July 21, 1970 J. H. MacKENZIE, JR 3,521,129

FRAME STRUCTURE FOR WIRE TERMINATION BLOCKS

Filed June 4, 1968 2 Sheets-Sheet 1

Fig. 1

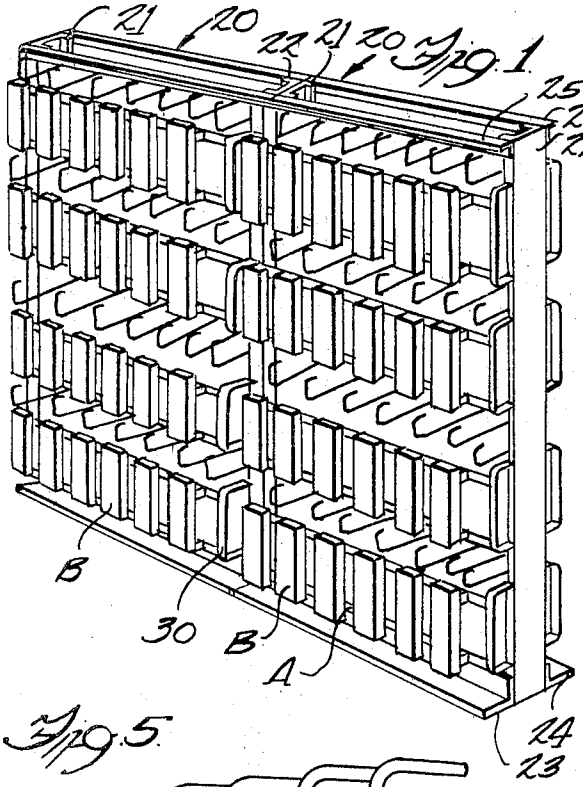


Fig. 2

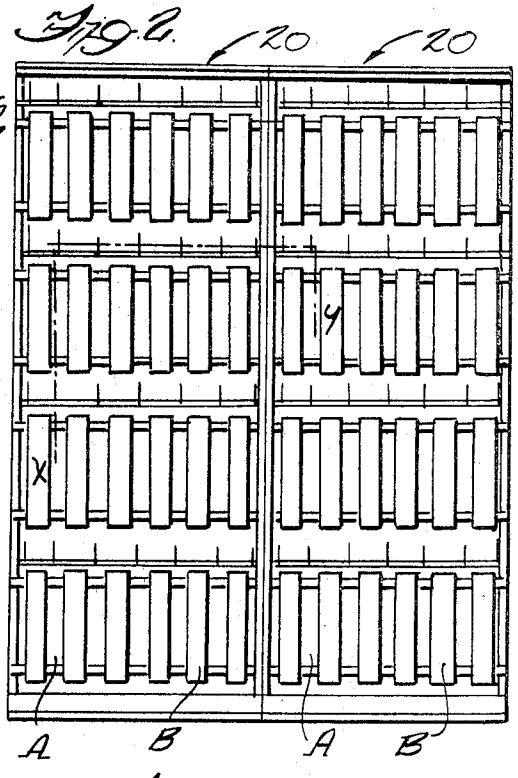


Fig. 5

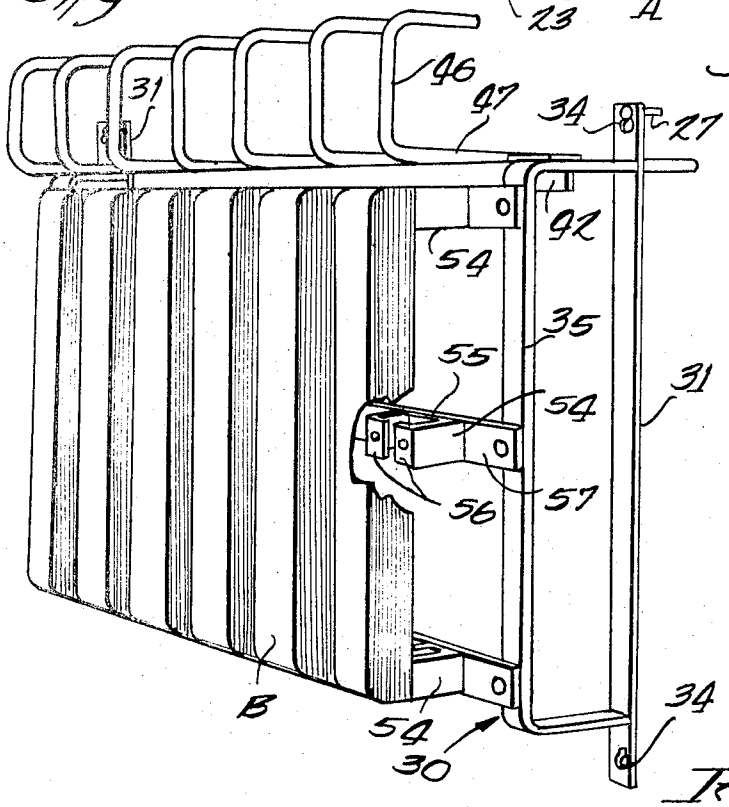
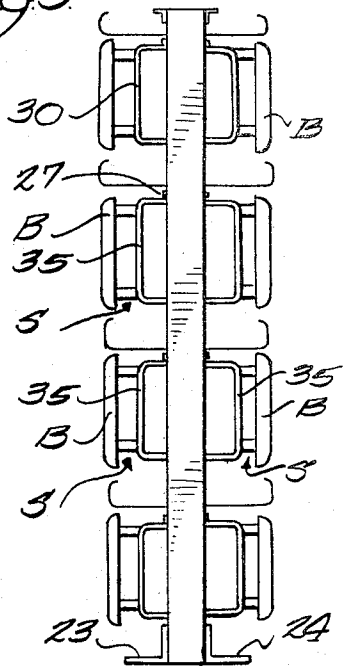


Fig. 3



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Filed June 4, 1968 2 Sheets-Sheet 2

Fig. 6

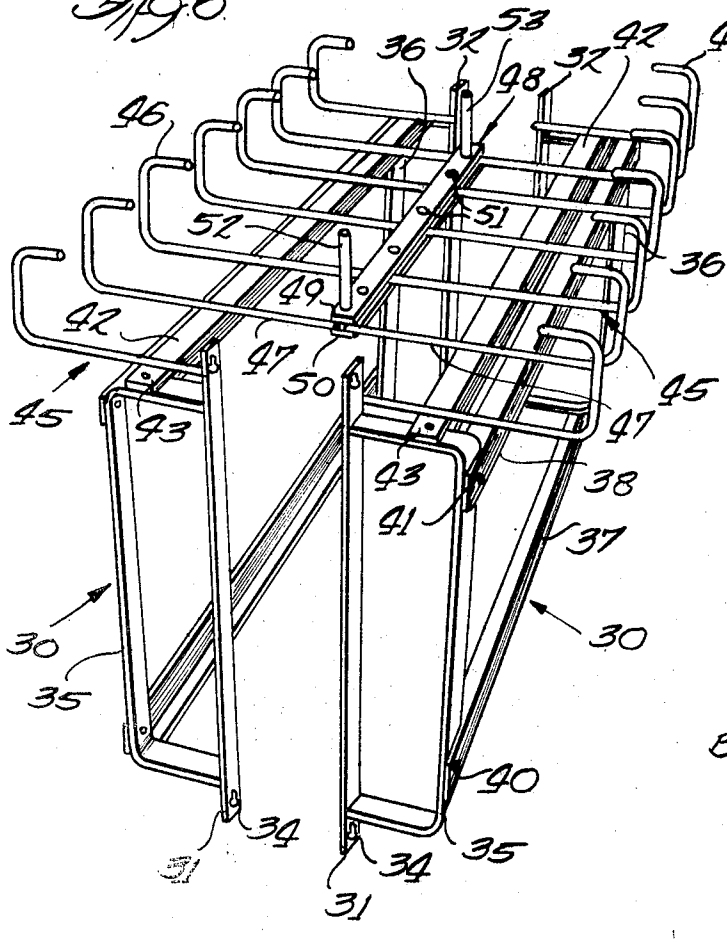


Fig. 7

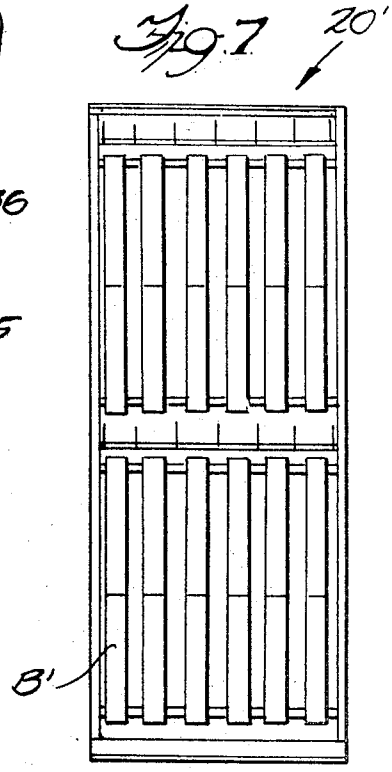
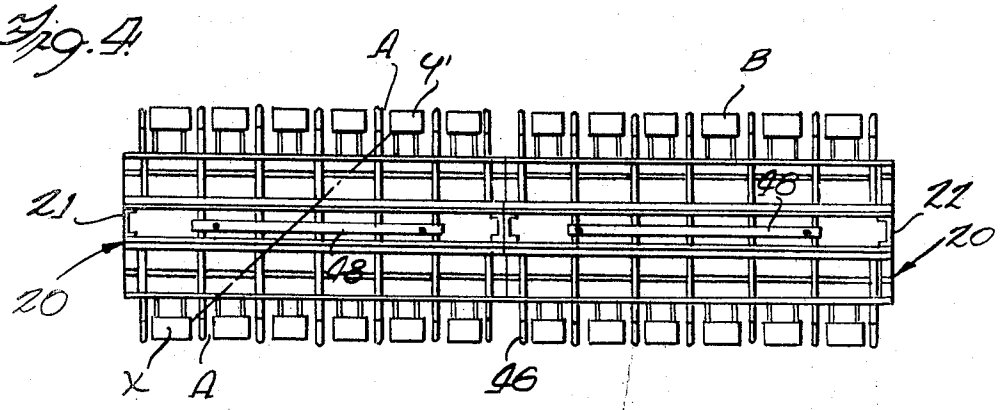


Fig. 4



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FRAME STRUCTURE FOR WIRE TERMINATION BLOCKS

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U.S. Cl. 317—122 8 Claims

ABSTRACT OF THE DISCLOSURE

A frame structure for mounting telephone wire termination blocks includes a vertical support and a plurality of modular frame members mounted thereon. Each modular frame member has horizontally spaced, vertically extending brackets that cooperate with the vertical support for mounting the frame. A termination block support is secured to the vertically extending brackets and carries a jumper rack which serves as a shelf for jumper wires.

BACKGROUND OF THE INVENTION

The field of the invention relates to a frame structure adapted to accommodate termination blocks used by telephone companies.

A need has arisen for a frame which can accept the new termination blocks of the quick connect type, and at the same time be compatible with existing equipment including the conventional solder type terminal assembly. In conventional systems, as a subscriber desired additional and more efficient telephone service it was necessary to use more floor space. Also, the cost of adding and maintaining such services was expensive due to the high labor cost caused by the congestion of the existing wiring system.

The subject invention seeks to provide a simple and inexpensive solution to the indicated problem, whereby floor space can be conserved, initial installation of wires can be accelerated, maintenance of the wiring system can be simplified and new lines can be added quickly and inexpensively.

SUMMARY OF THE INVENTION

It is an object of the invention to provide an improved frame for mounting telephone wire termination blocks which includes a jumper rack acting as a shelf for jumpering wires.

A further object is to provide an improved frame of the character indicated which is simple in form, easy to manufacture and assemble, and efficient in operation.

Other objects and advantages will become apparent as the description proceeds.

The invention in one form comprises a frame structure for accommodating telephone wire termination blocks including a vertical support and at least one pair of substantially identical modular frame members removably mounted on opposite sides of the vertical support. Each modular frame member has speed, vertically extending bracket members which engage the vertical support. Wire termination block supports are secured to the bracket members and extend outwardly therefrom to form horizontal passageways for jumper wires. A jumper rack is carried by the block supports and includes a plurality of open rings. A retainer clamp engages at least some of the rings of each modular frame member of a pair to form in conjunction with the rings a continuous shelf for the passage of jumper wires. The upper portion of the retainer clamp is provided with guide members for maintaining the jumper wires in an orderly arrangement on the jumper rack.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of the frame embodying the invention;

FIG. 2 is a front elevational view of the frame;

FIG. 3 is a side view of the frame;

FIG. 4 is a plan view of the frame;

FIG. 5 is a perspective view, partly broken away, of certain components of the frame;

FIG. 6 is another perspective view of certain components of the frame in an assembled condition; and

FIG. 7 is a front elevational view of an alternative embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, an improved frame structure is shown in FIGS. 1–4 and is generally indicated by the numeral **20**. Frame structure **20** is rectangular in configuration and is designed to accept wire termination blocks B of the quick connect type.

The frame structure has vertical supports **21** and **22** which are horizontally spaced and are preferably C-shaped in cross-section (see FIG. 4). The legs of the vertical supports face each other and are held in position by base support members **23** and **24** and cross members **25** and **26**. The base support members and the cross members are preferably L-shaped in cross-section. Base support member **23** and cross member **25** are welded, or otherwise suitably secured, to one leg of supports **21** and **22** on one side thereof. Likewise, base support member **24** and cross member **26** are welded, or otherwise suitably secured, to the other leg of supports **21** and **22**. The base support members **23** and **24** may be provided with apertures, not shown, for receiving bolts which may be used to secure the frame structure to a floor.

As shown in FIGS. 1, 2 and 4, two frame structures **20** may be secured together in an abutting relationship. This can be accomplished by providing apertures in the bight portions of the abutting support members **21** and **22** which receive securing means such as bolts, not shown. Thus, a plurality of frame structures **20** may be aligned along a wall in a simple and efficient manner, whereby individual frames may be replaced in part or the whole assembly may be deleted entirely with relative ease by merely disengaging the securing means.

The vertical supports are provided with headed studs **27** which are secured to the legs and extend outwardly therefrom. These studs are adapted to cooperate with a modular frame member **30** which is more clearly shown in FIGS. 4 and 5. Modular frame member **30** includes a pair of horizontally spaced mounting brackets **31** and **32**. Each bracket is provided with two keyhole apertures **34** which receive the headed studs **27** when the modular frame member is placed in position on the frame structure. In assembling the modular frame member mounting bracket keyholes **34** are aligned with headed studs **27** whereafter the bracket is slid over the studs and then released downwardly so that the smaller opening of the keyhole slot contacts the shank portion of the stud (FIG. 5). To remove the modular frame member, the assembly process is simply reversed.

A pair of block mounting members **35** and **36** are provided and are generally C-shaped in configuration. The free ends of each mounting member are welded to the brackets. Upper and lower brace members **37** and **38** extend between and are removably secured to the bight portion of each mounting member **35** and **36** by screws or the like. Brace members **37** and **38** are preferably L-shaped and have notched ends with tongues **40** and **41**, respectively, which engage the bight portion of the mounting member. The screws extend through the tongues and

are threadedly disposed in the mounting member. A rack support member **42** is provided and also extends between and is removably secured to mounting members **35** and **36** by screws. The rack support is preferably L-shaped and has notched ends with a tongue **43** on both ends which is secured to the upper leg of each mounting member. A screw extends through tongue **43** and is threadedly disposed in the upper leg of the C-shaped mounting member.

A jumper rack, generally indicated by the numeral **45**, is carried by rack support **42** and extends longitudinally of the modular frame member. Jumper rack **45** comprises a plurality of J-shaped rings **46** which are horizontally spaced on rack support **42**. The long leg **47** of each ring is welded to rack support **42**.

Referring to FIG. 6, two modular frame members are shown in the assembled condition as they would be when mounted on the frame structure **20**. A retainer clamp **48** is provided and includes upper and lower plate members **49** and **50**, respectively. The long legs of the J-shaped rings of a pair of opposing modular frame members, with the exception of the outermost rings, are disposed in a clamped relationship between the plates. Screws **51** are used to clamp the plates against the legs of the rings. The retainer clamp in conjunction with the rings form a continuous shelf for the passage of jumper wires between opposite sides of the frame structures. It is to be understood that the retainer clamp is assembled after the modular frame members have been mounted on the frame structure.

Two guide posts **52** and **53** extend from upper plate **49** and are suitably secured thereto, as by welding. These posts serve to channel and maintain the jumpering wires in an orderly arrangement on the jumper rack, thereby providing a compact and uniform wiring system.

The wire termination blocks B may be of several different types manufactured by the telephone companies, and form no part of the invention. The modular frame member disclosed herein is designed to mount the blocks now being used by the industry as well as those previously used. Blocks B may be secured to the mounting members by screws. Normally the blocks are manufactured with spacer mounting bracket means, not shown, which are used for mounting the block on the modular frame member. These spacer brackets in combination with the C-shaped mounting members of the modular frame provide a space S between mounting members **35** and **36** and the inner surface of blocks B (FIG. 3). This space is used for the passage of horizontal jumper wires. Preferably, the blocks are vertically aligned in a substantially flush relationship with the outer surface of the rings of jumper racks **45** as shown more clearly in FIG. 3.

When blocks are used which do not have spacer brackets, it is contemplated that a spacer be provided which acts to mount the block on the modular frame and space it therefrom in a substantially flush relationship with the jumper racks. In FIG. 5 such a bracket **54** is shown and is generally V-shaped with a flat bottom **55** and inturned flanges **56** which have apertures therethrough to receive mounting screws (not shown). An additional horizontally extending brace member **57** is provided intermediate brace members **37** and **38** and is necessary to assure stability since, unlike the blocks manufactured with spacer mounting brackets, the blocks manufactured without the brackets do not have sufficient reinforcement against bending.

The termination blocks may be of varying lengths and FIG. 7 shows blocks B′ mounted on frame structure **20′** which are approximately twice as long as those depicted in FIGS. 1–4. In this embodiment brackets **31** are not used and mounting members **35** and **36** are suitably secured directly to vertical supports **21** and **22**, as by welding. As is readily apparent, the frame is capable of accepting modular frame members of varying length and size with relative ease.

An advantage of using modular frame members is that the wire termination blocks may be mounted either before or after the modular frame member is positioned on the vertical supports. Once the modular frames are positioned, an individual modular frame can be easily removed when it is necessary for wire re-routing or for the placement of additional permanent incoming or outgoing cables without disturbing the remaining modular frames.

Another advantage of using modular frames is that they may be mounted on only one side of a frame. The frame then could be placed closely adjacent to a wall and floor space would be conserved. If additional telephone wire termination blocks are needed at a later time, it would be necessary only to move the frame away from the wall a sufficient distance to allow for the additional blocks on the other side of the frame.

As shown in FIGS. 1, 2 and 4 the blocks are mounted on the modular frames in such a way as to provide vertical passageways A. Such passageways aid in reducing the congestion of wires which has heretofore caused problems when jumper wires had to be re-routed. Each level of blocks has jumper racks which also help to reduce congestion of wires by providing a uniform distribution of jumper wires over the plurality of levels and thus, no individual level is required to accept an overload of jumper wires. This uniform distribution of wires enables a telephone workman to re-route jumper wires easier since the congestion of wires is reduced thereby making wire tracing less of a problem.

The permanent incoming and outgoing cables may be routed above frame structure **20** or may be brought up through the floor. In either instance, the cable is routed in the inner surface of the C-shaped vertical supports **21** and **22** and is held in place by suitable clamp means known in the art. The various wires from the cable may be connected to their respective termination points on the blocks. By disposing the permanent cable in the inner surfaces of the vertical supports, the possibility of interference with the jumper wires extending between the blocks is substantially eliminated.

In order to more clearly understand the ease with which the jumper wires may be routed, reference is made to FIGS. 2 and 4. A jumper wire path from block X to block Y is indicated in FIG. 2 by line — - — where blocks X and Y are located on the same side of the frame structure. It is necessary only to have two 90° bends for each jumper used to connect any two termination blocks on the frame structure. This simplifies jumper placement and routing and allows for the interweaving of jumper wires in a compact and orderly manner.

A jumper wire path from block X on one side of the frame to block Y′ on the opposite side is indicated by line — - — in FIG. 4. The legs **47** of rings **46** and retainer clamp **48** serve as a continuous shelf for the jumper wire extending between blocks X and Y′. As in the case where the blocks are on the same side of the frame, in this jumper connection there would be only two 90° bends in the jumper wires.

Preferably, the vertical support and the modular frame members, with the exception of the rings, are manufactured from a hot-rolled steel. The rings may be manufactured from a cold-rolled steel. Alternatively, other materials such as aluminum and synthetic plastic may be used.

Although the frame structure is designed to accommodate telephone wire termination blocks, it may with equal facility be used to mount solder type terminals, central office protectors and other electrical devices.

It is thus seen that a frame structure has been provided for mounting electrical devices, such as telephone wire termination blocks, which is simple in form, easy to manufacture and assemble, and efficient in operation.

While a particular embodiment of the invention has been shown, it is to be understood that the invention is not limited thereto since many minor modifications may

be made; and it is, therefore, contemplated by the appended claims to cover any such modifications as fall within the true spirit and scope of the invention.

The invention having thus been described, what is claimed and desired to be secured by Letters Patent is:

1. A frame structure for accommodating telephone wire termination blocks comprising a vertical support, at least one pair of substantially identical modular frame members removably mounted on opposite sides of the vertical support, each modular frame member comprising horizontally spaced, vertically extending members mounting the frame on the vertical support, termination block support means secured to the mounting means and extending outwardly therefrom including vertically extending members which are C-shaped in configuration and horizontally arranged members secured to the C-shaped members at the bight portion thereof, and a jumper rack carried by said block support means including a plurality of horizontally spaced J-shaped open rings, and a retainer clamp means engaging at least some of the rings of each modular frame member of a pair to form a continuous shelf with said rings for the passage of jumper wires.

2. The invention according to claim 1 wherein the vertically extending members of each modular frame member have apertures and the vertical support has lugs which are disposed within said apertures for mounting the frame on the support.

3. The invention according to claim 2 wherein the long leg of each J-shaped ring is secured to the block support means and has its free end extending toward the long leg of a J-shaped ring of the opposing modular frame member.

4. The invention according to claim 3 wherein the retainer clamp means includes two horizontally spaced plates removably connected together, and the free ends of the long legs of some of the J-shaped rings are disposed in a clamped relationship therebetween.

5. The invention according to claim 4 wherein the upper horizontal plate of the retainer clamp means includes at least two upwardly extending guides for channeling jumper wires.

6. A modular frame member for accommodating telephone wire termination blocks comprising a mounting means including horizontally spaced, vertically extending members each having a means thereon adapted to cooperate with a supporting structure for allowing the frame member to be disconnected therefrom; block support means secured to said mounting means and including vertically extending members which are generally C-shaped in configuration and horizontally extending members secured to said vertically extending members at the bight portion thereof, said vertically extending members having means for holding the termination blocks in place; and a jumper rack for wires carried by the block support means and located adjacent one end thereof.

7. The invention according to claim 6 wherein the jumper rack includes a plurality of horizontally spaced J-shaped open rings which are adapted to serve as shelves for jumper wires.

8. A modular frame member for accommodating telephone wire termination blocks comprising a mounting means including horizontally spaced, first vertically extending members each having a means thereon adapted to cooperate with a supporting structure for allowing the frame member to be disconnected therefrom; block support means secured to said mounting means and including second vertically extending members protruding generally outwardly of the mounting means with horizontally extending means secured to said second vertically extending members, said second vertically extending members having means for holding the termination blocks in place; and a jumper rack for wires carried by the block support means and located adjacent one end thereof.

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