United States Patent

MacKenzie, Jr.

[15] **3,665,377**

[45] **May 23, 1972**

[54] FRAME AND WIRE TERMINATION BLOCK ASSEMBLY

[72] Inventor: **Joseph H. MacKenzie, Jr.**, 431 Prairie Avenue, Wilmette, Ill. 60091

[22] Filed: **Jan. 27, 1971**

[21] Appl. No.: **110,164**

[52] **U.S. Cl.** .....**339/198 G**, 211/150

[51] **Int. Cl.** **H01r 9/00**

[58] **Field of Search** 339/98, 119, 120, 121; 211/99, 211/133, 148, 150, 175; 247/242

[56] **References Cited**

UNITED STATES PATENTS

1,039,694	10/1932	Burton	211/150
2,908,397	10/1959	Patterson	211/150 X

FOREIGN PATENTS OR APPLICATIONS

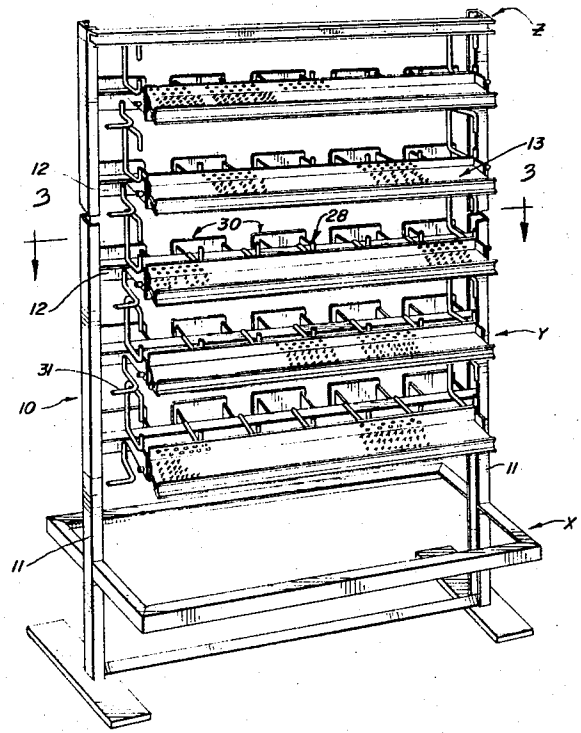
1,290,688	3/1969	Germany	248/242
693,660	8/1965	Italy	247/242

Primary Examiner—Joseph H. McGlynn
Assistant Examiner—Robert A. Hafer
Attorney—Pendleton, Neuman, Williams & Anderson

[57] **ABSTRACT**

A frame and wire termination block assembly is provided which enables a plurality of wire termination blocks mounted on the frame to independently assume various selected positions of tilted adjustment so as to facilitate connecting or disconnecting of various wire leads with respect to one or more blocks.

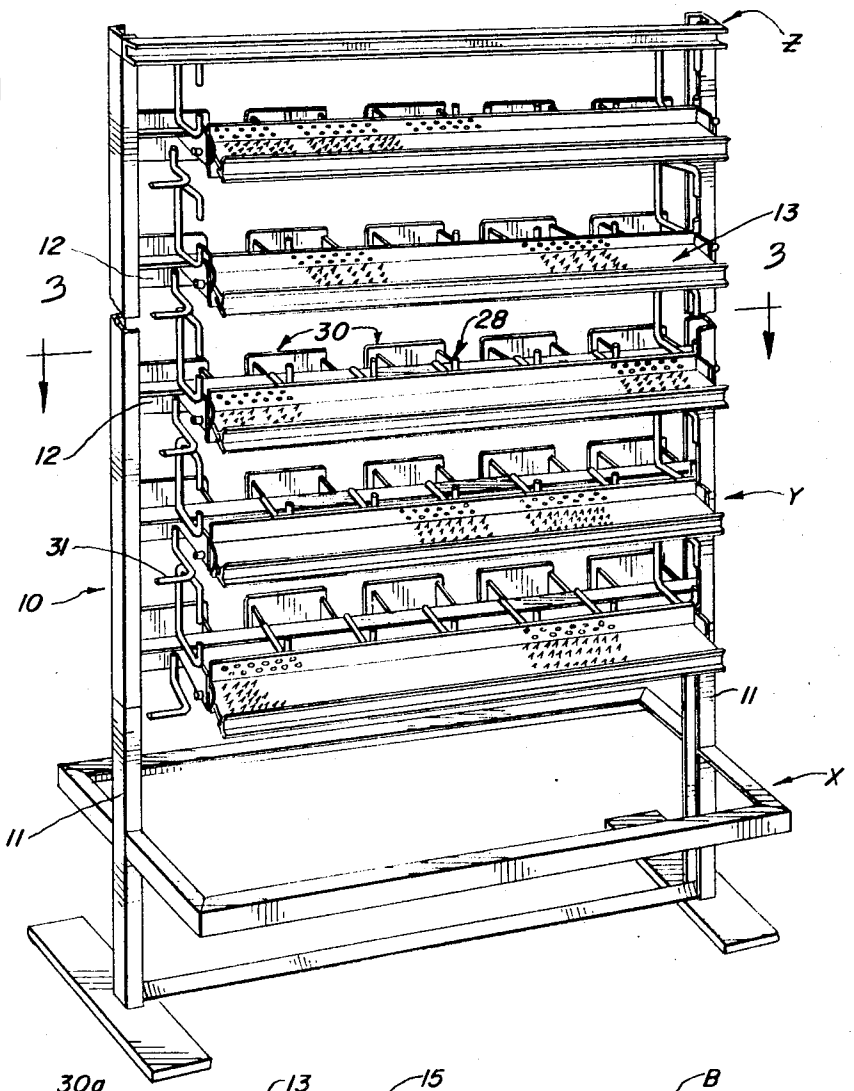
14 Claims, 5 Drawing Figures



Patented May 23, 1972 3,665,377

2 Sheets-Sheet 1

FIG. 1



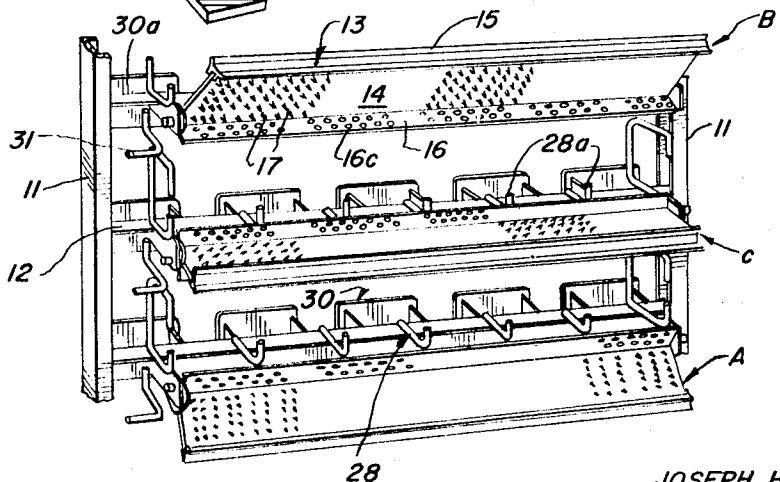


FIG. 2

INVENTOR
JOSEPH H. MAC KENZIE JR.
BY Pendleton, Neuman, Williams & Anderson
ATTORNEYS

Patented May 23, 1972 3,665,377

2 Sheets-Sheet 2

FIG. 3

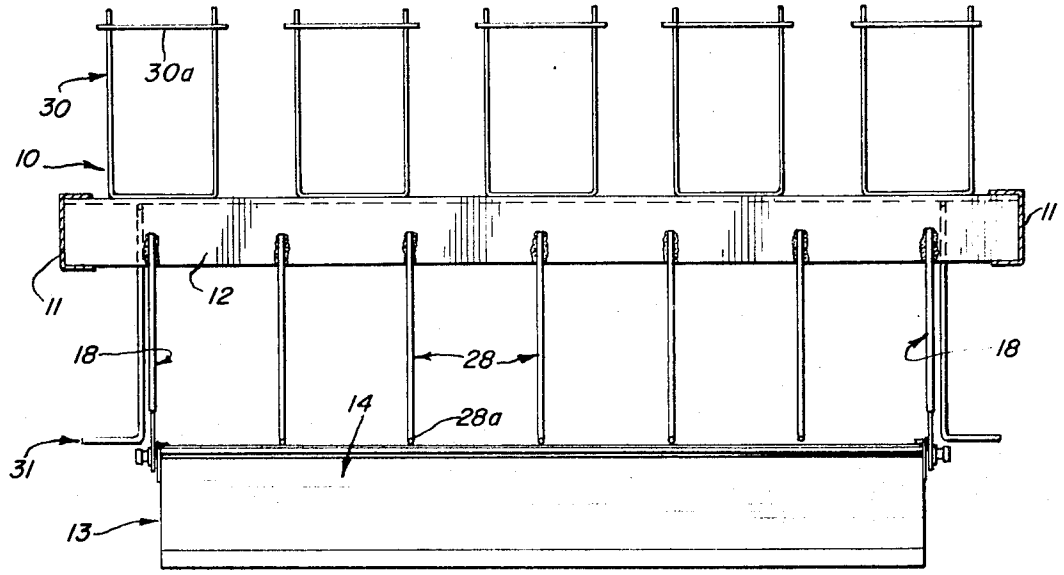


FIG. 4

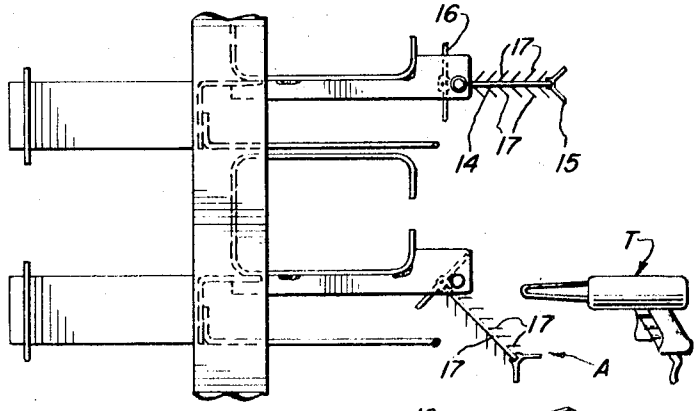
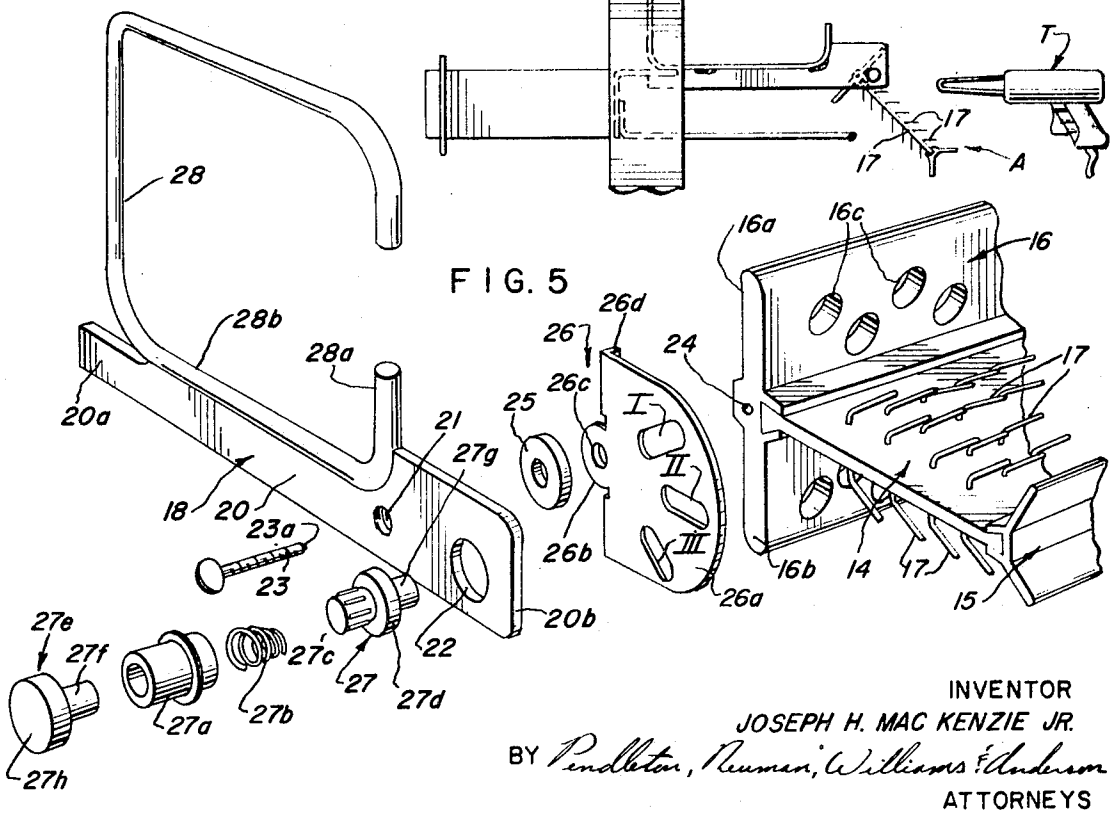


FIG. 5



INVENTOR
JOSEPH H. MAC KENZIE JR.
BY Pendleton, Neuman, Williams & Anderson
ATTORNEYS

FRAME AND WIRE TERMINATION BLOCK ASSEMBLY

BACKGROUND OF THE INVENTION

The assembly in question is adapted for use in conjunction with equipment such as found in telephone distribution centers or the like, wherein a large number of sound or electrical impulse transmission lines and cables are brought to a given location for interconnection with other transmission lines. Heretofore various apparatus for effecting the necessary interconnection of lines and cables have been provided; however, because of certain design characteristics, such apparatus have been beset with one or more of the following shortcomings: (a) the apparatus was of bulky construction, thereby requiring an inordinate amount of floor space to accommodate same; (b) the wire termination block density for a given frame was minimal because the blocks were fixedly secured to the frame, thereby necessitating greater clearance between adjacent blocks to provide the necessary access to the terminal posts carried on the blocks; (c) because of the fixed positions of the blocks, the wire connecting and disconnecting operation was a tedious manipulation requiring the talents of one possessed of a high degree of dexterity; and (d) the installation of the prior apparatus required an excessive amount of "on site" labor.

SUMMARY OF THE INVENTION

Thus, it is an object of this invention to provide an assembly which avoids the aforenoted shortcomings associated with prior apparatus of this general type.

It is a further object of this invention to provide a frame and wire termination block assembly wherein the blocks thereof are mounted on the frame so as to form a multi-level module where each block thereof may be tilted independently of the others and, thereby, greatly facilitate the wire connecting and disconnecting manipulation.

It is a still further object of this invention to provide a frame and wire termination block assembly wherein the various components thereof may be substantially preassembled in modular forms thereby minimizing the amount of "on site" labor required during installation of the equipment.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In accordance with one embodiment of this invention, an assembly of the type described is provided which includes a support and an elongated member mounted on the support and angularly disposed with respect thereto. Mounted on and projecting from the elongated member is a pair of spaced brackets. Disposed between the brackets and adjustably mounted thereon is an elongated wire termination block which is adapted to assume selected positions of tilted adjustment. Guide means for wire and cable are mounted on the elongated member and are disposed adjacent the block.

DESCRIPTION

For a more complete understanding of the invention, reference should be made to the drawings, wherein:

FIG. 1 is a fragmentary perspective front view of one form of the improved assembly.

FIG. 2 is similar to FIG. 1, but showing only a portion of the assembly with various blocks thereof in selected positions of tilted adjustment.

FIG. 3 is a fragmentary sectional view taken along line 3—3 of FIG. 1.

FIG. 4 is an enlarged fragmentary end view of the assembly of FIG. 2 and with one of the blocks thereof in a tilted position and showing the accessibility of the terminal posts of the tilted block with respect to a soldering tool or the like.

FIG. 5 is an enlarged perspective view of the connection between one end of a block and a bracket element; the component parts of the connection are shown in exploded relation.

Referring now to the drawings, and more particularly to FIGS. 1 and 2, one form of the improved assembly **10** is shown which is adapted to be used in conjunction with sophisticated

communication and/or data processing equipment wherein large numbers of wires and cables are interconnected. One important requisite of such an assembly is that it be readily accessible so that the wire connecting and disconnecting manipulations can be readily performed. The illustrated assembly **10** comprises a pair of upright channel-shaped supports **11** which may extend from floor to ceiling. If desired, however, the supports **11** may be arranged so as to form a section, self-supporting frame having a base module X, resting upon a floor surface, a block module Y interfitting with and extending upright from the base module X, and a top module Z interfitting with and overlying the block module Y. Each of the aforesaid modules may be preassembled, thus, requiring only interfitting of the modules "on site."

The supports are retained in spaced substantially parallel relation by a plurality of transversely extending cross members **12** which are affixed to the supports and are arranged in spaced substantially parallel relation. The number of members **12** utilized will depend upon the number of wire termination blocks **13** required for the particular installation.

Each block **13** is preferably of like construction and is provided with an elongated rectangularly shaped center portion **14**, an elongated wing-shaped side edge piece **15** secured to the outer elongated edge of the center portion, and an elongated shield piece **16**, see FIG. **5**. All of the aforenoted components **14**, **15** and **16** of the blocks **13** are preferably extrusions. Furthermore, the shapes of pieces **15** and **16** may be varied from that shown and will depend upon the particular installation. The block components are described in detail in my copending application filed concurrently herewith and entitled "Wire Termination Block Construction."

The center portion **14** of each block **13** is provided with a plurality of terminal posts or pins (e.g., 1,000) **17** which project from opposite sides of the center portion, see FIGS. **4** and **5**. The posts may be arranged in 10 rows of 100 posts each. It is preferred that the post on each side of the center portion be inclined approximately 45° toward the outer piece **15**. The desirability of the post incline will be discussed more fully hereafter.

Mounted on and projecting outwardly from each member **12** is a pair of bracket units **18**, see FIGS. **4** and **5**. A wire termination block **13** is positioned between each pair of units and is adjustably supported thereby so that the block may be manually moved to various positions of tilted adjustment, see FIG. **4**. In addition to the tilted positions, the block may be moved to a horizontal position, which is the position it would normally assume once the necessary connections to the posts **17** have been made.

Each bracket unit **18** in the illustrated embodiment includes an elongated horizontally extending arm **20**, one end **20***a* of which is adapted to be fixedly secured to the adjacent member **12**. The outer or opposite end **20***b* of the arm is provided with a pair of horizontally spaced openings **21** and **22**. Opening **21** is adapted to receive a pivot pin **23**, the leading end **23***a* of which is adapted to be threaded into an opening **24** formed in the endface of block piece **16**. Disposed between the endface of block piece **16** and arm **20** is a washer **25** and a lock piece **26**. Piece **26** is provided with a semi-circular front portion **26***a* and a rearwardly projecting tab **26***b*, the latter being provided with an opening **26***c* through which pin **23** is adapted to extend. The rear edge of front portion **26***a* is offset so as to form a pair of flanges **26***d*. The flanges are adapted to engage the laterally extending portions **16***a* and *b* of block pieces **16** so that the lock piece **26** and shield piece **16** will pivot as a unit about pin **23** as an axis.

Front portion **26***a* is provided with a plurality of arcuately spaced radiating slots or pockets I, II and III. Each slot is of like configuration and is adapted to accommodate a spring-loaded detent **27**, which in turn, is disposed within the opening **22** formed in the outer distal end **20***b* of arm **20**. The detent **27** may be of conventional construction and includes a sleeve **27***a* which is fixedly secured to the arm, a coil spring **27***b* disposed within the inner open end of the sleeve, a plunger **27***c* pro-

vided with an annular shoulder 27*d* slidably disposed within the open inner end of the sleeve, and an exposed button 27*e* having a shank portion 27*f* which slidably extends through an opening formed in the outer end of the sleeve. The inner end of the button shank is secured by any suitable means to the outer end of the plunger 27*c*. The opposite or inner end 27*g* of the plunger is shaped so that it will properly fit within the selected one of the slots I, II, or III and thereby retain the block 13 in either of two tilted positions or in the horizontal position, see FIG. 4. The outer end of the button 27*e* has an enlarged head 27*h* which is impassable with respect to the opening formed in the outer end of the sleeve 27*a*. To release the plunger end 27*g* from an interlocking position with respect to one of the slots I–III, merely requires a manual outward pull on the button head 27*h* until the plunger end is free of the slot, whereupon the block can be pivoted about pin 23 as an axis.

The number of slots and the angular relationship of the slots may be varied from that shown. In the illustrated preferred embodiment, slots I and II are approximately 90° apart with slot II bisecting such included angle. When the block 13 is in tilted position A, see FIG. 4, the terminal posts 17 projecting from the upper surface of the center portion 14 of the block are readily accessible for the wire connecting or disconnecting manipulation wherein a soldering tool T is normally utilized. When the block is disposed in tilted position B, see FIG. 2, the underside of the block center portion 14 is readily accessible for a similar manipulation. Once the necessary connecting and disconnecting manipulations have been performed, the block is returned to its normal horizontal position C. As aforementioned, the spring-loaded detent 27 cooperates with a lock piece 26 to retain the block in the selected position of adjustment.

As seen in FIG. 5 the shield piece 16 of the block is provided with a plurality of large openings 16*c* through which the various wires are caused to pass. By utilizing the openings 16*c* the various wires may be readily segregated, thus facilitating tracing of the wires, when required.

As seen in FIGS. 1 and 3, the blocks 13 are in vertical alignment and each is spaced a substantial distance outwardly from the horizontal member 12. Disposed within such spacings are a series of wire guides 28, there being a series of guides for each block. Each guide 28 of a series is preferably formed of rod stock which has been bent into either a J or C shape. The horizontal leg 28*b* has the inner end thereof affixed to the horizontal member 12, except as to the end guides of the series, which may have the leg portions 28*b* thereof affixed to a portion of the bracket arm 20, see FIG. 5. The horizontal legs 28*b* of the guides of a series coact with one another to serve as a support for wires or cables laid thereupon. The offset leg 28*a* limits lateral movement of the supported wire or cable and, thus, prevents a interference by the wires and cables with the pivotal adjustment of the adjacent block. It is important that the wires connected to either the top or bottom terminal posts 17 of the block be provided with a sufficient stress relief loop when the block is in its normal non-tilted position, so that subsequently the block can be readily adjusted to various tilted positions without undue strain being imparted to the wires.

In addition to the guides 28, there may be provided a second series of wire guides 30 which are spaced longitudinally along member 12 and project therefrom in a direction opposite from brackets 18 and guides 28, see FIG. 3. Each guide 30 of a series has a bail portion 30*a* spaced outwardly from member 12. Corresponding guides 30 of the second series are in vertical alignment and, thus, enable certain of the wires and cables to be segregated from one another while extending vertically from one block to another.

Besides the first and second series of guides, a third series of guides 31 may be provided in which the guides thereof are spaced endwise of the blocks and are secured to either the members 12 or one of both of the supporters 11 and serve to guide the vertically extending wires or cables which extend from adjacent equipment.

While the illustrated assembly 10 is shown as having termination blocks disposed on only one side of the members 12, it is to be understood, of course, that the blocks may be disposed on opposite sides of the members without departing from the scope of the invention. In addition, if desired, the supports 11 may run in horizontal directions and be secured, respectively, to the floor and ceiling, in which case the adjustable blocks would extend vertically rather than horizontally, as shown. In either illustration, the adjustability of the block is the same.

Because of the adjustability of the blocks, greater block density for a given frame is possible because the spacing between adjacent blocks may be reduced without interfering with the wire connecting and disconnecting manipulations. The various parts of the assembly are of such design that they may be substantially preassembled, thereby reducing "on site" labor to a minimum during initial installation of the apparatus.

I claim:

1. A frame and wire termination block assembly comprising a support, an elongated member mounted on said support and angularly disposed with respect thereto; bracket means mounted on and projecting from said member; and an elongated wire termination block having electrical contacts thereon, said block being adjustably mounted on said bracket means to assume selected positions of tilted adjustment.

2. The frame and wire termination block assembly of claim 1, wherein said support includes a pair of elongated elements arranged in spaced relation, and said elongated block substantially spans the distance between said elements.

3. The frame and wire termination block assembly of claim 1, including a plurality of elongated members mounted in spaced relation on said support and angularly disposed with respect thereto; bracket means for each of said members; and an elongated wire termination block for each bracket means; the spacing between said elongated members permitting tilted adjustment of one block without interference by adjacent blocks.

4. The frame and wire termination block assembly of claim 3, wherein said elongated members are arranged in spaced substantially parallel relation and tilting of each elongated block being about an axis substantially parallel to the longitudinal axis of said block.

5. The frame and wire termination assembly of claim 3, including first wire guide means carried by said elongated members and disposed adjacent to said blocks.

6. The frame and wire termination assembly of claim 5, including complemental second wire guide means carried by said support.

7. The frame and wire termination assembly of claim 6, wherein said first wire guide means comprises a plurality of rodlike units transversely mounted on each of said elongated members and disposed in longitudinally spaced relation thereon, the outer distal end of each rodlike unit being angularly offset to form a wire stop.

8. The frame and wire termination assembly of claim 1, wherein said bracket means includes a pair of spaced bracket elements mounted on and projecting transversely from said elongated member, the outer distal end of each bracket element pivotally supporting an adjacent end of said block, and means cooperating with the distal end of at least one bracket element and the adjacent end of said block for releasably retaining said block in selected positions of tilted adjustment.

9. The frame and wire termination block assembly of claim 8, wherein the cooperative means includes a spring biased detent carried by the outer distal end of at least one bracket element; said detent releasably and selectively engaging one of a plurality of pockets arranged in arcuately spaced relation, said pockets being formed adjacent the end of said block; the relative positions of said pockets with respect to said detent corresponding to selected positions of tilted adjustment of said block.

10. The frame and wire termination block assembly of claim 9, wherein said block is adjustable through a tilt angle of approximately 90°.

11. The frame and wire termination block assembly of claim 1, wherein said bracket means projects from opposite sides of the elongated member and a pair of elongated wire termination blocks are disposed on opposite sides of said elongated member, each block being adjustably mounted on a projecting portion of said bracket means to assume selected positions of tilted adjustment independently of the other block.

12. The frame and wire termination block assembly of claim 11, including first wire guide means disposed intermediate said elongated member and at least one of said blocks; said guide means being secured to said elongated member.

13. The frame and wire termination block assembly of claim 12, including second wire guide means mounted on said support and angularly disposed relative to said first wire guide means.

14. The frame and wire termination block assembly of claim 13, wherein said first guide means comprises a plurality of projecting rodlike units, each unit having a distal end angularly offset to form a stop.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,665,377 Dated May 23, 1972

Inventor(s) JOSEPH H. MacKENZIE, JR.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, lines 8-9, "section" should be -- sectional --

Column 3, line 40, "spacings" should be -- spacing --

Column 3, line 45, after "shape." insert -- The outer leg 28a of each guide is offset upwardly. --

Column 3, line 73, after "one" delete "of" and substitute therefor -- or --

Column 3, line 73, "supporters" should be -- supports --

Signed and sealed this 5th day of September 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
★ U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334