

[54] MODULAR JACK STRIP ASSEMBLY

[75] Inventors: William V. Carney, Valley Stream;
Paul V. Deluca, Port Washington,
both of N.Y.

[73] Assignee: Porta Systems, Roslyn, N.Y.

[22] Filed: Jan. 5, 1973

[21] Appl. No.: 321,365

[52] U.S. Cl. 339/198 H, 339/75 R, 339/91 R,
339/211

[51] Int. Cl. H01r 9/00

[58] Field of Search 339/198, 211, 75 R, 75 M,
339/92, 206, 207, 208, 182, 183, 91 R

[56] References Cited

UNITED STATES PATENTS

2,365,648	12/1944	Rossmann.....	339/75 A
2,739,292	3/1956	Modrey et al.	339/75 A
3,133,777	5/1964	Anhalt	339/211 X
3,277,422	10/1966	Shevlin	339/211
3,440,596	4/1969	Frompouicz	339/206 R
3,537,061	10/1970	Haag et al.	339/183
3,594,698	7/1971	Anhalt	339/75 M
3,605,070	9/1971	Krafthefer	339/91 R

OTHER PUBLICATIONS

Electro-Tech., AMP Inc., 4-1964.

Primary Examiner—Roy D. Frazier

Assistant Examiner—Robert A. Hafer

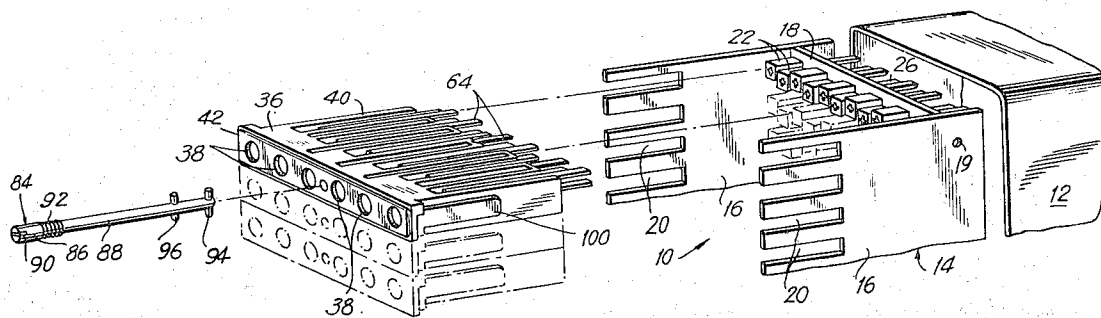
Attorney, Agent, or Firm—Philip D. Amins

[57]

ABSTRACT

A jack strip assembly is provided comprising an outer casing and an inner housing assembly. The inner housing includes a rear wall and a pair of side walls secured to the rear wall wherein the side walls are provided with a plurality of vertically spaced and horizontally aligned slots. Modular jack strips having a plurality of jacks and a pair of side shoulders are horizontally disposed within the inner housing assembly by engagement of the shoulders within the slots. Tuning fork contact assemblies having wire wrap terminals are positionally secured to the rear wall and adapted to removably receive contact blades or fingers of the individual jack appearances within each of the jack strips. The jack strip assemblies are provided with a longitudinal bore disposed in coaxial alignment with a keyway or slot provided in the rear wall. Extending through the longitudinal bore is a bayonet-type fastener having a slotted head and pairs of spaced flanges at the distal end portion thereof. When the jack strip is inserted within the housing assembly, it is removably secured with respect thereto by a predetermined amount of forward longitudinal movement and a quarter-turn rotation of the fastener. The rotational movement of the fastener causes the most distally positioned flanges to abuttingly engage the rear surface of the rear wall and the innermost flanges to abuttingly engage the inner surface of the jack strip assembly, thereby securing said jack strip assembly with respect to said inner housing assembly.

19 Claims, 8 Drawing Figures



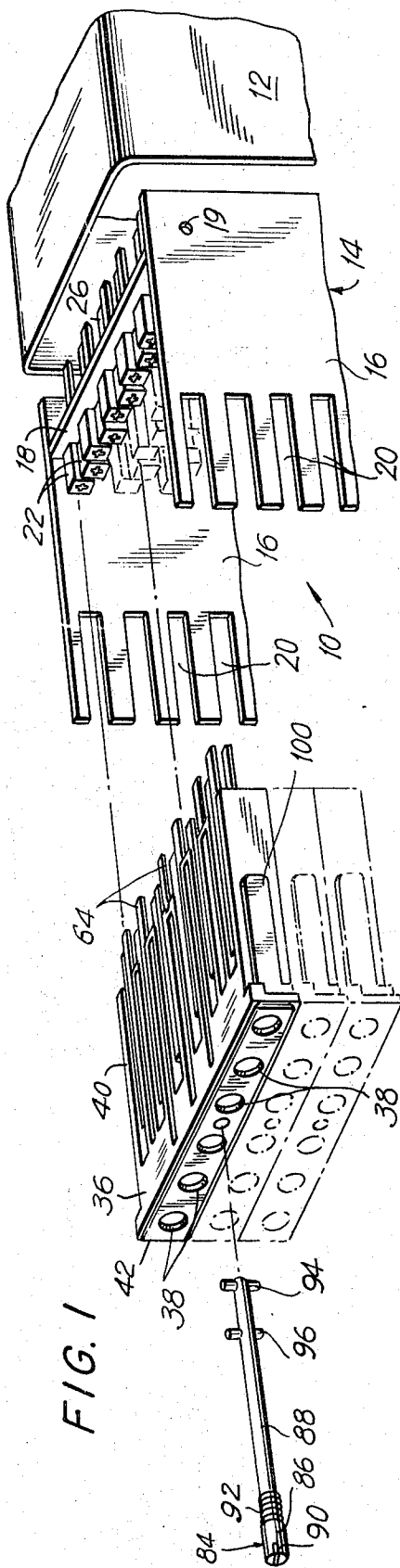


FIG. 3

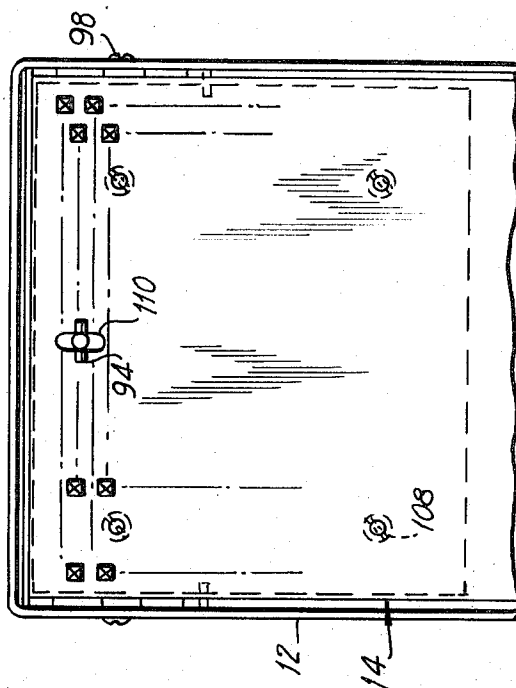
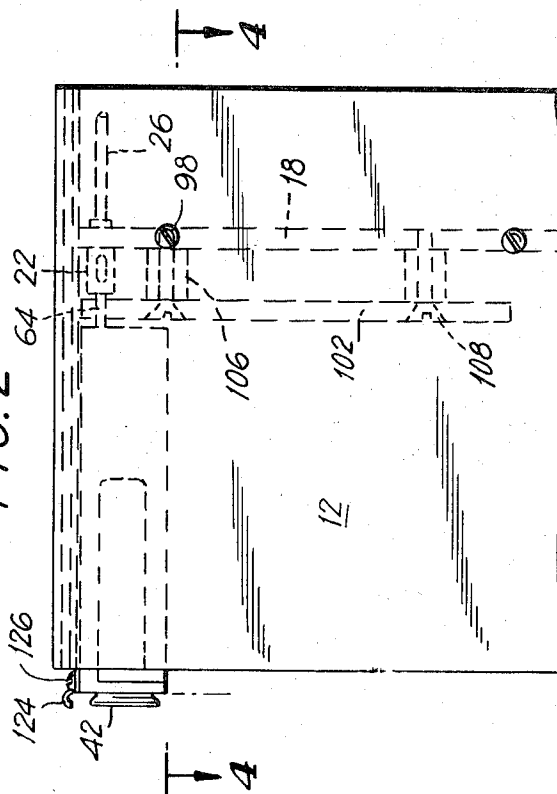


FIG. 2



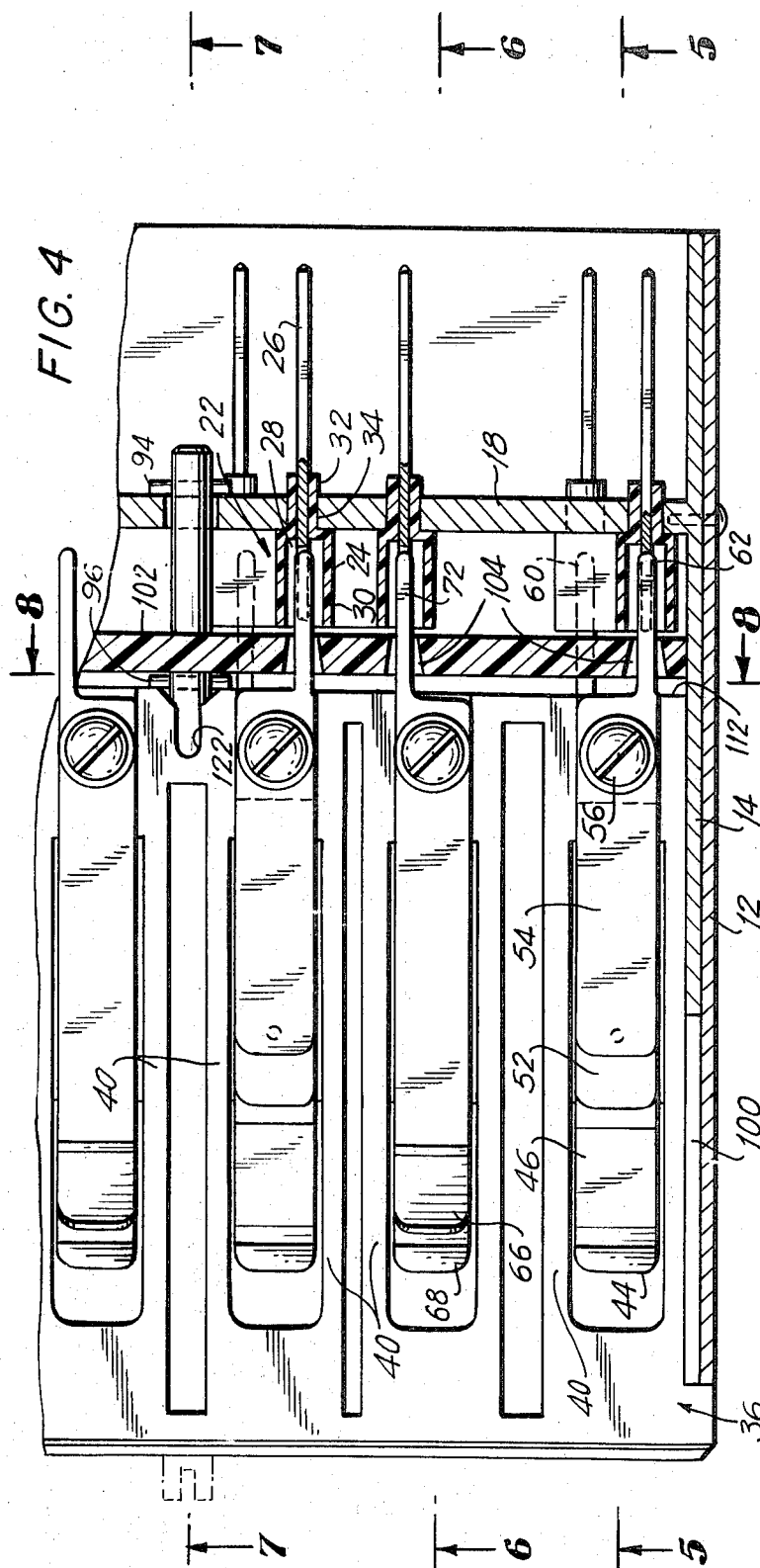
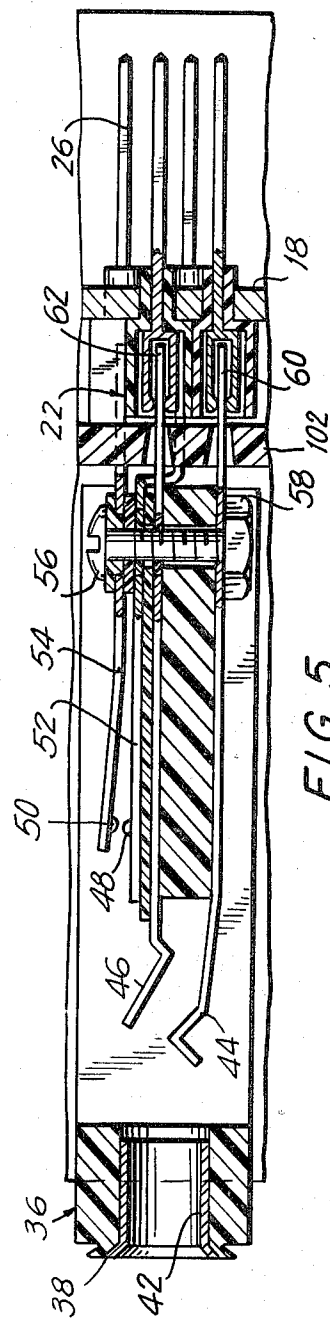


FIG. 6

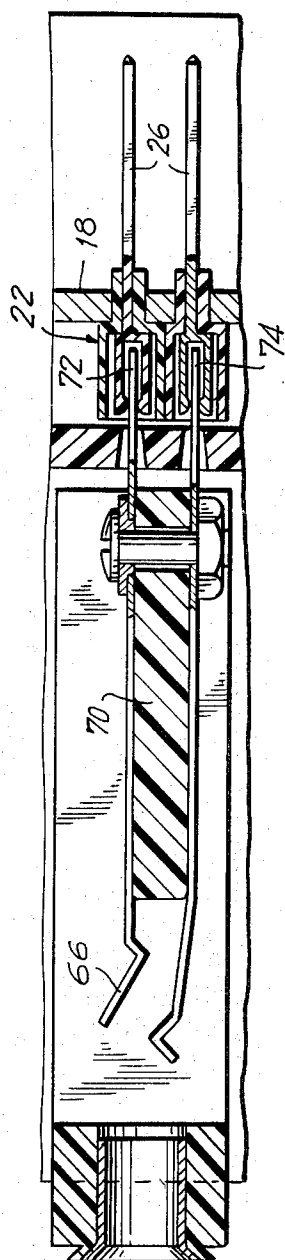


FIG. 7

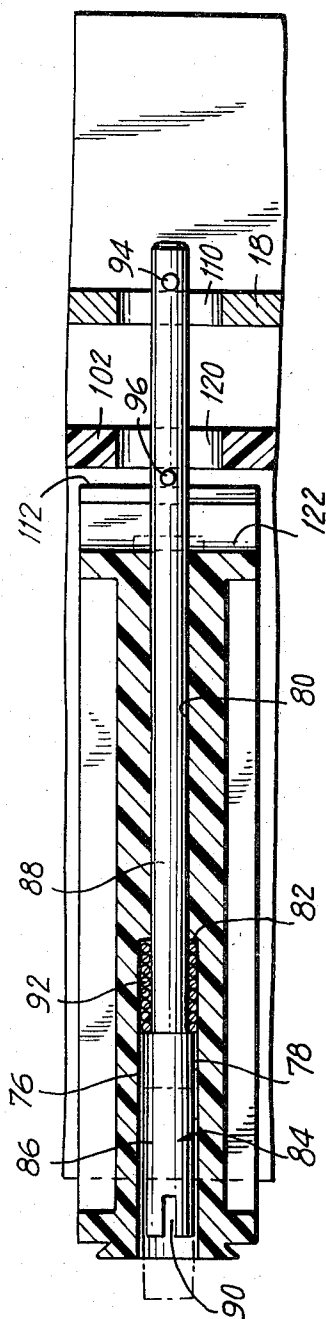
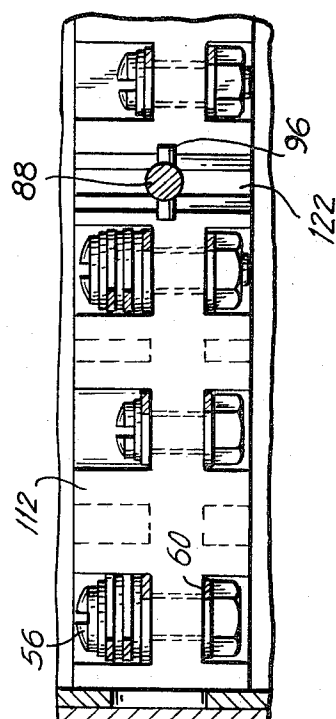


FIG. 8



MODULAR JACK STRIP ASSEMBLY

BACKGROUND OF THE INVENTION

It is commonplace in central telephone installations to employ a multitude of jack terminals in that they provide easy connect-disconnect operation. The problems encountered with present day jack terminals is that they are hard wired whereby it is exceedingly difficult to isolate problems which occur at the terminals. The problems which present themselves are open and short circuit wire connections and open and short circuit conditions at the jack terminals, per se.

The time required to initially isolate the problems and then rectify the same is usually quite appreciable and presents difficulty in maintaining proper and continuous operational telephone service.

SUMMARY OF THE INVENTION

Accordingly, it is the primary object of the present invention to provide a new and novel modular jack strip assembly which isolates the jack terminals from the hard wiring normally associated therewith.

It is another object of the present invention to provide a modular jack strip assembly of the foregoing type which encompasses fixed housing structures which in turn permit of present utilization or future expansion.

It is still another object of the present invention to provide a modular jack strip assembly which permits present hard wire connection and future jack terminal connection or both future hard wire and jack terminal connection.

It is yet a further object of the present invention to provide an assembly of the foregoing type wherein the modules utilized are removably secured with respect to the housing to enable immediate isolation of a problem at any particular jack terminal or terminals and facilitation of repair by the simple replacement of a modular jack strip.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, features and advantages of the present invention will become more apparent from the detailed description hereinafter considered in conjunction with the accompanying drawings wherein:

FIG. 1 is a partial exploded perspective view depicting a preferred embodiment of the modular jack strip assembly, constructed in accordance with the principles of the present invention;

FIG. 2 is a side view of the modular jack strip assembly of FIG. 1;

FIG. 3 is a rear view of the assembly shown in FIG. 1;

FIG. 4 is a view taken on the line 4—4 of FIG. 2;

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a sectional view taken on the line 6—6 of FIG. 4;

FIG. 7 is a sectional view taken on the line 7—7 of FIG. 4; and

FIG. 8 is a view taken on the line 8—8 of FIG. 4.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and more particularly

to FIG. 1 thereof, there is shown a modular jack strip assembly generally denoted by the reference numeral 10 and constructed pursuant to the principles of the present invention and illustrative of a preferred embodiment thereof. The assembly 10 comprises an outer casing or cover member 12 and an inner housing assembly 14. The inner housing 14 includes a pair of side walls 16 and a rear wall or mounting plate 18. The side walls 16 are secured to the rear mounting plate 18 by means of screws 19, or by any other suitably convenient means. The front portion of the side walls 16 are provided with a plurality of spaced vertically disposed and horizontally aligned slots 20, whose purpose will be described in more detail hereinafter.

A plurality of tuning fork contact members 22 are mounted in predetermined disposition on the mounting plate 18. As best seen in FIGS. 4 through 6, the tuning fork contact members 22 comprise an insulating bushing 24, a wire wrap post or terminal 26 and an inner U-shaped contact strip 28, with the terminal 26 and strip 28 being formed integrally with one another. The bushing 24 has a substantially rectangular portion 30 and a cylindrical shoulder portion 32. The members 22 are mounted on the plate 18 by having the cylindrical portion 32 thereof disposed within openings 34 formed in the mounting plate 18.

The assembly 10 also includes a plurality of modular jack strips, each of which is generally designated by the reference numeral 36. The jack strip 36 is of substantially rectangular configuration and is preferably fabricated of a hard impact plastic material. The jack strip 36 includes a plurality of individual jack terminals 38 disposed in spaced horizontal relationship, as viewed in FIG. 1. Each of the jack terminals 38 are internally spaced from one another by means of upwardly extending shoulders 40 disposed between adjacent ones of the terminals, as best seen in FIG. 4.

The various types of jack terminals which can be utilized in conjunction with the modular jack strip 36 of the present invention are numerous and the configurations depicted in FIGS. 5 and 6 are merely exemplary of those contemplated. In this regard, the terminal 38 shown in FIG. 5 is representative of a four terminal system wherein the inlet end 42 of the terminal 38 is adapted to receive a plug (not shown) therein, which plug is adapted to electrically contact the spring fingers 44 and 46 and thereafter cause the finger 46 to be biased upwardly in turn causing electrical connection between the contacts 48 and 50 of the fingers 52 and 54, respectively.

The spring members are separated by means of insulators and the entire apparatus is secured together by means of a bolt 56 and a nut 58. With particular reference to the spring fingers 44 and 46, it is seen in FIG. 5 that they terminate in outwardly extending contact blades or fingers 60 and 62, respectively. It is herein to be noted that the members 52 and 54 also terminate in outwardly extending contact fingers which are disposed in laterally offset relationship with respect to the fingers 60 and 62.

As best seen in FIG. 1, each of the individual jack terminals 38 have a predetermined number of outwardly extending contact blades, herein generally designated by the numeral 64, with the number of contact blades 64 connected to the terminals 38 being dependent upon the type of terminal utilized.

With reference to FIG. 6, there is depicted a simple two contact jack terminal employing spring fingers 66 and 68 separated by an insulative member 70 and terminating in contact blades 72 and 74, respectively.

Each of the modular jack strips 36 is provided with a longitudinally extending bore 76, as best seen in FIG. 7. The bore comprises an outwardly disposed portion 78 and a reduced inwardly extending portion 80 with the junction between the portions 78 and 80 defining an annular shoulder 82. A bayonet-type fastener 84 is fixedly positioned within the bore 76 and is capable of longitudinal movement between two fixed positions, as will be discussed more fully hereinafter. The fastener 84 includes an enlarged head portion 86 and a reduced shank portion 88. The enlarged head portion 86 is provided with a slot 90 at the outer end thereof while the reduced shank portion 88 has a compressible coil spring 92 disposed therearound at the juncture thereof with the enlarged head portion 86. The distal end of the fastener 84 is provided with a pair of spaced apart flanges or pins 94 and 96, respectively, whose purpose will become more apparent from the discussion hereinafter.

When it is desired to mount the modular jack strip assembly of the present invention, a physical location is selected which provides sufficient space requirements for the assembly 10. Thereafter, the particular jack strips which are to be utilized are designated; although not installed at this time. However, the inner housing assembly 14 is installed and the mounting plate 18 and a predetermined array of tuning fork contact members 22 are secured. The internal telephone office wire connections are then made by wire wrapping the specified wires about the wire wrap terminals 26, after which this portion of the assembly is deemed to be hard wired in position. The cover member 12 may then be secured to the inner housing assembly 14 by means of screws 98. If necessary and desirable, at this time, the individual jack strips 36 may then be placed in position in the assembly 10 in the following manner.

A jack strip 36 is slideably positioned between a pair of horizontally aligned slots 20 by having the side shoulder portions 100 inserted within the proper slots. When this is performed, the contact blades 64 seat themselves within the bushing 24 of the tuning fork contact member 22 in electrical contacting engagement with the U-shape contact strip 28, and thus the terminal post 26. In order to insure that the contact fingers 64 are properly positioned for seating within the bushing portions 24 of the contact members 22, the assembly is provided with an alignment plate 102 (FIG. 2) having tapered apertures 104 through which the fingers 64 protrude. The apertures 104 insure the straightening of any contact fingers which may have been slightly bent or dislodged from the proper position. The alignment plate 102 is secured to the rear mounting plate 18 by means of spacer blocks 106 and screws 108.

After the strips have been initially positioned in the manner hereinbefore described, they are locked in position by means of the bayonet-type fastener. In particular, a screw driver or other slotted instrument is placed in the slotted head 90 of the fastener 84 and the fastener is pushed inwardly against the outward biasing force of the coil spring 92. In this regard, care must be taken to insure that the flange 94 is disposed in a substantially vertical position so as to enable the same to

extend through the keyway 110 formed in the mounting plate 18. Thereafter, the fastener is rotated 90° or a quarter turn and released, thereby causing the flange 94 to engage the rear surface of the mounting plate 18 and also causing the flange 96 to engage the inner end 112 of the jack strip 36, as best seen in FIG. 7. In this manner, the individual jack strips are secured in releasable locked position with respect to the inner housing assembly 14.

It is herein to be noted that the jack strips may be placed in locked positions within the inner housing assembly 14 immediately after the posts 26 are hard wired, as previously discussed, or may be secured at some future subsequent time when the need and utilization therefor arises. Similarly, once the inner housing assembly 14 and plate 12 are secured in position, the connection of the tuning fork contact members 22 and the hard wiring thereof may be performed immediately or at some subsequent time when the need therefor is completely ascertained.

In the event that any particular jack terminal should fail and the circuit must be repaired, the same is accomplished by simply removing the individual jack strip 36 and replacing it with another similarly constructed jack strip. Thereafter, the defective jack strip may be repaired at leisure in an off-line environment.

In removing the jack strip 36 from the locked position all that need be done is to turn the slotted head 90 of the bayonet-type fastener 84 a quarter turn so as to enable the flange 94 to pass through the keyway 110 with the flange 96 becoming seated within a keyway or slot 122 (FIG. 4) formed in the jack strip 36, thereby preventing the fastener 84 from becoming disengaged from the jack strip 36. It is to be noted that the plate 102 is provided with a slot 120 to enable passage of the distal end of the fastener 84 therethrough.

It is usual to fabricate the assembly 10 so as to accommodate 15 individual jack strips; however, the number of strips 36 used in a particular assembly 10 is merely a matter of design and space requirements. Attention is directed to the fact that although in present discussion, the jack strips have been described as being disposed in a horizontal plane, the same is merely for purposes of illustration and not intended to be interpreted as a limitation of the present invention, since it is readily possible to position the entire assembly 10 in a substantially horizontal plane, as opposed to the vertical plane illustrated in the present drawings.

It is to be noted that terminal designation strips (not shown) are placed between adjacently disposed jack strips 36 in the spaces therebetween. However, in the case of the uppermost jack strip, there is provided an arcuate strip 124 secured by means of screws 126. The designation strip may then be inserted between the upper portion of terminal inlet end 42 and the strip 124.

It is apparent that the present invention provides a simple and effective solution for the quick and easy isolation of open or short circuit conditions on an individual jack terminal and the immediate repair and correction of the same, so as to insure continuous telephone operating service, in a central telephone office. It will also be apparent that the utilization of the present invention is not solely limited to telephone applications.

While we have shown and described the preferred embodiment of my invention, it will be apparent to those skilled in the art that there are many modifications, changes and improvements which may be made therein without departing from the spirit and scope thereof.

What is claimed is:

1. A modular jack strip assembly comprising a housing assembly, and a plurality of modular jack strips, said housing assembly including a mounting plate member, and jack strip mounting means connected to said mounting plate member said housing assembly being adapted to receive said plurality of modular jack strips, each of said jack strips comprising an insulated structure having a plurality of individual jack terminals each terminal having at least one electrical contact finger extending outwardly of said terminals, a plurality of electrical contact members positionally secured to said mounting plate member in a predetermined array, each of said jack strips including mounting members connected therewith, said jack strip mounting members being secured with said jack strip mounting means to positionally secure said jack strips with respect to said housing assembly, and corresponding ones of said electrical contact fingers being disposed in seated engagement with corresponding ones of said electrical contact members.
2. A modular jack strip assembly in accordance with claim 1, wherein said jack strips include releasable locking means connected therewith, said mounting plate member includes lock holding means, said lock holding means engaging said locking means to releasably lock said jack strips with respect to said mounting plate member and thus said housing assembly.
3. A modular jack strip assembly in accordance with claim 2, wherein said releasable locking means comprises a longitudinal aperture extending through said jack strip, a bayonet-type fastener disposed within said longitudinal aperture, a spring member disposed about a portion of said fastener and positioned within said aperture for biasing said fastener in a direction outwardly of said jack strip, retaining means connected to the distal portion of said fastener to retain said fastener within said aperture, and a locking member secured to the distal end of said fastener.
4. A modular jack strip assembly in accordance with claim 3, wherein said lock holding means comprises a slot formed in said mounting plate member.
5. A modular jack strip assembly in accordance with claim 4, wherein said fastener and said slot are disposed in substantially coaxial alignment.

6. A modular jack strip assembly in accordance with claim 3, wherein said jack strip includes a keyway which is recessed with respect to the inner end thereof, said keyway and said aperture communicating with each other, whereby said aperture is recessed with respect to the inner end of said jack strip, and said retaining means comprising a pair of flanges connected to said fastener.
7. A modular jack strip assembly in accordance with claim 3, wherein said locking member comprises a pair of flanges connected to said fastener.
8. A modular jack strip assembly in accordance with claim 1, wherein said electrical contact members comprise tuning fork contact assemblies including an insulating bushing having a slotted opening therein, a U-shaped contact strip disposed within said bushing, a wire wrap terminal connected to said U-shaped contact strip and extending outwardly from said bushing, and said contact fingers being disposed in mated engagement with said U-shaped contact strips within said bushing.
9. A modular jack strip assembly comprising a housing assembly, and a plurality of modular jack strips, said housing assembly comprising a rear wall, and a pair of side walls, means for securing said side walls to said rear wall, each of said side walls having a plurality of spaced slots formed therein with corresponding ones of said slots in said side walls being disposed in coplanar relationship, each of said jack strips comprising an insulated structure having a plurality of individual jack terminals disposed in laterally offset relationship, each of said jack terminals having at least one electrical contact finger extending outwardly therefrom, a plurality of electrical contact members mounted on said rear wall in a predetermined array, each of said jack strips having shoulders on both sides thereof, said plurality of modular jack strips being positionally secured to said housing assembly by slidable engagement of said shoulders within said side wall slots, and corresponding ones of said electrical contact fingers being disposed in seated engagement with corresponding ones of said electrical contact members.
10. A modular jack strip assembly in accordance with claim 9, including an outer casing, and means for securing said outer casing with respect to said housing assembly.
11. A modular jack strip assembly in accordance with claim 9, wherein each of said jack strips includes releasable locking means connected therewith,

said rear wall includes a plurality of lock holding means, and
each of said lock holding means engaging a corresponding one of said locking means to releasably lock said jack strips with respect to said rear wall. 5

12. A modular jack strip assembly in accordance with claim 9, wherein said releasable locking means comprises
a longitudinal aperture extending through said jack strip, 10
a bayonet-type fastener disposed within said longitudinal aperture,
a spring member disposed about a portion of said fastener and positioned within said aperture for biasing said fastener in a direction outwardly of said jack strip, 15
retaining means connected to the distal portion of said fastener to retain said fastener within said aperture, and 20
a locking member secured to the distal end of said fastener.

13. A modular jack strip assembly in accordance with claim 12, wherein
said lock holding means comprises a slot formed in said rear wall, 25
said locking means comprises a locking member secured to the distal end of said fastener, and
said locking member being engageable by the walls surrounding said slot. 30

14. A modular jack strip assembly in accordance with claim 13, wherein
said locking member comprises a pair of flanges connected to said fastener.

15. A modular jack strip assembly in accordance with claim 14, wherein
said jack strip includes a keyway which is recessed with respect to the inner end thereof,
said keyway and said aperture communicating with each other whereby said aperture is recessed with respect to the inner end of said jack strip, and
said retaining means comprising a pair of flanges connected to said fastener. 40

16. A modular jack strip assembly in accordance with claim 15, wherein 45
said electrical contact members comprise tuning fork contact assemblies including

an insulating bushing having a slotted opening therein,
a U-shaped contact strip disposed within said bushing,
a wire wrap terminal connected to said U-shaped contact strip and extending outwardly from said bushing, and
said contact fingers being disposed in mated engagement with said U-shaped contact strips within said bushing.

17. A modular jack strip assembly in accordance with claim 9, wherein
said electrical contact members comprise tuning fork contact assemblies including
an insulating bushing having a slotted opening therein,
a U-shaped contact strip disposed within said bushing, 0

wire wrap terminal connected to said U-shaped contact strip and extending outwardly from said bushing, and
said contact fingers being disposed in mated engagement with said U-shaped contact strips within said bushing.

18. A modular jack strip assembly in accordance with claim 16, including

a guide plate secured to said rear wall,
said guide plate having a plurality of apertures disposed in coaxial alignment with corresponding ones of said slotted openings in said insulating bushings, and
said apertures being tapered so as to provide an alignment means for said contact fingers and insuring proper mating engagement thereof with said U-shaped contact strips.

19. A modular jack strip assembly in accordance with claim 17, including

a guide plate secured to said rear wall,
said guide plate having a plurality of apertures disposed in coaxial alignment with corresponding ones of said slotted openings in said insulating bushings, and
said apertures being tapered so as to provide an alignment means for said contact fingers and insuring proper mating engagement thereof with said U-shaped contact strips.

* * * * *

50

55

60

65