July 30, 1963 C. B. HEYER 3,099,428

FOLDING TABLE OR LIKE STRUCTURE

Filed Oct. 19, 1961 2 Sheets-Sheet 1

FIG. 1

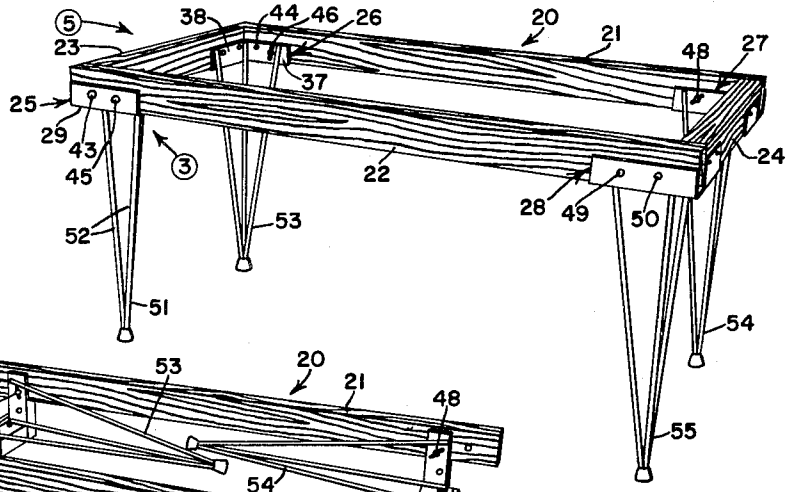


FIG. 2

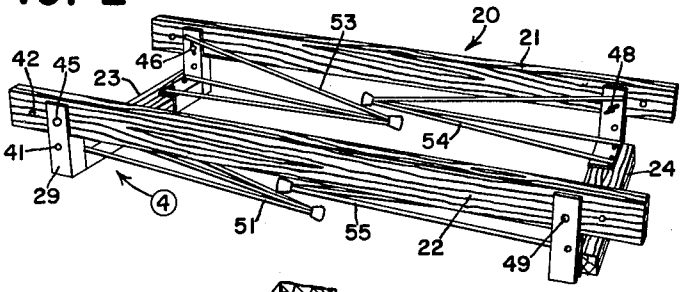


FIG. 3

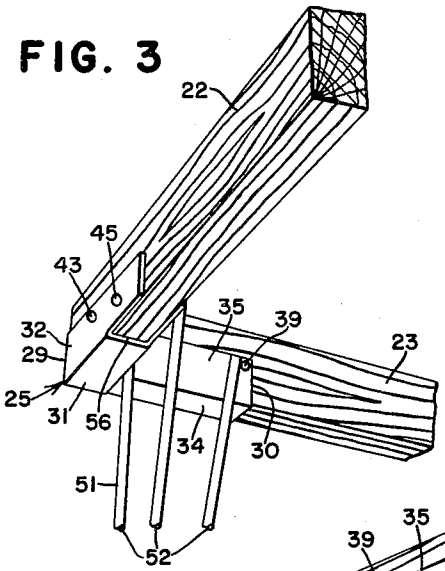
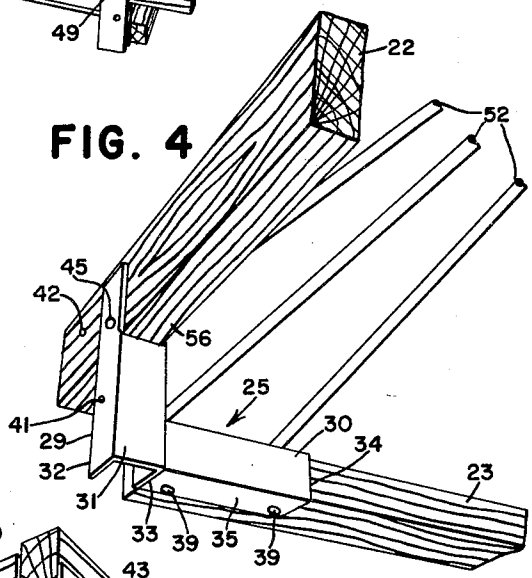


FIG. 4



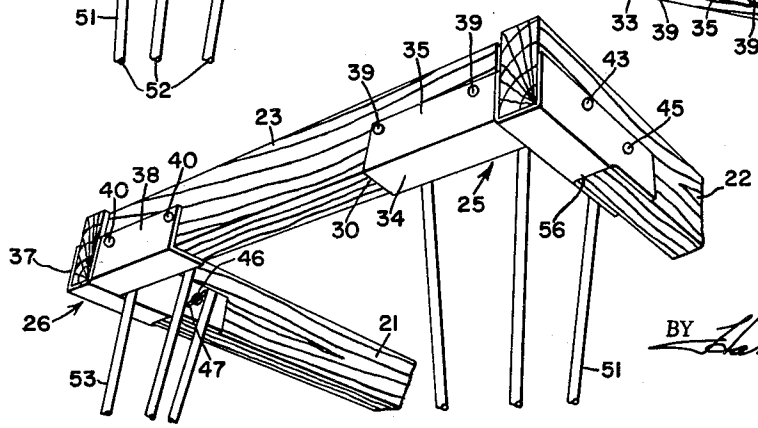


FIG. 5

INVENTOR.
C. B. HEYER
BY
ATTORNEY

July 30, 1963 C. B. HEYER 3,099,428

FOLDING TABLE OR LIKE STRUCTURE

Filed Oct. 19, 1961 2 Sheets-Sheet 2

FIG. 6

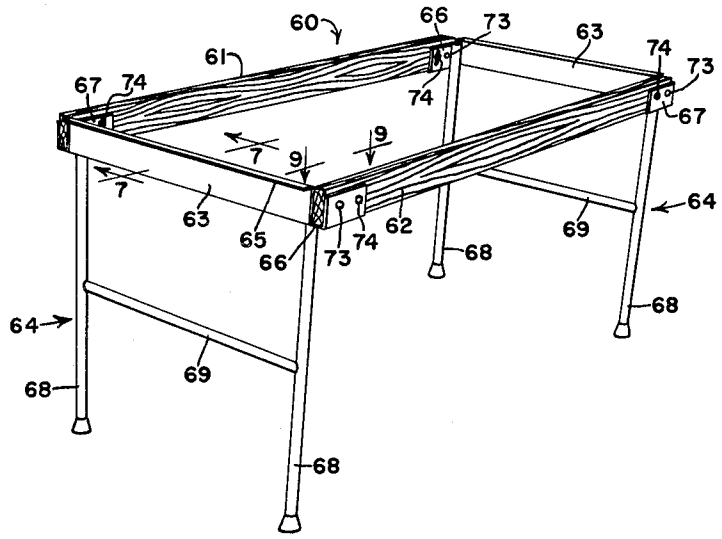


FIG. 7

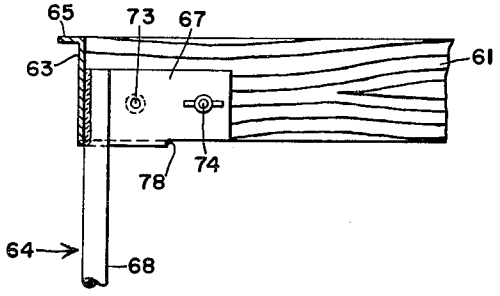


FIG. 9

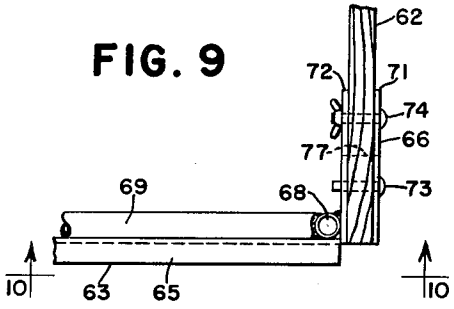


FIG. 10

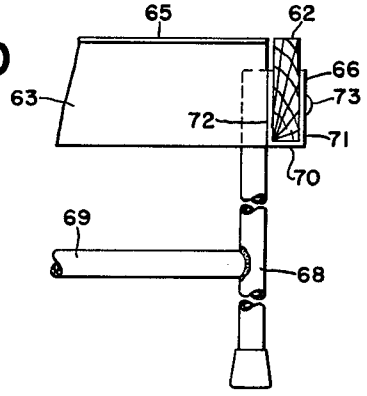
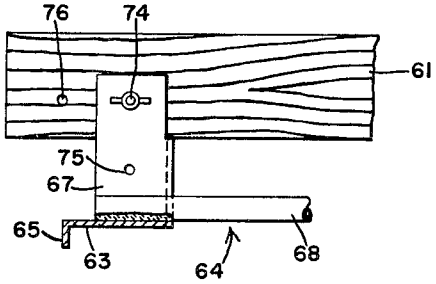


FIG. 8



INVENTOR.
C. B. HEYER

BY Harold M. Kolb

ATTORNEY

United States Patent Office 3,099,428 Patented July 30, 1963

3,099,428

FOLDING TABLE OR LIKE STRUCTURE

Clair B. Heyer, P.O. Box H, Milledgeville, Ill.

Filed Oct. 19, 1961, Ser. No. 146,230
10 Claims. (Cl. 248—166)

This invention relates to a folding table or similar structure and more particularly to improvements in corner elements or the like for connecting a plurality of leg means to the upper frame structure which supports the top.

The invention is concerned essentially with the provision of metal corner elements or components which may be used with dimension lumber in the construction of tables on a "do-it-yourself" basis. It is a feature of the invention to provide metal or the like members constructed and shaped so as to accommodate themselves to the ready receipt of such lumber or other components to the end that a table or the like may be simply, inexpensively and readily constructed by the average person. It is a further object of the invention to provide such corner elements with means whereby the legs may be folded from upright support positions to folded positions beneath the upper frame structure. A still further object resides in the construction of the corner elements in channel section so as to provide adequate strength for the structure at relatively low cost. The invention has for a still further object the provision of modified forms of end or corner element including cross connections to the adjacent elements to further improve the strength and rigidity characteristics of the completed structure.

The foregoing and other important objects and desirable features inherent in and encompassed by the invention will become apparent as preferred embodiments thereof are disclosed in detail in the ensuing description and accompanying sheets of drawings, the figures of which are described below.

FIGURE 1 is a perspective of an assembled table, less its top, showing the relationship between the upper frame structure, the corner elements and the leg means.

FIGURE 2 is a perspective of the same structure illustrating the leg means in folded position.

FIGURE 3 is an enlarged fragmentary perspective of one corner as seen generally in the direction of the encircled numeral 3 bearing the arrow as shown in FIGURE 1.

FIGURE 4 is a view similar to FIGURE 3, but shows the associated leg means in its folded position.

FIGURE 5 is a perspective, on an enlarged scale, showing that end of the table indicated by the arrow bearing the encircled numeral 5 in FIGURE 1.

FIGURE 6 is a perspective of a modified structure.

FIGURE 7 is an enlarged section as seen generally along the line 7—7 of FIGURE 6.

FIGURE 8 is a view similar to FIGURE 7 but showing the associated leg means in its folded position.

FIGURE 9 is a fragmentary plan, on an enlarged scale, as seen along the line 9—9 of FIGURE 6.

FIGURE 10 is a fragmentary elevation as seen along the line 10—10 of FIGURE 9.

The immediately following description pertains to that form of the invention shown in FIGURES 1 through 5.

The upper structure or frame chosen for purposes of illustration is designated in its entirety by the numeral 20, and is here made up of parallel relatively elongated side members 21 and 22 and a pair of shorter end or cross members 23 and 24. These are illustrated as being of conventional dimension lumber, such as 2 x 4's; although, this is not a limitation on the general applicability of the invention. As will be brought out below, these members may be of any length and, since they are not secured together except by the corner components to be described, wide flexibility of size is permitted. It is necessary only that the overall width of the table be such that the end members 23 and 24 are of such length as to fit between the side members 21 and 22.

The members of the structure 20 are held together by the plurality of corner components, there being four in number, one at each corner of the structure 20. For the sake of clarity, these will be given separate identifying numbers; namely, 25, 26, 27 and 28. Diagonally opposite pairs of these may be identical; that is, the elements 25 and 27 are the same, and the elements 26 and 28 are the same.

The element 25 comprises a first channel 29 and a second channel 30, the two being rigidly secured in right-angled relationship, as by welding. The channel 29 has a bottom 31 and opposite sides 32 and 33, the section of the channel being such that it faces or opens upwardly and the dimensions being such that it is adapted to embrace the associated end of the side member 22 from below, a relatively snug fit being preferred. The channel 30 is of similar dimensional and structural characteristic, having a bottom 34 and opposite sides 35 and 36. The channel 30 relatively snugly receives the proximate end of the cross or end member 23. As will be readily apparent, the associated corner element 26 at the same end of the frame structure 20 is symmetrically constructed, having angularly related channels 37 and 38, the former of which receives the associated end of the other frame member 21 and the latter of which receives the opposite end of the cross or end member 22. The ends of the cross member 22 may be appropriately permanently or otherwise fixed to the respective cross channels 35 and 38. In the case of the former, bolts, such as at 39 may be employed, and bolts may be used at 40 for securing the cross channel 38 to the other end of the cross member 22. To the extent described, it will be seen that the cross member 23 rigidly cross connects the two corner elements 25 and 26. It will also be apparent that the opposite cross member 24 rigidly cross connects the other two corner elements 27 and 28, the details of which will be apparent from those already described in connection with the elements 25 and 26, it being deemed unnecessary to repeat the dimensional characteristics and the means for fastening same, except to the extent hereinafter described.

The channel 29 of the corner element 25 is secured to the associated end of the side member 22 in the following manner: The sides 32 and 33 are transversely coaxially apertured in alinement as at 41, and the end of the side member 22 is similarly bored as at 42 (FIGURE 4). When the corner element is in its supporting position, a fastener, such as a pin 43, is passed through the alined apertures. A similar pin at 44 is used as part of the connection between the channel 37 of the other corner element 26 and the associated end of the other side frame member 21. The two pins 43 and 44 are coaxial on a transverse horizontal axis. The pins are removable, for purposes to presently appear.

Another part of the fastening means comprises a pair of pivot pins 45 and 46, the former for the connection between the channel 29 and the side member 22 and the latter for the channel 37 and the side member 21. These pivots are of course coaxial on a transverse horizontal axis. The pivots at 45 and 46 may comprise bolts having wing nuts secured to their inner ends, as clearly shown in FIGURES 1 and 5, the numeral 47 being applied in FIGURE 5 for purposes of identification of this part of the structure in common as among the corner elements. When the four pivot members or fastening means are in place at opposite ends of the structures, the frame elements are in their upright position as shown in FIGURE 1, and the tops thereof are coplanar in a horizontal plane so that a table top may be readily applied. When

the pins 43 and 44 are removed, the pins 45 and 46 serve as pivot means whereby the corner elements 25 and 26, together with the cross member 23, may be swung as a unit to a position such as that shown in FIGURE 2. In the case of the other corner elements 27 and 28, the pivots are shown at 48 and 49 and the removable pin for the element 28 appears at 50, it being clear that there is a similar removable pin between the corner element 27 and the associated end of the other side member 21, as will be clear from the empty apertures as shown in FIGURE 2.

The corner element 25 has rigidly secured thereto, as by welding, leg means, designated in its entirety by the numeral 51, which in this case comprises a plurality of rods 52, two of which are secured to the inner side of the channel 29 and one of which is secured to the front side of the cross channel 35 (FIGURES 3 and 4). A similar arrangement exists between the several rods of leg means 53 for the corner element 26 as well as for leg means 54 and 55 respectively for the corner elements 27 and 28.

In order that the folding position may be readily obtained merely by removing the removable pins and utilizing the pivot pins as fulcra, the bottom of each corner element in its longitudinal channel is cut out to afford a notch, identified for representative purposes at 56 in the corner element 25. In other words, the length of the sides 32 and 33 exceeds that of the bottom 31, thus leaving sufficient area in the channel to relatively snugly embrace the associated end of the side member in both folded and supporting positions. The same is of course true of the other elements 26, 27 and 28, which will be apparent without further description.

It will thus be seen that each corner element may be prefabricated of metal, appropriately dimensioned and pre-assembled so that the user buys them in a set of four and supplies his own lumber, thereby enabling him to construct a table or similar structure having the folding characteristics noted. The strength and rigidity of each component is adequate to establish the assembled structure as one of substantial utility, yet it may be inexpensively constructed. The angularly related channels in the case of each component lend themselves readily to adaptation to the mounting of the rod-type legs illustrated. Other types of legs may of course be utilized, as will be brought out below in the description of the second form of the invention.

Here, the top structure, designated in its entirety by the numeral 60 comprises a pair of parallel side members 61 and 62, opposite end members 63, 63 being included as part of identical end components, each designated in its entirety by the numeral 64. The cross member 63 of each unit 64 is preferably a metal angle having its top flange 65 arranged so that in the supported position of the structure, this top flange is coplanar with the top edges of the members 61 and 62 which, like the members 21 and 22 of the structure previously described, may be of dimensioned lumber. Opposite ends of each cross member 63 are rigidly secured as by welding to longitudinal channels 66 and 67. As additional parts of each unit assembly 64, there are included a pair of legs 68 which are rigidly secured as by welding to the corner afforded by the right angular relationship between the cross member 63 and its longitudinal channels 66 and 67 (FIGURE 7). The legs 68 may each be in the form of a single tube, and these are cross braced by a transverse tubular member 69. The channel 66 is upwardly opening to receive the proximate end of the side member 62, and thus has a bottom 70 and opposite sides 71 and 72, these being appropriately apertured to receive a pair of pins 73 and 74. The pin 74 constitutes a transverse pivot and the pin 73 is removable, as will be evidenced by the apertures 75 and 76 in the channel 66 and side member 61, respectively (FIGURE 8). Here again, wing nuts may be used on the pivot pins 74, it being clear that

similar pins are provided for the four corners. Any suitable means may be used for releasably retaining the pins 73 in place when the structure is in its supported position. When it is desired to fold the end units 64 beneath the top structure, as suggested especially in FIGURE 8, the ends 73 are removed and the pins 74, being horizontally coaxial, serve as pivot axes for the two units 64. Here again, the bottom flange 70 of the channel 66 is cut out, as seen at 77 in FIGURE 9. The bottom of the opposite channel 67 at the same end of the structure is likewise cut out, as shown at 78. This serves exactly the same function as the cut out in the channel of that form of the invention shown in FIGURES 1 through 5, and the same advantages are obtainable. Although, for the most part, the structure has been described at one corner, with abbreviated description for opposite corners, it will be understood that the nature of the construction appears identically or symmetrically throughout. Here, the end units 64 may be sold in pairs for the user to add his own side members, such as at 61 and 62, which may be supplemented by a top, for example, to complete a table. The factors of simplicity, low expense and a satisfactory structure from the standpoint of strength and rigidity occur as in the previously described form of the invention.

Features and advantages other than those outlined will readily occur to those versed in the art, as will many modifications and alterations in the preferred embodiments of the invention, all of which may be achieved without departure from the spirit and scope of the invention.

What is claimed is:

1. A folding table or the like having horizontal rectangular structure including a pair of parallel side members and a pair of parallel cross members affording four corners, and four leg means, one at each corner, characterized by four connector elements, one at each corner and comprising an upwardly opening channel parallel to and receiving a side member from below at said corner and extending from transverse alinement with the proximate cross member a relatively short distance toward the other cross member, each channel including means connecting same to the proximate cross member so that each cross member cross-connects a pair of channels, means connecting each connector element to its proximate leg means, each channel having a bottom and opposite sides respectively normally engaging the bottom and sides of its side member, pivot means on a transverse horizontal axis spaced lengthwise of each channel from the proximate cross member, said pivot means for each pair of cross-connected elements being coaxial for pivoting of each pair of cross-connected elements, the proximate cross member and the proximate pair of leg means as a unit between an upright depending supporting position and a folded position beneath said structure, each channel bottom being notched in an area below its pivot means and of a width commensurate with that of its side member to accommodate said side member when said folded position is incurred, and means releasably connecting each channel to its side member for securing said unit in its supporting position.

2. The invention defined in claim 1, in which: each connector element includes a relatively short cross channel horizontally normal to and secured to the associated first mentioned channel and opening upwardly to embrace from below the end portion of the proximate cross member, and the means connecting each element to a cross member includes said cross channel and fastener means cooperative between said cross channel and said cross member.

3. The invention defined in claim 2, in which: each leg means includes a plurality of rod-like parts secured to the channels of the associated element.

4. The invention defined in claim 1, in which: the connector elements are metallic and the cross members

are metallic and welded to the respective pairs of connector elements.

5. A connector element of the class described, comprising: an upwardly opening channel having a bottom, opposite upright sides and opposite ends, said sides respectively having apertures therein transversely alined on an axis spaced from one of said ends and spaced above the plane of said bottom, said bottom at said one end terminating short of the sides at said end by a distance substantially equal to the vertical distance between said bottom and said axis, and said sides respectively having second apertures therein transversely alined on an axis spaced from the first-mentioned axis toward said other end of the channel.

6. A connector element of the class described, comprising: an upwardly opening channel having a bottom, opposite upright sides and opposite ends, said sides respectively having apertures therein transversely alined on an axis spaced from one of said ends and spaced above the plane of said bottom, said bottom at said one end terminating short of the sides at said end by a distance substantially equal to the vertical distances between said bottom and said axis, and leg means rigidly secured to and depending from said channel.

7. A connector element of the class described, comprising: an upwardly opening channel having a bottom, opposite upright sides and opposite ends, said sides respectively having apertures therein transversely alined on an axis spaced from one of said ends and spaced above the plane of the bottom, said bottom at said one end terminating short of the sides at said one end by a distance substantially equal to the vertical distance between said bottom and said axis, and a second channel opening upwardly and horizontally normal to and rigidly secured to the first-mentioned channel.

8. The invention defined in claim 7, including: leg means secured to and depending from said channels.

9. A connector element of the class described, comprising: an upwardly opening channel having a bottom, opposite upright sides and opposite ends, said sides respectively having apertures therein transversely alined on an axis spaced from one of said ends and spaced above the plane of said bottom, said bottom at said one end terminating short of the sides at said one end by a distance substantially equal to the vertical distance between said bottom and said axis, a second and similar channel spaced horizontally from and parallel to the first-mentioned channel, and a cross member extending between and rigidly cross-connecting said channels.

10. The invention defined in claim 9, including: a pair of leg means rigidly secured to and depending respectively from said channels.

References Cited in the file of this patent

UNITED STATES PATENTS

1,991,992	Walters	Feb. 19, 1935
2,665,961	Anderson	Jan. 12, 1954
2,690,367	Bronson	Sept. 28, 1954
2,714,540	Diehm	Aug. 2, 1955
2,867,485	Schmidt	Jan. 6, 1959
2,874,708	Daus	Feb. 24, 1959

FOREIGN PATENTS

801,104	Great Britain	Sept. 10, 1958