

[54] **MOUNTING STRUCTURE FOR A POWER TRACK**

[72] Inventors: **Larry L. Routh**, Castro Valley;
James Contratto, Livermore, both
of Calif.

[73] Assignee: U. S. Industries, Inc., New York, N.Y.

[22] Filed: Nov. 2, 1970

[21] Appl. No.: 85,868

[52] U.S. Cl. 339/21 R, 248/343

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

[58] **Field of Search**.....339/14, 21, 125, 126, 135;
124/40; 191/40; 52/730, 731; 248/342, 343,
223, 224; 211/26

[56] **References Cited**

UNITED STATES PATENTS

3,246,074	4/1966	Neumann et al.	174/48
2,711,876	6/1955	Goebel	248/343
981,039	1/1911	Volk	248/343
3,295,093	12/1966	Neumann et al.	339/21 R

Primary Examiner—Marvin A. Champion

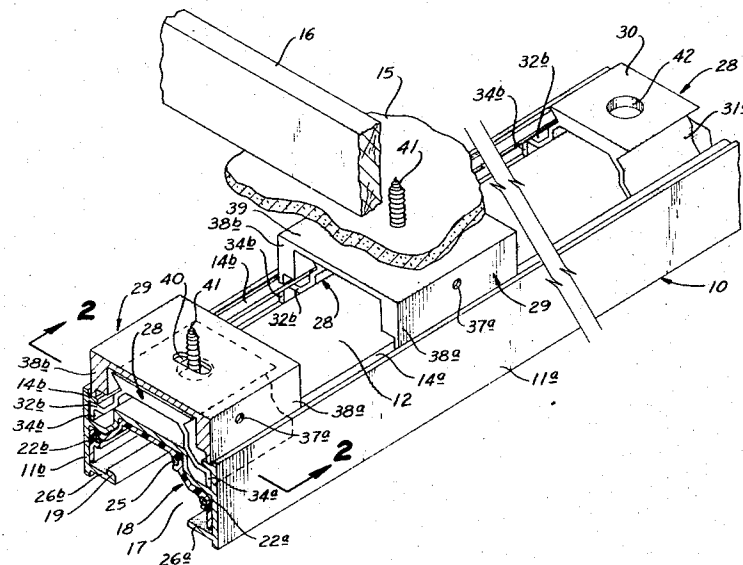
Assistant Examiner—Robert A. Hafer

Attorney—Joseph B. Gardner

[57] ABSTRACT

A structure for mounting the elongated, conductor-equipped track component for a power distribution system along the outer surface of a ceiling wall. Such tracks are long rigid components of the type providing an essentially continuous convenience outlet enabling electric plugs to be connected thereto at substantially any selected location therealong, and any system usually includes a plurality of track components interconnected in axially succession one with another. The mounting structure therefor comprises a plurality of inverted, generally U-shaped hanger components adapted to be fixedly attached to the ceiling wall at spaced apart locations therealong and in axial alignment. Each hanger component defines a cavity adapted to seat therein the upper end portion of a support component which is provided along its opposite sides with generally V-shaped recesses extending substantially from end-to-end thereof, and which recesses receive set screws carried by each hanger component which can be tightened against the associated support component to attach the same thereto. Each support component has outwardly turned hanger ledges intermediate the top and bottom thereof which slidably engage complementary inwardly turned hanger lips provided by the track component. Accordingly, each track component is attached to the ceiling wall via the support and hanger components.

4 Claims, 2 Drawing Figures



MOUNTING STRUCTURE FOR A POWER TRACK

This invention relates to a power distribution system and, more particularly, to mounting structure for attaching the elongated track components of such system to the undersurface of a ceiling wall.

Power distribution systems of the type with which the present mounting structure is useful are disclosed, for example, in the commonly assigned copending patent applications, of Larry L. Routh and James Contratto Ser. No. 19,660, filed Mar. 16, 1970; Ser. No. 695,597, filed Jan. 4, 1968, and Ser. No. 780,840, filed Dec. 3, 1968. As explained in such applications, the power distribution system includes a plurality of elongated, longitudinally extending track components connected, where necessary, in end-to-end succession by splice boxes or couplers disposed therebetween. Each track component is relatively rigid and defines a longitudinally extending convenience outlet therealong, and is intended to be supported along a ceiling or other building wall, and in certain particular instances may be partially or completely embedded therein rather than secured along the undersurface of a ceiling wall as in the present case. Each receptacle-equipped track component carries a conductor assembly within the convenience outlet therealong, and it is adapted to have one or more male plugs connected at any suitable location within the convenience outlet to the electric conductors thereat. Each run of one or more interconnected track components is connected, usually at an end thereof, with the power supply lines.

Objects, among others, of the present invention are to provide an improved arrangement for attaching such track components of a power distribution system to a ceiling wall or the like along the outer surface thereof; to provide an improved mounting structure of the character described which is convenient and easy to use and affords relatively free axial displacements of a track component during positioning thereof to effect proper location thereof and to facilitate the interconnection of successive track components; and to provide a mounting structure having a hanger component adapted to be attached to a ceiling wall, and a support component releasably interconnectable with an elongated track section and releasably securable to a hanger component.

Additional objects and advantages of the invention, especially particular features and characteristics thereof, will become apparent as the specification continues.

An embodiment of the invention is illustrated in the accompanying drawing, in which:

FIG. 1 is a broken perspective view of a power track supported along a ceiling wall by mounting structure embodying the invention; and

FIG. 2 is a transverse sectional view taken along the line 2—2 of FIG. 1.

The power distribution system partially illustrated in FIG. 1 may include a plurality of interconnected track components 10, only one of which is shown. Each track component 10 is provided with a receptacle adapted to have one or more plugs or adaptors (not shown) connected therewith at various locations therealong. Successive track components 10 are interconnected by splice boxes or couplers, and they are usually equipped at the terminal ends thereof with live or dead-end closures, none of these components being shown. Except

for polarization means used to cause particular polarities to be observed throughout the system, the track 10 and components associated therewith are generally symmetrical about a vertical center line therethrough; and in view of such symmetry, the same numerals are employed to identify the oppositely positioned counterpart elements, where appropriate, except that the suffixes *a* and *b* are added for purposes of differentiation therebetween.

Although details of the electrical system defined by and associated with the track 10 are not germane to the present invention, they will be briefly described and summarized hereinafter, but should additional and explicit discussions concerning the same be desired, they are available in one or more of the following patent applications commonly assigned with the present application to the same assignee: Routh and Contratto application Ser. No. 19,660, filed Mar. 16, 1970; Routh and Contratto application Ser. No. 880,335, filed Nov. 26, 1969; and Routh and Contratto application Ser. No. 780,840, filed Dec. 3, 1968.

Referring particularly to FIG. 2, the track component 10 is seen to include a pair of longitudinally extending and transversely spaced side walls 11*a* and 11*b* formed integrally with a longitudinally extending web 12 that is transversely disposed and projects between the side walls intermediate the top and bottom thereof. Adjacent their upper ends, the side walls 11 are turned laterally inwardly to define hanger flanges or lips 14*a* and 14*b* that are used in securing the track component 10 along the outer surface of a ceiling wall 15. As respects the present invention, the ceiling 15 may be completely conventional as, for example, either dry wall (plaster board, plywood, etc.) or wet wall (wood and/or metal lathing covered by plaster, etc.) construction. In the usual case, the wall 15 will be secured to a plurality of spaced apart joists 16 which are usually of wood or metal, depending upon the particular building construction.

The track component 10 is provided with a chamber or receptacle 17 in underlying relation with the web 12, and such receptacle or chamber defines a longitudinally extending convenient outlet adapted to receive one or more adaptors therein (not shown). The chamber 17 adjacent its upper end in underlying relation with the web 12 is provided with a conductor assembly denoted in general with the numeral 18. The conductor assembly 18 includes an elongated insulator or insulated holder 19 having a web 20 of substantially the same general configuration as that of the track web 12 so as to be able to closely underlie the same, as illustrated in the drawing. The insulator 19 is provided with a plurality of longitudinally extending channel- or slot-forming sockets respectively having electric conductors mounted therein; and in the particular construction being considered, there are two symmetrically disposed sockets respectively denoted with the numerals 21*a* and 21*b* respectively equipped with conductors 22*a* and 22*b*, and a third socket and conductor respectively denoted with the numerals 24 and 25.

Each of the conductor-equipped sockets 21 and 24 is provided with a restricted mouth confining the associated conductor therein and adapted to pass therethrough one of the contacts of an adaptor or of an end connector (none of which are shown). The con-

ductors 22 and 25 may be conventional copper wires (12 gauge, for example), and they are effectively constrained against longitudinal displacement with respect to the insulator 19 as, for example, by the frictional grip of the respective sockets within which they are confined. The insulator 19 is sufficiently rigid to be substantially self-sustaining and maintain the conductors in the spaced apart relationship shown to confine the same within the slots or channels therefor.

The conductor assembly 18 provides a plurality of circuits or pairs of conductors defining the same, and in this respect, the track component 10 is intended to be assembled in succession with other like track components in a predetermined orientation so that circuit continuities are observed and maintained throughout an entire distribution system. Such circuit continuities are established by equipping the track with polarization means which, in the particular construction being considered, includes the provision of inwardly turned flanges 26a and 26b projecting inwardly into the compartment 17 adjacent the lower ends of the side walls 11a and 11b; and by making the flanges asymmetrical such as with the polarizing rib 27 provided along the flange 26b and extending upwardly therefrom.

In the conductor assembly 18 shown in the drawings, the two pairs of conductors respectively defining the two circuits include a common conductor which, for example, may be the conductor 22a and it may be considered the neutral conductor. The conductors 21b and 25 are selectively associated with the neutral conductor 22a, and any adaptor to be used with the system is designed so as to be selectively connected to one or the other of such circuits, as explained in the aforementioned patent application Ser. No. 880,335. As is well known, in the usual distribution system the potential difference between the neutral conductor 21a and either of the conductors 21b and 25 is of the order of 110 volts ac, and the potential across the conductors 21b and 25 (which potential is not ordinarily used in a lighting system) is of the order of 220 volts ac. The polarization means 27 permits adaptors and end connectors to be inserted into the chamber 17 for contact with the various conductors in only one predetermined orientation, and inspection of FIG. 2 will make it evident that the intention is to assemble the track component 10 and conductor assembly 18 in only one predetermined orientation because the webs 12 and 20 are asymmetrical about a vertical plane through the center of the compartment 17.

The structural arrangement provided for mounting the relatively rigid, axially elongated, conductor-equipped track component 10 along the outer surface of a ceiling wall 15 includes a support component 28 releasably interconnectable with the track, and a hanger component 29 adapted to be attached to the ceiling wall and being releasably securable to the support component. Thus, the cooperative interrelation of the support component 28 and hanger component 29 is effective to secure a track component 10 at substantially any selected location along a ceiling wall 15.

The support component 28 ordinarily has a restricted axial dimension, as illustrated in FIG. 1, and it is slidably interconnected with the track component 10 so as to be axially movable therealong, but it is constrained with respect thereto against both transverse

and vertical displacements. In structural terms, the support component 28 has a substantially flat top wall 30 and side walls 31a and 31b depending therefrom. Since the support component 28 is symmetrical about a vertical plane therethrough, as shown best in FIG. 2, the side walls 31 are essentially identical and each is configured so as to have a horizontally disposed hanger ledge 32 intermediate the ends thereof. The hanger ledges 32 are turned laterally outwardly and terminate in depending legs 34 which, together with the respectively associated ledges 32, have substantially the same vertical extent as the spacing between the hanger lips 14 and underlying web 12 of the track component 10. The transverse dimension defined between the outer surfaces of the legs 34 is slightly less than the corresponding dimension defined between the inner surfaces of the track walls 11 so that the support component is insertable therein, as illustrated in the drawing.

It will be appreciated, especially by reference to FIG. 2, that relative transverse and vertical displacements between the track component 10 and support component are prevented by the substantially contiguous adjacency of the support legs 34 with the respectively associated track walls 11 and with the hanger ledges 32 of the support component and hanger lips 14 of the track. On the other hand, the support component 28 is axially displaceable with respect to the track 10 which facilitates accurate positioning of the track, as will be described in detail hereinafter. It should be observed that the support component 28 may have any suitable length, but it is usually economically advantageous to reduce the metal used by restricting the length of the support components.

Respecting interconnection of the support and hanger components 28 and 29, the support component 28 is provided at the mergence of the side walls 31 and top wall 30 thereof with V-shaped channels or recesses 35a and 35b which extend substantially from end-to-end of the support component, and are respectively adapted to seat the inner ends of set screws 36a and 36b therein. The set screws 36 respectively extend through threaded openings 37a and 37b provided therefor in the depending side walls 38a and 38b of the hanger component 29. At their upper ends, the side walls 38 are connected with a flat top wall 39 and define therewith a hollow interior or downwardly-opening cavity 40' that seats the upper end of the support component 28 therein, as illustrated best in FIG. 2. The top wall 39 of the hanger component 29 is provided centrally with an opening or aperture 40 therein adapted to pass the threaded shank of a fastener 41 therethrough which, in the usual case, will be a sheet metal screw or wood screw depending upon the construction of the joists 16 into which the screw is threaded. The top wall 30 of the support component 28 is provided centrally with an opening or aperture 42 therethrough which is somewhat larger than the aperture 40 with which it is alignable in the top wall 39 of the hanger component 29. The opening 42 is adapted to accommodate the enlarged head of the screw 41, and it also provides access to the head of such screw should this be desired.

The upper end of the support component 28 fits easily into the cavity 40' provided by the hanger com-

ponent 29 whenever the set screws 36 are retracted from the cavity. However, relative movement between the support and hanger components 28 and 29 is rigidly constrained whenever the set screws 36 are tightened inwardly into the recess 35 of the support component and into tight frictional engagement therewith, as shown in FIG. 2. Although such tightening of the screws 36 constrains the support and hanger components against relative displacements, the track 10 is freely movable in axial directions because of its slidable interconnection with the support component, as heretofore explained. Such permissible axial displacements of the track 10 enables the the same to be accurately positioned in axial directions while being supported along a ceiling wall by the support and hanger components which permits a workman to have free use of his hands without being required to hold and support the track components. It is clear in FIG. 2 that the transverse dimensions of the support component 28 are somewhat less than the transverse dimension of the cavity 40 defined by the hanger component 29 so that some lateral shifting of the support component and track is permitted by loosening one screw 36 and tightening the other to shift the position of the support component in one direction and vice versa to shift the support component in the opposite direction. In this same respect, the aperture 40 in the top wall 39 of the hanger component 29 is elongated transversely to permit some lateral shifting of the hanger component with respect to the screw 41 within the dimensional limits of the aperture.

In use of the apparatus, hanger components 29 are secured to the undersurface of the ceiling in axial alignment and at appropriately spaced locations by means of screws 41 which are received within joists 16 so as to provide a firm support for the track assembly. Toggle bolts and similar devices may be used in the event that the hanger components cannot be aligned with the ceiling joists. Next, depending upon the particular installation, the support components 28 are either secured to the respectively associated hanger components 29 by means of the set screws 36 (such assembly could be effected before securing the hanger components 29 to the ceiling because access for the screws 41 is afforded through the openings 42 in the support components) and the track 10 then engaged with the support components by sliding the depending legs 34 and hanger ledges 32 of each support component into the space provided therefor beneath the hanger lips 14 of the track, or alternatively by sliding a plurality of support components 28 into the space provided therefor along the track 10 and then lifting the track and support components as a unit toward the ceiling to seat the respective support components in the hanger components provided therefor whereupon the set screws 36 are then tightened to effect the requisite interconnection of the support and hanger components. In either case, each track component 10 can be shifted axially relative to the support and hanger components to properly position the track.

While in the foregoing specification an embodiment of the invention has been set forth in considerable detail for purposes of making a complete disclosure thereof, it will be apparent to those skilled in the art that numerous changes may be made in such details

without departing from the spirit and principles of the invention.

What is claimed is:

1. In combination with a relatively rigid, axially elongated, conductor-equipped track component for a power distribution system and which track component has transversely spaced side walls each equipped with an inwardly projecting hanger lip extending substantially from end to end thereof; structure mounting said track component along the outer surface of a ceiling wall in depending relation therewith and comprising: a support component equipped with laterally disposed hanger ledges respectively adapted to underlie and slidably engage said hanger lips to releasably interconnect said track and support components to enable the latter to support the former and at the same time accommodate relatively free axial displacements therebetween, an inverted generally U-shaped hanger component attached to such ceiling wall in underlying relation therewith and having a hollow interior defining a cavity adapted to receive the upper end portion of said support component therein, and means releasably securing said hanger component to said support component and mounting the latter and any track component supported thereby in depending relation beneath such ceiling wall and including fastener structure operative between said hanger component and upper end portion of a support component received within said cavity, said fastener structure being effective to fixedly interrelate only said support and hanger components while any track component carried by said support component remains axially displaceable with respect thereto and also being effective to enable a track-carrying support component to be both secured to and released from said hanger component after the latter is attached to a ceiling wall.

2. The combination of claim 1 in which said support and hanger components are short in axial dimension relative to said track component and are axially displaceable with respect to each other upon release of said fastener structure with the result that a track-carrying support component can be secured to and released from an associated hanger component while both the track and hanger components remain in relatively fixed axial positions with the latter attached to a ceiling wall.

3. In combination with a relatively rigid, axially elongated, conductor-equipped track component for a power distribution system and which track component has transversely spaced side walls each equipped with an inwardly projecting hanger lip extending substantially from end to end thereof; structure for mounting said track component along the outer surface of a ceiling wall in depending relation therewith and comprising: a support component equipped with laterally disposed hanger ledges respectively adapted to underlie and slidably engage said hanger lips to releasably interconnect said track and support components to enable the latter to support the former and at the same time accommodate relatively free axial displacements therebetween, an inverted generally U-shaped hanger component adapted to be attached to such ceiling wall in underlying relation therewith and having a hollow interior defining a cavity adapted to receive the upper end portion of said support component therein, and

means for releasably securing said hanger component to said support component to mount the latter and any track component supported thereby in depending relation beneath such ceiling wall and including fastener structure operative between said hanger component and upper end portion of a support component received within said cavity, said fastener structure being effective to fixedly interrelate only said support and hanger components while any track component carried by said support component remains axially displaceable with respect thereto and also being effective to enable a track-carrying support component to be both secured to and released from said hanger component after the latter is attached to a ceiling wall, the transverse dimension of said hanger component being no greater than that of said track component so as to be essentially within the transverse limits defined by the side walls thereof.

4. The combination of claim 3 in which said support

and hanger components are short in axial dimension relative to said track component and are axially displaceable with respect to each other upon release of said fastener structure with the result that a track-carrying support component can be secured to and released from an associated hanger component while both the track and hanger components remain in relatively fixed axial positions with the latter attached to a ceiling wall, and in which said means for releasably securing said hanger component to said support component further includes a pair of axially elongated recesses respectively provided by said support component along its opposite sides and extending substantially from end to end thereof, said fastener structure including a pair of set screws carried by said hanger component and adapted to extend into the cavity defined thereby so as to seat within the respectively associated recesses of said support component.

* * * * *

20

25

30

35

40

45

50

55

60

65