Sept. 28, 1948. J. C. MACY 2,450,050

ELECTRICAL CONNECTOR

Filed Sept. 28, 1945

Fig. 1.

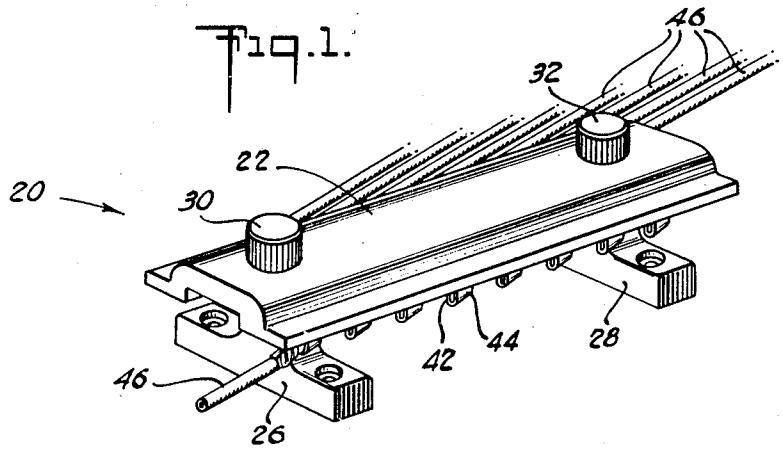


Fig. 2.

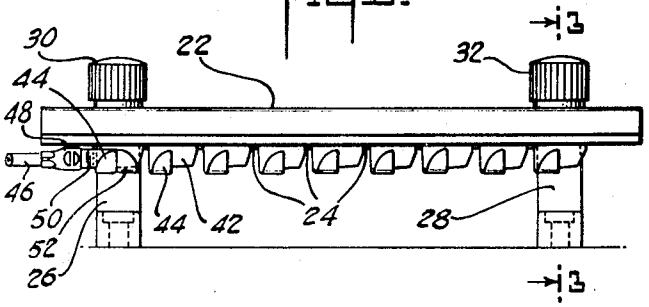


Fig. 3.

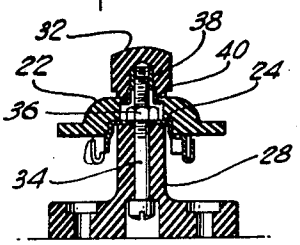


Fig. 4.

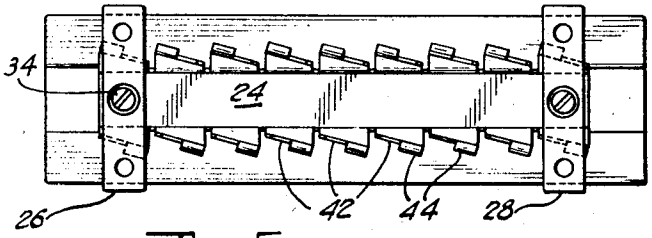


Fig. 5.

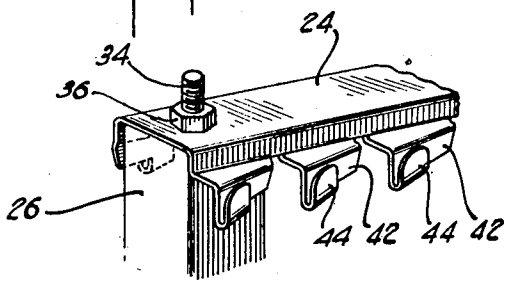
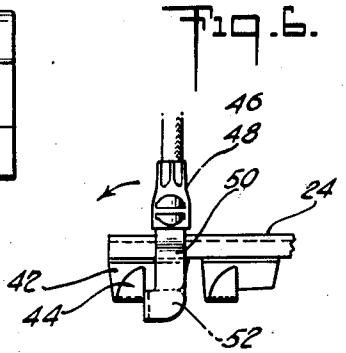


Fig. 6.



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ELECTRICAL CONNECTOR

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Application September 28, 1945, Serial No. 619,050

4 Claims. (Cl. 173—334)

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This invention relates to electrical interconnectors and terminal blocks of the type which enable the making of a good electrically conductive, readily disconnectable circuit between two or more electrical conductors. The invention pertains particularly to interconnectors and connector blocks for use with terminals of the knife-disconnect type, one example of which is described and claimed in my copending application Serial No. 530,317, filed April 10, 1944, and it is a further modification of and improvement upon my later applications Serial No. 557,629, filed October 7, 1944, and Serial No. 560,606, filed October 27, 1944. It has to do particularly with interconnectors of the bus bar type from which a number of parallel circuits may be fed.

It is frequently desirable in wiring systems to bring wires from various circuit elements to a convenient location where interconnections are made on a terminal block or panel. In this way installations, testings and replacements of circuits have for years been facilitated. As a consequence of this practice there has long been a demand for interconnecting terminal blocks which are compact and well insulated against accidental contacts, which hold all connections securely and which are adaptable to various combinations of cross-connected circuits. Examples of improved and modern terminal blocks and connectors are described and claimed in the application of Vernon E. Carlson, Serial No. 481,667, filed April 3, 1943, as well as in my prior applications above-mentioned. These connectors have successfully filled great demands for electrcnic and communication installations such as occur in modern airplanes, ships, automobiles, and the like, where a common signal or potential must be fed one or more times through multiplicities of branching networks.

One use of a bus bar type of multiple connector embodying the present invention is in a bomber airplane communications system. There the various headphones are connected in parallel in one network; the microphones are connected in parallel in another. The entire system must be readily removed or installed and it must be absolutely foolproof. A bus bar incorporating the present invention makes possible immediate connection in parallel (or disconnection) of the headphones and/or microphones for an entire bomber. Other demands which which can now be filled with the invention will immediately suggest themselves.

It is an object of the present invention to provide a bus bar connector of the character described having to a notable extent the characteristic and capabilities above set forth. A further object resides in the provision of a connector which overcomes the disadavntages inherent in various prior art connectors. The invention additionally aims to give a multiple connector of the bus bar type which is simple to manufacture and operate and which assures trustworthy service under the most severe working conditions. Other objects will be in part pointed out as the description proceeds and will in part become apparent therefrom.

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In this specification and the accompanying drawings, I have shown and described a preferred embodiment of my invention and suggested various modifications thereof; but it is to be understood that these are not intended to be exhaustive nor limiting of the invention, but on the contrary are given for purposes of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify and adapt it in various forms, each as may be best suited to the conditions of a particular use.

In the drawings:

Figure 1 is a perspective view of a bus bar connector assembly embodying the invention;

Figure 2 is an elevational view of the assembly illustrated in Figure 1;

Figure 3 is a sectional elevation taken along the line 3—3 of Figure 2;

Figure 4 is a view of the assembly illustrated in Figure 2 taken from below;

Figure 5 is a fragmentary view of a portion of the bus bar of the illustrated assembly; and,

Figure 6 is a further fragmentary view of a portion of the bus bar illustrating the manner in which a wire is connected thereto.

In Figure 1 the electrical connector unit is indicated generally by numeral 20. It consists of a cover plate 22 overlying the bus bar 24 (see also Figures 2 and 3) and a pair of mounting posts 26 and 28. Plate 22 is held in the position shown by means of a pair of knobs 30 and 32. Figure 3 illustrates a holding screw 34 and a holding screw nut 36 which are used to lock the bus bar 24 and mounting post together. Each of the knobs 30 and 32 is provided with an internally threaded sleeve 38 (see Figure 3) having a skirt 40. Sleeve 38 is rigidly secured inside of the knob and skirt 40 has an outwardly turned lower edge which loosely engages under a flange in cover plate 22 so that the knob can be rotated with respect to the cover plate but cannot be separated there-

from. Thus knobs 30 and 32 are utilized to clamp cover plate 22 upon bus bar 24 by engagement of the internal threads of sleeve 38 with the upwardly projecting end of holding screw 34, and when the knobs are unscrewed the cover plate may readily be lifted from the assembly.

Bus bar 24 in the present embodiment is stamped from highly conductive electrical sheet copper and is provided (see Figure 5) with a series of downwardly depending, integrally formed connection portions, each of which comprises a tab 42 and a turned-up ear 44. These connection portions are generally similar to those described and claimed in the application of William S. Watts, Serial No. 530,296, filed April 10, 1944, or in my prior application Serial No. 530,317 aforementioned. A wire 46 (see Figures 2 and 6) provided with a connector 48 having a projecting blade 50 and a turned-up ear 52, all as illustrated and described in the applications above-identified, can be easily and securely attached to any one of the connection portions. As shown in Figure 1 a large number of closely spaced wires may thus be connected to a common source of power through the bus bar, one or more of the wires being used to feed power to the bus bar and the others being used to distribute the power through whatever arrangement or rearrangement of circuits is required. In the embodiment shown, each of the connection portions (see Figure 4) forms a small angle, for example on the order of 15 degrees, with the longitudinal axis of bus bar 24 thus permitting a maximum number of leads to be connected within a limited amount of space. When a connector 48 is to be engaged with a connection portion of the bus bar, it is positioned as shown in Figure 6 and moved downwardly, counterclockwise, to a horizontal position as shown in Figures 1 and 2. The blade portion 50 of the connector enters between tab 42 and ear 44. The ear of the connector assumes a position against the inner surface of tab 42. When cover plate 22 is placed upon the assembly and knobs 30 and 32 are threaded onto the holding screws, the cover plate cannot be removed; and because of the overlying peripheral edges of the cover plate, the individual connectors 48 cannot be moved to the position shown in Figure 6 and, accordingly, cannot be disconnected from the bus bar.

From the foregoing it will be seen that a multiple bus bar connector made in accordance with the present invention is well adapted to attain the ends and objects hereinbefore set forth and to be economically manufactured since the whole combination is suited to common production methods and is susceptible to a wide latitude of variations as may be desirable in adapting the invention to different applications.

As various embodiments may be made of the above invention and as changes might be made

in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A bus bar of the character described for interconnecting a plurality of electrical conductors including a central portion having a plurality of counterpart connection portions projecting at closely spaced intervals therealong, each connection portion comprising a blade-like tab having a reversely bent back integral ear, each blade-like tab determining a plane, and the planes of any two adjacent tabs being disposed substantially parallel to each other and spaced apart by an amount which is slightly in excess of the overall diameter of an electrical conductor.

2. A bus bar of the character described including a central portion having a plurality of counterpart connection portions projecting at closely spaced intervals therealong, each connection portion comprising a blade-like tab having a reversely bent back integral ear, and each blade-like tab being set at an angle on the order of 15 degrees with respect to the adjacent peripheral outline of said central portion.

3. A bus bar of the character described including a longitudinally extending central portion having a plurality of counterpart connection portions projecting at closely spaced intervals therealong, each connection portion comprising a blade-like tab having a reversely bent back integral ear, and each blade-like tab being set at an angle on the order of 15 degrees with respect to the longitudinal axis of said central portion.

4. A bus bar of the character described including a longitudinally extending central portion having a plurality of counterpart connection portions projecting at closely spaced intervals therealong, each connection portion comprising a blade-like tab having a reversely bent back integral ear, each blade-like tab being set at an angle on the order of 15 degrees with respect to the longitudinal axis of said central portion, and adjacent connection portions being spaced apart by an amount which is small as compared to the width of the tabs thereof.

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The following references are of record in the file of this patent:

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