Nov. 26, 1963 J. MADL, JR 3,112,093

CABLE TRAY

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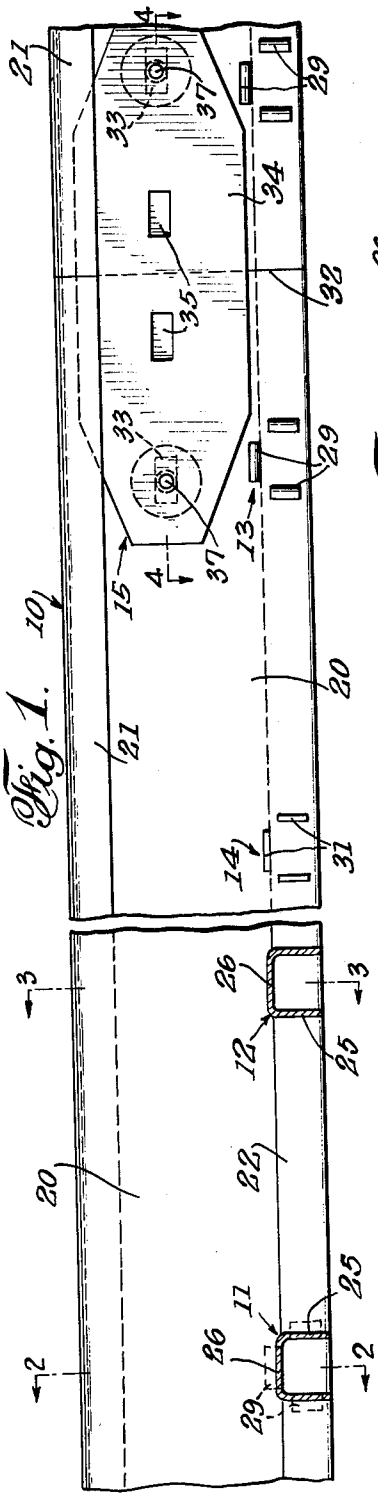


Fig. 1.

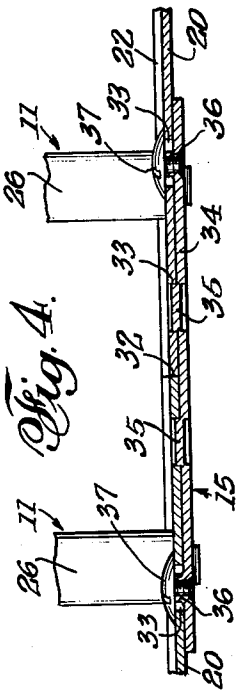


Fig. 4.

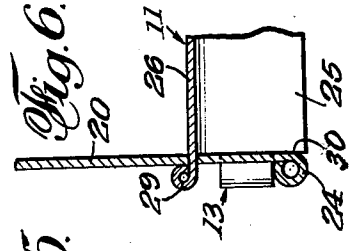


Fig. 6.

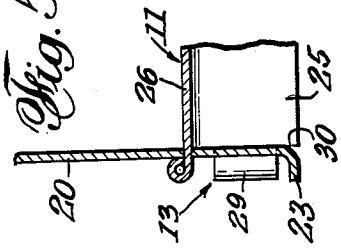


Fig. 5.



Fig. 3.

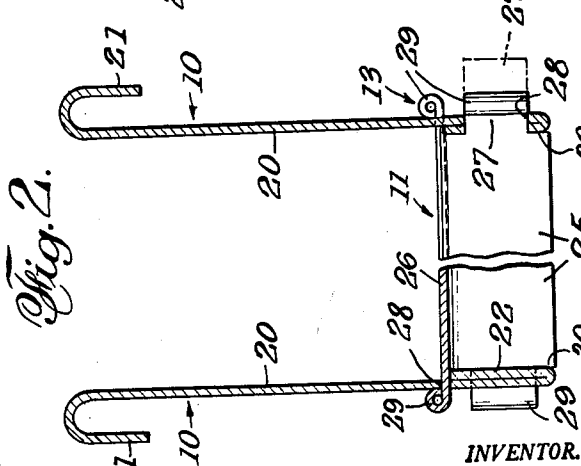


Fig. 2.

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CABLE TRAY

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This invention relates to a cable tray or cable ladder and has for an object to provide an efficient and improved item of the character referred to for supporting cables, pipes, wiring, conduit, tubing and other elongated items that are provided in buildings and other structures.

Another object of the invention is to provide a cable tray that, while strong, is inexpensive to manufacture and has considerable flexibility of use in a wide range of installations.

A further object of the invention is to provide a cable tray that, because of its ease and facility of assembly, may be stocked in knock down or separated form, thereby greatly reducing the inventory that is ordinarily required and yet allowing rapid filling of orders for cable trays varying considerably in size and proportion.

Since cable trays have a depth dimension that varies between three and six inches, longitudinal center-to-center spacing of the cross-channel members that may be three, six, twelve and eighteen inches, and widths between six and twenty-four inches varying in increments of two, three, four and six inches, the stock or inventory of a distributor of prior cable trays is necessarily unduly large in order for him to be in position to fill orders without special handling and the attending additional expense.

The components of the present cable tray structure, because of ease of assembly thereof, may be stocked as individual items, in a large range of size, and, upon receipt of an order therefor, assembled as desired from a numerous yet low cost inventory.

Further, the knock down inventory is space-saving in relation to the more bulky pre-assembled cable trays.

This invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description, which is based on the accompanying drawing. However, said drawing merely shows and the following description merely describes preferred embodiments of the present invention, which are given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

FIG. 1 is a broken longitudinal side elevational view, partly in longitudinal section, of a cable tray according to the present invention.

FIG. 2 is an enlarged and broken cross-sectional view as taken on the line 2—2 of FIG. 1.

FIG. 3 is a similar cross-sectional view of one side of the tray as taken on line 3—3 of FIG. 1.

FIG. 4 is a fragmentary longitudinal sectional view as taken on the line 4—4 of FIG. 1 and drawn to the scale of FIG. 1.

FIGS. 5 and 6 are fragmentary and enlarged cross-sectional views of modifications.

The cable tray that is illustrated comprises, generally, side members 10, cross members 11 and 12, means 13 to connect the ends of the members 11 and the side members 10, means 14 interengaging the ends of members 12 and the side members 10, and splice means 15 to connect the adjacent abutted end of the trays. The above

generally described cable tray is advantageously made of sheet steel or aluminum.

The side members 10 are alike, each comprising a side wall 20, upper outwardly and downturned reinforcing flange 21, and a lower reinforcing portion shown in FIGS. 1, 2 and 3, as an inturned flange wall 22, in FIG. 5, as an outturned flange 23, and in FIG. 6, as an outturned rolled bead 24. In any case, each side member 10 may be thin-walled, yet strong for the intended purpose.

The cross members 11 and 12 are essentially alike in the portion that spans between the sides 10. While they may have a different cross-sectional form, for instance, angle section, the same, as shown, are preferably of channel cross-section with side flange walls 25 and a connecting top wall 26. Regardless of the cross-sectional shape of the members 11 and 12, the same are disposed with their top walls 26 up and serving as smooth support surfaces for cables, wiring, etc., longitudinally disposed in the trays. Said members preferably extend between the lower portions of the sides 10 to provide for maximum effective height of the sides.

The means 13 connects the ends of the cross members 11 and the sides 10, said means preferably comprising elongated extensions 27, one from each flange and top wall of each said member, a set of slits 28 punched through each wall 20 in such relation as to receive the extensions 27, and tight crimps or beads 29 formed on the ends of extensions and in clinching engagement with the outsides of the side members 10. Said slits 28 are punched in flange walls 22 in cases where said walls extend substantially above the lower edges of the side walls 20.

With the extensions 27 straight, the same are entered into slits 28 to protrude as shown by the dot-dash lines of FIG. 2. Then, as these extensions are formed into beads, the same draw the sides 10 into tight engagement with the ends 30 of the members 11 and effect a rigid assembly of sides and cross members.

The means 14 locate the ends of cross members 12, the same comprising extensions 31 similar to, but substantially shorter than, the extensions 27. The sides 10 are provided with slits 28 as above described to receive said extensions 31. It will be realized that the cross members 11 and 12 are all assembled into place before the extensions 27 of the members 11 are beaded over. Thus, the members 12 serve as side spacers as well as supports while members 11 constitute connections for the sides 11. It is a matter of choice how many connector members 11 are used for each tray, two being the minimum for good construction, the intermediate members 12 filling in between the connector members, accordingly.

FIG. 1 shows each set of slits 28 in use to receive the extension 27 or 31, as the case may be. It will be realized that not all the slits provided need be put into use. Thus, trays may be assembled with differently spaced transverse support members, according to lead out and other requirements. It will also be realized that the same cable tray may have unevenly spaced cross members, as desired, for a particular condition, the flexibility of the present construction lending itself to variations in the assembly of the components. Of course, the sides 10 need not be straight but may be curved, providing parallelism is retained.

The splice means 15 is provided on both side members 10 to connect the same where they abut along line 32. At each end of each wall 20 of each side member 10 are formed two aligned openings 33 that are preferably rectangular but, in any case, have elongated sides. A splice plate 34 is positioned to span across the seam 32 and against the outer faces of the aligned walls 20. Two embossments 35 in plate 34, one for each end opening in each wall 20, are entered into said openings, as in FIG. 4, and constitute keys that lock the trays against

endwise separation. The fit of embossments 35 in said openings 34 is preferably such that there is substantially no end play between trays, nor looseness that would allow one tray to assume an angle relative to the other. Inwardly drawn tapped embossments 36 are provided on plate 34 so they may enter the other two openings 33. An oval headed screw 37, engaged in said embossments 36, locks the plate 34 in place, the heads of said screws abutting the inner faces of tray walls 20.

The ends of the walls 20 may be each provided with three instead of two openings 33, and each end of each splice plate 34 may, accordingly, be provided with two embossments 35 and a tapped embossment 36. The latter may be preferably provided between the embossments 35. As to the mentioned nicety of fit of embossments 35 in openings 33, manufacturing tolerances should be taken into account to assure facility of assembly or connection of adjacent trays, particularly as to longitudinal or end play movement of the embossments 35 in the openings 33. While the tapped embossments are shown as entered into openings 33 with which aligned, the same may be outwardly directed so that only the shanks of screws 37 pass through said openings. In this way, larger screw shanks may be used to give maximum strength.

While the foregoing has illustrated and described what is now contemplated to be the best mode of carrying out the invention, the constructions are, of course, subject to modification without departing from the spirit and scope of the invention. Therefore, it is not desired to restrict the invention to the particular forms of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described this invention, what is claimed and desired to be secured by Letters Patent is:

1. In a cable tray having transversely spaced longitudinal side members and a plurality of transverse members spanning across the space between the side members, means to connect each end of each transverse member to each side member, said means comprising at least two end extensions on the transverse member extending into and through the side member, and a rolled bead on each extension in tight clinching engagement with the outer face of the side member.

2. In a cable tray according to claim 1, said two extensions being disposed on mutually normal planes, and the beads on the extensions extending along said planes.

3. A cable tray comprising end-abutted tray sections, said sections having longitudinal side members and said members, on each side, being aligned, each side member, adjacent its abutting end, having two longitudinally spaced openings therein, the four openings of two abutted side members being aligned, a splice plate disposed against the outer face of each side member, two embossments on each splice plate in keying engagement in two of the aligned openings in the side members, and screws connecting each splice plate and the side members and extending through the other two openings.

4. A cable tray comprising end-abutted tray sections, said sections having longitudinal side members and said members, on each side, being aligned, each side member, adjacent its abutting end, having two longitudinally spaced openings therein, the four openings of two abutted side members being aligned, a splice plate disposed against the outer face of each side member, two embossments on each splice plate in keying engagement in two of the aligned openings in the side members, and screws connecting each splice plate and the side members and extending through the other two openings, the splice plate being provided with two tapped embossments for said screws and the latter embossments extending into said latter two openings.

5. A cable tray comprising transversely spaced longitudinal side members, said side members being formed with upwardly directed flanges longitudinally extending from and along the lower marginal edges of said members and in flatwise abutment with the inner faces of the side members, a plurality of transverse members spanning the space between the side members, means to connect each end of each transverse member to each side member, said means comprising a plurality of spaced extensions at each end of each transverse member, certain of said extensions extending through the up-turned flange at the bottom of the side member and through said side member, and another of said extensions being seated upon the upper marginal edge of the up-turned flange and extending through the side member, certain of said extensions being distorted to abut the outer faces of said side members to secure said parts against displacement.

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