United States Patent

Brumfield

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[54] **CONNECTOR KIT ATTACHABLE TO EXISTING NEUTRAL BAR ASSEMBLY**

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[73] Assignee: **Square D Company,** Park Ridge, Mich.

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[21] Appl. No.: **125,717**

[52] **U.S. Cl.** .....**339/198 N**
[51] **Int. Cl.** **H01r 9/00**
[58] **Field of Search**.....339/198, 242, 19, 22, 272

[56] **References Cited**

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Assistant Examiner—Robert A. Hafer
Attorney—Harold J. Rathbun and Paul J. Rose

[57] **ABSTRACT**

A connector kit attachable in the field to an existing neutral bar assembly to enable larger wires to be connected thereto than it was originally designed to accept.

5 Claims, 9 Drawing Figures

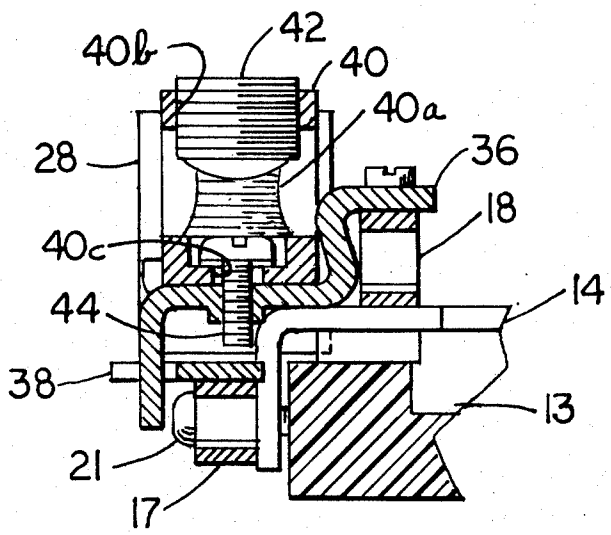


FIG.-1 (PRIOR ART)

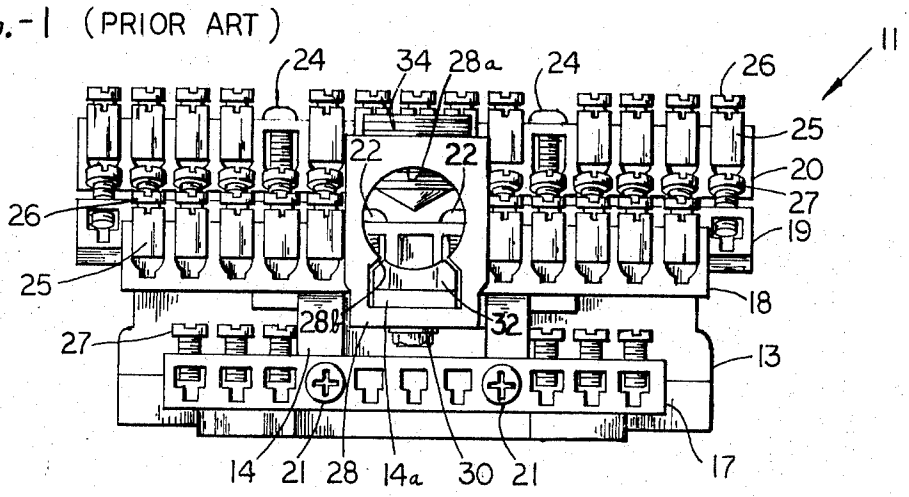
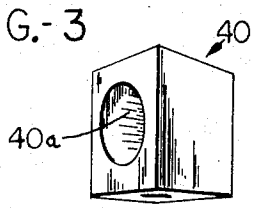


FIG.-3



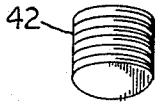


FIG.-6

FIG.-4

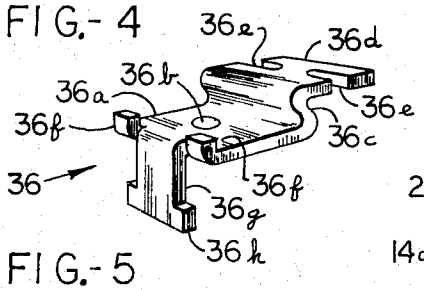


FIG.-5

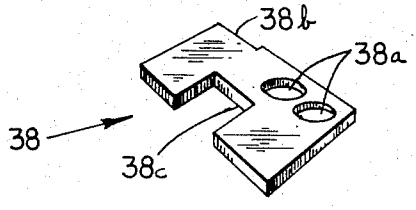
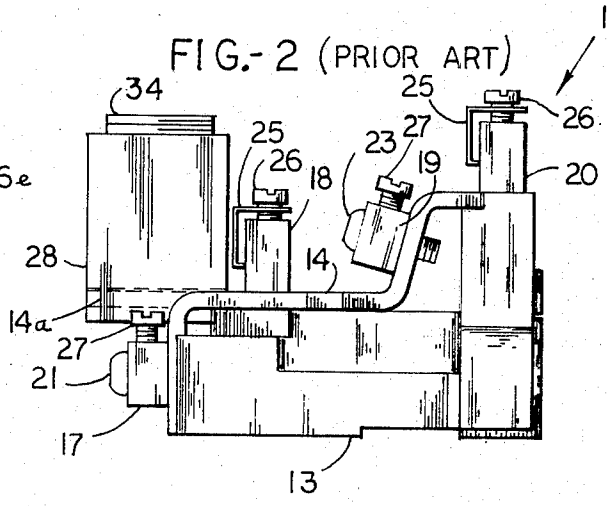


FIG.-2 (PRIOR ART)



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FIG.-7

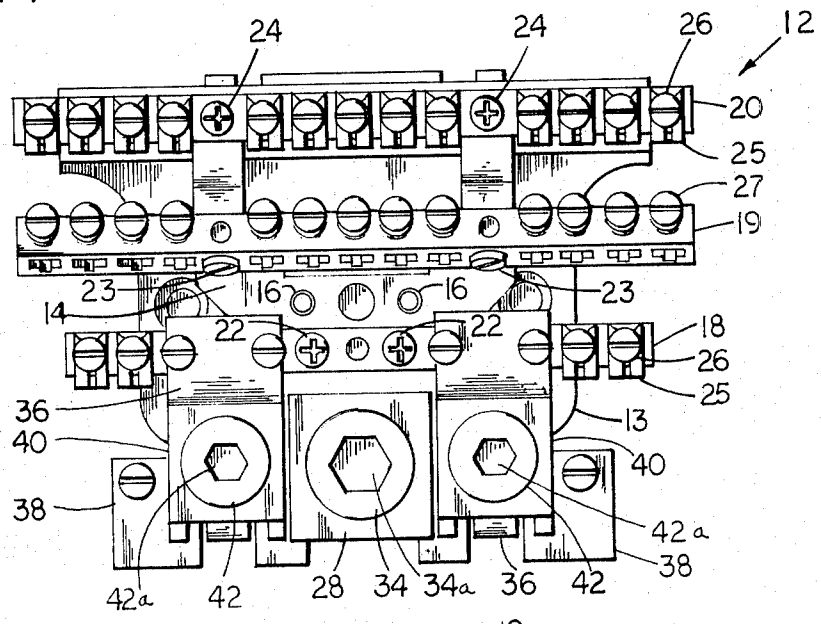


FIG.-8

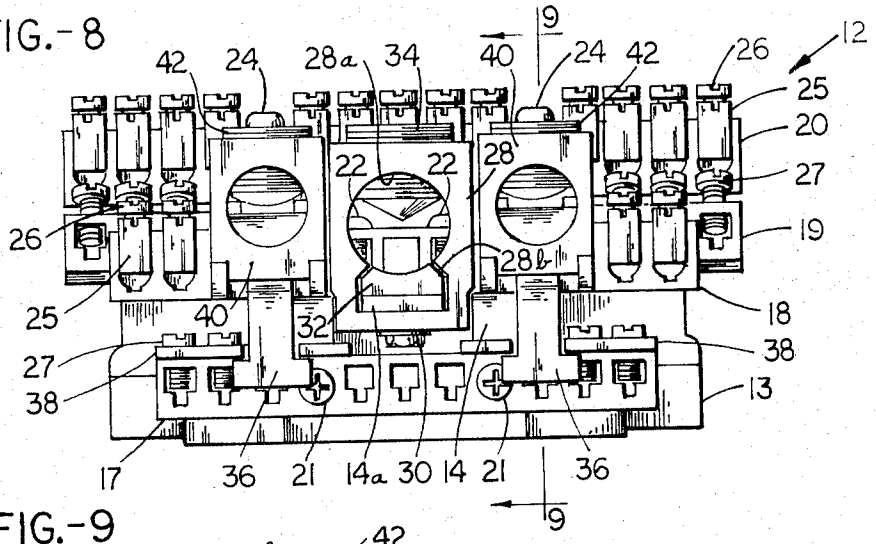
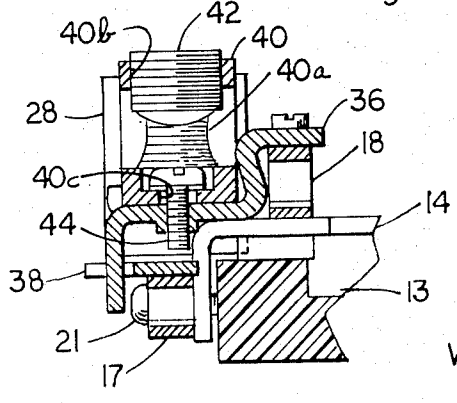


FIG.-9



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CONNECTOR KIT ATTACHABLE TO EXISTING NEUTRAL BAR ASSEMBLY

Electrical circuit breaker panelboards are generally designed to accept circuit breakers of a given maximum rating. With the ever increasing demand for electrical power, it is desirable to be able to install circuit breakers of a larger rating than that for which a panelboard was originally designed. This requires being able to connect larger wires to the neutral bar assembly of the panelboard than it was originally designed to accept.

An object of the invention is to provide a connector kit rigidly securable in the field to a stepped pair of neutral bars of the neutral bar assembly of an existing electrical panelboard and enabling the assembly to accept a larger wire than it was originally designed to accept, the connector kit having a good electrical connection to the assembly after installation and being able to withstand the higher clamping torque required for the larger wire.

Other objects and advantages will become apparent from the following specification considered along with the accompanying drawings in which:

FIG. 1 is a front view of a prior existing neutral bar assembly;

FIG. 2 is an end view of the prior neutral bar assembly taken from the right-hand side of FIG. 1;

FIG. 3 is a perspective view of a connector body of a connector kit constructed in accordance with the invention;

FIG. 4 is a perspective view of a stepped mounting bracket of the connector kit;

FIG. 5 is a perspective view of a support plate of the connector kit;

FIG. 6 is a perspective view of a clamping screw of the connector kit;

FIG. 7 is a top view of a neutral bar assembly similar to the prior existing neutral bar assembly of FIGS. 1 and 2 but having a pair of the connector kits of this invention secured thereto;

FIG. 8 is a front view of the neutral bar assembly of FIG. 7; and

FIG. 9 is a fragmentary sectional view taken along the line 9—9 of FIG. 8.

With reference to the drawings, a prior existing neutral bar assembly 11 of FIGS. 1 and 2 and a modified neutral bar assembly 12 of FIGS. 7–9 having the connector kit of the invention secured thereto each include a molded plastic base 13 having a mounting bracket 14 secured thereto by a pair of screws 16 (FIG. 7) threaded into the bracket from the underside of the base and having head portions (not shown) recessed therein.

Four neutral bars 17, 18, 19, and 20 are secured to the bracket 14 of each of the assemblies 11 and 12 respectively by pairs of screws 21, 22, 23, and 24. Each of the bars is preferably formed by the method disclosed in U.S. Pat. No. 3,228,094 issued Jan. 11, 1966, and if desired, the bars 18 and 20 may have spring clip clamping shoes 25 mounted on their clamping screws 26 as shown more fully in U.S. Pat. No. 3,426,319 issued Feb. 4, 1969. The bars 17 and 19 are provided with clamping screws 27.

The bracket 14 of each of the assemblies 11 and 12 includes a tang 14*a* (FIGS. 1, 2 and 8) on which a main neutral wire connector body 28 is mounted by an inverted screw 30 which extends through a lower portion of the body 28, is threaded into the tang 14*a*, and extends with clearance sufficiently into a hole in a spacer 32 in a wire receiving aperture 28*a* of the body 28 to prevent the spacer 32 from sliding out of the body 28. Overhanging portions 28*b* of the body 28 prevent the spacer 32 from rising off the screw 30. A clamping screw 34 is threaded into the body 28 to clamp the main neutral wire (not shown) of an electrical panelboard against the spacer 32. The clamping screw 34 is provided with a hexagonal recess 34*a* (FIG. 7) for receiving a hexagonal socket wrench.

The connector kit of this invention includes a stepped mounting bracket 36 best shown in FIG. 4, a support plate 38 best shown in FIG. 5, a connector body 40 best shown in FIG. 3, a clamping screw 42 best shown in FIG. 6, and a mounting screw 44 (FIG. 9). In the embodiment shown, two of the connector kits are mounted on the neutral bar assembly 12 as shown in FIGS. 7–9.

Each bracket 36 includes a generally square mounting platform portion 36*a* having a central threaded hole 36*b* extending therethrough. Each connector body 40 is generally in the shape of a square prism and has a hole 40*a* extending therethrough from front to back for receiving a wire conductor and a threaded hole 40*b* (FIG. 9) extending from the top into intersecting relationship with the hole 40*a* for receiving the respective clamping screw 42. Each clamping screw 42 is provided with a hexagonal recess 42*a* (FIG. 7) for receiving a hexagonal socket wrench. At the bottom of the body 40 a hole 40*c* aligned with but of smaller diameter than the hole 40*b* is provided for receiving the mounting screw 44. The hole 40*c* is enlarged at its upper end to accommodate an enlarged head portion of the screw 44. The screw 44 is threaded into the hole 36*b* to secure the body 40 to the platform portion 36*a*.

At the rear of the mounting platform portion 36*a* the bracket 36 is provided with a riser portion 36*c* (FIG. 4) leading to a fastening portion 36*d* parallel with the platform portion 36*a* and having a pair of open-end slots 36*e* disposed respectively at opposite ends for receiving mounting screws.

At the front of the mounting platform portion 36*a*, the bracket 36 is provided with a pair of spaced upwardly extending tangs 36*f* disposed respectively adjacent opposite sides and effective in conjunction with the riser portion 36*c* to prevent the body 40 from twisting relative to the mounting platform portion 36*a*. Between the tangs 36*f* the bracket 36 is provided with a downwardly extending T-shaped tongue 36*g* having a head portion 36*h*.

The support plate 38 is generally rectangular and is provided with a pair of holes 38*a* (FIG. 5) for receiving mounting screws, a corner recess 38*b* for accommodating a portion of the bracket 14, and an open-end slot 38*c* for receiving the tongue 36*g*.

To install a connector kit on the right side, for example, of the connector body 28 as viewed in FIG. 1, the three rightmost screws 27 are removed from the neutral bar 17, the support plate 38 of the connector kit is placed on top of the neutral bar 17 with the two holes 38*a* aligned respectively with the holes for the two rightmost screws 27, and the two rightmost screws 27 are then replaced to secure the support plate 38 on

the neutral bar **17** with the recess **38***b* adjacent the bracket **14** and the slot **38***c* facing outwardly. The third, fourth, and fifth rightmost screws **26** are then removed from the neutral bar **18**, and the mounting bracket **36** of the connector kit with the connector body **40** secured thereto by the screw **44** is mounted with the tongue **36***g* in the slot **38***c*, the head portion **36***h* below the support plate **38**, the fastening portion **36***d* on top of the neutral bar **18**, and the slots **36***e* aligned respectively with the holes for the third and fifth rightmost screws **26**. Two screws **26** without the spring clip clamping shoes **25** are then replaced in the third and fifth rightmost holes to secure the mounting bracket **36** in place.

A connector kit may be installed in a similar manner on the left side of the connector body **28** as viewed in FIG. **1**.

The connector kits are readily and rigidly securable in the field to the neutral bar assembly of an existing panelboard to enable acceptance of larger wires than can be accommodated by the neutral bars **17**, **18**, **19**, and **20**. The cooperation between the support plate **38** and the tongue **36***g* greatly strengthens the mounting of the mounting bracket **36** on the neutral bar **18**, and the screw **42** of each connecter kit may be tightened with a high torque to clamp a wire tightly without fear of twisting the connector kit off the neutral bar assembly.

I claim:

1. A connector kit securable in the field to a stepped pair of upper and lower neutral bars of a neutral bar assembly of an existing electrical panelboard, the kit comprising a support plate secured to the lower neutral bar after installation of the kit, a stepped mounting bracket having a fastening portion secured to the upper neutral bar after installation of the kit, a mounting platform portion disposed between the fastening portion and the support plate after installation of the kit, a riser portion connecting the mounting platform portion and the fastening portion, and a depending tongue portion extending downwardly from the mounting platform portion and interlocked with the support plate after installation of the kit, a connector body secured to the mounting platform portion after installation of the kit, and a clamping screw threadly engaged with the connector body after installation of the kit.

2. A connector kit as claimed in claim **1** including a mounting screw securing the connector body to the mounting platform portion after installation of the kit.

3. A connector kit as claimed in claim **1** wherein the mounting platform portion is provided with a pair of upwardly extending tangs disposed oppositely from the riser portion and respectively on opposite sides of the tongue portion.

4. A connector kit as claimed in claim **1** wherein the support plate is provided with an open-end slot receiving the tongue portion after installation of the kit.

5. A connector kit as claimed in claim **1** wherein the tongue portion is T-shaped and has a head portion disposed on the opposite side of the support plate from the mounting platform portion after installation of the kit.

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