Aug. 19, 1958 R. L. FOOTE ET AL 2,848,703

TERMINAL BLOCK WITH SHIFTABLE MARKER STRIP

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Fig. 1.

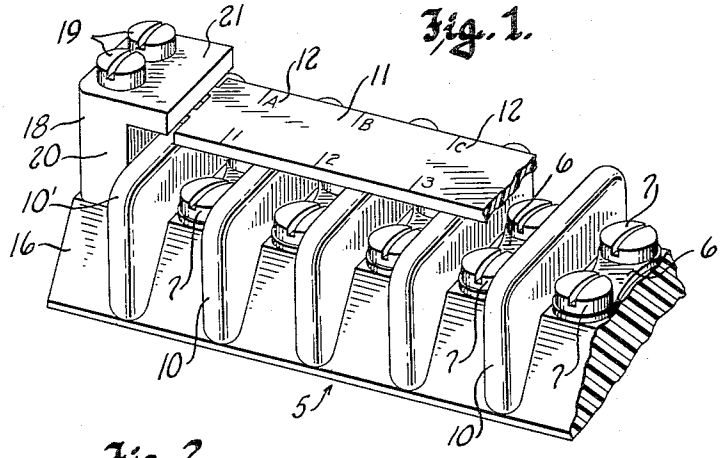
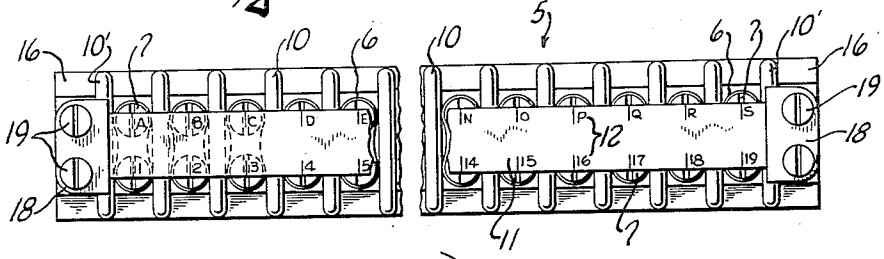
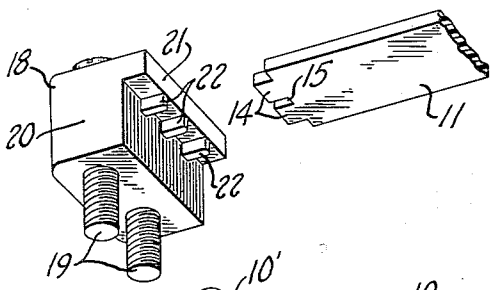


Fig. 2.





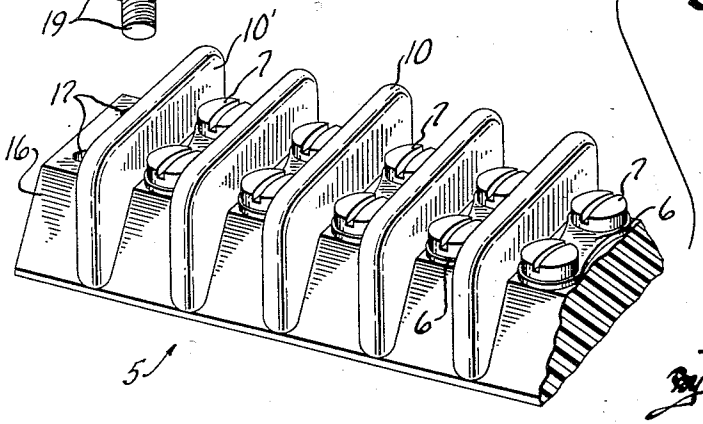


Fig. 3.

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Fig. 4.

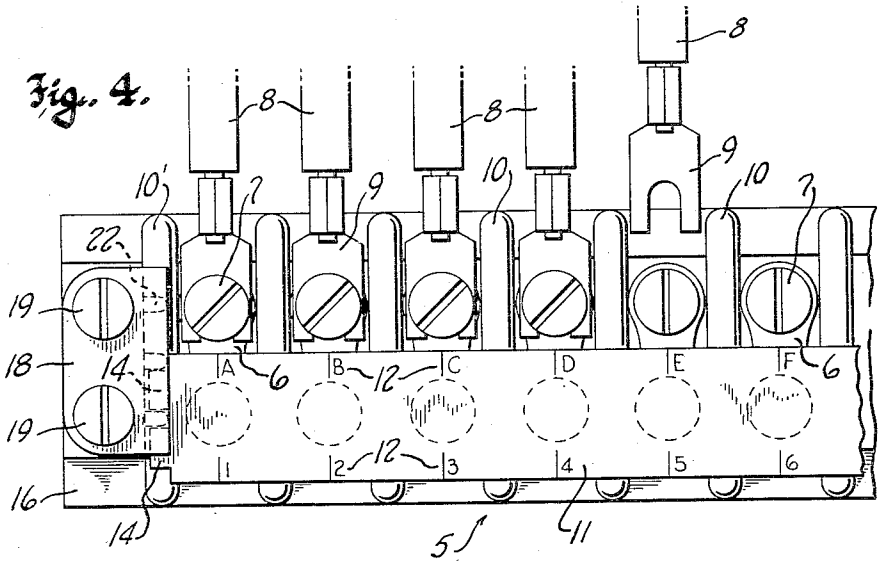
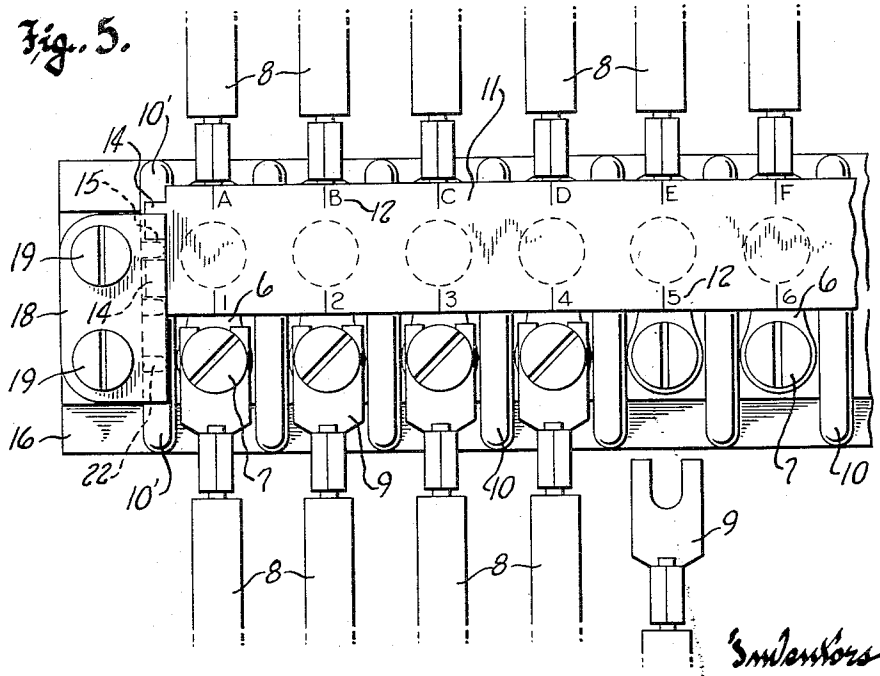


Fig. 5.



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TERMINAL BLOCK WITH SHIFTABLE MARKER STRIP

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Fig. 6.

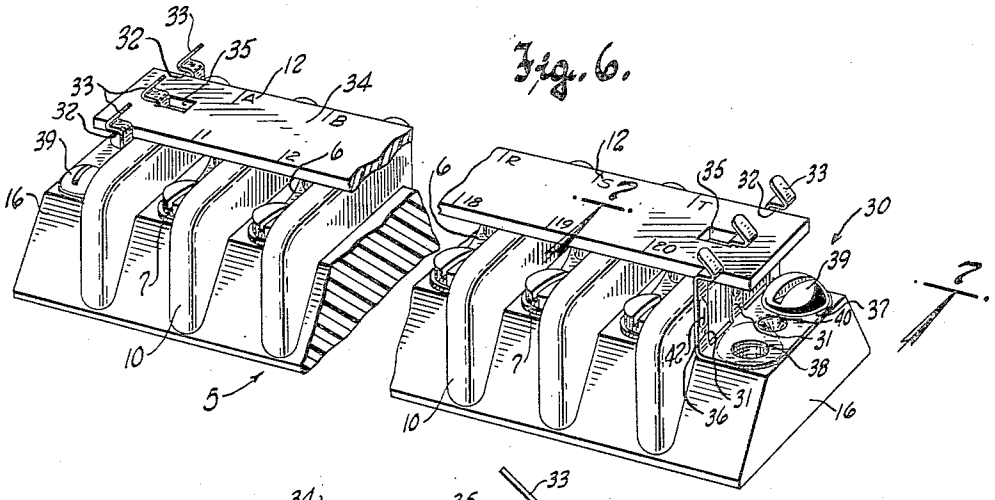


Fig. 7.

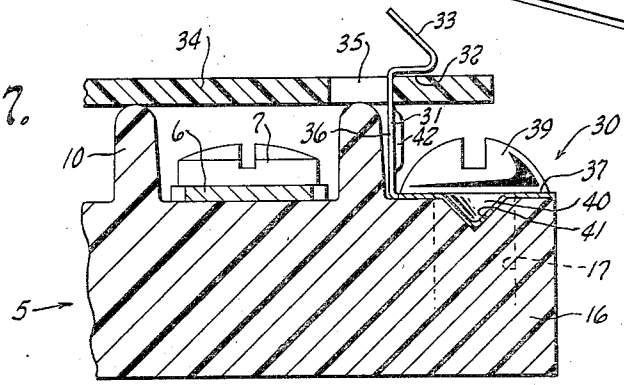


Fig. 8.

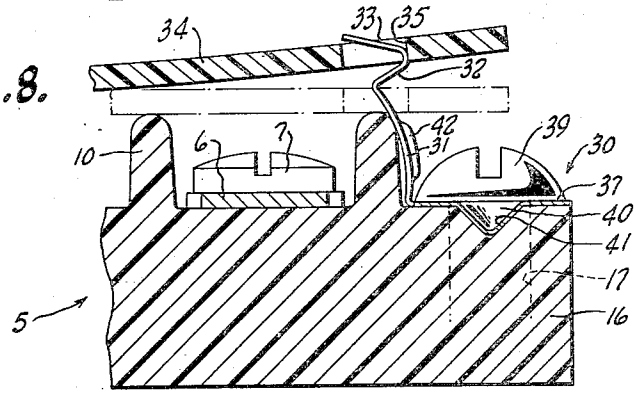
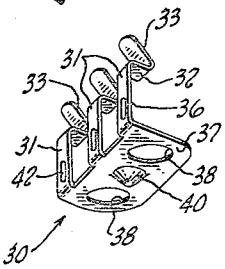


Fig. 9.



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2,848,703

TERMINAL BLOCK WITH SHIFTABLE MARKER STRIP

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Application October 3, 1956, Serial No. 627,528

(Filed under Rule 47(a) and 35 U. S. C. 116)

8 Claims. (Cl. 339—113)

This invention, like that of the copending application, Serial No. 480,582, filed December 6, 1954, now abandoned of which this application is a continuation-in-part, relates to electrical connecting devices of the type comprising an elongated insulative block having a plurality of metallic terminal members thereon, to each of which a conductor is secureable, and the invention refers more particularly to marker strips for such terminal blocks.

A terminal block of the type here under consideration, sometimes referred to as a terminal strip, comprises an elongated block of insulating material, such as Bakelite, having transversely opposite pairs of electrically connected terminals disposed between longitudinally spaced transversely extending separators or barriers projecting up from the top of the block with the terminals arranged in two longitudinally extending rows, each of which is near one side edge of the block. The terminals are generally screws threaded into metal straps fixed to the block between adjacent separators or barriers, and since the terminal screws are arranged in rows one adjacent to each longitudinal side edge of the block or strip, the ends of a pair of conductors may be readily secured to the terminal block and electrically connected with one another. Such a terminal block facilitates wiring and maintenance because the two conductors of each pair when connected to their respective terminals extend laterally in opposite directions from the terminal block.

Since such terminal blocks frequently have a large number of pairs of terminals (sometimes upwards of twenty), and numerous conductors are brought to them, it is very desirable that the several terminals be distinctively identified to facilitate making the right connections between the several conductors connected to each block. For this purpose, indicia, such as numbers or letters, are sometimes provided on the block itself, adjacent to each terminal thereon, or else are delineated on a separate so-called marker strip which is usually clamped between the terminal block and its mounting, with a marginal edge portion of the marker strip projecting laterally beyond the terminal block and having the indicia thereon. In either case, however, the indicia are obscured by the conductors which project from the terminal block and overlie the side of the block and the exposed edge portion of the marker strip, so that although the indicia are helpful when initial connections to the terminal block are being made, they are of little value during subsequent maintenance or repair work thereon.

There has long been a recognized need for a marker strip having indicia which will be visible after the block is wired. It has also been appreciated that any such strip must not be in the way when the terminal block is being wired but must nevertheless be disposed near the terminals, with its indicia in lateral alignment with them so as to identify the terminals. The problem is complicated by the very stringent space limitations to which terminal blocks must often be accommodated.

It is, therefore, an object of the present invention to provide a marker strip for a terminal block of the character described, which strip may be readily secured to a terminal block to identify the terminals thereof in any of three different positions, in one of which the strip overlies the central portion of the block, substantially covering and protecting both rows of terminals but in a manner affording restricted access thereto for circuit testing purposes, while in each of the other two positions it completely covers one row of terminals and fully exposes the other row.

Another object of this invention resides in the provision of a marker strip for a terminal block of the character described which strip may be quickly attached to and removed from a terminal block without the need for any tools.

Still another object of this invention resides in the provision of a marker strip for a terminal block of the character described, which marker strip may be securely held in any one of three predetermined positions on the block, from each of which positions the strip is readily removable to any other, but in all of which terminal identifying indicia delineated on the same face of the strip are at all times readily visible and in lateral alignment with the terminals which they identify.

A further object of this invention resides in the provision of unusually simple and compact securement means for readily detachably fastening a marker strip of the character described in place, overlying the top of a terminal block, which securement means does not necessitate any enlargement of the block. In connection with the foregoing objective, it is another object of this invention to provide a marker strip mounting means which may be installed on presently available terminal blocks, so that no change will be needed in the dies from which such terminal blocks are molded.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein-disclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate two complete examples of the physical embodiment of the invention constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a fragmentary perspective view showing one end portion of a terminal block equipped with the marking strip of this invention;

Figure 2 is a plan view of the terminal block and strip shown in Figure 1;

Figure 3 is a view similar to Figure 1 but showing the terminal block, marker strip, and securement means for the latter in disassembled relation;

Figure 4 is a plan view of a terminal block showing the marker strip of this invention in position covering one row of terminals to facilitate the securement of conductors to the other row of terminals on the block;

Figure 5 is a view similar to Figure 4 but showing the strip shifted to a position covering the row of terminals having conductors connected thereto, thereby facilitating installation of conductors to the row of terminals then uncovered;

Figure 6 is a perspective view showing both end portions of a terminal block equipped with a slightly modified form of marker strip and mounting therefor;

Figure 7 is a fragmentary longitudinal sectional view through the terminal block of Figure 6, said view being taken on the plane of the line 7—7 in Figure 6;

Figure 8 is a view similar to Figure 7, but illustrating

the manner in which the marker strip is removed or replaced in this form of the invention; and

Figure 9 is a perspective view of one of the marker strip retaining members used in this modified embodiment of the invention.

Referring now more particularly to the accompanying drawings, in which like numerals designate like parts throughout the several views, the numeral 5 designates generally an elongated terminal block molded of insulating material such as Bakelite, having two rows of equi-spaced terminals 7 at the top thereof, one row adjacent to each of the opposite side edges of the block. The terminals are preferably screws threaded into the ends of metal straps 6 which bridge transversely opposite terminals and dispose them in pairs between transverse insulating barrier walls 10 projecting upwardly from the top of the block; the bridge straps being suitably fixed to the top of the block.

The body 5 has a trapezoidal cross section, and the barriers 10, which are integral with the body have side edges flush with the lower side edges of the block and top edges which are flat and lie in a common plane parallel to the top of the block and spaced a distance above the terminals. By virtue of the trapezoidal cross sectional shape of the body 5 and the fact that the side edges of the barriers are substantially vertical, the barriers not only effectively separate the terminals in each row from one another, but also the solderless connectors 9 on the ends of the conductors 8 by which the conductors are connected to the terminals, without necessitating having the barriers extend beyond the widest portion of the block. This specific relationship between the cross sectional shape of the body and the shape of the barriers besides strengthening the barriers has the advantage of affording a wide support for the marker strip 11 of this invention, which, as will be described, is adapted to be secured in any one of three laterally spaced positions overlying the top edges of the barriers and coacting with them to protect the terminals.

The marker strip 11 is formed from insulating material which is flexible enough to permit the strip to be bowed to a considerable extent, and while it may be transparent, it has been shown as opaque so that indicia 12 delineated thereon will show up most clearly. The width of the strip is somewhat greater than the center-to-center distance between the two rows of terminals screws 7 so that when the strip is in its center position, best shown in Figure 2, it covers the major portions of the terminal heads and the bridging straps. The strip is long enough to span all of the barriers or separators 10, and at each end has a plurality of longitudinally projecting integral tongues 14 defined and separated from one another by endwise opening notches 15. These tongues rest upon the upper edges of the endmost barriers 10' on the block when the strip is laid lengthwise across the top of the block to engage under a novel securement means now about to be described.

Conventional terminal blocks of the type hereunder consideration have projecting end portions 16 which extend beyond the endmost barriers 10' a distance about equal to the space between adjacent barriers 10, and provide mounting lugs for the block. A pair of holes 17 in each of these mounting lug portions of the block accommodates the securement screws by which the block is fastened in place. The marker strip securement means of this invention comprises a pair of retainers 18 each of which fits on one of the end mounting lugs of the block and is secured in place by means of the same mounting screws or bolts 19 by which the terminal block is secured in place. Each retainer is substantially inverted L-shaped as viewed from the side, its block-like stem portion 20 projecting upwardly while the base of the L, which is uppermost, comprises a flange 21. Holes in the stem or body portion 20 of the retainer register with the holes 17 in the mounting lug on which the retainer rests to receive the mounting screws 19.

The retaining members are mounted with their flanges 21 projecting toward one another, and each flange overlies and is spaced above the upper edge of its adjacent end barrier 10', the space between the bottom of the flange 21 and the upper edge of the barrier being sufficient to snugly accommodate the thickness of the tongues 14 on one end of the marker strip.

To preclude lateral displacement of the marker strip, each of the retaining members is provided with a plurality of laterally spaced apart longitudinal ridges 22 at the underside of its flange 21. When the retaining member is mounted on the block these ridges extend down to the top of the adjacent barrier 10' and cooperate therewith and with the flange 21 to define, in effect, a plurality of slot-like wells in which the tongues on the marking strip may be received, the ridges fitting closely in the slots 15 in the marking strip to preclude lateral displacement thereof.

Preferably the tongues 14 on the marker strip are uniform in width, as are the slots 15 therein, and the ridges 22 on the retaining member are uniform in thickness and uniformly spaced apart so that the tongues on the marking strip can be engaged in any of the slot-like wells defined by the retaining member and its adjacent barrier. Hence, the sides of the tongues 14 and the sides of the ridges 22 may be considered as cooperating abutments having laterally facing surfaces interengageable with one another in any of three positions of the marker strip, to hold the strip against accidental lateral displacement from the selected position, but from each of which positions the strip may be readily removed by bowing it along its length sufficiently to disengage the tongues from beneath the flange 21 on one of the retaining members and then withdrawing it endwise from beneath the flange on the other retaining member. Insertion of the marking strip is, of course, accomplished by reversing this procedure, and it will be seen that the marking strip must be sufficiently flexible to permit it to be bowed the necessary extent to accommodate this manner of installation and removal.

When the terminal block is being wired, the marking strip may be installed as shown in Figure 4, with its tongues so engaged with the retainer as to dispose it closer to one longitudinal edge of the block than to the other so that the row of terminal screws along one edge of the block is exposed and readily accessible. The indicia along one edge of the marking strip will then be directly adjacent to the terminals which they identify, and the wiring of the terminal block will thus be greatly facilitated. When one side of the terminal block has been wired, the marking strip may be very readily removed and installed in the position shown in Figure 5 wherein it is displaced to the other side of the center of the block so that the row of terminal screws along the other edge of the block is exposed and readily accessible. When the terminal block is entirely wired, the marking strip is preferably installed in the position shown in Figures 1 and 2, overlying the longitudinally central portion of the block, wherein it not only provides clearly visible identification of the several terminals on the block but also provides a protective covering over all of the terminals on the block.

Attention is directed to the fact that in its center position the marking strip coacts with the barriers to protect all of the terminals against accidental or unintended contact with extraneous objects while affording restricted though sufficient access to the terminals to enable the probes of circuit testing instruments to be applied to the terminals.

The modified embodiment of the invention illustrated in Figures 6 to 9, inclusive, though structurally different from that of Figures 1 to 5, inclusive, is nevertheless generically the same, and has the same advantage of

readily detachably holding the marking strip in any one of its three defined positions. However, in this modified form of the invention, the marking strip need not be flexible. To this end, the retaining means comprises a simple stamping 30 mounted on each end of the block and provided with three separate latches in the form of upstanding spring fingers 31 shaped to have readily detachable interengagement with the marking strip. Accordingly, the upper end portions of these spring fingers are bent to provide hooks with downwardly facing ledges 32, and upwardly inclined cam surfaces 33. The ledges 32 of all of the spring fingers, lie in a common plane and thus correspond to the undersides of the flanges 21 in the other embodiment of the invention. As shown this common plane in which all of the ledges 32 lie, is spaced above the common plane of the upper edges of the barriers or separators 10 a distance but slightly greater than the thickness of the marking strip 34, so that by engaging over the adjacent portion of the strip any one of these ledges holds the strip down on the barriers.

Each end portion of the marking strip has a rectangularly shaped hole 35 therein of a size to permit the hooked free end portion of any one of the spring fingers to be passed therethrough, as shown in Figure 8. These holes 35 are so spaced that the distance between the remote edges thereof, i. e. those edges of the holes nearest the ends of the strip, is substantially the same or slightly less than the distance between the outer faces of the upright leg portions 36 of the spring fingers so that when the strip is in position, the spring fingers are under a slight tension and the marker strip is held against endwise shifting.

From a comparison of Figures 7 and 8, it will be readily understood that, during the application of the marking strip, one end thereof may be engaged with the selected spring finger at one end of the block, and then its opposite end may be forced down onto the corresponding spring finger at the other end of the block. During this latter action, the outer edge of the hole 35 slides across the cam surface 33 of the selected finger and thereby flexes the free end of the finger far enough to permit it to pass through the hole 35 and snap over the top of the marking strip. As will be clear, such engagement of both ends of the marking strip with the selected pair of spring fingers or latches confines the strip between the top of the barriers 10 and the ledges 32 of the engaged spring fingers.

The location of the retainers 30 on the ends of the terminal block and the lateral spacing between the fingers thereof, is such that the marking strip may be secured in any one of the hereinbefore defined positions, namely, a central position overlying the major portion of both rows of terminals and two laterally displaced positions, in each of which the marking strip completely covers one row of terminals and fully exposes the other row. It should also be understood that to hold the marking strip against lateral displacement in any one of its three positions, the width of the holes 35 in the ends of the strip is such that, transversely, the spring fingers have little or no play in the holes. Hence, like the sides of the tongues 14 and the ridges 22 of the other embodiment of the invention, the sides of the holes 35 and the side edges of the spring fingers may be considered pairs of cooperating abutments having laterally facing surfaces interengageable with one another in any of the three positions of the marker strip, to hold the strip against lateral displacement with respect to the block.

The securement of the reatiner stamping 30 to the ends of the terminal block may be effected in any suitable manner, but is conveniently accomplished by providing the stampings 30 with flat attaching flanges 37 of a size to overlie the adjacent top surface of the block with holes 38 in these flanges registering with the holes in the block through which the mounting screws 39 pass. To accurately locate the retainer stampings on the block, the flanges 37 preferably have downwardly projecting embossments 40 which enter into suitably shaped depressions 41 or holes in the top of the block, and thus serve as dowel pins; and, if desired, the upright portions 36 of the spring fingers may be stiffened by longitudinally extending ribs 42 pressed therein.

From the foregoing description, taken together with the accompanying drawings, it will be readily apparent that this invention provides a combined marker and protection strip for a terminal block of the character described, which strip may be readily attached to the block in any of three positions, in one of which it covers and protects all of the terminals on the block, and in each of the other two positions it completely covers some and fully exposes the rest of the terminals, and in any of which positions, the strip provides indicia which are directly adjacent to the terminals which they identify; and it will also be seen that the simple marker strip securement means of this invention may be used with conventional terminal blocks without necessitating any modification of the latter for the securement of marker strips thereto.

What we claim as our invention is:

1. In an electrical connecting device of the type comprising an elongated block of insulating material carrying a plurality of electrical terminal members at longitudinally spaced intervals, extending transversely along its top and to each of which a pair of conductors may be attached with the conductors extending laterally in opposite directions from the block: an elongated marker strip of flexible insulating material carried by the terminal block at its top with the strip running lengthwise of the block and extending flatwise over portions of all of the terminal members on the block, said marker strip having laterally spaced abutments on its ends, and a retaining member fixed on each end portion of the block, said retaining members extending toward one another and being spaced above the top of the block, and beneath which the end portions of the marker strip are insertable, each of said retaining members having a plurality of laterally spaced locating abutments at the underside thereof interengageable with said abutments on the marker strip to hold the strip against lateral displacement with respect to the retaining members while enabling the strip to be inserted under the retaining members with its side edges spaced unequal distances from the adjacent sides of the block, to expose a portion of each terminal member for securement of a conductor thereto, or with the strip centered between the side edges of the block and covering the major portion of the terminal members.

2. In an electrical connecting device of the type comprising an elongated block of insulating material carrying a plurality of electrical bridging members extending transversely across the top of the block at longitudinally spaced intervals, the bridging members having terminals at the ends thereof by which a pair of conductors may be attached to each of said bridging members with the conductors extending laterally in opposite directions from the block: an elongated marker strip of flexible insulating material carried by the terminal block at its top with the strip running lengthwise of the block and extending flatwise over portions of all of the bridging members and the terminals thereon, said marker strip having endwise projecting laterally spaced tongues on its ends; and a retaining member on each end of the insulative block, each of said retaining members having a plurality of elongated laterally spaced apart slot-like wells, the wells in the two retaining members opening toward one another to snugly receive the tongues on the marker strip and the tongues on the marker strip being engageable in different wells in each retaining member to enable the marker strip to be attached to the block either with its side edges spaced unequal distances from

the adjacent sides of the block, to expose a portion of each bridging member and one of the terminals thereon, or with the strip centered between the side edges of the block and covering the major portion of all of the bridging members and the terminals thereon.

3. In an electrical connecting device, the combination of: an elongated terminal block having longitudinally spaced transversely extending separators projecting up from the top of the block, and transversely opposite pairs of terminals on the top of the block between adjacent separators and arranged in parallel longitudinally extending rows, the tops of said separators lying in a common plane parallel to the top of the block; a flat elongated marking strip having a length sufficient to span all of the separators and width only slightly greater than the center to center distance of said rows of terminals; indicia on one face of the marking strip for identifying said terminals; and means for securing said strip to the block with the strip resting on the tops of the separators and said face thereof which has the indicia thereon uppermost, with the strip centered over said rows of terminals to restrict access to the terminals in both rows thereof, or with the strip completely covering the terminals in either row thereof and providing substantially unobstructed access to the terminals in the other row thereof, said last named means comprising retaining means on the ends of the block having ledges thereon with downwardly facing surfaces of substantial area overlying the endmost separators and flatwise contiguous to the top surface of the end portions of the marking strip so as to proclude flatwise displacement of the strip from the block, and pairs of cooperating abutments on the retaining means and on the end portions of the marking strip having laterally facing surfaces interengageable with one another in any of said positions of the marking strip to hold the strip against lateral displacement relative to the block.

4. In an electrical connecting device, the combination of claim 3 further characterized by the fact that the means for securing the marking strip in any one selected position on the block comprises a plurality of laterally spaced spring latches on each end of the block having hooks on their upper end portions with downwardly facing surfaces providing the said ledges, and each end of the marking strip having a hole therein to receive the hooked end of a selected latch with the downwardly facing surface of the hooked end engaging over and contiguous to the top face of the strip.

5. In an electrical connecting device, the combination of claim 4 but wherein said spring latches at each end of the block are upstanding resiliently flexible fingers all of which are a part of a stamping having a mounting flange overlying the top of the block and from one edge of which said fingers project, the upper free ends of the fingers being bent to form hooks with downwardly facing portions and upwardly inclined cam portions rising from the free ends of said downwardly facing portions.

6. In an electrical connecting device, the combination of claim 3 further characterized by the fact that the means for securing the marking strip to the block comprises a sheet metal stamping secured to the top of the block at each end thereof, each of said stampings having three upstanding spring fingers, the upper ends of which are bent to provide downwardly facing ledges, and each end of the marking strip having a hole therein to receive the upper free end portion of one of the spring fingers with its downwardly facing ledge portion overlying the top surface of the strip to hold the strip down on the block.

7. In an electrical connecting device, the combination of claim 6 further characterized by the fact that the height of the downwardly facing ledge portions of the spring fingers above the common plane of the separators on the block is but slightly greater than the thickness of the marking strip, so that the ledge portions are contiguous to the top surface of the marking strip when the strip is in position.

8. In an electrical connecting device, the combination of claim 7 further characterized by the fact that the longitudinal distance between the remote ends of the holes in the marking strip is substantially the same as the distance between the remote faces of the spring fingers so that, when in position the marking strip is held against endwise shifting.

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