July 21, 1942. T. OBSZARNY 2,290,491

PLUG AND JACK CONNECTOR UNIT

Filed Aug. 12, 1940

Fig. 1.

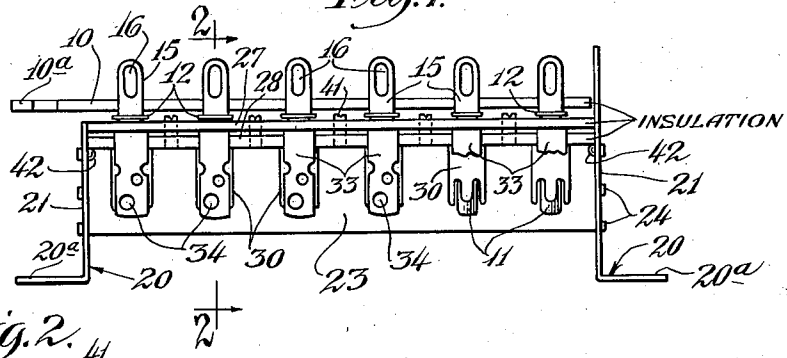


Fig. 2.

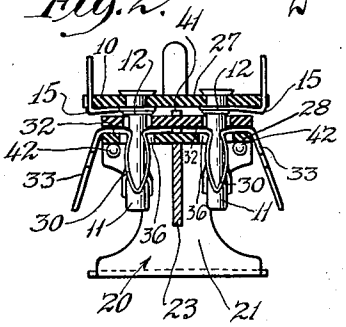


Fig. 3.

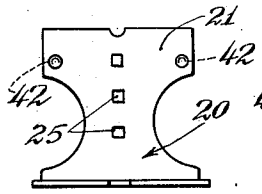


Fig. 4.

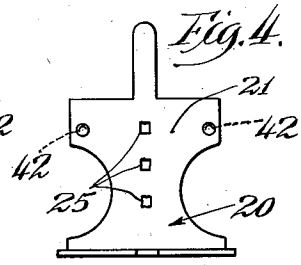


Fig. 5.

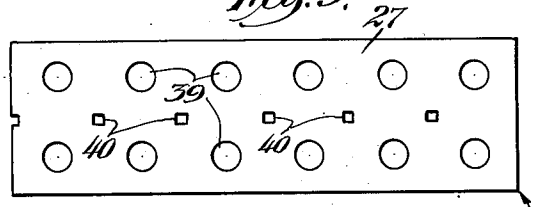


Fig. 6.

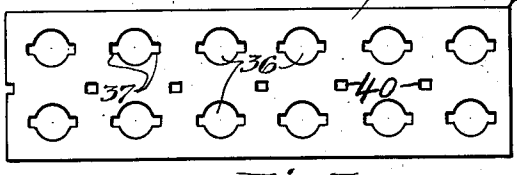
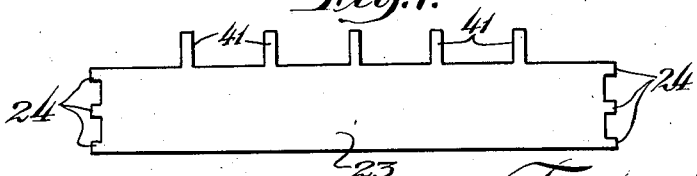


Fig. 7.



INVENTOR.
Theodore Obszarny
BY Bair & Freeman
Attorney.

Patented July 21, 1942

2,290,491

UNITED STATES PATENT OFFICE

2,290,491

PLUG AND JACK CONNECTOR UNIT

Thedore Obszarny, Chicago, Ill., assignor to Guardian Electric Manufacturing Co., Chicago, Ill., a corporation of Illinois

Application August 12, 1940, Serial No. 352,318

5 Claims. (Cl. 173—332)

This invention relates to electrical circuit connectors, and more particularly to detachably connectable plug and jack units for simultaneously completing or breaking portions of a plurality of different electrical circuits of various types of machines and apparatus. Such units may be made in various sizes to employ a desired number of sets of cooperating plug and jacks. For economy in manufacture I have found a preferable range of sizes for the plug and jack connector units to include multiples of 2 to 24 sets, but, if desired, larger size units may be made.

In the more widely used types of commercially available plug and jack units the jacks are arranged in banks, supported in pairs on opposite sides of a vertically disposed mounting frame which is composed of a plurality of panels of insulating material and wherein a mechanical operation is required to secure each of the jacks in position on the mounting panels, which construction is now considered too costly.

It is therefore, one of the main objects of this invention to provide a novel and improved construction of jack units which permits effecting a substantial saving in material required.

Another object is to provide an improved multiple jack unit construction which greatly reduces the number of parts, the handling of parts in assembly, and the number of mechanical operations to be performed in assembling of the parts, thereby effecting substantial economy in fabrication of such units.

A further object is to provide a simplified, compact, multiple jack unit of the character indicated having a pair of horizontally disposed panels of insulating material from which a plurality of jacks are suspended with their plug receiving sockets extending substantially perpendicularly to said panels, in registration with apertures formed therein.

Still another object is to provide a novel and improved jack unit wherein a plurality of jacks are arranged in a bank and each jack having portions embraced between a pair of connected panels of insulating material for firmly locking the jacks in fixed position.

A still further object of this invention is to provide a novel and improved jack unit characterized by the provision of a pair of panels of insulating material and a multiplicity of jacks seated in apertures formed in one of the panels and the other panel being superimposed upon the first and both panels being rigidly connected together to a mounting frame for locking the jacks in fixed position.

Other objects and advantages of this invention will be apparent from the following description, taken in connection with the accompanying drawing in which:

Figure 1 is a view in side elevation of my novel plug and jack connector unit, embodying the present invention.

Figure 2 is a vertical transverse sectional view through the device, taken substantially as indicated at line 2—2 on Figure 1.

Figures 3 and 4 are external elevational views of the respective ends of the mounting frame.

Figures 5 and 6 are plan views of the respective panels of insulating material which carry the jacks.

Figure 7 is an elevational view of the tie bar which connects the end members of the mounting frame.

In the illustrated embodiment of my invention as represented in the drawing, I have shown a connector device including 12 sets of cooperating plug and jack units, arranged in two spaced apart banks of 6 each. As above mentioned, it is to be understood that devices of this type may be made up in various multiples of plug and jack units arranged in a bank or group relation.

The connector device is composed of two detachably connectable units, one carrying the plugs and the other carrying the jacks. The unit carrying the plugs includes a panel 10 of insulating material from which project at right angles thereto a plurality of elongated plugs 11. These plugs desirably are of cylindrical tubular form, each having a shoulder 12 adjacent one end seated against the surface of the panel and a portion of the plug beyond the shoulder projects through an aperture in the panel and is riveted over against the opposite side thereof as seen in Figure 2 of the drawing. As may be seen in the drawing, the plugs are spaced uniform distances apart and from the marginal edge of the panel and are arranged in two banks or groups disposed in substantially parallel relationship to each other. Mounted on each plug and anchored between shoulder 12 and the panel 10 is a terminal clip 15 which extends laterally beyond the adjacent edge of the panel and having its end portion bent upwardly and formed with an aperture 16 to provide a connection for an electrical conductor.

One end of the panel 10 projects a substantial distance beyond the last plugs of the banks as indicated at 10a, and it is to be understood that said projecting portion serves the purpose of providing a mounting and support for the end

portion of a cable containing the conductor wires which are connected to the terminals 15 of the respective plugs.

The unit carrying the jacks includes a mounting frame comprising a pair of spaced apart end members 20. Said end members are formed to provide a pair of spaced apart substantially parallel upwardly extending end plates 21, which are rigidly connected together by an elongated tie bar or plate 23 disposed in vertical relation. The tie bar 23 has its opposite ends formed with a plurality of vertically spaced apart lugs 24 adapted to be inserted into correspondingly arranged apertures 25 of the respective end plates 21. When the lugs are projected through the apertures of the end plates the outer ends thereof are upset or riveted for rigidly uniting the end plates to the tie bar 23.

As may be noted in Figure 1 of the drawing, the tie bar 23 is located a substantial distance below the upper ends of the respective end plates for accommodating a pair of superimposed horizontally disposed panels 27 and 28 of insulating material. These panels serve to support a multiplicity of jacks 30 arranged in two banks on opposite sides of the tie bar 23, in proper spaced apart relation for registration with cooperating plugs 11 of the plug unit.

The jacks are desirably formed of spring metal and are of generally U-shaped formation for firmly embracing opposite sides of the plugs as seen in Figure 2. The upper ends of the leg portions of each jack terminate in flanges 32 adapted to be seated upon the upper face of the panel 28. One of said flanges 32 of each jack merges into a terminal lug 33 extending laterally beyond the marginal edge of said panel 28 and bent in a downward direction as seen in the drawing. These terminal lugs are provided with apertures 34 for connection to suitable conductor wires of the various electrical circuits.

The panel 28 is formed with properly located apertures 36 through which the jacks 30 project downwardly, with their flanges 32 seated on top of panel 28. Each aperture is formed with a pair of oppositely disposed slots or recesses 37 for accommodating the cooperatively formed portions of the jacks for locking the jacks against rotative movement within said apertures. Superimposed directly upon the panel 28 with the jacks seated in position in the apertures in said panel is the second panel 27, as above mentioned, which seats tightly against the flanges and part of the terminal extensions of the respective jacks and serves to preclude dislodgment of the jacks from the panel 28. The panel 27 is provided with a plurality of apertures 39 arranged in two banks and positioned for registration with the apertures 36 in the panel 28 and with the plug receiving socket portions of the respective jacks.

These panels 27 and 28 with the jacks seated in place are firmly secured together and to the mounting frame. For this purpose the respective panels are each provided with a centrally located series of longitudinally spaced apart apertures 40 adapted to be mounted upon correspondingly located upwardly extending lugs 41 formed on the upper marginal edge of the tie bar 23. When the panels are mounted on said lugs said lugs are upset or riveted over for firmly securing the two panels 27 and 28 with the respective jacks anchored thereon in fixed relation to the mounting frame. It is to be noted that the parts are so dimensioned that when the panels are riveted in fixed position on the mounting frame the upper surface of the upper panel 27 is disposed substantially flush with the upper edges of the end panels 21 of the mounting frame.

To reenforce the panels 27 and 28 so as to preclude lateral tilting on the upper edge of the tie bar 23 each of the end plates 21, are formed with a pair of horizontally spaced apart inwardly projecting bosses 42 located with their upper edges in substantial alignment with the upper marginal edge of the tie bar 23, as may be seen in the drawing, to provide additional support for the ends of said panels.

For convenience in mounting the entire unit in connection with other apparatus with which it is used, said end frame members 20 are formed with outwardly extending apertured feet 20a which extend endwise beyond said end panels 21 in a position for convenient engagement of fastening means, such as screws, by means of a suitable tool.

It will now be apparent that the novel and improved plug and jack unit above described results in a compact construction, which permits effecting a substantial saving in material required, and greatly reduces the handling of the separate parts during assembly, as well as materially reduces the mechanical operations to be performed in the assembling of the parts.

Particular attention is directed to the fact that in the assembly of the jacks per se said jacks are merely dropped into the apertures 36 of panel 28, in proper position, and the panel 27 then placed upon the panel 28 with the jacks projecting downwardly from said panel 28 and the assembly of the two panels together and to the mounting frame is effected by riveting of the panels to the tie bar 23 as above described, thus eliminating the performance of any mechanical operations for the securement of the individual jacks to the mounting panels.

Although I have herein shown and described a preferred embodiment of my invention, manifestly it is capable of modification and rearrangement of parts without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting this invention to the precise form herein shown and described, except as I may be so limited by the appended claims.

I claim as my invention:

1. In a structure of the character described, a jack unit comprising a mounting frame including a pair of upright, spaced apart parallel end plates, and a vertically disposed elongated tie plate rigidly connected at its ends in perpendicular relationship to said end plates, a horizontally disposed elongated panel of insulating material rigidly mounted on said frame and seated on the tie plate and said end plates, and a plurality of jacks, arranged in banks on opposite sides of the tie plate and seated in apertures formed in said panel, said jacks being formed with their plug receiving sockets disposed in registration with said apertures and extending substantially perpendicularly to said panel.

2. In a structure of the character described, a jack unit comprising a mounting frame including a pair of upright, spaced apart parallel end plates, and a vertically disposed elongated tie plate rigidly connected at its ends in perpendicular relationship to said end plates, a horizontally disposed elongated panel of insulating material rigidly mounted on said frame and seated on the tie plate and said end plates, a plurality of jacks, arranged in banks on opposite sides of

the tie plate and seated in apertures formed in the panel, the upper end of the jacks being formed with a flange for seating against the top of the panel, with their plug receiving sockets extending perpendicularly to said panel, and a second panel of insulating material superimposed upon the first panel and rigidly secured to said frame for holding the jacks seated, said superimposed panel having apertures registering with the sockets of the jacks.

3. In a structure of the character described, a jack unit comprising a mounting frame including a pair of upright spaced apart substantially parallel end plates, and a vertically disposed elongated tie bar rigidly attached at its ends to said end plates, a horizontally disposed elongated panel of insulating material seated on said tie bar, a plurality of jacks, arranged in banks on opposite sides of the tie bar and seated in apertures formed in the panel, the upper end of the jacks being formed with a flange for seating against the top of the panel, with the plug receiving sockets of the jacks extending substantially perpendicularly to said panel, and a second panel of insulating material superimposed upon the first panel for holding the jacks seated, said panels being rigidly connected to the tie bar, and said superimposed panel having a series of apertures registering with the sockets of the jacks, each of the end plates being formed with a pair of inwardly extending bosses, at opposite sides of the tie bar, positioned to serve as additional support for the ends of said first mentioned panel.

4. In a structure of the character described, a jack unit comprising a mounting frame including a pair of upright spaced apart substantially parallel end plates, and a vertically disposed elongated tie bar rigidly attached at its ends to said end plates, a horizontally disposed elongated panel of insulating material seated on said tie bar, a plurality of jacks, arranged in banks on opposite sides of the tie bar and seated in apertures formed in the panel, the upper end of the jacks being formed with a flange for seating against the top of the panel, with the plug receiving sockets of the jacks extending substantially perpendicularly to said panel, and a second panel of insulating material superimposed upon the first panel for holding the jacks seated, said panels being rigidly connected to the tie bar, and said superimposed panel having a series of apertures registering with the sockets of the jacks, each of the end plates being formed with a pair of inwardly extending bosses, at opposite sides of the tie bar, positioned to serve as additional support for the ends of said first mentioned panel, the lower end of each of the end plates terminating in a horizontally extending foot, projecting perpendicularly to and outwardly from said plates.

5. In a structure of the character described, a jack unit comprising a frame including a pair of upright spaced apart substantially parallel end plates and a vertically disposed tie bar connected at its end to said plates, a horizontally disposed panel of insulating material seated on the tie bar, a plurality of jacks, arranged in banks on opposite sides of the tie bar and seated in apertures formed in the panel, with their plug receiving sockets aligned with said apertures and extending substantially perpendicularly to said panel, said sockets being formed at their upper ends with a flange for seating against the top of said panel, and a second panel of insulating material superimposed upon the first panel for holding the jacks seated, said tie bar having its ends and its upper edge formed with one or more lugs for rivet connection respectively to said insulating panels and to said end plates of the frame.

THEDORE OBSZARNY.