

[54] **LOW VOLTAGE TERMINAL STRIP
CAPABLE OF WITHSTANDING HIGH
VOLTAGE TRANSIENTS**

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[58] Field of Search **339/198 R, 198 C, 198 E,
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[56] **References Cited**

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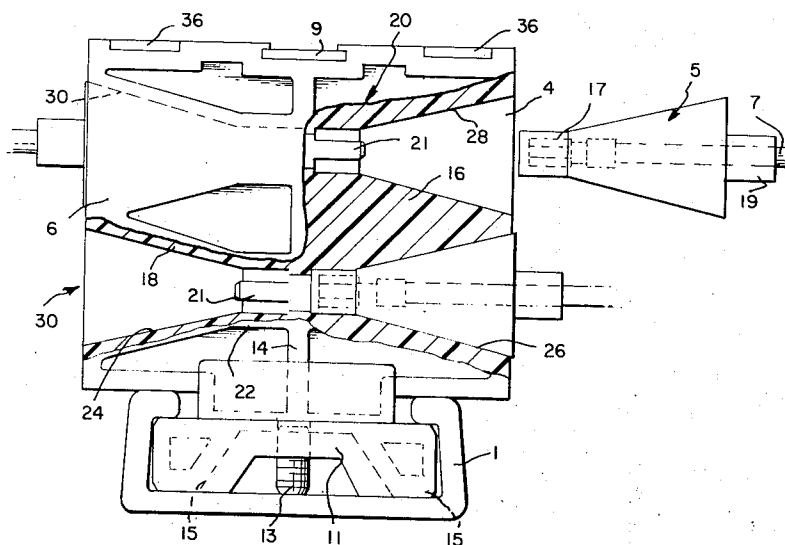
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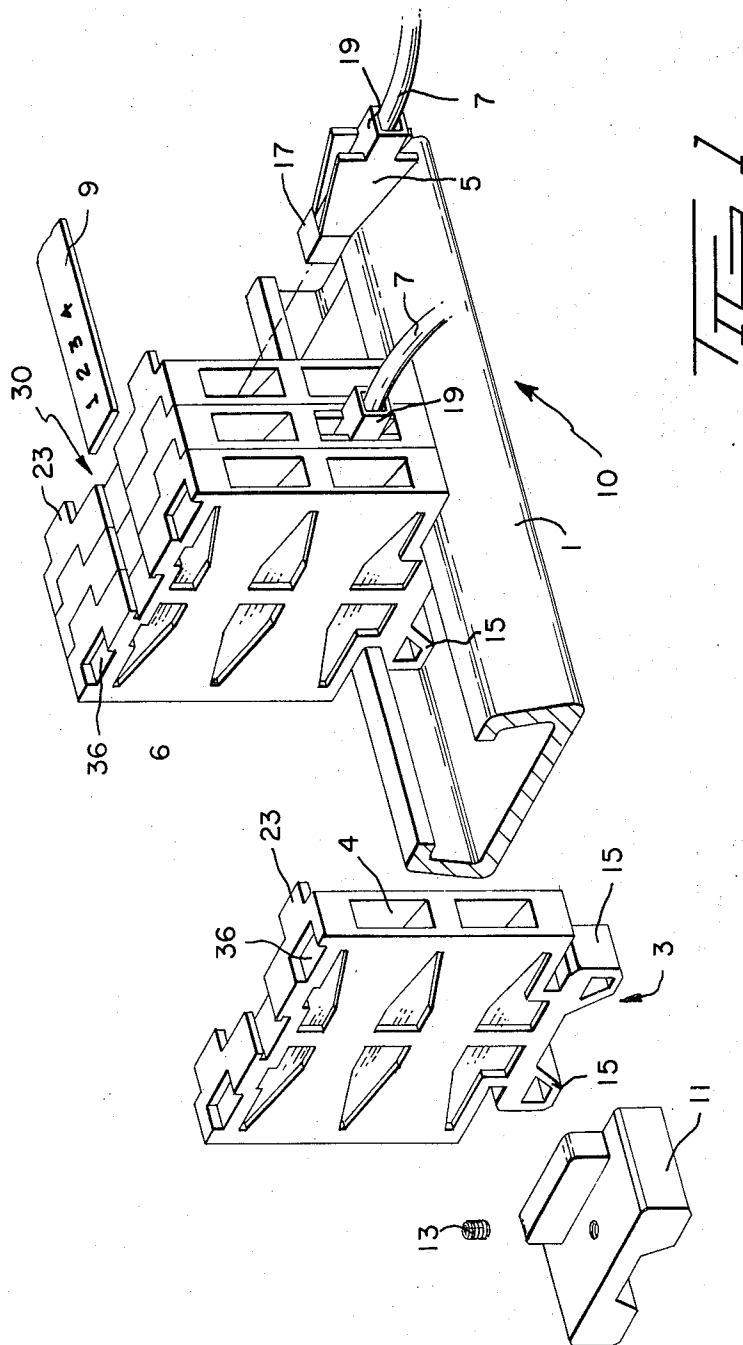
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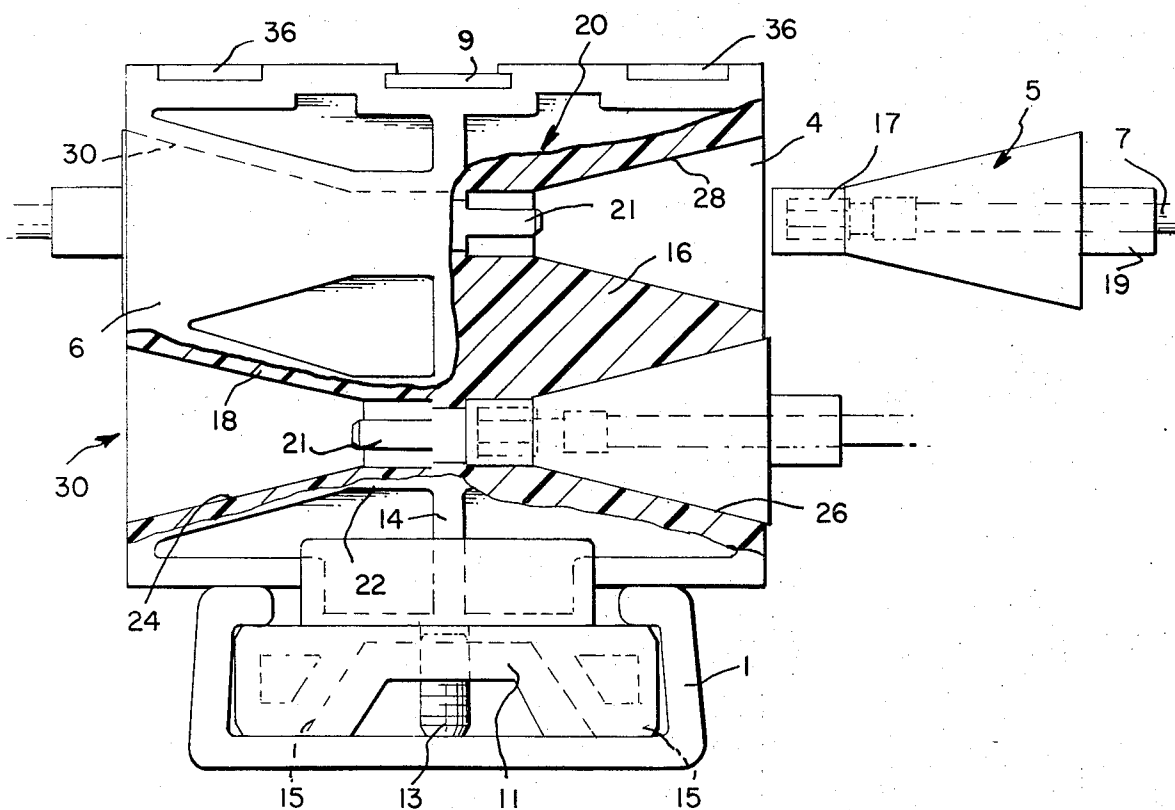
[57] **ABSTRACT**

A terminal strip to provide for varying numbers and combinations of connections between input conductors and output conductors is disclosed. The strip is built up of any desired number of insulating block elements, each of identical structure, all mounted on a channel shaped track between end stops. The block elements have interlocking means and they define plural cavities with sets of contact terminals inside the cavities to which the conductors are terminated in desired patterns. Barrier wall sections subdivide the cavities and separate sets of terminals. The cavities are of pyramid shape, the electrical plug therefore being of the same pyramid shape to provide intimate contact between the walls of the cavities and the plug to increase the distance via air between contacts. High voltage surge conditions can be successfully withstood due to cavity spacings, post spacings, presence of barrier walls, and use of insulating material for all elements except the contact terminals. Access cover means and cavity identifying marker means are also provided.

2 Claims, 2 Drawing Figures







LOW VOLTAGE TERMINAL STRIP CAPABLE OF WITHSTANDING HIGH VOLTAGE TRANSIENTS

The present invention relates in general to electrical terminal blocks or strips which are adapted to make any desired number and combination of electrical interconnections among a plurality of conductors. The terminal strip of the invention is of the modular type construction, in that it is built up of a plurality of identical terminal block sections. As will be seen, the terminal strip includes special provisions for withstanding very high voltages which, under certain conditions, might be imposed upon the individual connectors or loads due to the relatively larger amount of insulation between contact elements as well as the ability to be easily wired in the field. This could not be done readily by the prior art which utilized wrapped junctions for connection to pins, this requiring special tools not available in the field. In accordance with the present invention, such connection can be made in the field using routine crimping tools and semi-skilled servicemen.

The terminal strip of the invention will serve as a flexible and versatile interconnection system. For example, in a junction box for making multiple connections in telephone equipment networks, or among components in data processing systems, or the like, it will provide interconnections for plural sources to plural loads via individual conductors or via groups of plural conductors.

The high voltage terminal strip described herein is composed of a plurality of insulator housing blocks of identical construction which are mounted on a track member and held together thereon in a stack. The housing blocks are each, in essence, a flat plate or main vertical wall with a pair of pyramid shaped sections connected together to form horizontal dividing walls extending outward therefrom at its center and top and bottom walls each having a flaired section to form a pyramid shaped cavity with one face of one of the pyramid shaped sections. A plurality of cavities is formed, one between each pyramid shaped wall section and a top and bottom wall and conductors, to be interconnected, extend into the cavities through the vertical wall wherein they are anchored. Two pairs of metal contact terminals are mounted in one vertical wall, with the other dividing wall separating the pairs of terminals. The terminals are force fitted into small apertures in the vertical wall in which they are mounted. The walls have notches and cooperating tabs fitted into notches of adjacent sections to interlock them into a unitary strip. The conductors are terminated to opposite ends of the terminals in any selected pattern. More than one conductor can be terminated to one end of each terminal if necessary.

It is an object of the invention to provide a terminal strip assembly serving to make interconnections between plural electrical conductors in any desired pattern, and in a structure which affords protection against high voltage surges on said conductors.

It is another object to provide such a terminal assembly made up of a small number of different component parts, all of insulating material for high voltage protection, and so as to be rugged, reliable, flexible in use and service repair, and at the same time inexpensive to manufacture.

Other objects and attainment of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there is shown and described an illustrative embodiment of the invention, it being understood, however, that this embodiment is not intended to be exhaustive nor limiting of the invention but is provided 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 it in various forms, each as may be best suited to the conditions of a particular use.

IN THE DRAWINGS

FIG. 1 is a perspective view, partially exploded, of a group of terminal blocks assembled on a track and making up the terminal strip of the present invention; and

FIG. 2 is a cross-sectional view of one of the identical terminal blocks mounted on the track.

Referring to FIGS. 1 and 2, the terminal strip 10 of the invention is made of a plurality of terminal block housings or modules 3 of electrically insulating material stacked together on a track on channel 1 as shown. Each housing 3 comprises flat side walls 4 and 6 which are oriented perpendicular to the track 1 when in position in the strip. A perpendicular pair of dividing walls or partitions 14 comprising a vertical wall and a horizontal wall composed of pyramid shaped member 16 and 18, connected together at the base of the pyramid and positioned between the side walls 4 and 6 to form four pyramid shaped cavities with upper and lower walls 20 and 22 which include bevelled portions 24, 26, 28, 30. A contact member 21 is mounted in the wall 14 with finger portions thereof extending into the cavities on opposite sides of the wall 14 for mating with a contact 17 in a pyramid shaped electrically insulating plug 5 which is shaped to make intimate contact with the walls of the cavities when connection is made. The plug 5 includes a finger hold portion 19 into which the wire 7 enters for connection to contact 17, such as by crimping or the like. The module 3 also includes notches 15 which ride in the V-shaped channel 1 as shown. The modules 3 include tab portions 23 and indents 36 for interlocking the modules. A channel 38 is also provided for receiving and retaining a marker strip 9 which acts to tie the modules together as well as operating as a marker strip to identify the modules. The modules 3 are secured together in the channel 1 by means of a stop member 11 which rides in the channel and is locked therein by means of a screw 13 which provides a friction stop.

The device is operated by mounting the track 1 in a cabinet or the like and then sliding the modules 3 into the channel of the V-shaped track 1 via the notches 15 which fit into the interior of the channel. When a desired number of modules has been entered onto the track, an end plate or stop 11 is entered into the channel from one or both sides thereof, depending upon whether there is a physical stop already formed at one end of the channel. The stop 11 is locked in the channel by the screws 13 by the pressure applied thereby to the bottom of the channel. The protrusions 23 and indents 36 mate to form a structural interlock and therefore a unitary entity on the track. The channel 38 receives the

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marker strip 9 which acts to tie the modules together as well as providing module identification.

The plug 5 includes a contact 17 to which a stripped wire 7 has been crimped. The contact 17 has a retaining spring of well known type to lock the contact within the plug 5 when the contact is forced therein. The plug 5 includes a finger hold portion 19 by which the plug is inserted into the cavity in the module whereby the contact 17 is forced over the male contact 21 to make electrical connection therewith. Plug 5 fills the cavity and makes intimate contact with a major portion of the interior walls of the cavity to provide electrical isolation between contacts 21 due to the distance between these contacts.

It can be seen that there has been provided a terminal strip wherein connection is easily made in the field using simple crimping tools and the like, which does not require skilled personnel and which provides a great deal of insulating material between adjacent contacts.

Though the invention has been described with respect to a specific preferred embodiment thereof, many variations and modifications will immediately become apparent to those skilled in the art. It is therefore the intention that the appended claims be interpreted as broadly as possible in view of the prior art to include all such variations and modifications.

What is claimed is:

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1. An electrical connecting assembly comprising, in combination, a plurality of identical insulating housing members of rectangular form, means for mechanically interlocking said housing members with their side walls in abutting relation to form a terminal strip of desired length, each housing member being a solid block of insulating material provided with a pair of triangular-shaped cavities in an edge wall thereof with its smaller end inwardly thereof, the adjacent walls of the cavities sloping away from each other inwardly of the housing member, an electrical contact member embedded in the bottom wall of each cavity and extending into the cavity, and plug means exteriorly dimensioned to snugly engage the walls of said cavities and provided with electrical contact means at the small ends thereof for cooperative engagement with the respective contact means.

2. An electrical connecting assembly in accordance with claim 1 wherein a second pair of triangular-shaped cavities are formed in the opposite edge wall of the housing in respective alinement with the cavities of the first-mentioned pair, said contact members being respectively common to two alined cavities, there being second plug means carrying contact means and dimensioned to snugly engage the respective walls of the second pair of cavities.

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