

Feb. 25, 1941.

V. F. MILLER

2,233,107

WIRE GUIDE AND TERMINAL CONNECTOR

Filed May 17, 1939

2 Sheets-Sheet 1

FIG. 1

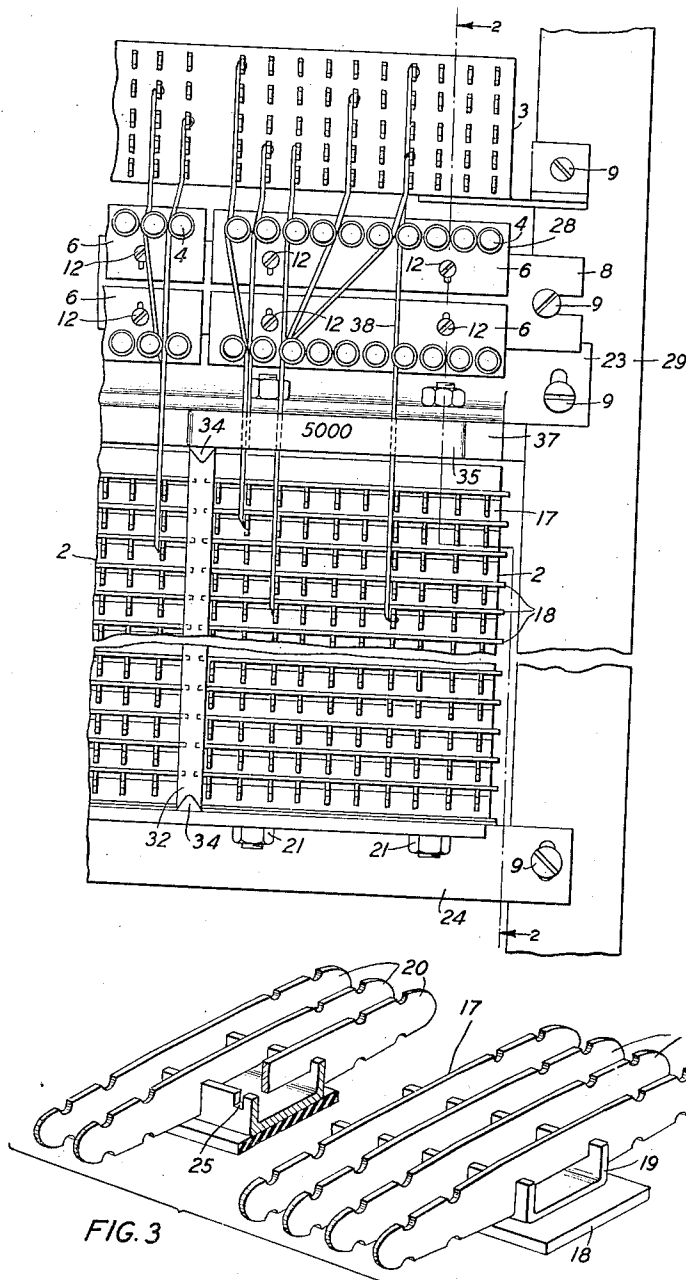


FIG. 2

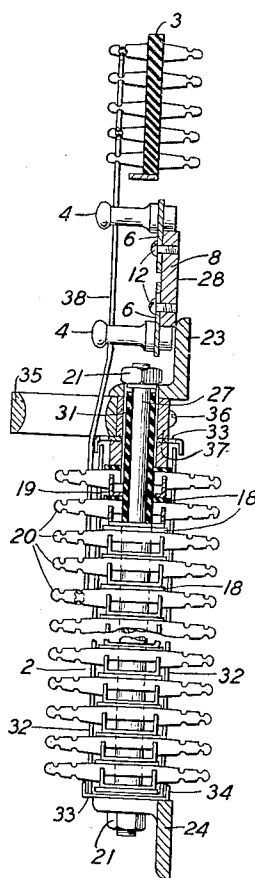
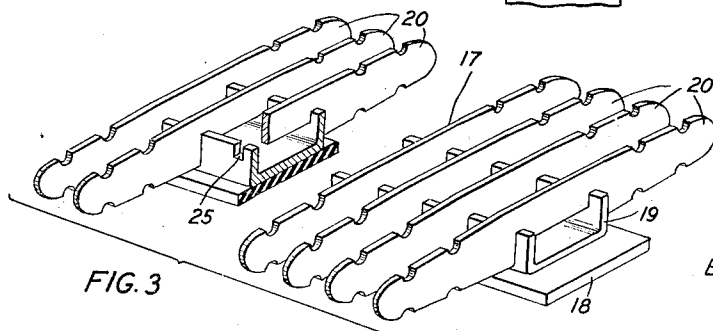


FIG. 3



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FIG. 4

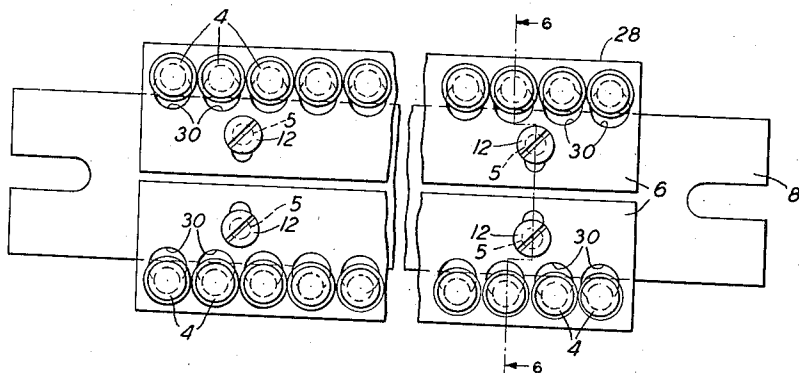


FIG. 5

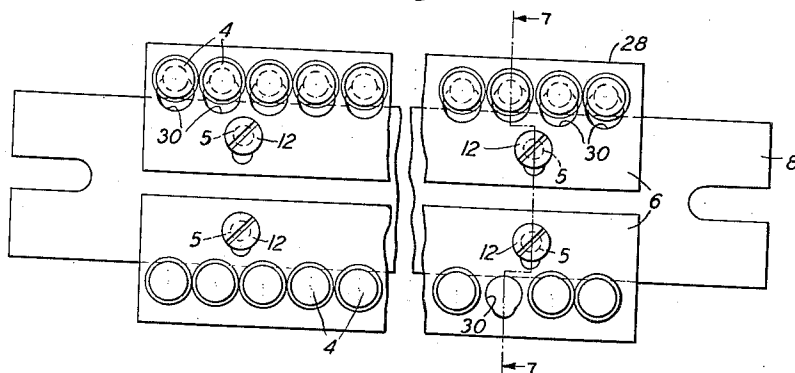


FIG. 6

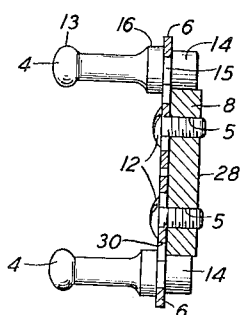
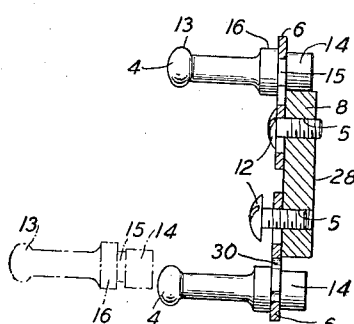


FIG. 7



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WIRE GUIDE AND TERMINAL CONNECTOR

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Application May 17, 1939, Serial No. 274,115

11 Claims. (Cl. 179-93)

This invention relates to wire guides and terminal connectors, and more particularly to guiding means known as fanning strips which may be advantageously utilized in fanning or distributing electric conductors between one or more groups of terminal connectors.

An object of the invention resides in the provision of a fanning strip which comprises a supporting bar, a locking plate which can be secured to said bar, and a number of guide studs or pins disposed at suitable distances from each other in a row of apertures in the plate and so located that when the plate is clamped to the bar, the studs are locked securely in position.

A still further object of the invention is the provision of an improved and highly efficient terminal strip and terminal strip assembly in which the individual strips are light yet strong in construction, economical to manufacture and easy to assemble, if desired, in any suitable manner but preferably in the pile-ups that can be held together by tie rods that will provide for the uniform alignment of terminals so as to facilitate wiring connections of any kind. It is also an object of the invention to provide certain details or features of improvement which tend to increase the general efficiency and serviceability of a device of this particular character.

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

In the accompanying drawings:

Fig. 1 is a front elevation of a wire guide assembly as contemplated by this invention, disposed between two banks of terminal strips of which the lower is constructed according to the teachings of the present invention;

Fig. 2 is a side elevation of Fig. 1 taken along the section line 2-2;

Fig. 3 is a sectionalized perspective view of a terminal strip unit;

Fig. 4 shows one form of a wire guide provided with an upper and lower plate, with each plate accommodating one row of guide studs locked into position;

Fig. 5 is the same as Fig. 4 except that the lower locking plate is displaced to its unlocked position;

Fig. 6 is a side view of Fig. 4 taken along the section line 6-6; while

Fig. 7 is a side view of Fig. 5 taken along the section line 7-7, but including a showing of the theoretical horizontal location of the studs when the lower plate is in a locked position.

Referring now to the drawings in which the same reference numerals in the different figures refer to identical parts, one form of the wire guide 28 is shown between an upper terminal strip assembly unit 3 and a lower terminal strip assembly unit 2, all of which are secured to two suitable uprights of which only the right one 29 is shown.

The wire guide or fanning strip 28 comprises a back plate or supporting bar 8, one or more front plates 6 supported by said bar and a number of guide studs or pins 4 carried by said plate or plates. The bar 8 is preferably of rectangular shape and of any suitable length, and notched at each end for engagement with holding screws 9 that engage in the tapped apertures of the upright supports 29. The bar is further provided with a number of longitudinally aligned threaded apertures 5, which hold the front plates 6 secured thereto by means of screws 12. The number of such apertures and their disposition on the bar will depend, of course, upon the number of front plates which the bar is to carry and this, in turn, will depend upon whether the wire guide is to consist of one row of guide studs disposed horizontally across one or more front plate units which, if more than one, will be positioned in horizontal juxtaposition on the bar and held thereto by a suitable number of screws 12 per plate, or two horizontal rows of guide studs each carried by a suitable number of plates horizontally positioned on each side of the longitudinal center of the bar. In the embodiment of the invention herein used for illustration the wire guide 28 comprises two rows of guide studs, ten studs in each row being carried by a separate plate 6 which is secured to the bar 8 by two screws 12, one at each end of the plate. It is understood, however, that the plate 6 may be a single plate and that the wire guide may consist of one row of guide studs instead of two.

Each of the upper and lower plates 6 may be rectangular in shape and provided with two slotted holes for the passage therethrough of the supporting screws 12 which, when in position but not completely driven in to cause the head of the screw to abut on the face of the plate, permit the plate 6 to move slidably away from the longitudinal axis of the bar 8.

Each plate 6 is provided with a number of

horizontally aligned apertures 30 of the character clearly disclosed in Fig. 5 which may be spaced apart as desired to provide the required conductor clearance. The apertures of the upper plate are disposed slightly below its upper longitudinal edge so that when the plate is fully resting upon the screws 12, the lower edge of each of the apertures comes below the top edge of the bar 8. The apertures on the lower plate, on the other hand, are disposed slightly above its bottom edge so that when the lower surface of the slotted apertures are in contact with the surfaces of the screws 12 the top edges of the apertures are slightly above the lower edge of the bar 8.

The guide studs or pins 4 are made of any suitable insulating material, but preferably of rubber, and have the structural configuration shown in Fig. 7. The stud has a round head 13, an adjoining undercut cylindrical portion to accommodate the nesting of wires, a shoulder 16, a grooved portion 15 having a diameter equal to the difference between the vertical length of the stud holding aperture 30 in the plate and the length of the slack of the screw slot of screw 12, and a thickness slightly greater than the thickness of the plate 6. The diameter of the projecting portion 14 beyond the groove 15 is slightly larger than that of the seat 15 but smaller than that of the plate aperture 30 in order to permit the stud to slip easily therethrough.

To secure the studs on the mounting plate the screws 12 are loosened to permit the plate to be slidably displaced until the inner edges of the slots abut against the shanks of the retaining screws 12. In this position, the apertures of the plate are clear of the edge of the bar 8 and the studs may be inserted by pushing the portions 14 through the apertures until the rear portion of shoulder 16 of each of the studs abuts against the front of the plate. The plate 6 is then slidably moved towards the longitudinal center line of the bar, thereby causing the edge of the bar to close in over the edge of the stud apertures until the portion 14 of each of the studs rests on the edge of the bar. The screws 12 of the plates are then tightened and the studs are secured against front and back movement by the fact that the groove 15 is wedged under the outer edge of the retaining aperture by the engagement of the portion 14 against the edge of the bar 8.

Should it become necessary to remove any one or all of the studs, the plate 6 is loosened as before described, and the studs are removed by slipping them out of their respective retaining apertures. Other studs may then be inserted therein, after which the plate is locked to the bar as before described.

The terminal strip assembly 2 comprises a number of terminal strip units 17 which are mounted one on top of the other and clamped together by tie rods 27 or other suitable clamping means, which are adapted to retain the same together on the horizontal angle irons 23 and 24 connected to the upright columns 29.

Each of the individual terminal strips includes a bottom insulating support 18 to which is attached a tinned brass grille or channel member 19 having notches 25 in each flange which are suitably aligned to support the terminal strips 20 at any suitable angle, though preferably at right angles. The notches are spaced sufficiently to allow for the passage of the desired number of conductors through the vertical grooves formed between the vertically aligned

terminal members in each of the strips when assembled as shown in Fig. 1.

Each of the terminals 20 is made of brass and doubly notched at either end for wiring and strapping at either the front or rear. When the terminals are inserted into the notches, the assembly of terminals and channel are heated and, due to the fact that the terminals are solder dipped and the channel is tinned, the terminals become soldered in place.

Each terminal strip is separated from an adjacent strip in a vertical pile-up, by the strip of insulation 18, and the whole is supported by tie-rods 27 clamped at either end by nuts 21 to the angle irons 23 and 24 to provide a flexible assembly and a uniform pile-up. For insulating each tie rod from the terminal strips each of said rods is surrounded by a sleeve 31 of insulating material.

As the assembly of the wire guide 28 and terminal unit 2 is shown in Fig. 1, the terminals to be cross-connected are those on units 3 and 2 and the conductors 38 disposed on the terminals of terminal strip 3 are passed between two studs of the upper fanning strip immediately below the terminal to be cross-connected and between the two studs of the lower fanning strip in vertical alignment with the terminal row in the unit 2 to one of the terminals of which the conductor is to be cross-connected.

Horizontally and vertically disposed designation strips are provided adjacent to the terminal strip assemblies 2. A vertically positioned designation strip 32 of insulating material is disposed between adjacent terminal strip assemblies 2 and is held in position by plates 33 assembled on the tie rods 27 at each end of the strip assembly, the plates having tongues 34 which engage against the outer face of the designation strip 32 at the ends thereof and which tongues may be bent outwardly to release the designation strip when it becomes desirable to replace a strip with another bearing different designations. A horizontally disposed U-shaped designation strip 35 is positioned immediately above each terminal assembly 2 bearing on the face of its outer arm a designation printed thereon or otherwise secured thereto. The inner arm of the strip 35 is secured by screws 36 to a spacer 37 mounted on the upper ends of the tie rods 27 between the upper plate 33 and the angle iron 23. This designation strip may be readily detached for replacement by a differently designated strip by removing the screws 36.

While I have described my invention in connection with one specific embodiment thereof, it is to be understood that various other embodiments thereof might be made without departing from the spirit of the invention as defined within the scope of the appended claims.

What is claimed is:

1. A terminal strip comprising a channel member having one series of aligned notches in the edges of each of its flanges and parallelly disposed terminal members supported in the notches of said channel.

2. A terminal strip comprising a channel member having one series of aligned notches transverse its flanges and parallelly disposed terminal members rigidly affixed in each pair of notches of said channel.

3. A terminal strip assembly comprising a plurality of superimposed terminal units, each of said units comprising a channel member having one series of aligned notches transverse its

flanges, parallelly disposed terminal members rigidly secured in each pair of notches of said flanges and an insulating member connected to the base of the channel, and means for clamping together a number of said terminal units to produce an alignment of corresponding terminal members in each unit.

4. A terminal strip assembly comprising a plurality of superimposed terminal units, each of said units comprising a channel member having one series of aligned notches transverse its flanges, parallelly disposed terminal members rigidly secured in each pair of notches of said flanges and an insulating member connected to the base of the channel, a spacing member, a designation strip removably secured to said spacing member and means for clamping together said spacing member and said terminal units with the terminal members of said units in alignment.

5. A terminal strip assembly comprising a plurality of groups of superimposed terminal units, each of said units comprising a channel member having aligned slots transverse its flanges, parallelly disposed terminal members rigidly secured in each pair of slots of said flanges and an insulating member connected to the base of the channel a vertically disposed designation strip positioned between adjacent groups of terminal units, a supporting plate for each end of said designation strip having bendable tongues for removably holding said designation strip in position and means for clamping together said supporting plates and said superimposed terminal units with the terminal members of said units in alignment.

6. In a terminal strip comprising a channel member having aligned slots in the flanges thereof with parallelly disposed terminal members supported in said slots, the method of securing the terminal members in the slots of the channel member which consists of tinning said channel member, solder-dipping said terminal members, inserting said terminal members in said slots and heating the assembly to the solder melting temperature.

7. A device for the distribution of conductors and the like comprising in combination, a supporting member, a locking plate adjustably secured to one face of said member and provided with a plurality of aligned apertures disposed beyond the edge of the said supporting member in one position of said locking plate, and a removable pin of insulating material extending through each of said apertures, each of said pins being locked in its aperture by wedging between the edge of said supporting member and the outer edge of the enclosing aperture when

said locking plate is moved to its locking position.

8. A device for the distribution of conductors and the like comprising in combination, a supporting member, a locking plate adjustably secured to one face of said member and provided with a plurality of aligned apertures disposed beyond the edge of said supporting member in one position of said locking plate, and a removable pin of insulating material positioned in each of said apertures, said pin having a circumferential groove and a projecting end portion whereby said pin is locked in its aperture when said locking plate is moved to its other position by the engagement of the outer edge of the aperture within the groove of the pin and the engagement of the end portion of the pin against the edge of the supporting member.

9. A device for the distribution of conductors and the like comprising in combination, a supporting member, a pair of locking plates oppositely disposed and adjustably secured to one face of said member with their outer edges extending beyond the opposite edges of said member and each having a plurality of apertures in the extending portions thereof, and a removable pin of insulating material extending through each of said apertures, said pins being locked in its aperture against the edges of said member by the movement of said locking plates to their locking positions.

10. A combined wire guide and terminal connector comprising upright supports, adjustably secured pin guides intermediate said supports, and terminal connector banks on either side of said pins and secured to said supports comprising terminal unit pile-ups of insulated channel members having slotted upright flanges with parallelly disposed terminal members rigidly secured therein.

11. A cross-connecting rack comprising upright supports, an upper assembly of terminal strips secured between said supports, a lower assembly of terminal strip units secured between said supports, each unit of said lower assembly comprising a channel member having upwardly extending flanges provided with aligned slots and parallelly disposed terminal members secured in said slots, and a guide for distributing wires connecting terminals of said upper and lower terminal strip assemblies interposed between said assemblies and comprising a supporting member secured to said supports, a plurality of apertured locking plates adjustably secured to said supporting member and removable guide pins positioned in said apertures and locked therein when said plates are moved to their locking positions.

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