May 8, 1962 C. M. MUGLER 3,033,630

FOLDING TABLE

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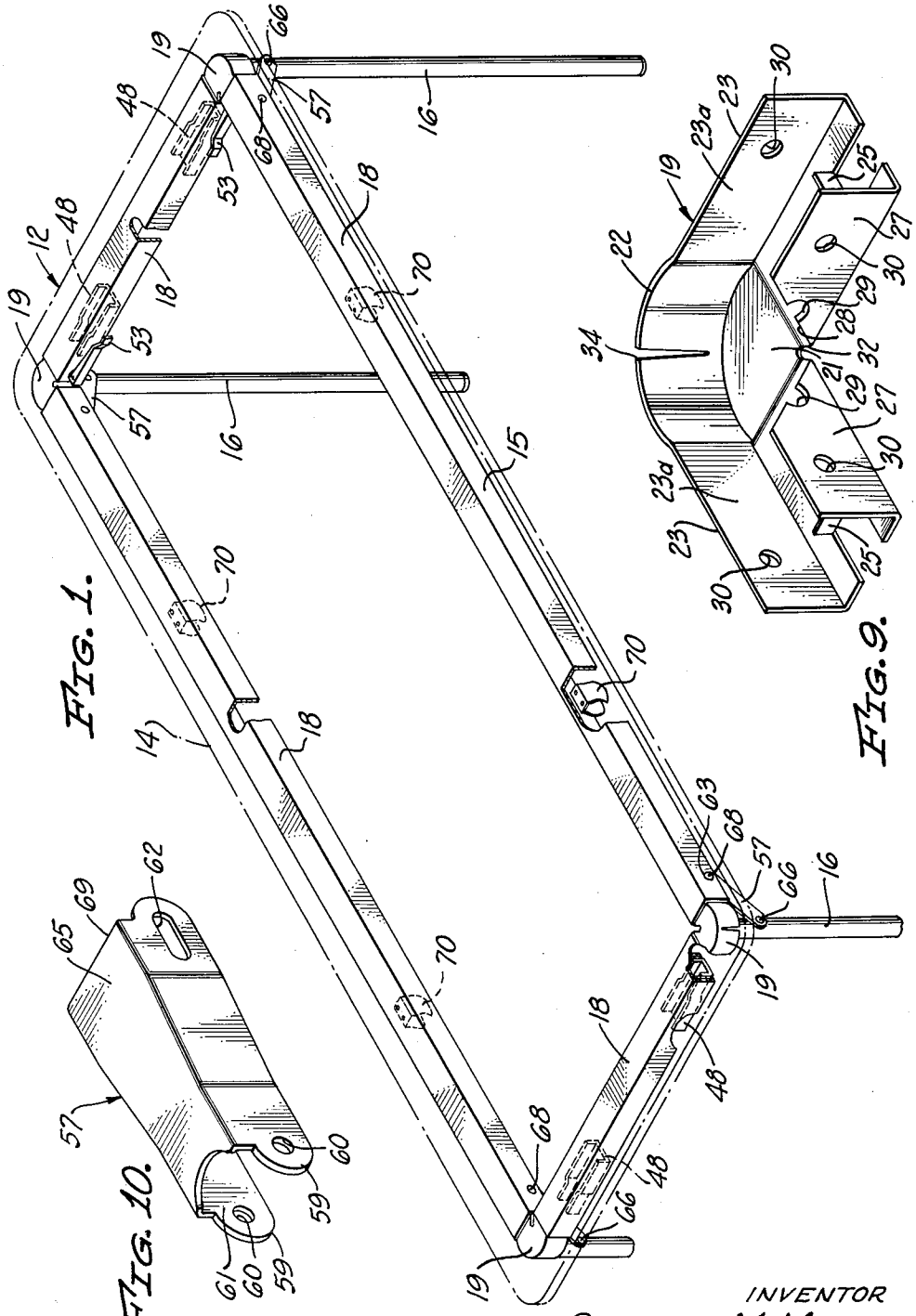


FIG. 1.

FIG. 9.

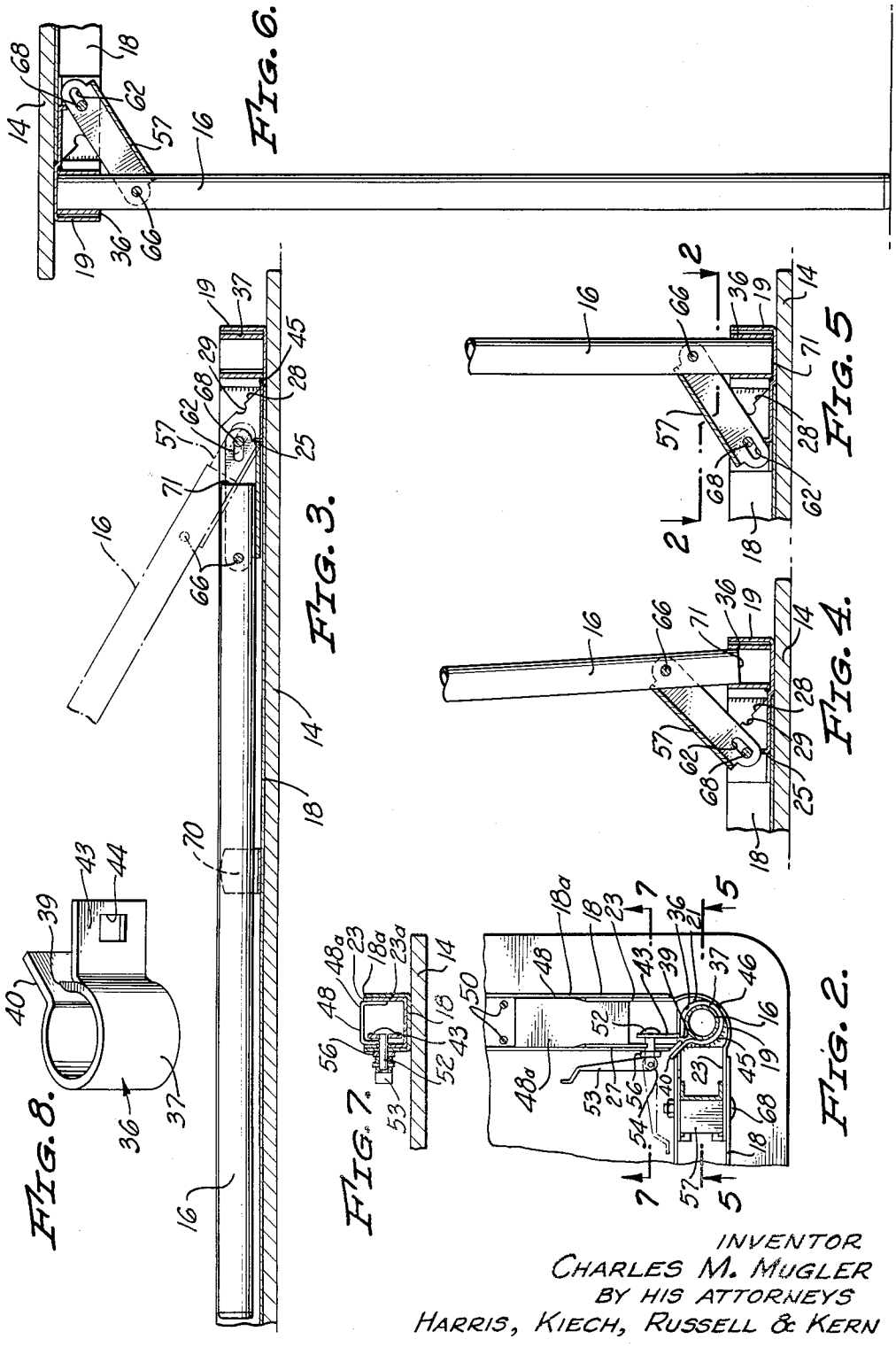
FIG. 10.

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FOLDING TABLE

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The present invention relates in general to folding table structures and in particular to folding tables of the type used for banquets and the like. The general object of the invention is to provide a folding structure of a rugged nature which is capable of accommodating several people, when unfolded, and which is capable of being folded into a compact unit for storage, movement from one location to another, for stacking, and the like.

In general, the invention contemplates a folding table structure having a leg structure adapted to be held in either an operative or an inoperative, retracted position. The table structure is provided with a leg structure positioning means made up of a socket member designed to receive one end of the leg structure and means for varying the cross section of the socket member to provide a clamping action. Means are normally provided for interconnecting the leg structure and the table structure permitting the movement of the leg structure from its inoperative, retracted position to its operative position wherein one end of the leg is placed in the socket member and clamped therein. The interconnecting means comprises a link member having one of its ends pivotally connected to the table structure and its other end pivotally connected to the leg structure adjacent the end positioned in the socket member.

In a preferred embodiment of the table structure of the invention, the socket member of the leg structure positioning means includes a hollow metal cylinder or sleeve having an opening running its length with an arm, preferably integral with the cylinder, extending from the cylinder along one side of the opening. One end of the hollow cylinder is positioned against the table structure with a portion of the abutting end wall of the cylinder away from the arm being welded to the table structure, thus leaving a second portion of its end wall unwelded to the table structure. Application of a force to the arm extending from the cylinder will cause the unattached portion of the cylinder to move in the direction of closing the longitudinal opening, thereby reducing the cross section of the hollow metal cylinder to provide a clamping action, securing the end of the leg structure in place.

The folding table structure of the invention preferably employs a box frame formed of two spaced, parallel, downwardly facing channel members connected at their opposite ends to two similarly disposed channel members, thus providing a continuous four-sided rigid structure. The table top is lightly attached to this box frame. The channel members of the box frame carry the load, relieving the top of this duty. An important object of the present invention is to provide a structure wherein the table top itself is substantially relieved of all load-carrying duty. This feature lengthens considerably the usable life of the table.

Another object is to provide a structure wherein the legs in their retracted, inoperative positions are housed within the structure proper, rather than simply folded against the bottom side of the table as customarily done.

A further object is to provide a leg structure positioning means employing a socket member designed to receive one end of the leg with means for varying the cross section of the socket member to provide a clamping action for securing the erect leg in position.

Another object of the invention is to provide a folded table structure which permits the piling of several of the tables.

Another object of the invention is to provide a structure wherein loads carried by the erect, opened table are transmitted primarily through the several legs of the structure with a minimum of the load being transmitted through the pivot links interconnecting the legs to the table structure proper.

The foregoing objects, advantages, features and results of the present invention, together with various other objects, advantages, features and results thereof which will be evident to those skilled in the folding table art in the light of this disclosure, may be achieved with the exemplary embodiment of the invention described in detail hereinafter and illustrated in the accompanying drawings.

In the drawings:

FIG. 1 is an isometric view of a preferred embodiment of the table of the invention, partly in cross section, and with the table top shown in phantom lines;

FIG. 2 is a fragmentary bottom view of a corner of the table, partly in cross section taken along the line 2—2 of FIG. 5, illustrating the supporting socket and its clamping device;

FIG. 3 is a fragmentary side view with a leg of the table shown in its retracted position, and with the same leg illustrated in phantom lines in a partly raised position;

FIG. 4 is a cross-sectional view of a corner of the table with the leg shown in a nearly erect position, with its inner end just entering the supporting socket;

FIG. 5 is a cross-sectional view taken along line 5—5 of FIG. 2, illustrating the leg in its fully erect position, with the inner end of the leg fully engaging the supporting socket;

FIG. 6 is a cross-sectional view similar to FIG. 5, with the leg fully illustrated and resting on the floor;

FIG. 7 is a sectional view taken along lines 7—7 of FIG. 2;

FIG. 8 is an isometric view of the leg-supporting socket;

FIG. 9 is an isometric view of a corner plate of the table; and

FIG. 10 is an isometric view of a link for interconnecting the leg and table structure.

Referring to FIG. 1 there is illustrated a foldable table 12 made up of a table top 14 supported by a box frame 15 which in turn is supported at each of its corners by a leg structure 16. The rectangular box frame 15 is formed of four, downwardly facing, channel members 18. Adjoining channel members 18 are interconnected at the four corners of the box frame 15 by corner pieces 19.

The four corner pieces 19, which are alike, are conveniently formed by stamping to provide, as best seen in FIG. 9, a corner section 21 which has a rounded outside wall 22, and two channel sections 23 which open into the corner section 21 at right angles to each other. The two channel sections 23 of the corner piece 19 resemble each other with each having an outside wall 23a integral with the outside wall 22 of the corner section 21. Each channel section 23 of the corner piece 19 is provided with a turned-up lug 25 in the bottom of its channel and an inside wall 27. The inside walls 27 each possess a downwardly sloping inside edge 28. The continuity of the inside edge 28 of each inside wall 27 is broken by a half-moon notch 29. The outside walls 23 and inside walls 27 of both channel sections have intermediate their lengths directly opposing holes 30 which lie in the plane of the lug 25. Cut-out portions 32 and 34, respectively, of the inside corner of the corner section 21 and in its rounded outside wall 22 permit the stamping of the piece without splitting or tearing of the metal.

Each corner piece 19 carries a leg structure positioning means made up of a socket member 36 and means for

varying the cross section of the socket member to provide a clamping of the leg member through a reduction in the cross section of the socket 36. Each socket member 36, as best seen in FIGS. 2 and 8, is formed of a hollow metal cylinder 37 which has an opening 39 running its length. The wall of the cylinder 37 at either side of the longitudinal opening 39 continues, with the wall at one side of the opening being bent outwardly to provide a first arm 40 and with the wall at the other side of the opening being bent at a still sharper angle to provide a somewhat larger second arm 43. The second arm carries a square hole 44 near its outside edge. The socket 36 is positioned against the downwardly facing, under side of the section 21 of a corner piece 19. Only a portion of the abutting end wall of the cylinder 37 is welded to the corner piece 19. A weld 45 fixing the cylinder 37 to the structure runs from a point near the end of the first arm 40, along the length of that arm, and around one side of the cylinder 37, terminating at a point 46 which is at the outside geometric corner of the corner piece 19. The second portion of the end wall of the abutting cylinder, extending from the point 46, around the other side of the cylinder 37 and including the second arm 43, is left unattached to the corner piece 19.

Reference to FIGS. 2 and 7 will best illustrate the manner in which the corners of the box frame 15 are assembled. Each of the channel sections 23 of the corner piece 19 is telescoped into its corresponding channel member 18, with the outer wall 23*a* of each channel member engaging the inside wall of its respective channel member 18. A stacking plate 48 of a general U-shaped cross section is disposed in the channel member 18 with its outside bottom wall 48*a* slightly out of flush with the longitudinal edge 18*a* of the channel member 18. Four of the stacking plates 48 are incorporated in the table structure, with two being placed in each channel member 18 at the ends of the box frame 15. This arrangement permits the stacking of folded tables back-to-back without the channel members of one table slipping into the chamber members of the other. Screws 50 lightly attach the table top 14 to the channel members 18 of the box frame 15.

FIG. 2 illustrates the manner in which the leg 16 disposed in the socket clamp 36 is locked in position. A bolt 52 carried in the square hole 44 of the second arm 43 extends through the half-moon notch 29 (FIG. 9) of the inside wall 27 of the corner piece 19, and through an aligned hole of the channel member 18. The bolt 52 at its outer end has a clamp arm 53 pivoted to it. The pivot end of the clamp arm 53 presents a cam surface 54. With the clamp arm 53 in the position illustrated in solid lines in FIG. 2, the high side of the cam surface engages a washer 56 disposed between the channel member 18 and the arm 53, thus drawing the bolt 52 and the second arm 43 of the socket 36 toward the left, thereby reducing the cross section of the socket member and clamping the leg in position. Movement of the clamp arm 53 into the position illustrated in phantom lines in FIG. 2 moves the low side of the cam surface 54 into engagement with the washer 56, thereby relieving the force on the bolt 52 and the second arm 43, permitting the removal of the leg 16 if desired from the socket 36.

Each leg 16 is pivotally held to the box frame 15 through the agency of a link member 57. The link member 57 has a general U-shaped cross section (FIG. 10) and is provided with two stepped-in sections along its length. The link member at its widest end has a width somewhat smaller than the interior width of the channel member 18 and at its narrow end the side walls are extended to form two ears 59 which carry aligned holes 60. The two walls of the link at its wide end are each provided with an elongated slot 62 which directly oppose each other. The long dimension of the two slots is in a plane parallel to the bottom 65 of the link. The inside walls 61 of the ears 59 are spaced apart a distance to permit them to straddle the leg member 16. The link is held at its end of reduced dimension to the leg by a bolt 66 which extends through the ears 59 and the leg 16 near its inner end. The link 57 is pivotally attached at its other end to the channel member 18 by a bolt 68 which extends through the aforementioned slots 62 of the link and aligned holes 63 of the channel member 18.

The sequence of FIGS. 3, 4, 5 and 6 demonstrates the moving of the retracted leg 16 which is housed in the channel member 18 to its wholly erect position of FIGS. 5 and 6. The leg is first moved into the partially raised position shown in phantom lines of FIG. 3 wherein the outside edge 69 of the large end of the link 57 first engages the upwardly extending lug 25 carried by the inside bottom of the channel member 18. In first elevating the leg 16 it is moved out of engagement with a spring clip 70 disposed in the channel member 18. With further movement of the leg upwardly in an arcuate path, a position is reached where the leg is pivoted sharply downwardly into the position illustrated in FIG. 4, wherein the inner end 71 of the leg enters the top portion of the socket 36. At this time the pivot pin 68 of the channel member 18 engages the outer end of the slot 62. With the seating of the leg in the socket 36 as shown in FIG. 5, the inner end 71 of the leg engages the bottom of the corner piece 19 and the inner end of the slot 62 is in contact with the pin 68. The clamp handle 53 is moved into the position illustrated in solid line in FIG. 2, thus effecting a clamping of the socket 36 about the inner end 71 of the leg 16. This manner of securing the leg in its operative position frees the structure of cross-bracing between the legs 16 as is frequently employed in foldable tables. The absence of the cross-bracing permits the seating of people with greater comfort, there being no striking of the knees on the bracing. In some commercially available foldable table structures, the cross-bracing actually reduces the number of people that could otherwise be seated at the table. The particular design of the link member 57 imparts some lateral stability to the leg member 16. It will be recalled that the link 57 at its wide end has a dimension closely approximating that of the channel 18 in which it is pivoted. With lateral shifting of the table, the side walls of the link member 57 will promptly engage the walls of the channel 18, thus limiting lateral movement of the leg with respect to the structure. The use of the channel members 18 in the construction of the box frame in addition to strengthening the structure provides housing for the retracted legs. This arrangement not only protects the legs but facilitates stacking of the folded table structure with the incorporation of the stacking plates 48 as previously described.

Although an exemplary embodiment of the invention has been disclosed herein for purposes of illustration, it will be understood that various changes, modifications, and substitutions may be incorporated therein without departing from the spirit of the invention, as defined by the claims which follow.

I claim:

1. In a folding table structure wherein at least one of the legs is movable away from its operative position, the improvement comprising:

a leg positioning means including a longitudinally split tubular socket member designed to receive one end of said leg, said split tubular socket member having one of its ends positioned against the table structure with a portion of the abutting end wall being secured to the table structure and the other abutting portion free of the table structure; and

means for drawing the free side of the tubular socket member toward the secured side, thereby providing a clamping action for holding the leg in its operative position.

2. In a folding table structure having a leg structure adapted to be held in either an operative or an inoperative position, the combination of: a leg structure posi-

tioning means comprising a socket member designed to receive one end of said leg structure, said socket member including a hollow cylinder having a wall opening running the length of the cylinder, said cylinder having one of its ends positioned against the table structure with a portion of the abutting end being fixed to the table structure, and means for varying the cross section of the cylinder of the socket member to provide a clamping action; and means interconnecting said leg structure and table structure permitting movement of the leg structure from its inoperative position to its operative position wherein said one end of the leg structure is placed in the cylinder and clamped therein, said interconnecting means comprising a link member having one of its ends pivotally connected to the table structure and its other end pivotally connected to the leg structure adjacent its said one end.

3. A folding table structure in accordance with claim 2 wherin the cylinder of the socket member has an arm extending outwardly from one side of the opening and wherein the means for varying the cross section of the cylinder of the socket member is connected to said arm to permit the application of a force, causing the unattached portion of the cylinder to move in the direction of closing, said longitudinal opening, thereby reducing the cross section of the hollow cylinder.

4. In a folding table structure having a leg structure that may be held in either an operative or an inoperative position, the combination comprising: a longitudinal, downwardly facing channel member comprising an element of said table structure, said channel member serving to house the leg structure in its inoperative position with said leg structure being held in the channel of the channel member in substantially parallel relationship; a socket clamp member aligned with the channel member and adjacent one end of the leg structure, said socket clamp member including a hollow cylinder having a wall opening running the length of the cylinder, said cylinder having one of its ends positioned against the table structure with a portion of the abutting end wall being held to the table structure with means being provided for varying the cross section of said cylinder to provide a clamping action; and means interconnecting said leg structure and table structure permitting movement of the leg structure from its inoperative, housed position to its operative position wherein said one end of the leg structure is placed in the cylinder of the socket clamp member and clamped therein, said interconnecting means comprising a link member having one of its ends pivotally connected to said channel member adjacent the socket clamp member and its other end pivotally connected to the leg structure adjacent its said one end.

5. A folding table structure in accordance with claim 4 wherein the cylinder of the socket clamp member has an arm extending outwardly from one side of the opening and wherein the means for varying the cross section of the cylinder is connected to said arm to permit the application of a force, causing the unattached portion of the cylinder to move in the direction of closing said longitudinal opening, thereby reducing the cross section of the hollow cylinder.

6. A folding table structure in accordance with claim 4 wherein the link member at its end connected to the channel member carries an elongated pivot slot, said slot extending longitudinally lengthwise of said link, with the link member being pivotally connected to the channel member by a pivot pin having an axis perpendicular to the channel member, said pivot pin extending through the slot of said link, said arrangement of link, slot, and pin facilitating movement of the leg structure from its inoperative, housed position to its operative position whereby the pin engages the outer end of the slot during said movement, with the inner end of the slot engaging the pin when said one end of the leg is seated in the socket clamp member.

7. In a folding table structure, the combination comprising: a table top; a box frame supporting said table top and formed of two spaced, parallel, downwardly facing channel members connected at their opposite ends to two similarly disposed channel members, providing a continuous four-sided, rigid structure; a socket clamp member disposed at each corner of the structure, said socket clamp member including a hollow cylinder having a wall opening running the length of the cylinder, said cylinder having one of its ends positioned against the table structure with a portion of the abutting end wall being held to the table structure with means being provided for varying the cross section of said cylinder to provide a clamping action; a leg structure associated with each socket clamp member, said leg structure having an operative and an inoperative position, with the leg structure in its inoperative position being housed within the channel of one of the channel members in substantially parallel relationship thereto with its inner end closest to said socket clamp member, and in its operative position being held vertically of the box frame and table top with its inner end disposed in the cylinder and clamped therein; and a link element connecting each leg structure to the box frame, each link element being pivotally connected at one of its ends to the leg structure adjacent the inner end of the leg and at its other end being pivotally connected to the box frame adjacent the respective socket clamp member.

8. A folding table structure in accordance with claim 7 wherein the adjoining channel members are interconnected through a stamped, integral, downwardly facing, corner piece having a corner section with a rounded outside wall and two channel sections opening into the corner section at right angles to each other, said channel sections being sized to permit their telescoping into their respective adjoining channel members.

9. A folding table structure in accordance with claim 7 wherein the cylinder of the socket clamp member has an arm extending outwardly from one side of the opening and wherein the means for varying the cross section of the cylinder is connected to said arm to permit the application of a force, causing the unattached portion of the cylinder to move in the direction of closing said longitudinal opening, thereby reducing the cross section of the hollow cylinder.

10. A folding table structure in accordance with claim 7 wherein the link member at its end connected to the channel member carries an elongated pivot slot, said slot extending longitudinally lengthwise of said link, with the link member being pivotally connected to the channel member by a pivot pin having an axis perpendicular to the channel member, said pivot pin extending through the slot of said link, said arrangement of link, slot, and pin facilitating movement of the leg structure from its inoperative, housed position to its operative position whereby the pin engages the outer end of the slot during said movement, with the inner end of the slot engaging the pin when said one end of the leg is seated in the socket clamp.

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