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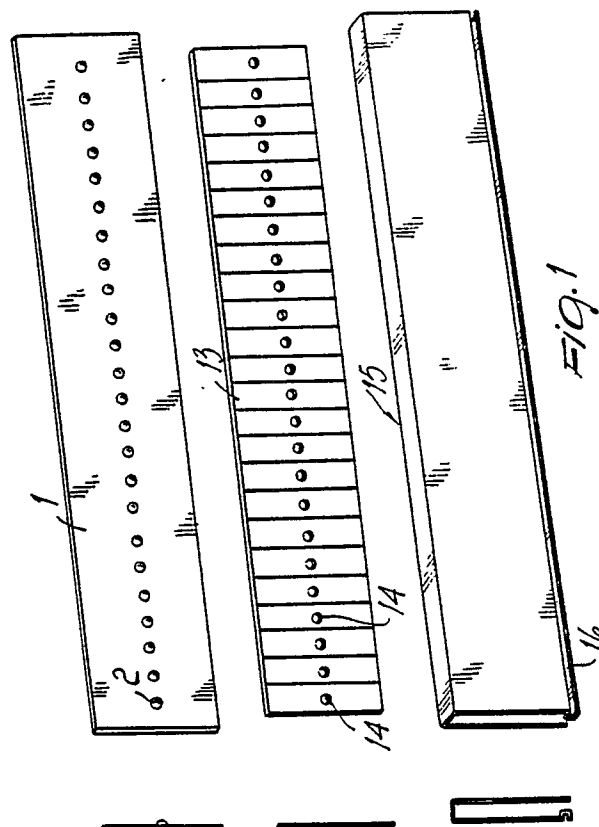
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(54) **Assembly of modular conductive bus-bars coupled in a polyphase system for supplying modular breakers and electrical apparatus.**

(57) There is disclosed an assembly of modular conductive bus-bars coupled in a polyphase system for supplying modular breakers and electrical apparatus, which assembly comprises a plurality of modular conductive bus-bar sets removably mutually associated with one another, each set including a section member, a base bar member (1), a plurality of electrical branching elements (3, 4, 5, 6, 7), removably selectively associated with the base bar (1), and a thickness levelling bar (13) removably associated with the base bar and electrical branching elements, resilient means (17) being moreover provided for removably coupling the several modular bus-bar sets in order to make the polyphase system.



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ASSEMBLY OF MODULAR CONDUCTIVE BUS-BARS COUPLED IN A POLYPHASE SYSTEM FOR SUPPLYING MODULAR BREAKERS AND ELECTRICAL APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to an assembly of modular conductive bus-bars coupled in a polyphase system for supplying modular breakers and electrical apparatus, and represents an improvement of the Italian copending patent application No. 21,000 B/87, filed on March 3, 1987 in the name of the same Applicant and having for title "A structure comprising a plurality of conductive bus-bars coupled in a polyphase system for supplying breakers and modular apparatus".

In this patent application there is disclosed a conductive bus-bar structure for supplying modular breakers and electrical apparatus, which comprises two or more adjoining bus-bars, housed in an open section member, having corresponding longitudinal guide members and closed by a removable cover member, having a plurality of slots formed at its longitudinal axis, the bus-bars being in turn provided with a plurality of lugs cantilever-wise extending in a parallel plane with respect to their laying plane and adapted to be easily removed.

Even if the bus-bar structure disclosed in the above mentioned Italian Patent Application has been found to be completely satisfactory, further improvements have been discovered in further studies for industrially making the bus-bar structure of said copending application.

More specifically, problems have been found relating both to a rather complex shape of the PVC section member and to the removal of the mentioned lugs according to the preset breaking lines.

SUMMARY OF THE INVENTION

Accordingly, the task of the present invention is to provide such an assembly of modular conductive bus-bars coupled in a polyphase system for supplying modular breakers and electrical apparatus, which is able to solve, in a simple and unexpensive way, the mentioned problems related to the complex shape of the PVC section member and the removal of the coupling lugs disclosed in the above mentioned Italian copending patent application.

Within the scope of the above mentioned task, a main object of the present invention is to provide such a conductive bus-bar assembly, the bus-bars of which can be used for quickly and easily making either bipolar, tripolar or quadripolar electric sys-

tems, depending on requirements.

Another object of the present invention is to provide such a bus-bar assembly the bus-bars of which can be power supplied both at one end of the respective bus-bars and at the electrical branching arrangements of said bus-bars.

Yet another object of the present invention is to provide such an assembly of modular bus-bars, in which the individual bus-bar sets can be removably assembled in very quick and simple way.

According to one aspect of the present invention, the above mentioned task and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by an assembly of modular conductive bus-bars coupled in a polyphase system for supplying modular breakers and electrical apparatus, having the features of the main claim.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed description of an embodiment of the invention, which is illustrated, by way of an indicative but not limitative example, in the accompanying drawings, where:

Figure 1 is an exploded perspective view illustrating the main component parts of the bus-bar assembly according to the invention;

Figure 2 shows a plurality of possible electrical branching elements which can be associated with the subject modular bus-bar assembly; and

Figure 3 is a cross-sectional view illustrating a possible configuration of a conductive bus-bar assembly according to the invention in its assembled condition.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the Figures of the accompanying drawings, and, more specifically, to Figure 1, the assembly of modular conductive bus-bars, coupled in a polyphase system for supplying modular breakers and electrical apparatus according to the invention, comprises a rectangular rod or bar 1 having, along the longitudinal middle central line

thereof, a plurality of lugs 2 of substantially semi-spherical configuration, said bar 1 being made of a suitable electrically conductive material such as copper.

With the single lugs of the bar 1 can be removably associated, preferably in a snap way, a plurality of electrical branching elements respectively indicated at the reference numbers 3, 4, 5, 6 and 7 in Figure 2.

For performing this removable coupling, the mentioned electrical electrical branching elements, which are also made of an electrically conductive material, are provided, at the centres thereof, with suitable coupling holes 9, 9, 10, 11, 12 having mating shapes and size with respect to those of the mentioned lugs 2 of the bar 1.

These electrical branching elements, on the other hand, are of a known type and, accordingly, they will be not disclosed herein in further details.

In this connection it should however be pointed out that, with respect to the conductive bus-bar structure disclosed in the above mentioned Italian copending Patent Application, the electrical branching elements 7 herein provided give a further possibility of coupling, to the polyphase bus-bar system, an optional electrical cable of given cross-section.

The assembly of modular conductive bus-bars according to the invention further comprises a thickness leveling rod or bar 13, having a shape and size substantially corresponding to those of the rod or bar 1; the leveling rod or bar 13, which is advantageously made of PVC, is also provided with a plurality of holes 14, which are aligned along the longitudinal middle line of the bar 13 and are specifically provided for snap engaging with the lugs 2 of the rod or bar 1.

Each individual conductive bus-bar of the polyphase structure will be obtained by respectively coupling the conductive rod or bar 1 to the electrical branching elements 3, 4, 5, 6, 7 and then to the thickness leveling bar 13.

Then, the thus made assembly or set will be removably engaged in a section member, made of an electrically insulating material and indicated in Figure 1 by the reference number 15, which has a U-shaped cross-section and, at one of the base edges of the U-shape, defines a further longitudinal small recess, also of U-shape, indicated at 16, for coupling with a corresponding section member of another conductive bus-bar modular assembly.

Thus, it should be apparent that the assembly according to the invention comprises a plurality of bus-bar modular sets, each formed by coupling, within the section member 15, the conductive bar 1 and one or more of the electrical branching elements 3, 4, 5, 6, 7, depending on requirements, and the leveling bar 13.

Each modular electrical bus-bar set thus formed will be successively snap engaged, by means of the recess 16 of the section member 15, with a like adjoining set, the two sets being electrically insulated from one another.

The assembled condition of the polyphase structure according to the invention is shown by the schematic cross-sectional view of Figure 3.

From Figure 3 it should be apparent that, in particular, the single phase bus-bar sets have been assembled, in order to obtain the desired polyphase system, by using a longitudinal spring assembly, indicated overall at the reference number 17 and having the illustrated configuration, which spring assembly is moreover suitable to provide the necessary contact pressure between the bars 1 and several electrical branching elements 3, 4, 5, 6, 7.

Also in this case, as in the bus-bar structure of the above mentioned Italian copending Patent Application, the bus-bars can be power supplied both at one end of each single bus-bar and at the single electrical branching elements; in particular, a power supply at the ends of the bus-bars provides very high rating capabilities.

From the above disclosure it should be apparent that the invention fully achieves the intended task and objects.

While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof, it should be apparent that the disclosed embodiment is susceptible to many modifications and variations all of which will come within the spirit and scope of the appended claims.

Claims

1. An assembly of modular conductive bus-bars, coupled in a polyphase system for supplying modular breakers and electrical apparatus, characterized in that said assembly comprises a plurality of conductive bus-bars modular sets adapted to be removably associated with one another, each set including, in a section member made of an electrically insulating material, a base conductive bar, a plurality of electrical branching electrically conductive elements, removably selectively associated with said base-bar and an electrically insulating thickness leveling bar removably associated with said base bar and said electrical branching elements, there being moreover provided resilient means for removably coupling a preset number of modular bus-bar sets in order to provide a polyphase system.

2. An assembly according to Claim 1, characterized in that each base bar comprises a plurality of clamping means adapted to removably snap

engaging in a plurality of corresponding clamping means of mating shape provided on each electrical branching element and on said thickness leveling bar.

3. An assembly according to the preceding Claim, characterized in that the clamping means provided on each bar consist of a plurality of aligned substantially semispherical lugs. 5

4. An assembly according to the preceding Claims, characterized in that the clamping means provided on each electrical branching element consist of holes each of which is adapted to removably snap engage with one of the lugs of said bar. 10

5. An assembly according to one or more of the preceding Claims, characterized in that the clamping means provided on said thickness leveling bar consist of a plurality of aligned holes adapted to snap engage with the corresponding lugs of said bar. 15

6. An assembly according to one or more of the preceding claims, characterized in that said electrically insulating section member including each said conductive bus-bar modular set has a substantially U-shaped cross-section, near one of the base edges of the U-shape being provided a longitudinal coupling recess also having a substantially U-shaped cross-section. 20 25

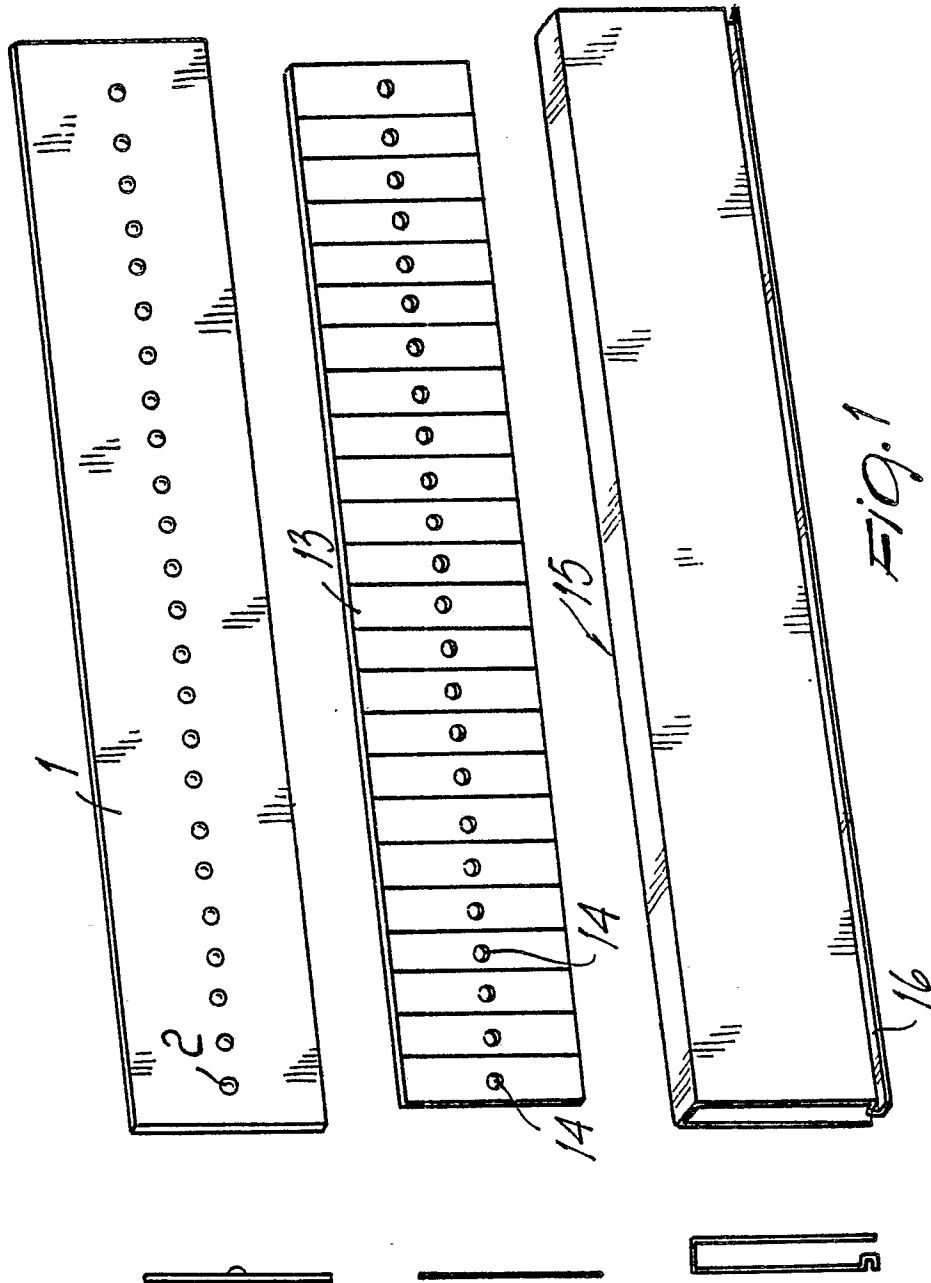
7. An assembly according to one or more of the preceding Claims, characterized in that the resilient means for removably coupling said bus-modular sets, for making said polyphase system consist of a longitudinal spring set adapted to hold in an adjoining relationship the bus-bar sets and provide the necessary contact pressure between the bus-bars and electric branching elements. 30 35

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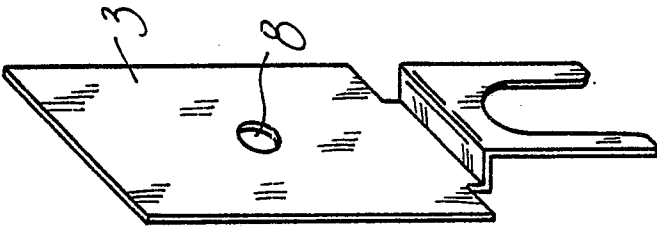
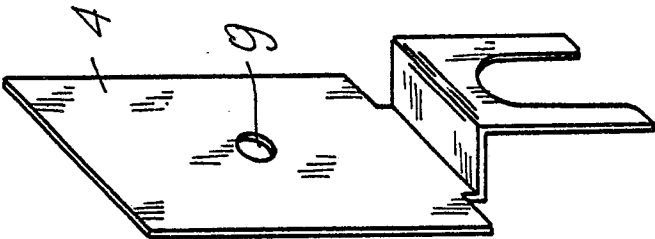
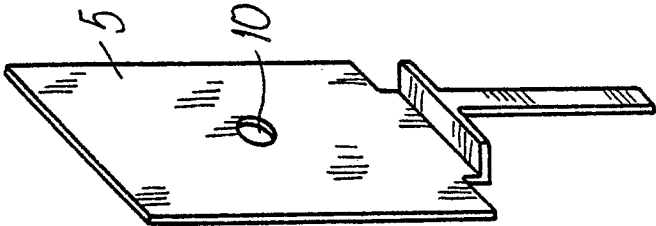
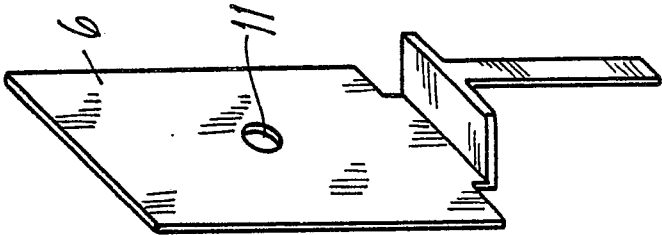
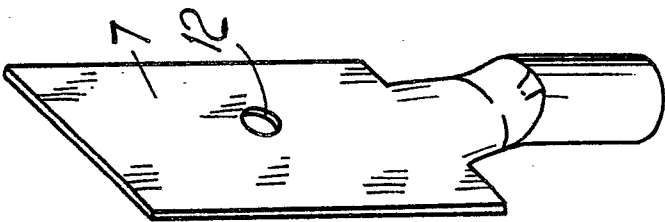


FIG. 2

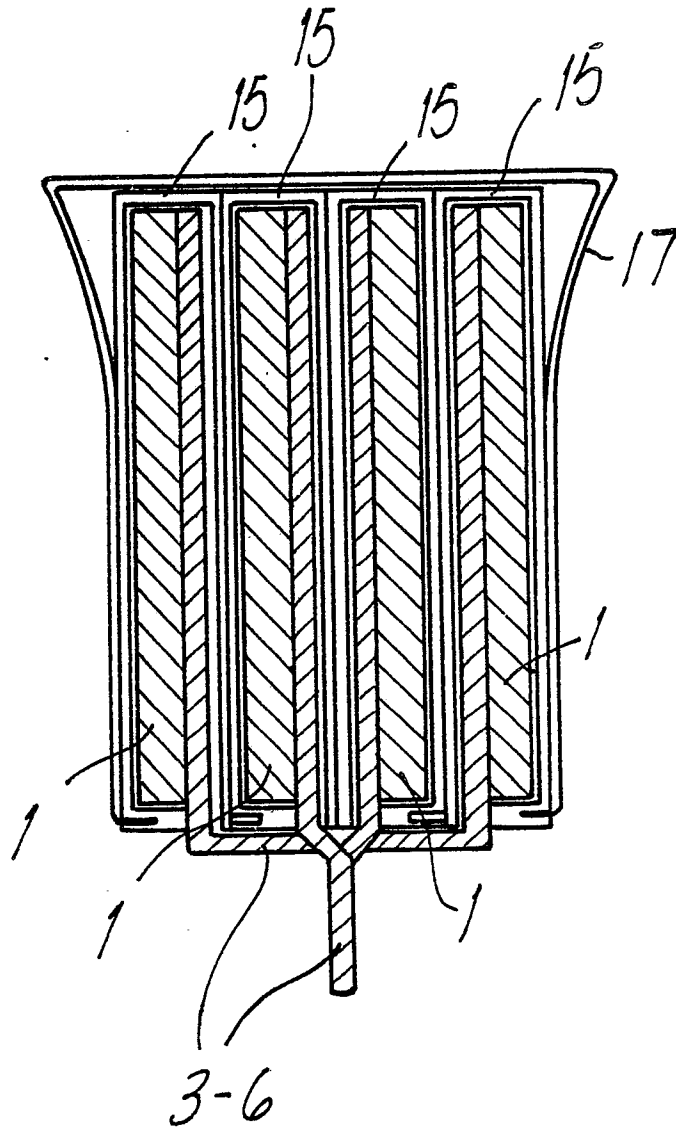


FIG. 3