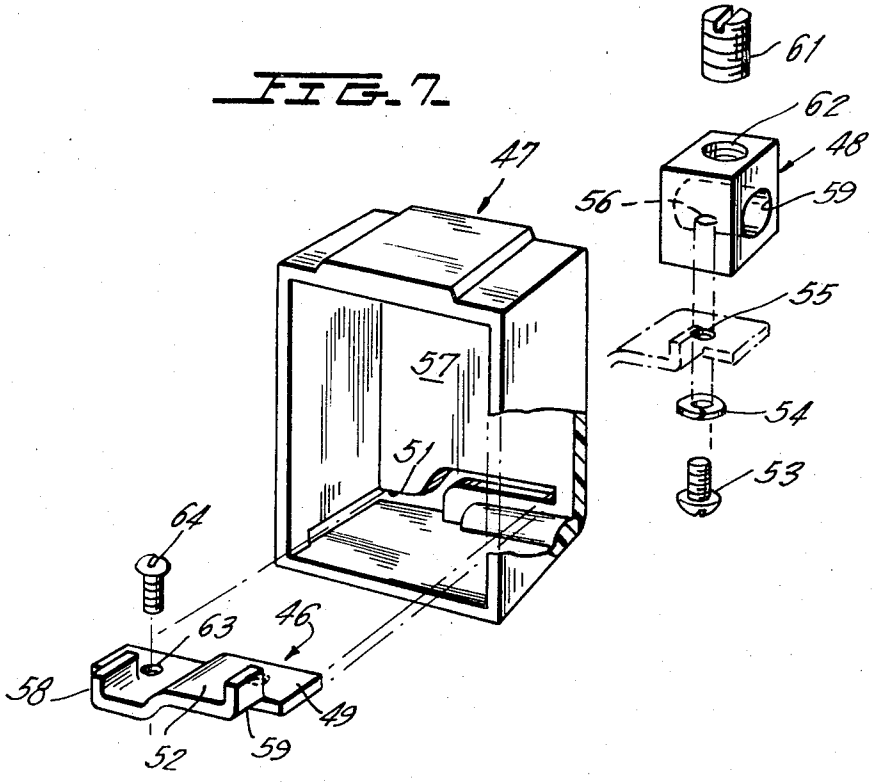


FIG. 5.

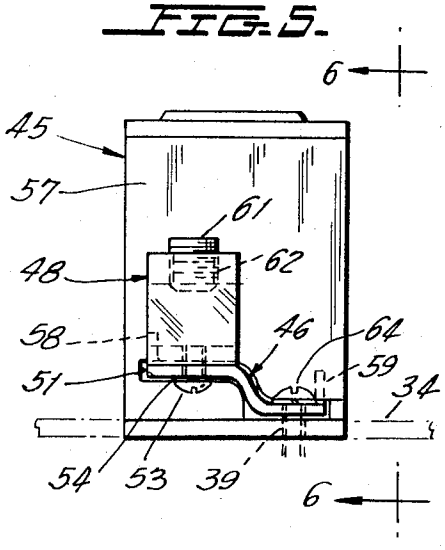
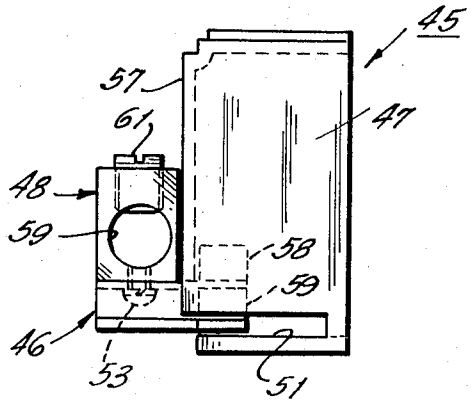


FIG. 6.



PANELBOARD WITH PROVISION FOR OPTIONAL USE WITH MAIN BREAKER OR MAIN LUGS WITH SPACED INSULATORS SUPPORTING MAIN BUS BARS

This invention relates to electric distribution panelboards in general and more particularly relates to panelboards of this type that may utilize either a main circuit breaker or main lugs.

For home and light industrial application it is often sufficient for panelboards to be energized through main lugs connected directly to the panelboard bus bars rather than being energized through a main circuit breaker. However, the dealer is required to stock two different panelboards, one for a main circuit breaker and the other for main lugs. This has proven costly to the dealers in that a good deal of money must be tied up in inventory and from a manufacturing standpoint this has been costly because different constructions were required.

In accordance with the instant invention, a single panelboard construction is provided that will accept either a main circuit breaker or main lugs at the option of the installer. The main lugs occupy the same space required for the circuit breaker, and the panelboard is constructed so that the main circuit breaker and the main lugs may be mounted at either end of the bus bars for convenience of connecting the energizing cables.

Identical insulators are provided with recesses which receive the ends of the bus bars to operatively position the latter. These insulators are also provided with apertures that are aligned with apertures in cable connectors of the main lugs to simplify routing of the energizing cables to the main lugs.

Accordingly, a primary object of the instant invention is to provide a novel construction for a panelboard that is adapted to utilize either main lugs or a main circuit breaker at the option of the installer.

Another object is to provide a panelboard of this type in which the main circuit breaker and main lugs may be mounted at either end of the main bus bars.

Still another object is to provide a panelboard of this type that is economical to manufacture.

A further object is to provide a novel main lug assembly for a panelboard of this type.

These objects as well as other objects of this invention will become readily apparent after reading the following description of the accompanying drawings in which:

FIG. **1** is a plan view of a panelboard constructed in accordance with teachings of the instant invention with the cover removed.

FIG. **2** is an end view of the panelboard interior looking in the direction of arrows **2—2** of FIG. **1.**

FIG. **3** is a side elevation of the panelboard interior looking in the direction of arrows **3—3** of FIG. **1.**

FIG. **4** is an elevation of a bus bar insulator looking in the direction of arrows **4—4** of FIG. **1.**

FIG. **5** is a front elevation of a main lug assembly.

FIG. **6** is a side elevation of the main lug assembly looking in the direction of arrows **6—6** of FIG. **5.**

FIG. **7** is an exploded perspective of the main lug assembly.

Now referring to the figures. Panelboard **10** includes shallow panlike housing **11** having rear wall **12** in front of which interior **20** is mounted by means of two screws **13** and four ears **14,** the latter being struck forward from rear wall **12.** Housing **11** is also provided with inwardly turned front lips **15, 16** along opposite forward edges thereof for securement of trim plate **17** in a manner well known to the art. Also disposed within housing **11** is neutral assembly **18** secured in front of rear wall **12** by a pair of screws **19,** and positioned at the left of interior **20** as viewed in FIG. **1.** At the option of the installer the complete panel **10** may be rotated 180° to accommodate a situation requiring the neutral on the right-hand side thereof.

Interior **20** includes a pair of molded insulators **22, 23** seated on the forward surface of rear wall **12.** Since insulators **22, 23** are identical only the construction of insulator **22** will be described in any detail. More particularly, insulator **22** includes main section **24** extending at right angles to rear housing wall **12.** At the rear of the main section **24** are a pair of relatively short outboard feet **25** and a relatively long central foot **26** all resting against the forward surface of rear wall **12.** Central foot **26** is provided with clearance notch **27** through which securing screw **13** extends, and outboard feet **25** are provided with locating recesses that receive ears **14.**

Triangular stabilizing rib **28** also connects foot **26** to one surface of main section **24.** The opposite surface of main section **24** is provided with rectangular recesses **31, 32** that receive the ends of rectangular main bus bars **33, 34,** respectively, to operatively position these members in spaced parallel relationship in a common plane that is parallel to rear wall **12.** This same surface of main section **24** is also provided with a plurality of aligned recesses **36** that receive projections (not shown) of circuit breaker mounting rib **35** to position the latter midway between bus bars **33, 34** and at right angles to rear surface **12** as well as at right angles to main sections **24** of insulators **22, 23.** For a reason which will hereinafter seem obvious, main section **24** is provided with cable guide apertures **37, 38** positioned forward of recesses **31, 32** respectively.

Each of the bus bars **33, 34** is provided with means defining a plurality of circuit breaker locating or connecting points. For each of these connecting points the means comprises a threaded aperture **39.** Interior **20** is adapted to mount push-push type circuit breakers **41, 42** of circuit breaker assembly **43** in the manner described in U.S. Pat. No. 3,344,317 issued September **26,** 1967, to W. H. Edmunds for a Circuit Breaker Use Limiting Means. In addition, interior **20** is constructed to mount a pair of main lug assemblies **45, 45,** one of which is shown in detail in FIGS. **5–7.** More particularly, main lug assembly **45** includes formed conducting strap **46,** insulating housing **47,** and main lug **48.** To assemble these elements main section **49** is inserted into housing **47** through the open end thereof and then out through slot **51** in the housing main wall **57,** so that retaining section **52** of strap **46** is disposed within housing **47.** Then screw **53,** after passing through lock washer **54,** passes through clearance aperture **55** in main section **49,** and is received by threaded aperture **56** in lug **48** to secure the latter to the forward surface of strap **46.** At this point main wall **57** is positioned between lug **48** and the forwardly turned ends **58, 59** of retaining section **52,** thereby mounting housing **47** to strap **46.** Threaded aperture **58** of lug **48** receives clamping screw **61** which, in a manner well known to the art, is adapted to hold one or more wires inserted into lug **48** through clearance aperture **62** thereof. Clearance aperture **63** through main section **49** receives screw **64** that

is received in threaded engagement by a bus bar aperture **39** to electrically and mechanically connect lug assembly **45** to one of the bus bars **33, 34.**

It is noted that interior **20** is so constructed that circuit breaker assembly **43** may be mounted at any of the locating points along bus bars **33, 34.** However, when used as a main breaker, assembly **43** is customarily mounted adjacent to one or the other of insulators **22, 23.** A pair of lug assemblies **45** may be used in place of circuit breaker assembly **43,** with both assemblies requiring the same amount of panelboard space. The phantom indications of assemblies **43** and **45, 45,** mounted to the same interior **20** in FIG. **1,** are presented merely to illustrate the versatility of interior **20** and are not intended to illustrate ordinary operating conditions.

Although there have been described preferred embodiments of this novel invention, many variations and modifications will now be apparent to those skilled in the art. Therefore, this invention is to be limited not by the specific disclosure herein but only by the appending claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An electric distribution panel including a relatively shallow panlike housing; first and second inulsator members of substantially equal size and shape mounted in spaced relation to the rear wall of said housing and extending forward therefrom; first and second elongated main conductors extending generally parallel to each other in a common plane parallel to said rear wall; each of said insulator members including a plurality of recesses wherein the ends of the conductors are entered to provide the sole support operatively mounting the conductors to the insulator means; a circuit breaker locating and supporting rib positioned between said main conductors with the ends of said rib being supported by said insulator members; each of said main conductors, at locations spaced along the length thereof, being provided with means defining circuit breaker connecting points; each of said insulator members including first and second guide apertures positioned in the vicinity of the respective first and second main conductors and slightly forward thereof to direct energizing cables for said panel to cable receiving openings of main lug means positioned inboard of the insulating members and connected to those of said connecting points at the ends of said conductors.

2. An electric distribution panel as set forth in claim **1** in which there are first and second main lug means connected to the first and second conductors, respectively; both of said main lug means being positioned between said first and second insulator members; each of said main lug means including a cable gripping lug positioned forward of said main conductors in operative alignment with one of said guide apertures in each of said insulator members.

3. An electric distribution panel as set forth in claim **2** in which each of said main lug means is part of a subassembly that includes a conducting strap abutting one of said conductors, said lug secured to said strap, and a hollow insulating housing member connected to said strap; said housing member being shaped and positioned to simulate a circuit breaker housing.

4. An electric distribution panel as set forth in claim **3** in which the strap is positioned forward of the conductor which it abuts; said lug positioned forward of said strap; said housing member positioned to one side of said lug, with the latter being outside the former.

5. An electric distribution panel as set forth in claim **4** in which the strap includes retaining formations disposed within said housing member; said retaining formation and said lug cooperating to retain said housing member connected to said strap.

6. An electric distribution panel as set forth in claim **2** in which the lugs are provided with cable receiving openings facing the apertures in the insulator members.

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