

May 24, 1955

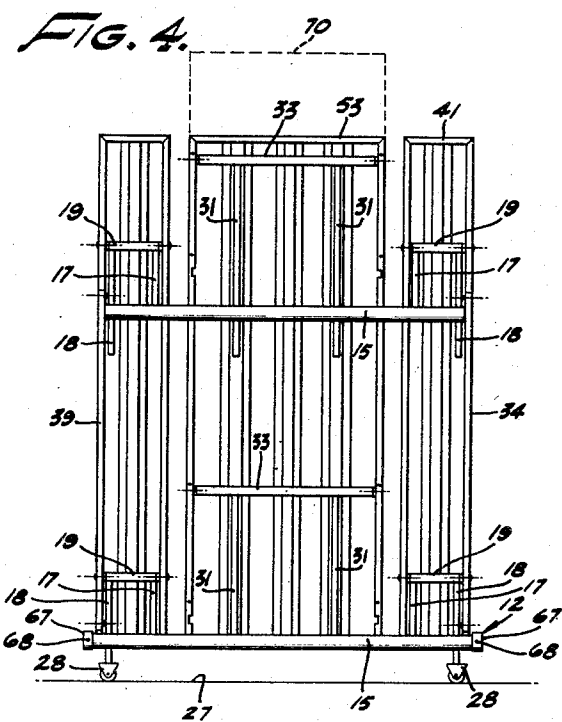
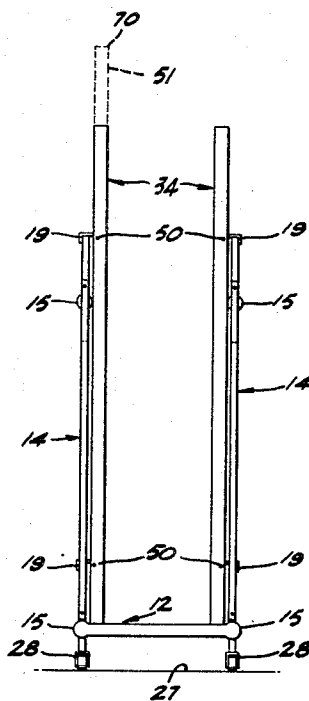
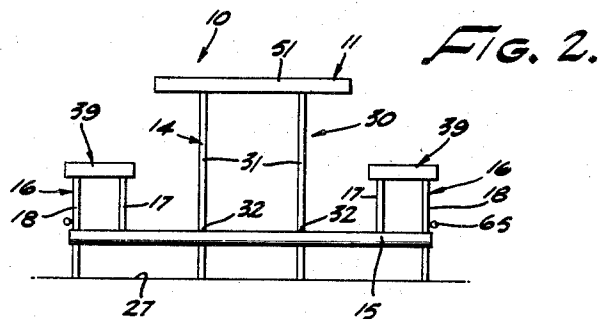
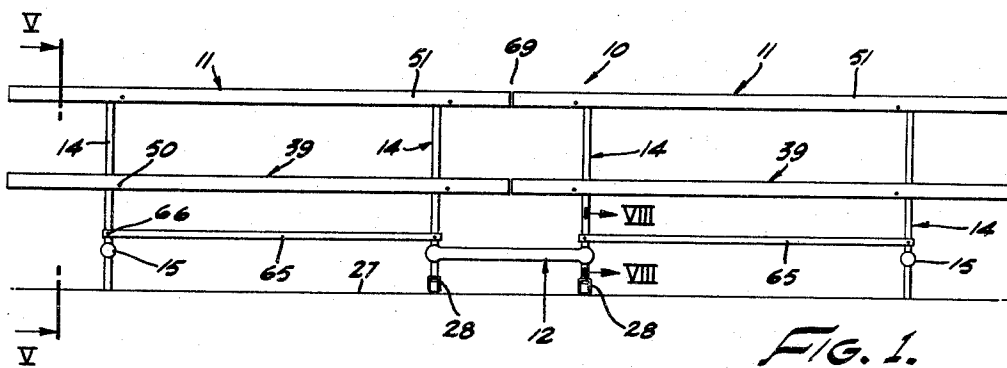
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2,708,961

COMBINED FOLDABLE TABLE AND BENCH CONSTRUCTION

Filed March 25, 1954

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

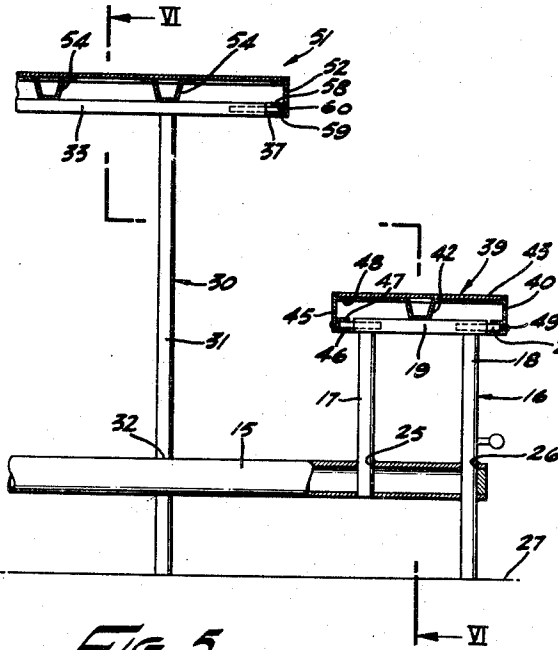


FIG. 5.

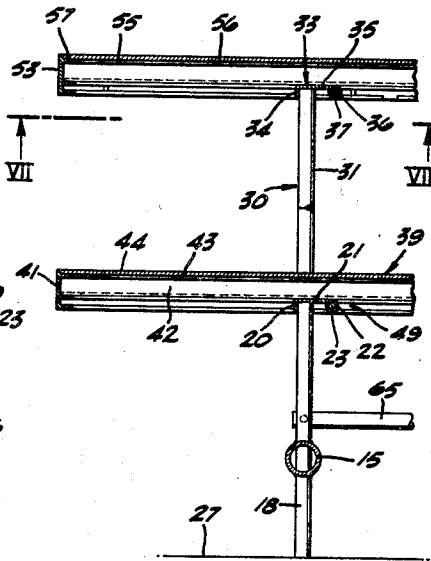


FIG. 6.

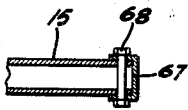


FIG. 8.

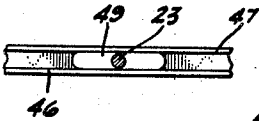


FIG. 9.

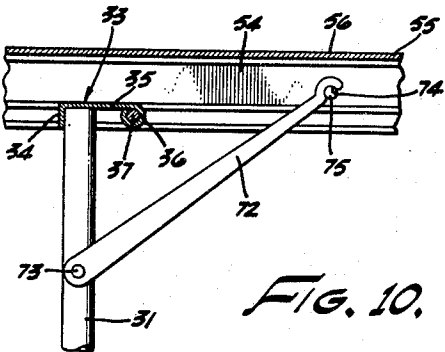


FIG. 10.

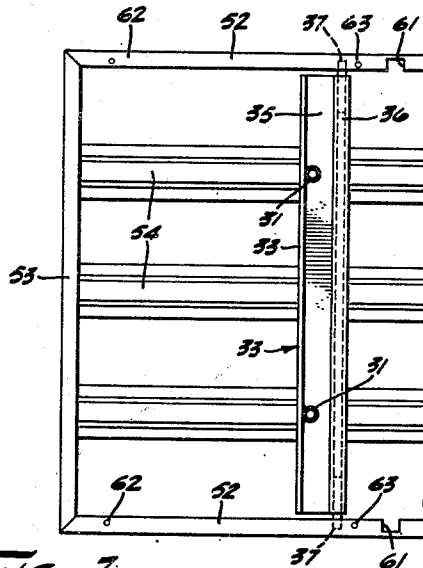


FIG. 7.

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COMBINED FOLDABLE TABLE AND BENCH CONSTRUCTION

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Application March 25, 1954, Serial No. 418,738

16 Claims. (Cl. 155—124)

This invention relates to an improved foldable combined table and bench construction and more particularly to a pair of interconnected foldable easily movable table and bench units, each having a height, when upended into vertical folded relation, only slightly greater than the length of each unit, and providing, when in extended coplanar horizontal relation, a continuous table and bench construction.

Prior proposed foldable table and bench sets have been arranged for association with and storage within suitably constructed wall cabinets. Such tables have been primarily used in school cafeterias or multi-purpose rooms which serve large numbers of persons. They are readily and quickly stored and have been very acceptable and satisfactory for the purpose for which they were intended.

However, there has also developed a need for a foldable combination table and bench construction which is not associated with a wall storage cabinet and which may be readily folded and moved into a suitable storage area as against a wall or into another room. The problem of moving a vertically folded table that is standing virtually on end through a doorway requires a folding table and bench construction which affords maximum length of table and bench while still permitting the table in folded vertical position to pass through a door into another room. Stability and ease of movement is also required of such a table in folded vertical position. In folded position table units must be relatively closely spaced together to most effectively utilize storage space.

This invention contemplates an improved foldable and combined table and bench construction which may be readily upended into vertical folded storage position of minimum height and which affords a table of maximum length.

An object of this invention is to disclose and provide a novel combined foldable table and bench construction wherein a table top panel is mounted in a novel manner so that overall height of the folded upended table is kept to a minimum.

An object of this invention is to disclose and provide a foldable table and bench combination wherein the top surface and edges of the table and bench construction are protected when in upright folded storage position.

Another object of this invention is to disclose and provide a novel foldable table and bench construction wherein two table and bench units may be joined together to provide a table of great continuous length and may be folded into a stable storage position for movement as one assembly to a storage area.

A further object of this invention is to disclose and provide a foldable table and bench construction wherein bench panels are permanently pivotally connected to leg frames and a table top panel is pivotally and slidably connected to said leg frames so that, when folded, inner edges of the table top panels may lie in the same plane as the bench panels and with ends of said panels in alignment.

A still further object of this invention is to disclose and provide leg frames for such a combination table and bench construction wherein said leg frames are of simple construction, may be easily connected to bench and table top panels, and offer minimum interference to feet and legs of persons seated adjacent ends of the table.

A still further object of this invention is to disclose and provide a pair of table and bench units so constructed and arranged that they may be readily interconnected to provide a table of great continuous length and which may be folded into upright storage position while interconnected.

The invention contemplates a foldable table and bench construction wherein such a pair of table and bench units may be readily disconnected and separated so as to provide a pair of separate table and bench units which may be positioned as desired.

Generally speaking this invention contemplates a lightweight, strong, easily handled table and bench construction wherein a pair of rigid leg frames are employed, each comprising a single horizontal tie member having spaced upstanding bench supporting means and an intermediate upstanding table supporting means carried thereby. Bench panels are permanently pivotally connected to said bench supporting means and a table top panel may be pivotally and slidably connected to said table support means in such a manner that when the table construction is raised into vertical folded storage position, bench and table panels are moved into a common vertical plane and the end edges of said bench and table panels are aligned horizontally, the bottom edges of said panels lying closely adjacent to floor level so that the entire unit may be readily rolled or moved to a storage area. The leg frames fold against the table and bench panels to lie in a vertical plane closely spaced and parallel to the plane of the associated panels. The pair of units are folded in such a manner that the finished normally top surfaces and edges of the table top panel and bench panels face inwardly toward the unit connected therewith so that said surfaces are afforded protection against damage or marring while in storage and while being moved to and from storage.

Other objects and advantages of this invention will be readily apparent from the following description of the drawings in which an exemplary embodiment of this invention is shown.

In the drawings:

Fig. 1 is a side elevation of a pair of interconnected table and bench units embodying this invention.

Fig. 2 is an end view of the construction shown in Fig. 1.

Fig. 3 is a side elevation of the table units in Fig. 1 in upended folded vertical relation, the dotted lines indicating height of the table top panel before alignment thereof with the bench panels.

Fig. 4 is an elevation view taken from the left of Fig. 3 showing the table and bench construction in folded condition.

Fig. 5 is a fragmentary enlarged view taken in the plane indicated by line V—V of Fig. 1.

Fig. 6 is a fragmentary enlarged longitudinal sectional view taken in the planes indicated by lines VI—VI of Fig. 5.

Fig. 7 is a fragmentary bottom view of a table top panel taken from the plane indicated by lines VII—VII of Fig. 6.

Fig. 8 is a fragmentary section view showing the details of connection of the connecting bar to the leg frame means, the section being taken in the plane indicated by line VIII—VIII of Fig. 1.

Fig. 9 is a fragmentary side view of the pivotal con-

nection of the bench panel to the bench supporting means.

Fig. 10 is a fragmentary view showing a latch means for holding separate table units against collapse.

In Fig. 1 there is illustrated a foldable combination table and bench construction embodying this invention wherein said table and bench construction generally indicated at 10 includes a pair of substantially identically constructed table and bench units generally indicated at 11. Units 11 differ only in that they are left and righthand constructions so that they may be interconnected by a connecting bar means 12. For purposes of brevity and clarity, the construction of only one unit 11 will be described, it being understood that reference numerals applied to one table unit will refer to identical features of construction and parts on the other unit 11.

Each table and bench unit 11 comprises longitudinally spaced outer and inner leg frame means 14. Each outer and inner leg frame means 14 includes a hollow cylindrical tubular transversely extending horizontal tie member 15. Adjacent each end portion of tie member 15 may be provided upstanding bench supporting means 16, each bench supporting means including an inboard column 17 and an outboard column 18. The columns 17 and 18 may be interconnected and secured together at their top portions by a transversely extending horizontal top cross member 19. The cross member 19 may be formed of a downwardly facing channel-like section having a free flange 20, a horizontal web 21 and an inwardly curled depending flange 22 which provides a through bore for reception of a pivot pin 23.

The inboard column 17 on each leg frame extends into aligned openings 25 in tie member 15 and may be secured therein as by welding. It should be noted that the lower end of each column 17 does not extend below the lower surface of the tie member 15. Each outboard column 18 on the outer leg frames may extend through aligned openings 26 in tie member 15 and project downwardly to seat against a supporting surface 27 such as a floor. The lower end of each of such columns 18 may be provided with a suitable cap to prevent marring of the floor surface 27.

Each column 18 of inner leg frames 14 may be provided with roll means 28, such as casters, to facilitate movement of the table construction when in folded storage position as shown in Figs. 3 and 4. While it is understood that casters may be provided on the outer leg frames 14 if desired, it has been found preferable to not provide such roll means and to permit nonrolling contact of the outer leg frames with the floor surface to serve as anchors or positioning means for the table.

Between and extending above the bench supporting means 16 each leg frame 14 may include an upstanding table support means 30 comprising a pair of transversely spaced upstanding columns 31. In outer leg frames 14 the columns 31 extend through bores 32 in tie member 15 for contact with the floor surface 27. The columns 31 may be secured to the tie member 15 as by welding and their lower ends may be provided with suitable caps to prevent marring of the floor surface 27. It should be noted that the columns 31 of the inner leg frames 14 do not extend below the tie member 15 (Fig. 4) so that there will be no interference with the function of the roll means 28 when the unit is in folded storage position.

Each pair of columns 31 may be interconnected by a transversely extending channel-like horizontal top cross member 33. The cross member 33 may be of the same cross-sectional shape as the cross member 19 and may include a depending flange 34, a web 35 and an inwardly curled flange 36 providing a bore for stub shafts 37 which project outwardly therefrom at each end.

It should be noted at this point that the leg frames 14 each include bench supporting means 16 and table supporting means 30 which lie in the same plane and which lie above the transverse tie member 15. The

transverse tie member 15 of each leg frame 14 is spaced relatively closely to the floor surface so that little or no effective interference is offered to the legs of persons sitting adjacent ends of the table and end seating areas on the benches may be effectively and comfortably utilized. The outer leg frames 14 are provided with four points of rest against the floor surface 27 while the inner leg frames 14 each carry a pair of roll means or casters 28.

Each pair of longitudinally aligned bench supporting means provides a support for a bench panel 39. Each bench panel 39 may comprise a rectangular elongated peripheral frame formed of interconnected parallel side and end frame sections 40 and 41. End sections 41 may be interconnected by an inverted hat section 42 which extends along the longitudinal axis of the bench panel 39. An elongated rectangular strip of sheet metal 43 may be supported by the sections 40, 41 and 42 and across the top of said sheet metal 43 may be provided a suitable top surfacing material such as high-pressure laminated plastic 44.

The sections 40 and 41 are of the same extruded shape and include a vertical web 45 provided with longitudinally extending parallel, vertically spaced inwardly directed bottom pair of flanges 46 and 47 and a parallel top flange 48 defining a peripheral seat for said sheet metal and top surfacing material 44. The web 45 provides a smooth outer surface forming peripheral edges of bench panel 39.

The bench panel 39 so constructed may be connected to the leg frames 14 by seating a bottom surface portion of hat section 42 on the spaced cross members 19 and by inserting pin 23 entirely through the bore of curled flange 22 of the top cross member 19 and through aligned holes provided therefor in webs 45 of the side sections 40. The pin 23 so assembled affords a permanent pivotal connection as at 50 between the bench supporting means 16 and the bench panel 39. The pivotal connections 50 of each unit lie inwardly of the leg frames 14 as best seen in Fig. 1. A longitudinally extending shoe 49 may be mounted on each end of pin 23 and positioned between the pair of flanges 46 and 47 to provide adequate bearing area to prevent distortion of the metal flanges when under load which might cause misalignment of the pivotal connection 50. The pivotal connection 50 and top cross member 19 provide hinge means which limit hinge movement between the panel 39 and bench supporting means to about 90°.

The table top panel 51 is supported by the longitudinally spaced table supporting means 30 and may comprise an elongated rectangular peripheral frame having side sections 52 and end sections 53 of the same extruded structural shape as that described for the side and end sections 40 and 41 of the bench supporting means. The end sections 53 may be interconnected by a plurality of parallel, transversely spaced, inverted hat sections 54, two of said hat sections lying in the same vertical-longitudinal planes as corresponding longitudinally-aligned table columns 31. The hat sections 54 may rest upon the webs 35 of the horizontal cross members 33 of the table supporting means.

The table top panel 51 is also provided with an elongated rectangular strip of sheet metal 55 and a top surfacing material 56 made of suitable laminated plastic material preferably of the same color and design as that provided for the bench panel 39. The sheet metal and top surfacing material is supported by peripheral inwardly directed top flanges 57 of the end and side sections 52 and 53 and by the hat sections 54.

A bottom pair of inwardly extending flanges 58 and 59 on each side section 52 provides a longitudinal extending inwardly facing groove 60. The table top panel 51 is pivotally and slidably connected to the table support means by reception of ends of the stub shafts 37 carried by the top cross members 33 within opposed

grooves 60. To facilitate assembly of panel 51 and members 33 the flanges 59 may be provided with openings 61 to permit ends of shafts 37 to enter said grooves 60 (Fig. 6). The table top panel 51 is thus slidably and pivotally mounted on the table support means 30 by sliding engagement of shafts 37 in grooves 60.

Sliding movement of the table top panel 51 is limited by a pair of longitudinally spaced stop bolts 62 and 63 which extend through each pair of flanges 58 and 59 adjacent one end of the table top panel 51. The stop bolt 63 is removable to permit stub shafts 37 to be positioned between bolts 62 and 63. Stop bolt 62 affords a limit stop for positioning the table top panel 51 when it is in vertical folded position so that the top end section 53 will be in alignment with top end sections 41 of the bench panels 39. The stop bolt 63 limits the position of the table top panel 51 when the table top panels are in coplanar horizontal relationship and when the leg frames 14 are disposed at right angles to the plane of the table and bench panels.

Link means 65 for maintaining the leg frames 14 in parallel vertical relationship when the table and bench construction is folded into vertical storage position may extend between the inner and outer bench columns 18 in a plane slightly above the plane of the tie members 15. The link means 65 are provided a permanent pivotal connection as at 66 to said columns 18. The pivotal connections 66 of the link means 65 with the leg frames 14 and the pivotal connections 50 of the bench panels with the leg frame means provide a parallelogram arrangement whereby the leg frames will remain vertically disposed as the table and bench unit is folded upwardly into storage position. It may be noted here that the inward offsetting from the plane of the leg frames 14 of the pivotal connections 50 and the pivotal connection of shafts 37 with the table top panels 51 afford a means for permitting the leg frame means 14 to lie in a vertical plane parallel to the vertical plane of the table top panel and bench panel when in vertical storage position as best seen in Fig. 3.

A pair of table units 11 may be interconnected by connecting bar 12, said connecting bar being of generally channel section and provided at each end with a circular flanged recess 67 adapted to enclose the end portions of tie members 15 of the inner leg frames 14. The connecting bar 12 may be removably connected to said end portions by means of pins 68 extending through the connecting bar and through said end portions.

As shown in Fig. 1 a pair of units 11 may provide a continuous table of great length wherein table top panels 51 and bench panels 39 are in horizontal continuous parallel relationship. The leg frames 14 are vertically disposed. The inner end edges of table top panels 51 and bench panels 39 are closely spaced together as at 69.

When it is desired to fold the pair of units 11 into upright storage position, an outer end of one table top panel 51 may be grasped and the unit lifted upwardly, pivoted about the inner pivotal connections of the panels 39 and 51 to the leg frames, and moved toward the adjacent interconnected unit 11. Upon such upward and inward movement the bench panels pivot about their permanent pivotal connections 50 and the table top panel pivots about its pivotal connections of the shafts 37 in the grooves 60. Assuming that relative movement of the table top panel 51 with respect to the groove 60 is not permitted during the upward folding movement, it will be apparent from the arrangement of the pivotal connections of the table top panel to the leg frames that the table top panel 51 will extend substantially above the top edge of the bench panels as indicated by dotted lines at 70 in Figs. 3 and 4. When the panels are vertically disposed, the table top panel 51 may be gently lowered until the shaft 37 contacts the stop pins 62, whereby the top edge of the table top panel lies in horizontal alignment with the top edges of the bench means 39. It is understood that sliding of the top panel 51 into final

lowered upright position may be accomplished simultaneously with the movement of the table top panel to vertical position. The other unit 11 may then be similarly folded to upright storage position.

It may be noted that the aligned bottom edges of the table and bench panels when in folded storage position lie in close spaced relation to the floor surface 27. Obviously, if desired, the bottom panel edges may be lowered to minimum distance from the floor surface in order to reduce the overall height by merely changing the location of the pivotal connections between the panels and the leg frames.

In vertical storage condition it should be noted that the folded units are quite stable because of the four spaced roller means 27 and the disposition of the panels inwardly of the leg frames. Further, the top surfaces of the table top panels and bench panels lie in virtually the same spaced vertical planes and are faced toward each other so that they are afforded protection against marring or damage while the units are moved to storage locations.

When a continuous table construction of the length illustrated in Fig. 1 is not desired, the units 11 may be readily separated to provide two table and bench units by removing the connecting bars 12 from the inner leg frames 14 by withdrawing the pins 68. When each unit 11 is thus separated, each unit may be prevented from collapsing by means of a latch member 72 pivotally connected to a table column 31 as at 73 and extending diagonally upwardly for latching engagement as at 74 with a pin 75 provided on the adjacent overlying hat section 54. The pivoted latch member 72 thus provides a simple effectively operated means to lock the table and bench panels and the leg frames in table position.

It is understood that while the leg frames 14 are illustrated as being of tubular metal stock any other suitable section of metal or other material may be utilized in the construction of these foldable table and bench sets. The extruded sections forming the rectangular frames of the table and bench panels may also be varied as desired. The leg frames are simply rigidly constructed so that the tie member 15 may be located relatively close to a floor surface so as to provide minimum interference with feet and legs of a person sitting adjacent ends of the table. It should be particularly noted that the bench supporting means of the inner leg frames are connected to their respective bench panels at a zone spaced from the end of the bench panel a distance not exceeding the height of the bench supporting means since to so exceed such height would cause the bottom edges of the panels to contact the floor surface when the unit is in vertical storage position. The connecting bar means 12 is substantially equal in length to twice the distance separating the end of a bench panel from its zone of connection with the bench supporting means so that when the pair of table and bench units are interconnected the opposed end edges of the table top panels and bench panels are in close proximity so as to afford a virtually continuous table and bench construction.

It is understood that various modifications and changes may be made in the table and bench construction described above and which come within the spirit of this invention, and all such changes and modifications coming within the scope of the appended claims are embraced thereby.

I claim:

1. In a foldable, combined table and bench construction, the provision of: two rigid leg frames, each leg frame including a horizontal tie member, an upstanding bench supporting means carried near each end portion of the horizontal tie member and an upstanding table supporting means carried by the horizontal tie member between said bench supporting means and extending thereabove, all said means lying in virtually a single plane; two bench panels, each bench panel being permanently

connected to and joining bench supporting means of each of said leg frames, said permanent connection including hinge means between each bench supporting means and a bench panel limiting hinge movement to about 90°; and a table top panel connected to and joining the table supporting means of said two leg frames, said bench panels lying in a plane spaced from and below the plane of the table top panel when said table is in unfolded position, the connection between the table supporting means and table top panel including a pivotal and slidable connection whereby the ends of the table top panel may be moved into alignment with the ends of the bench panels when said table is in folded position and wherein the table top panel is in a plane common to the plane of the bench panels; and link means connecting outer portions of said leg frames to maintain the same in parallel vertical position during folding and unfolding.

2. A combined foldable table construction of the character stated in claim 1, wherein each bench supporting means of one leg frame is connected to a bench panel at a zone spaced from the end of the bench panel a distance not exceeding the height of the bench supporting means.

3. A combined foldable table and bench construction comprising two folding tables of the character described in claim 2 and a connecting bar having each end firmly attached to a leg frame of each of said tables, said connecting bar being substantially equal in length to twice the distance separating the end of a bench from its zone of connection with the adjacent bench supporting means.

4. In a foldable, combined table and bench construction, the provision of: two rigid leg frames, each leg frame including a horizontal tie member, an upstanding bench supporting means carried near each end portion of the horizontal tie member and an upstanding table supporting means carried by the horizontal tie member between said bench supporting means and extending thereabove, all said means lying in virtually a single plane; two bench panels being pivotally connected to and joining bench supporting means of each of said leg frames, and a table top panel connected to and joining the table supporting means of said two leg frames, the connection between the table supporting means and table top panel including a pivotal and slidable connection whereby the ends of the table top panel may be moved into alignment with the ends of the bench panels when said table is in folded position and wherein the table top panel is in a plane common to the plane of the bench panels; and link means connecting outer portions of said leg frames to maintain the same in parallel vertical position during folding and unfolding.

5. In a foldable combined table and bench construction, the provision of: two table and bench units in longitudinal alignment, each unit comprising inner and outer rigid transverse leg frames, each leg frame comprising a horizontal tie member, upstanding bench supporting means carried adjacent each end of said tie member and an upstanding table supporting means carried by said tie member between said bench supporting means; bench panels carried by longitudinally spaced bench supporting means and permanently pivotally connected thereto; a table top panel carried by said table support means and pivotally and slidably connected thereto; link means pivotally connecting said bench supporting means below said bench panels; and means extending between and removably connecting tie members of inner leg frames whereby each table unit may be upended into vertical folded storage position with top surfaces of said table and bench panels in face-to-face relation, said pivotal and slidable connection of said table top panel to said table supporting means affording longitudinal movement of said table top panel relative to said leg frames so that said table and bench panels may be transversely aligned.

6. A foldable combined table and bench construction as defined in claim 5, wherein the pivotal connections of said table and bench panels to their respective supporting means lie in a plane inwardly offset from the plane of the

leg frame means whereby said panels when in folded upright position will lie inwardly of said leg frame means.

7. A foldable, combined table and bench construction as defined in claim 5, wherein said inner leg frames are provided with roll means and wherein said outer leg frames are adapted to frictionally contact a supporting floor surface.

8. A foldable, combined table and bench construction as defined in claim 5, wherein longitudinally spaced top means are provided on each table top panel for limiting the movement of said table top panel with respect to said leg frames.

9. In a combined, foldable table and bench construction, the provision of: a plurality of longitudinally spaced transversely disposed leg frame means, each leg frame means comprising transversely spaced bench supporting means and an intermediate table supporting means extending above said bench supporting means; a horizontal tie member connecting said supporting means, said bench supporting means including a depending portion extending below said tie member and adapted to contact a floor surface; link means pivotally interconnecting bench supporting means of each leg frame means; bench panels carried by bench supporting means of said leg frame means and pivotally connected thereto on an axis spaced from the plane of said bench supporting means; a table top panel slidably carried by said table supporting means and having a pivotal and slidable connection thereto with the axis of said pivotal connection spaced from the plane of said table support means; and latch means extending between one of said panels and said leg frame means for holding said table construction against collapse.

10. A foldable table and bench construction as defined in claim 9, wherein said slidable and pivotal connection of said table top panel to said table support means includes inwardly facing grooves on side sections of said table top panel and stub shafts carried by said table supporting means received within said groove.

11. A table and bench construction as defined in claim 10, wherein stop bolts are carried by said side sections and extend across said groove for limiting movement of said table top panel with respect to said table supporting means in folded and unfolded position.

12. A leg frame construction for use with a combined foldable table and bench construction comprising, in combination: a horizontal tie member; bench supporting means adjacent each end of said tie member each including laterally spaced inboard and outboard columns and a top cross member connecting top portions of said columns, said top cross member including means spaced from said columns for hingedly connecting a bench panel thereto, said outboard bench column extending below said tie member for contact with a floor surface; and table supporting means between and extending above said bench supporting means including upstanding transversely spaced columns connected at their top portions by a transverse top cross member, said top cross member having means for pivotally connecting a table top panel thereto along a transverse axis spaced from said table columns.

13. A leg frame construction as defined in claim 12, wherein said bench supporting means and said table supporting means lie in the same plane.

14. In a foldable combined table and bench construction, the combination of: two table and bench units interconnected in end-to-end relation, each unit comprising inner and outer leg frame means each frame means including a bench supporting means and a table supporting means; a bench panel extending between said bench supporting means and a table top panel extending between said table supporting means; means pivotally connecting said bench panel to said bench supporting means for hinged movement about an axis spaced from said bench supporting means; means pivotally and slidably connecting said table top panel to said table supporting means and spaced from said table supporting means; and means inter-

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connecting said inner leg frame means whereby said panels may be upended so that said table and bench panels lie in vertical planes spaced from the vertical planes in which said leg frame means lie when the units are in folded storage position.

15. A table construction as defined in claim 14, wherein stop means are provided for said slidable connecting means for said table top panel whereby said table top panel is transversely aligned with said bench panel when in upright folded storage position.

16. In a foldable combined table and bench construction, the provision of: two rigid leg frames, each leg frame including a horizontal tie member, an upstanding bench supporting means carried near each end portion of the horizontal tie member and an upstanding table supporting means carried by the horizontal tie member between said bench supporting means and extending thereabove; two bench panels pivotally connected to and joining bench supporting means of each of said leg frames, and a table top panel connected to and joining the table supporting

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means of said two leg frames, the connection between the table supporting means and table top panel including a pivotal and slidable connection whereby ends of the table top panel and ends of the bench panels may be laterally aligned when said table is in folded position; and link means connecting said leg frames to maintain the same in parallel, vertical position during folding and unfolding.

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