

April 25, 1961

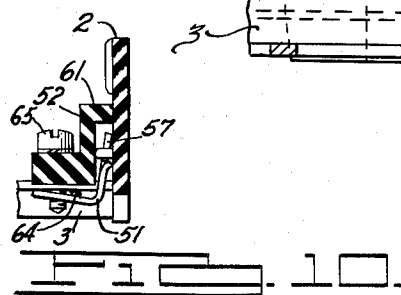
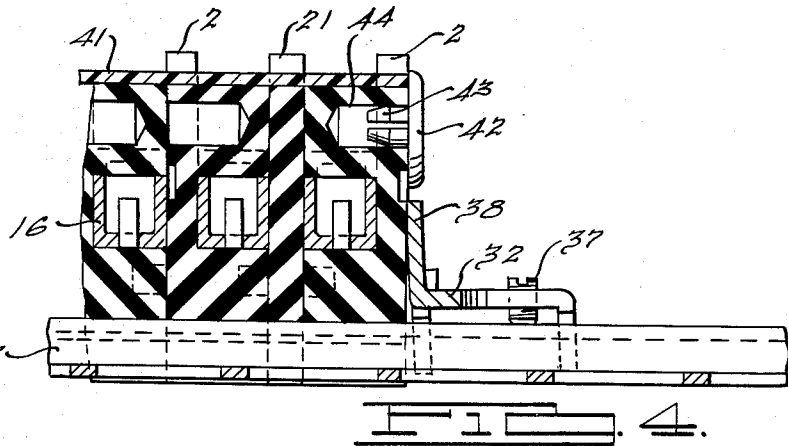
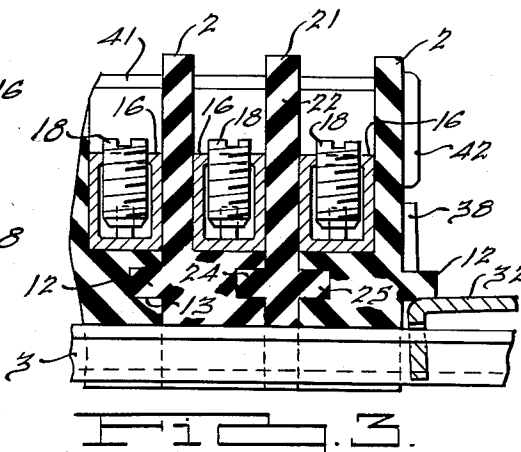
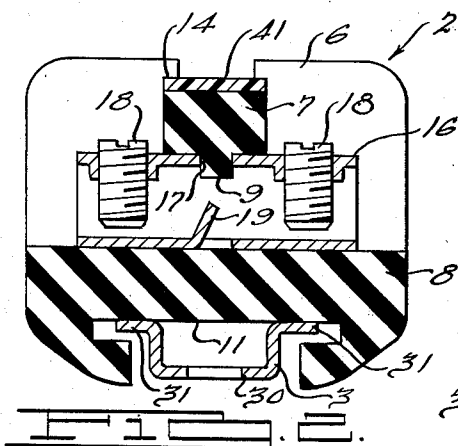
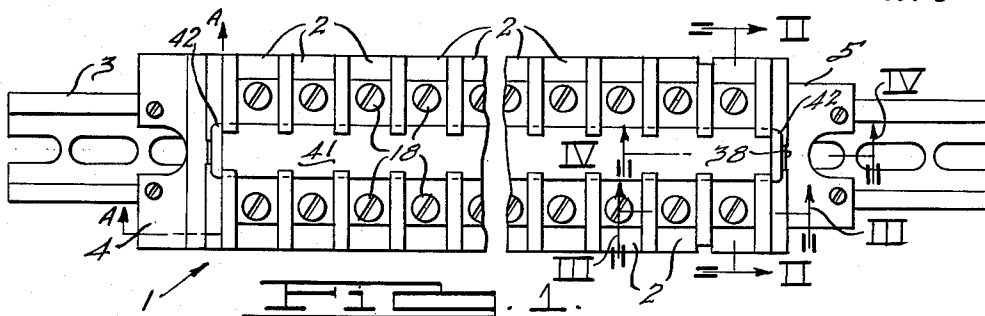
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2,981,922

ELECTRIC TERMINAL STRIP

Filed May 16, 1956

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

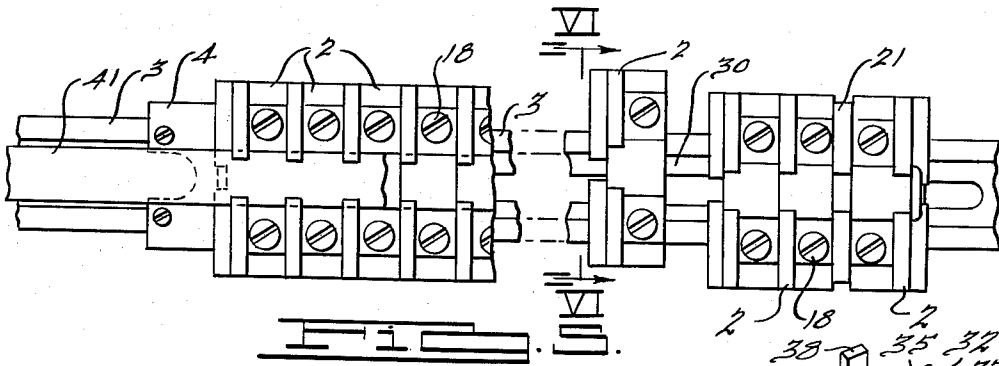


FIG. 6.

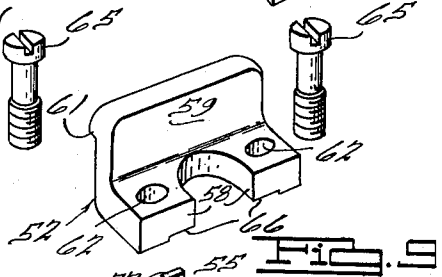
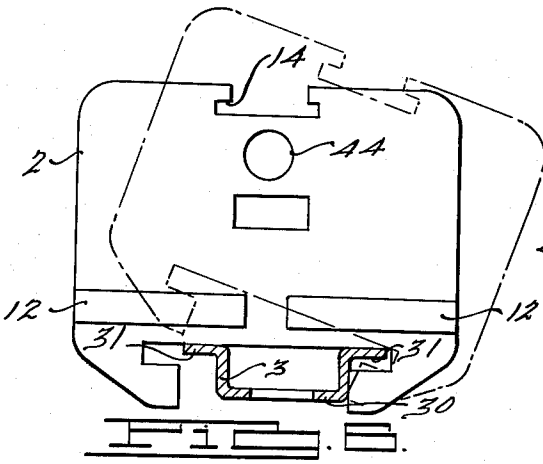
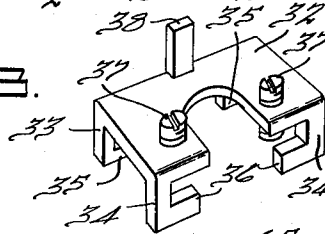


FIG. 9.

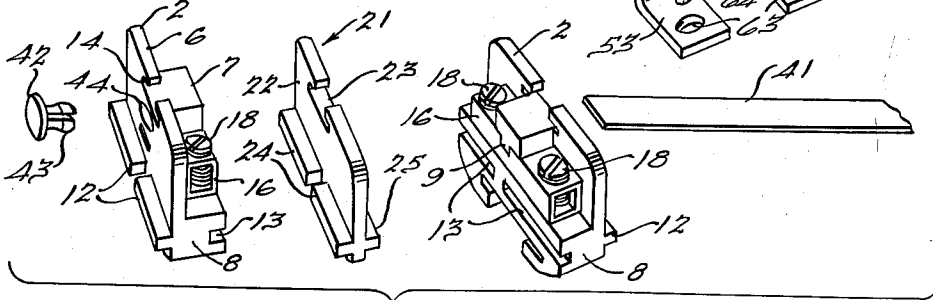


FIG. 10.

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2,981,922

ELECTRIC TERMINAL STRIP

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Filed May 16, 1956, Ser. No. 585,345

6 Claims. (Cl. 339—198)

This invention relates to terminal strips and more particularly to a terminal strip composed of joined individual terminal blocks provided with connectors to which electrical connections may be made.

The object of the invention is the provision of a terminal strip of any desirable length composed of individual terminal blocks interlocking on adjacent sides and adapted to be clamped together to form the composite terminal strip.

Another object of the present invention is the provision of a terminal strip composed of individual terminal block members with the individual members readily releasable from the composite strip for removal or interchange.

A further object of the present invention is the provision of a terminal strip composed of individual terminal block members and a single intermediate spacing unit with one of the terminal block members cooperating with the spacing unit to provide an end unit for the terminal strip.

A further object of the present invention is the provision of a readily adjustable end clamp for the composite terminal strip which may be easily maneuvered to permit manipulation of individual terminal blocks comprising the composite terminal strip.

Another object of the present invention is the provision of an indicia strip for composite terminal strips of the preceding objects which may be readily removed and adjusted within the terminal strip.

A further object of the present invention is the provision of an individual terminal block and channel support construction which will permit removal of the terminal block from the channel with lateral movement of the block with respect to the channel and rotational movement of the block with respect to the longitudinal axis of the channel.

Other objects and features of the invention will be readily apparent to those skilled in the art from the specification and appended drawings illustrating certain preferred embodiments in which:

Figure 1 is a top plan view of a composite terminal strip.

Figure 2 is a sectional view taken along the line II—II of Figure 1.

Figure 3 is a sectional view taken along the lines III—III of Figure 1.

Figure 4 is a sectional view taken along the lines IV—IV of Figure 1.

Figure 5 is a partial top plan view of the composite terminal strip and illustrating the preliminary removal of one individual terminal block.

Figure 6 is a sectional view taken along the line of VI—VI of Figure 5.

Figure 7 is an exploded perspective view of two terminal block units and an intermediate spacing unit with one of the block units reversed to form an ending unit for the composite terminal strip.

Figure 8 is a perspective view of an end clamp.

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Figure 9 is an exploded perspective view of another form of an end clamp for use with the terminal strip of the present invention.

Fig. 10 is a side elevation of a portion of the composite terminal strip along line AA in Fig. 1 with the end clamp of Fig. 9 in position.

The terminal strip 1 of the present invention comprises an assembly of a plurality of individual terminal block units 2 supported on a channel 3 and clamped in place by a pair of end clamps 4 and 5.

The individual terminal block units 2 are constructed of a molded insulated material to provide a vertical barrier 6 generally toward one side thereof and a pair of horizontal barriers 7 and 8. Barrier 7 is provided with an extending rib 9 and barrier 8 is provided with a T-shaped slot 11. The side of the block along which the barrier 6 extends is provided with a pair of extending ribs 12 and the side of the block opposite to the rib portions 12 is provided with a pair of slots 13. The barrier 6 is provided at its top with an inverted T-shaped slot 14 immediately above the horizontal barrier 7. In the space between the upper and lower surfaces of the horizontal barriers 8 and 7, respectively, an electrically conducting connector 16 is provided with a horizontal groove 17 at its upper surface for cooperation with the rib 9 to provide alignment of the connector within the block. The connector 16 is provided with a pair of terminal screws 18 threading through pierced and tapped holes in the connector for cooperation with the base of the connector to provide for electrically connecting conductors to the terminal strip. A turned up rib 19 is provided at the base of the connector to function as a registering stop for conductors inserted into the connector. Adjacent individual terminal blocks 2 when joined together to form the composite terminal strip are interconnected with each other through the cooperation of the ribs 12 with the slots 13 of the next adjacent unit and the vertical barriers 6 of the adjacent units enclose the connectors 16 snugly between their adjacent surfaces.

To terminate a row of individual terminal blocks in the formation of the composite terminal strip an intermediate spacing unit 21 is provided having a vertical barrier 22 with a T-shaped slot 23 and a pair of extending ribs 24 and 25 one at each side of the barrier 22. The ribs 24 and 25 cooperate with the grooves 13 of adjacent individual terminal block units 2 with one of the units reversed with respect to the other as shown in Figure 7 so as to direct its grooves 13 in the opposite direction from the grooves of the other assembled individual terminal block units. As also seen in Figure 3, the termination of the terminal strip constitutes the end terminal block 2 of the groups of terminal blocks directed in an original direction cooperating with an intermediate spacing member 21, with the member 21 also cooperating with a reversed terminal block 2 at the end of the terminal strip.

The composite terminal strip is supported on and clamped to the U-shaped channel member 3 having horizontally extending portions 31 which extend from the base portion 30. The extensions 31 cooperate with the bar portion of the T-shaped slot 11 in the individual terminal blocks and are of a dimension to prevent direct vertical removal of the terminal block from the channel when the block is centrally aligned with the channel. The end clamps 4 and 5 constitute identical U-shaped members each having a bight portion 32 intermediate pairs of depending legs 33 and 34 at each side constituting the leg portions of the U shape. The legs 33 are each provided with an inwardly directed portion 35 and the legs 34 are each provided with an inwardly directed portion 36. A pair of adjustable clamp screws 37 are threaded through tapped holes in the bight portion 32 of the U shape and an aligning finger 38 is turned up

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from the bight portion at the end of the clamp opposite the end provided with the clamping screws 37. The clamp is adapted to be positioned on the channel 3 with the outward flanges 31 positioned between the inner surface of the bight portion 32 and the inner surface of the inwardly directed portions 35 and 36 on the legs 33 and 34 respectively. The clamp may be slid along the channel to any desired position to where its finger 38 becomes positioned between the ribs 12 of the individual terminal block members 2. In this position the clamp will align the block members on the channel and will prevent lateral sliding of the blocks with respect to the channel. The clamp is secured in place by turning the adjustable screws 37 into the bight portion where the inner ends cooperate with the upper surface of the flanges 31 on the channel 3 so that, as seen in Figure 4, the clamp pivots about the engagement of the inner surface of the portion 35 with the undersurface of the extending flange 31 of the channel 3. With full adjustment of the screws 37 the clamp will be aligned with the inner surfaces of the inwardly directed portions 35 and 36 cooperating with the undersurface of the flanges 31 of the channel 3 and the finger 38 will be aligned with the space between the ribs 12 on the terminal block 2 to operate as an end barrier and lateral aligning means for the terminal strip. When all of the individual terminal block units 2 comprising the composite terminal strip are interengaged and aligned, the second of the clamp members may be slid along the channel 30 to align its finger 38 with the space between the ribs 12 of the end block unit and may be there clamped in place by adjustment of its adjustable screws 37. The adjustment of the screws on the second clamp will effect at least a minor squeezing action to compress the units together through the rotary movement of the clamp about its engagement with the channel flanges applying this force to the terminal blocks through the extending finger 38.

Once the complete composite terminal strip has been assembled an indicia strip may be passed through the slots 14 in the individual units to provide a surface upon which identification may be made for each of the terminal strip sections. The strip may constitute a sheet of flexible material 41 passing through the crossbar portion of the T-shaped slot 14 and may be held in place at each end by resilient rivet-like members 42 provided with an oversized head portion aligned with the crossbar portion of the slot in the individual terminal block units. The inner portion of this member 42 is provided with a barbed shaft 43 for cooperation with the inner surface of a hole 44 in each of the terminal block units so that once the member 42 is inserted its shaft will engage the terminal block and provide a resistance to removal of the member.

In Figures 5 and 6 is illustrated the method for removal or replacement of any of the individual terminal block units constituting the composite terminal strip 1. In Figure 5 the individual unit 2 is shown transversely moved on the channel 3 to substantially the position shown in full lines in Figure 6. To accomplish this movement, one or the other of the clamps at the end of the composite strip is released from its clamping engagement with the channel 3 by loosening the adjustable screws 37 thereof to permit movement of the clamp along the channel. With the clamp moved on the channel, the terminal strip may be separated into its individual components of individual terminal blocks to permit access to any of the desired ones of the assembly. The individual terminal block may then be moved as shown in Figures 5 and 6 to a position where the channel 3 will be aligned to one side of the T-shaped slot in the base of the terminal block. The terminal block may then be rotated about the side in engagement with the channel 3 to remove the opposite side of the block from its alignment with that side of the channel.

In Figure 6 the position of the terminal block after this rotary movement is shown in dot-dash lines indicating

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the position of the terminal block just prior to complete removal from the channel. Another terminal block may be inserted in place in the composite terminal strip by reversing the order of manipulation; that is, placing one extending flange of the channel 3 in the crossbar portion of one side of the T-shaped slot 11 of the terminal block 2 and then rotating the block about its engagement with that side of the channel to position the channel for lateral movement into alignment with both extending portions 31 aligned in the crossbar portion of the T-shaped slot 11. The composite terminal strip may then be reassembled into its composite form by re-aligning the ribs and slots in the adjacent terminal block units and by repositioning the clamp at the then free end of the terminal strip. Once again reassembled, the indicia strip 41 may be returned to its positions in the upper T-shaped slot 14 in the individual terminal blocks 2 and locked into position with the locking member 42.

Figs. 9 and 10 illustrate a modified form of an end clamp for use with the terminal strip of the present invention. The clamp is of two-part formation with a sheet metal base piece 51 and an upper piece 52 which may be of moulded or cast construction. The base piece 51 is of a folded-over U-shape construction providing a pair of legs 53 and 54 and a bight portion 55. The inner surface of the bight 55 and the inner surface of the legs 53 and 54 are cut out prior to formation of the piece into its L-shape to develop a guide slot 56 for cooperation with the flanges 31 of the channel 3 with the bight 55 above and the legs 53 and 54 below the channel. At the outer surface of the bight 55 an extending finger 57 is provided for cooperation with the space between the ribs 12 of the end unit of an assembled terminal strip in the same manner as the finger 38 of the end clamp of Figure 8.

The upper piece 52 is of an L-shape formation with a bifurcated horizontal portion 58 and an upright portion 59. The upright portion 59 is provided with an extending rib 61 at the back and upper surface thereof for cooperation with the end block of an assembled terminal strip as will be seen with explanation of the assembled position of the end clamp.

The bifurcated horizontal portion 58 is provided with holes 62 therethrough and the legs 53 and 54 of the base piece 51 have threaded holes 63 in alignment with the holes 62.

Adjusting screws 65 are adapted to extend through the holes 62 and thread into holes 63 to effect securing of the end clamp in place on the terminal strip.

Each of the legs 53 and 54 is also provided with a nib 64 raised from the upper surface thereof and adjacent to the corner produced by the formation of the guide slot 56.

The bottom surface of the horizontal portion 58 is formed with a shallow groove 66 just slightly wider than the dimension of the channel at the extending flanges 31 thereof and not quite as deep as the channel is thick to function as an alignment means for the clamp during assembly with a terminal strip.

The end clamp shown in Fig. 9 can be used to replace the clamp shown in Figs. 1, 4, and 8, to secure the prescribed plurality of individual terminal units on the channel 3. When this arrangement is used, the molded part 52 is disposed above the flanges on channel 3 and the part 51 has a portion thereof extending to engage the bottom surface of the flanges on channel 3. Therefore, as the screws 65 are tightened, a clamping action will occur between parts 52 and 51 to intimately press the clamp 52 against the top surface of the flanges while clamp 51 is intimately pressed against the bottom of the flange. This will provide a frictional engagement between the clamp and channel and prevent the clamp from sliding on the channel. When this occurs, as shown in Fig. 10, the rib 61 will be in contact with the end surface of the end block and conceal the ridges 12 formed

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thereon while the lower clamping member 51 is rotated about fulcrums 64 to push the finger 57 toward the end block and therefore press the blocks of the entire terminal strip toward one another. In this connection it is to be noted that finger 57 is received in the space between the ribs 12 so as to prevent transverse movement of the end blocks on the channel 3.

It may be seen from the foregoing description of the component parts of the terminal strip of the present invention that the strip may be made of any desired length through the selection of the proper quantity of individual terminal block units and that individual selected units may be readily removed from the assembled strip without the necessity of threading all or portions of the strip off a frame or the like and then back on again. Adjustment of the terminal strip requires a minimum of separation of the unit with an easily manipulatable lateral sliding and rotational movement of the individual block desired to be replaced or removed.

While certain preferred embodiments of the invention have been specifically disclosed, it is understood that the invention is not limited thereto, as many variations will be readily apparent to those skilled in the art and the invention is to be given its broadest possible interpretation within the terms of the following claims.

What is claimed is:

1. A terminal strip comprising a plurality of identical terminal block units arranged in face-to-face contact in an uncompleted row with each unit facing in the same direction as the other units, each of said units having spaced ribs on one side and spaced grooves complementary to the ribs on the other side, the ribs of each of said units but one at one end of the uncompleted row being received in the complementary grooves, respectively, of a next adjacent unit for interlocking adjacent units, an intermediate spacing member having spaced ribs on both sides complementary to the spaced grooves of said units, the ribs on one side of said spacing member being received in the grooves of the one of said plurality of units at the other end of the uncompleted row thereby to partially complete said row, an additional terminal block unit similar to each of said plurality of units, the ribs on the other side of said spacing member being received in the grooves of said additional unit to complete the row, whereby spaced ribs are presented at each end of the completed row, a support member, each of said units and said spacing member having means for mounting the units and spacing member on said support member so said units and spacing member have an unrestricted movement transverse of the completed row between limits, a pair of adjustable end clamps disposed at the ends of the completed row, respectively, each of said end clamps having means operable upon progressive tightening thereof for securing its associated end clamp in fixed position to said support member, a portion on each of said end clamps extending into the space between said presented ribs at its end of the completed row to align said units on the support member, and means on said end clamps, respectively, operative to progressively press said units and spacing member with increasing pressure as a result of progressively tightening said end clamps on the support member.

2. A terminal strip in accordance with claim 1 characterized in that each of said units and said spacing member has an additional groove, said additional grooves are aligned with each other when said units and said spacing member are aligned in said completed row, and an indicia strip having a length equal to the length of the completed row is received in said aligned additional grooves.

3. A composite terminal strip in accordance with claim 1 characterized in that each of said units and said spacing member has a T-shaped slot in the base thereof defining a pair of oppositely directed slots, said support member has wing portions received in said slots, respec-

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tively, when said units and spacing member are mounted on said support member, and said wing portions are sized with respect to said slots to permit said unrestricted movement of said units and spacing member transverse of the completed row within limits.

4. A composite terminal strip comprising a plurality of juxtaposed terminal blocks each having a T-shaped slot in the base thereof, an elongated support member received in the T-shaped slots of the blocks and sized to permit the blocks to have unrestricted lateral movement with respect to the support member between limits when the blocks are assembled on the support member in a row to form a composite terminal strip, complementary interlocking means on said blocks for interlocking with adjacent ones of the blocks to maintain the blocks in said row in alignment and to prevent relative lateral movement between the blocks, an adjustable end clamp at each end of said row, each of said clamps having a means including a portion cooperating with the interlocking means on its associated end block for preventing lateral movement of its associated end block with respect to the support member, each of said clamps having fastening means for progressively tightening its associated end clamp to said support member, and each of said clamps having means for tilting the lateral movement preventing portion thereof toward the blocks for pressing the blocks of said row together with increasing pressure as its associated fastening means is tightened to said support member.

5. A composite terminal strip comprising a plurality of juxtaposed terminal blocks each having a T-shaped slot in the base thereof, an elongated support member received in the T-shaped slots of the blocks and sized to permit the blocks to have unrestricted lateral movement with respect to the support members between limits when the blocks are assembled on the support member in a row to form a composite terminal strip, complementary interlocking means on said blocks for interlocking with adjacent one of said blocks to align the blocks on the support member in said row and to prevent relative lateral movement between the blocks, an adjustable end clamp at each end of said row, each of said clamps having a means including a portion cooperating with the interlocking means on its associated end block for preventing lateral movement of its associated end block with respect to the support member, each of said clamps having fastening means for progressively tightening its associated end clamp to said support member, and a fulcrum on the aligning means of each of said clamps for tilting the lateral movement preventing portion thereof toward the blocks for pressing the blocks of said row together with increasing pressure as each clamp is tightened to said support member, whereby a force is applied by said aligning means parallel to said member to press said blocks together tightly.

6. A composite terminal strip comprising an elongated U-shaped channel support member having outwardly turned flanges on opposite sides located in a common plane to define a generally T-shaped transverse section, a plurality of terminal blocks, each of said blocks having an exposed T-shaped slot complementary in shape to the outline of the T-shaped transverse section so that the individual blocks may be slid longitudinally on the support into juxtaposed positions to provide a row of blocks on the support, means on each of said blocks providing a mechanical interlock with an adjacent block to prevent relative transverse movement between the blocks on the support when said blocks are juxtaposed, said T-shaped slots in the blocks being dimensioned sufficiently greater than said T-shaped transverse section of the support member so the blocks have an unrestricted transverse movement on the support between limits to permit any one of said blocks to be individually removed from said row and from said support when the individual block to be removed is disengaged from adjacent blocks and

pivoted and transversely moved relative to the support, and a clamping means on each end of the row, each of said clamping means being slidable on the support member and having means thereon for transversely aligning its associated end block of the row on the support member and for longitudinally pressing the blocks of the row together when the clamping means is tightened on the support member.

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