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ELECTRICAL TERMINAL BLOCK

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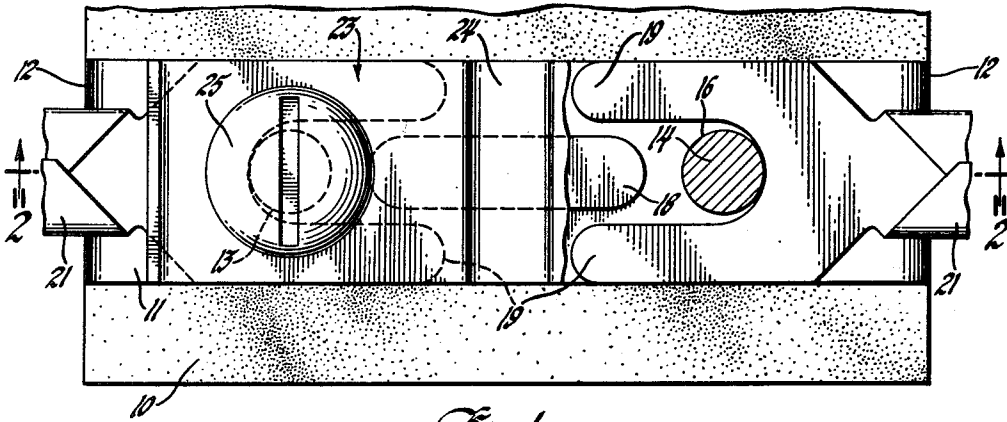


Fig. 1

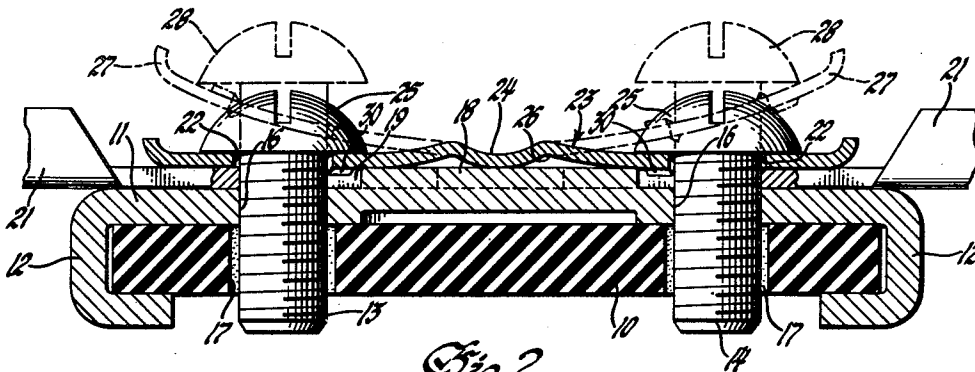


Fig. 2

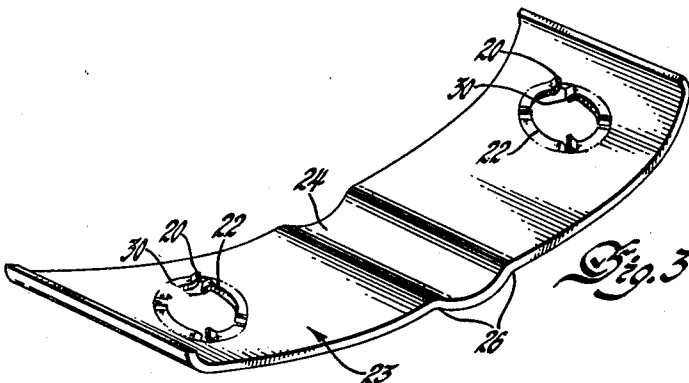


Fig. 3

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ELECTRICAL TERMINAL BLOCK

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3 Claims. (Cl. 339—65)

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This invention relates to electrical terminal connectors and has particular relation to devices for use in the relatively uniformly timed assembly operations by which automobiles and other articles of manufacture, and the parts and sub-assemblies for such automobiles and articles, are produced.

Heretofore it has been customary to employ connectors comprising blocks or strips of electrically insulative material upon which were disposed spaced bars of electrically conductive material to which oppositely disposed pairs of terminals were connected by screws projecting through the opposite ends of the bars and into openings formed in the electrically insulative material. These screws were projected into threaded openings in the bars but were not tightened during the manufacture of the connectors. They were loosely assembled in this manner to permit the terminals to be inserted under the screws during the assembly operations in which these connectors later were employed. While these bars have been disposed in parallel relation to one another, in many instances, there has been no means, or only ineffective means on the bars, to guide the terminals with respect to one another and with respect to the bars and it has therefore been possible to assemble the terminals at various angles with respect to the connector, hence making it possible to do less than what might be considered a workmanlike job of assembling these terminals.

Also, inasmuch as the screws which have been employed in the connectors are merely loosely started in the connector bars, it has been possible for these screws to move relative to the bars during shipment of the connectors and during the handling thereof prior to the assembly operations in which they have been employed. Sometimes these screws came out and were lost and it has been necessary in the midst of assembly operations to find other screws and to replace the screws. Also the screws have been movable relative to the bars to such an extent as to cause variation in the number of turns required to tighten the screws. This has resulted in a tendency to vary the time required in successive assembly operations. Such variation is objectionable in these operations.

An object of the invention therefore is to provide an electrical connector in which a plurality of terminals can be assembled at a relatively uniform rate and without the necessity for interrupting assembly operations for the purpose of finding and replacing screws, lining up terminals, adjusting the angles of terminals, etc.

Another object of the invention is to provide an electrical connector with guide means for guiding electrical terminals into position with respect to the connector so that the terminals will

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be aligned with respect to one another and the terminal bars with which the terminals are adapted to contact.

Another object of the invention is to provide a resilient locking strip or bar for the terminal securing means of electrical connectors, to prevent the terminal securing means from becoming lost or improperly positioned.

Another object of the invention is to provide a locking strip or bar for the terminal securing means of electrical connectors which will pivot on means for electrically connecting the terminals and which is relieved and bent away from the terminal connecting bar to permit the terminals to be inserted without the ends of the terminals engaging the conducting bar beyond the terminal securing means.

Other objects, features, and advantages of the invention will be apparent from the following specification and from the appended drawing, in which:

Figure 1 is a plan view of an electrical terminal connector embracing the principles of the invention.

Figure 2 is a vertical sectional view through the structure disclosed by Figure 1. Figure 2 is taken substantially in the plane of line 2—2 on Figure 1.

Figure 3 is a perspective view of a locking member employed in the structure disclosed by Figures 1 and 2.

Referring particularly to Figure 1, numeral 10 indicates the end of an electrically insulative strip across which a plurality of connector bars 11 may be disposed in spaced and parallel relation. The bars 11 have laterally and inwardly bent ends indicated at 12 which are adapted to extend about and to receive the oppositely disposed edges of the strip 10. Spaced terminals securing screws 13 and 14 are adapted to project through threaded openings 16 formed transversely in the bars 12 and adjacent the opposite ends thereof. Openings 17 are formed in the strip 10 for the purpose of allowing the threaded ends of the screws 13 and 14 to project through the strip 10. The openings 17 are larger than the screws so as to receive the screws without engagement therewith.

The bars 11 have elongated guides 18 projecting from the upper surfaces thereof, the thickness of the guides 18 being practically the same as the thickness of bifurcated ends 19 of terminals 21 adapted to be connected in pairs by the connector bars 11. The width of the guides 18 is somewhat less than the diameter of the screws 13 and 14 and the guides 18 project between the screws with the opposite edges thereof in parallel relation to the corresponding edges of the screws.

When the terminals 21 are secured in place be-

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neath the screws 13 and 14, the bifurcated ends 19 of the terminals will be projected in electrically contacting engagement with the surfaces of the bars 11 and on opposite sides of the screws 13 and 14 and the guides 18.

The screws 13 and 14 are adapted to project through openings 22 formed adjacent the opposite ends of arcuate and resilient locking strips or members indicated at 23. The openings 22 have radially disposed slits projecting therefrom, which define the ends of arcuate locking members indicated at 20. The opposite ends of the members are successively bent in opposite directions adjacent the slits referred to, to provide resilient locking lugs indicated at 30. These lugs engage the screw heads 25 and the terminal ends 19 for resiliently opposing the loosening movement of either the screws or the terminals.

The middle portions of the members 23 are formed in such a way as to provide transversely extending beads 24, the convexly curved surfaces of the beads 24 being adapted to engage the upper surfaces of the guides 18. The beads 24 therefore provide fulcrum means for the strips 23 on which the strips are supported by the guides 18. The beads 24 also are formed to provide relief portions 26 adjacent the opposite reversely bent edges thereof, these relief portions being disposed substantially above and in spaced relation to the ends of the terminals 21, when the terminals are disposed in operative relation to the bars 11.

The heads of the screws 13 and 14, which are indicated at 25, are adapted to tighten opposite ends of the locking members 23 downwardly against the upper surfaces of the terminals 21, when the terminals 21 are secured in operative or electrically contacting engagement with respect to the bars 11.

When the screws 13 and 14 are in retracted positions the heads thereof are indicated in dot-and-dash lines at 28. In such dot-and-dash line positions of the screws, the opposite ends of the locking members 23 also are indicated in dot-and-dash lines at 27.

When the opposite ends of the members 23 are contracted into the positions indicated at 27, it will be apparent that the ends of the bars will tend to engage the edges of the heads of the screws, and will therefore tend to tilt the screws within the threaded opening 16 so that the screws will tend to oppose and to resist accidental displacement from the retracted positions in which the heads of the screws are positioned.

When the terminal connector devices are assembled for shipment, the screws 13 and 14 and the locking members 23 are disposed in the dot-and-dash positions indicated at 28 and 27 respectively in Figure 2. The screws and the locking devices associated therewith are adapted to remain in the positions indicated at 27 and 28 until an assembly operation is to be performed and at which time the terminals 21 are inserted with the bifurcated ends 19 thereof on opposite sides of the screws 13 and 14 and in opposed relation to the ends of the guides 18. Thereupon the screws 13 and 14 are tightened within the openings 16 until the opposite ends of the locking members 23 are brought firmly down against the adjacent surfaces of the terminals 21. Under such circumstances, the locking members 20 which are formed in the members 23 will tend to bear against the lower surfaces of the heads of the screws 13 and 14 thereby tending to prevent rotational movement of the screws that

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might affect the electrical contacting engagement between the terminals and the opposite ends of the bars 11.

With such connector devices assembled with the screws thereof in substantially equally retracted positions, it will be apparent that the screws may be tightened upon the terminals with practically the same number of degrees of rotation of each screw with respect to the conductor bars supporting the screws. It will also be apparent that the resilient locking members 23 will tend to maintain the screws against accidental movement from either of the operative positions for the screws, thereby rendering the terminals suitable for the relatively uniformly timed assembly operations previously referred to.

I claim:

1. A terminal block comprising an electrically insulative strip, an electrically conductive bar secured to said strip, terminal screws operatively engaging said bar and projecting from opposite ends thereof, terminal guide means projecting from said bar and between said screws, and a resilient locking strip having the opposite ends thereof disposed beneath said screws and having a transversely disposed bend portion intermediate the ends thereof engaging said terminal guide means.

2. A terminal block comprising an electrically insulative strip, an electrically conductive bar secured to said strip and having the ends thereof projecting laterally and inwardly adjacent the edges of said strip and around said strip, a pair of terminal screws engaging said bar adjacent the opposite ends of said bar, resilient locking means disposed beneath said screws, said locking means having laterally disposed end portions adapted to follow the operation of said screws throughout the operative movement of said screws, and terminal guide means projecting from said bar and extending between said screws, said guide means being disposed in opposed relation to an intermediate portion of said locking means and supporting said locking means throughout the range of operation of said screws.

3. A terminal block comprising an electrically insulative strip, an electrically conductive bar secured to said strip, terminal screws operatively engaging said bar and projecting from opposite ends thereof, terminal guide means projecting from said bar and between said screws, a resilient locking strip having the opposite ends thereof disposed beneath said screws and having a transversely disposed bend portion intermediate the ends thereof engaging said terminal guide means, said opposite ends of said locking strip having holes through which said screws extend, and secondary locking means in engagement with said screws to resist turning of said screws within said holes.

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