June 23, 1953 M. ROSE 2,643,365

TERMINAL PIN BLOCK

Filed Dec. 28, 1949

FIG. 1

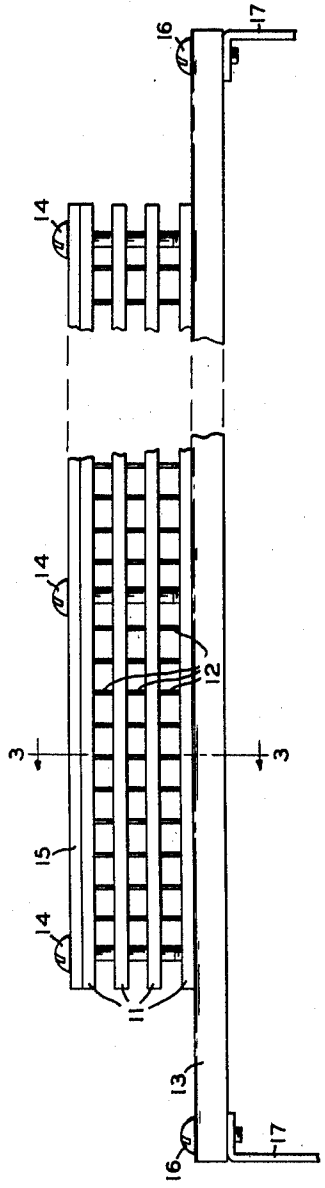


FIG. 4

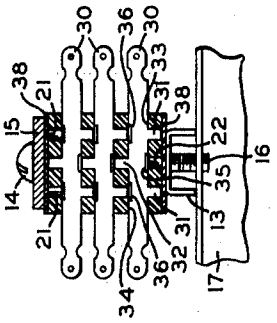


FIG. 3

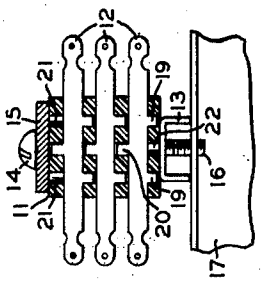
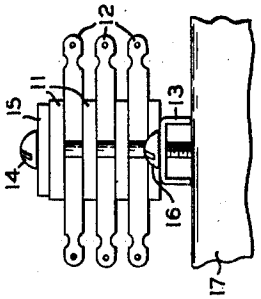


FIG. 2



INVENTOR:
MORRIS ROSE

BY John J. Bellamy
ATTORNEY

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TERMINAL PIN BLOCK

Morris Rose, Chicago, Ill., assignor, by mesne assignments, to Kellogg Switchboard and Supply Company, a corporation of Delaware

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2 Claims. (Cl. 339—198)

1

This invention concerns terminal assemblies for electrical equipment and more particularly relates to an improved multiple terminal-pin block especially adaptable to the interconnection of apparatus such as is used in the telephone communication industry.

Terminal-pin blocks corresponding in type to that of the present invention ordinarily comprise a slab-like support member through which terminal pins extend, projecting from opposite faces of the support member to permit wires to be attached to both ends of the pins as desired. The terminal pins are in the form of strips, or blades, such as may be readily punched from sheet metal, and are arranged in two or more overlying rows, pins standing edgewise in each such row to facilitate passing the insulated portion of a number of wires between them along the face of the support member.

In practice, the support member of a block takes the form of (1) a single-piece, block of hard rubber or similar material having holes drilled therethrough in rows, and the pins forced through the holes and gripped therein, or (2) a built-up block wherein separate segments overlie each other, one for each row of pins, with each segment having saw cuts across the upper side thereof to receive a row of pins which are held in place by the next overlying segment when the parts are clamped together.

In view of the foregoing, the principal object of the invention is to provide a terminal-pin block serving the foregoing purpose and which can be readily produced by simple mass-production processes to meet all ordinary requirements as to number and arrangement of terminal pins.

A feature of the invention is that the terminal pins have suitable locating tabs thereon which are received in openings in insulating strips between which the rows of pins lie, the parts being clamped together to provide a rigid pin block of which the pins form a structural part.

It is another feature of the present invention that beside being able to produce the essential elements entirely by simple punch-press operations, their assembly into a block also may be simply accomplished with no more complicated tools than a screwdriver.

The novel structure embodying these and other features which I believe to be characteristic of my invention is defined with particularity in the appended claims. My invention, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the

2

following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a broken side-elevation view of a terminal-pin block embodying the principles of the present invention;

Fig. 2 is an end-elevation view of the terminal block of Fig. 1;

Fig. 3 is a cross-sectional view of the terminal block of Fig. 1 as taken along line 3—3; and

Fig. 4 is a cross-sectional view of another embodiment of the present invention in which terminal members of a different type are utilized.

Referring to the drawings in greater detail, the terminal-pin block assembly exemplified in Fig. 1 comprises four similar terminal-support strips 11 made of electrical insulating material between which a plurality of terminal members 12 are clamped on edge in parallel side-by-side relation. Three rows or levels of terminal members 12 are thus provided, each pair of adjacent rows having a common support strip 11, and the terminal members of each row being arranged in alignment with terminal members of the adjacent rows.

The terminal members 12 are relatively thin longitudinal strips of brass or somewhat similar electrical conducting material. Their length is somewhat greater than the width of the support strips 11 with which they are associated to permit extension of their ends a sufficient distance beyond the edge of the stack of strips 11 to permit ready accessibility for connection of wire leads thereto. Each end of the terminal members is provided with a small lead hole and a pair of confronting nicks in the upper and lower edges of the terminal member in order to facilitate winding and soldering of one or more wire leads thereon. It will be readily realized, however, that although the terminal ends are described as having a specific shape, any one of a number of configurations may be provided at such ends to enable connection of wire leads thereto without venturing outside the scope of the present invention.

In order to assure proper placement and alignment of the terminal members 12 between the strips 11, each terminal member is provided, as shown in Fig. 3, with three positioning projections, a pair of such projections 19 extending from one edge and a third projection 20 extending in an opposite direction from the opposite edge at a point intermediate of the first two. Correspondingly, the terminal support strips 11 are provided with apertures aligned in columns of three extending across the width of each strip

to accommodate the positioning projections of terminal members 12 disposed above and below the respective strips 11. To permit establishment of this relation, the outer apertures 21 in each column are so spaced that they match the spacing between terminal projections 19 to be accommodated thereby. Similarly, the single aperture 22 in each column of apertures is disposed in a position intermediate of apertures 21 to accommodate a centrally located projection 20 of any terminal member 12. The apertures 21 and 22 are circular and just sufficiently large to permit slidable insertion of the projections 19 and 20 therein without permitting longitudinal or lateral misalignment of the terminal members after they are positioned in the block. Although the apertures 21 and 22 are herein set forth as being circular, it will be readily realized that any of a number of aperture configurations which will provide a snug fit for the terminal projections may also be used.

In order to hold the terminal members 12 of each row in alignment with terminal members in adjacent rows, the pattern of apertures in all of the support strips 11 are made identical. Thus, the apertures in each support strip 11 in a terminal-block assembly are caused to be in vertical alignment with similar apertures in each of the other strips 11 of the block assembly.

The terminal members 12 are all oriented similarly within the block assembly in such a manner that all terminal edges having two projections 19 are associated with a terminal support strip 11 disposed below, while the terminal edge with a single projection 20 is associated with a terminal support strip 11 located above. This arrangement provides separate spaced apertures within a common strip for positioning projections 19 and 20 of terminal members in adjacent rows of the block. Since each terminal member is positioned and held by three separate spaced projections 19 and 20, not only vertical alignment of terminal members 12 is assured, but rigid lateral alignment is effected as well.

The support strips 11 in this embodiment of the invention are made at least slightly thicker than the length of any of the terminal projections 19 or 20 associated therewith. This arrangement prevents the terminal projections 19 and 20 from protruding into contacting engagement with terminal members in rows adjacent to the row in which they are located.

Clamping of elements of the block assembly is effected by means of two or more bolts 14 passing through a clamping bar 15 and threaded into tapped holes provided in a mounting or base channel 13. The bolts 14 pass through snug aligned apertures properly spaced along the length of the parallel support strips 11 to permit making of a threaded engagement with the base channel 13. A clamping bolt 14 is provided near each end of the block assembly, and as many additional bolts are provided in between as are necessary to effectuate rigid securement of elements in the assembly. In the present instance the spacing between bolts 14 was chosen so that ten terminal members would be grouped between each pair of adjacent bolts in order to facilitate numerical identification of individual terminals.

The fact that bolts 14 pass through snug apertures in support strips 11 aids in preventing such strips from being moved out of lateral or longitudinal alignment with respect to each other. These apertures are sufficiently large, however, to permit slidable movement of the strips 11 over

the length of the bolts. Upon tightening the bolts 14 by threading them into the base channel 13, the clamping bar 15, which is a rigid longitudinal strip of material such as aluminum or iron, acts to distribute forces on the uppermost terminal-support strip 11 in the assembly. The uppermost strip 11 in turn acts on the terminal members 12 associated therewith to similarly distribute forces on the terminal support strips at lower levels to establish a rigid relation of elements in the assembly.

The channel member 13 may be readily made to any standard size suitable for mounting the terminal block on the framework of apparatus with which it is to be associated. It may be secured to portions of such framework by a pair of mounting bolts 16 passing through suitably disposed apertures in channel 15 for establishment of a threaded relation with tapped holes provided in the framework portions 17 of associated apparatus.

Fig. 4 illustrates another embodiment of the present invention utilizing a different type of terminal member 30 designed to provide added safety against the possibility of short-circuit contacts between terminal members in adjacent rows. Terminal members 30 have two spaced positioning projections 31 on an edge 33 and a third such projection 32 intermediately disposed on an opposite edge 34 as on the terminal members 12 of the previous embodiment. In addition, complementary cutout portions 35 and 36 somewhat greater in width than the positioning projections, are provided on the terminal edges at points immediately opposite the projections 31 and 32 respectively. These cutout portions give extra protection against the possibility of insufficient airgap distance between the aligned terminal members in adjacent rows of an assembled terminal block. The depth of the cutout portions is such that when the terminal members are aligned in adjacent rows in properly oriented relationship, a definite airgap is always provided about the positioning projections between terminal edges. An additional feature of the cutout portions is that they permit much larger dimensional tolerances for the support strip thickness and projection lengths. The configuration of the terminal ends may, as in the above described embodiment, be of any desired form just so long as the main body portions of the terminal members have edges parallel to each other so that the associated support strips 11 will be maintained in parallel relation.

The particular arrangement thus described eliminates the need for making the projections 31 and 32 smaller in length than the thickness of the support strips 11. Both of these dimensions may actually be the same. In effecting such a dimensional relation of elements, however, a pair of insulating members 38 are required in order to separate the upper and lower terminal support strips 11 from the clamping bar 15 and the base channel 13 respectively, thereby preventing possible contact of terminal projections by the metal clamping members. It is obvious, however, that other structural details of the present invention, such as the manner of clamping the elements together and mounting them on associated apparatus may be the same in both embodiments described.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art, that changes and modifications may be made without depart-

ing from this invention in its broader aspects, and therefore, the aim in the appended claims is to cover all such changes in modification as fall within the true spirit and scope of this invention.

I claim:

1. A multi-level stacked terminal-block assembly comprising a plurality of layers of terminal members, each layer comprising a row of uniformly spaced blade-like terminal members, each disposed on edge with its length extending across the row, each terminal member in any layer being aligned with a terminal member in each other layer, said assembly further comprising similar overlappingly aligned insulating support strips, separate ones of said strips underlying said rows, respectively, and another of said strips overlying the topmost row, whereby the terminals of any row are between two adjacent strips and are in edge contact with each, clamping means exerting an inward clamping force on the uppermost and lowermost strips to hold the assembly firmly together, each said strip containing a separate transverse cross row of three uniformly spaced perforations in alignment with each adjacent terminal member in a row, all terminal members being similarly disposed and each having a central edgewise extension on one edge entering the central one of the three associated perforations in one adjacent support strip and having

two outer edgewise extensions on the opposite edge entering the outer openings in the other adjacent support strip, whereby with the support-strip thickness in excess of the length of the edgewise extensions, the terminals are maintained in insulated relationship to each other and are held firmly in assembled position.

2. In a multi-level stacked terminal-block assembly as set forth in claim 1, each terminal member having a notch in its edge opposite each edgewise extension thereof, each such notch having a width in excess of the width of the edgewise extensions, whereby the separation gap between any edge extension of a terminal member and the adjacent terminal member is increased.

MORRIS ROSE.

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