

April 10, 1951

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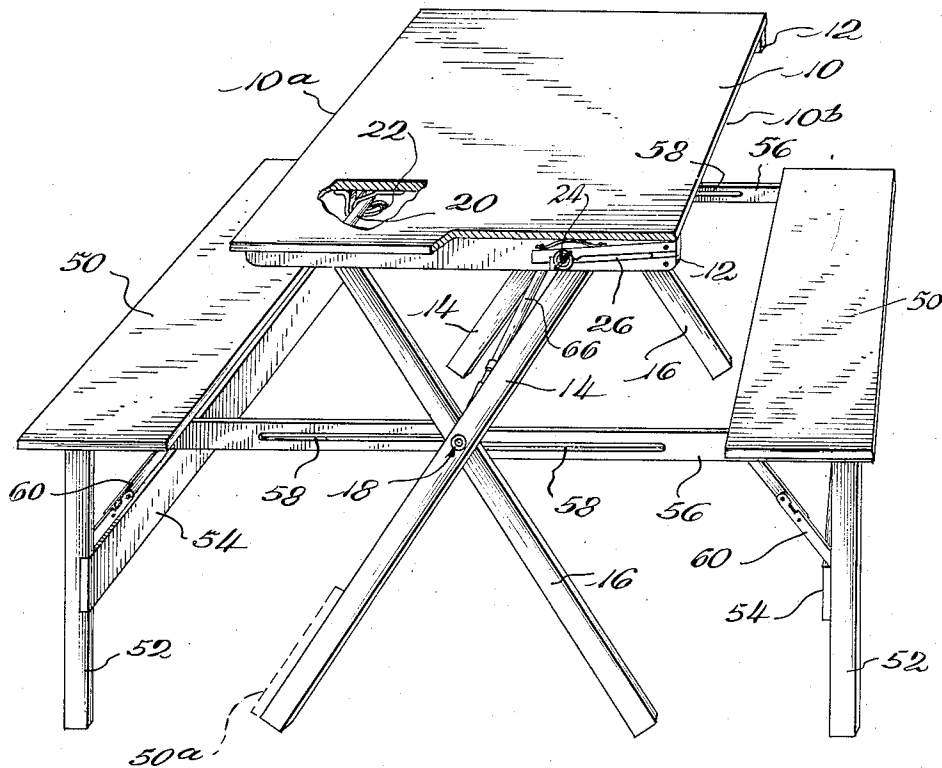
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FOLDING TABLE AND SEAT STRUCTURE

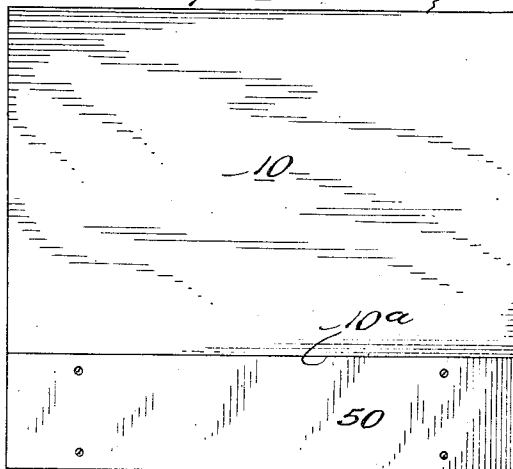
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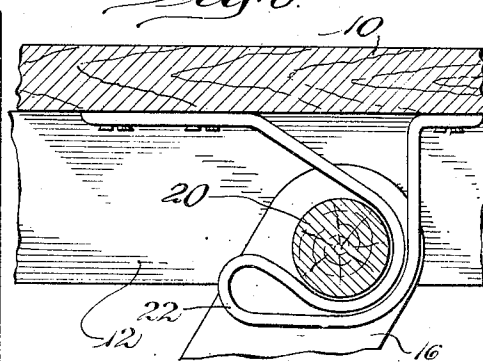
*Fig. 1.*



*Fig. 5.*



*Fig. 6.*



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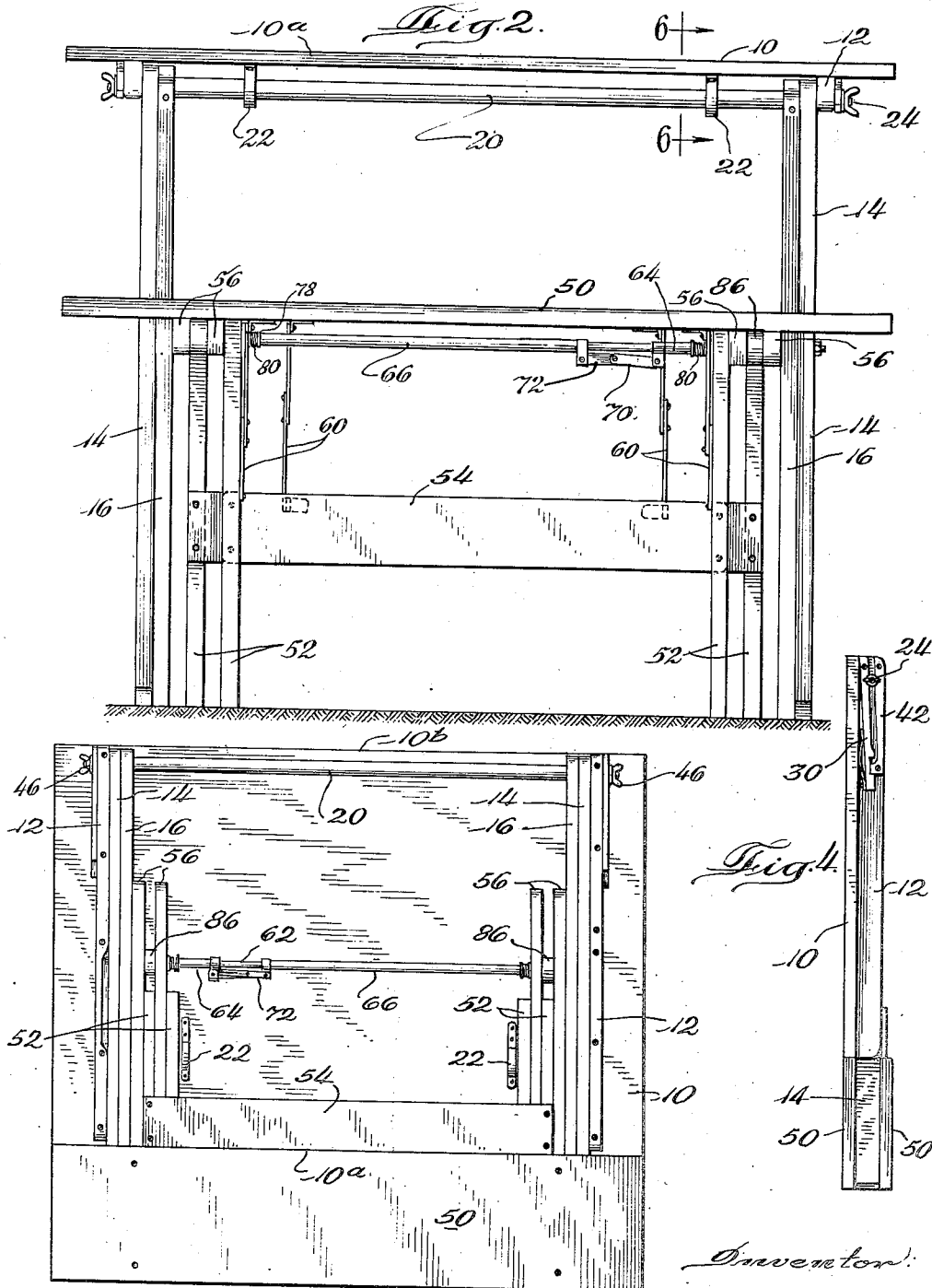
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FOLDING TABLE AND SEAT STRUCTURE

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*Fig. 3.*

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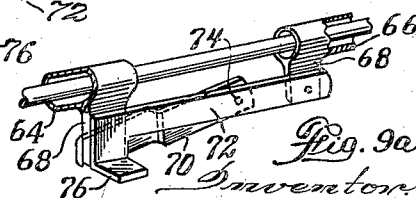
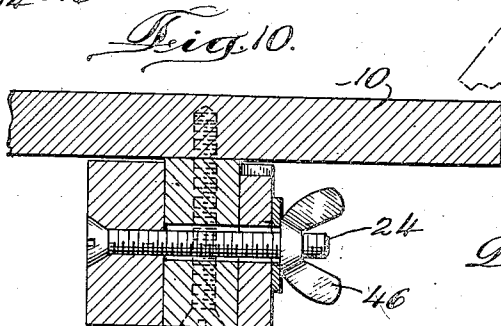
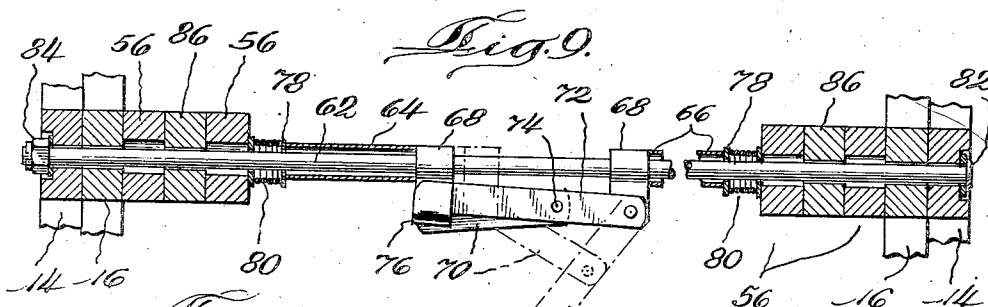
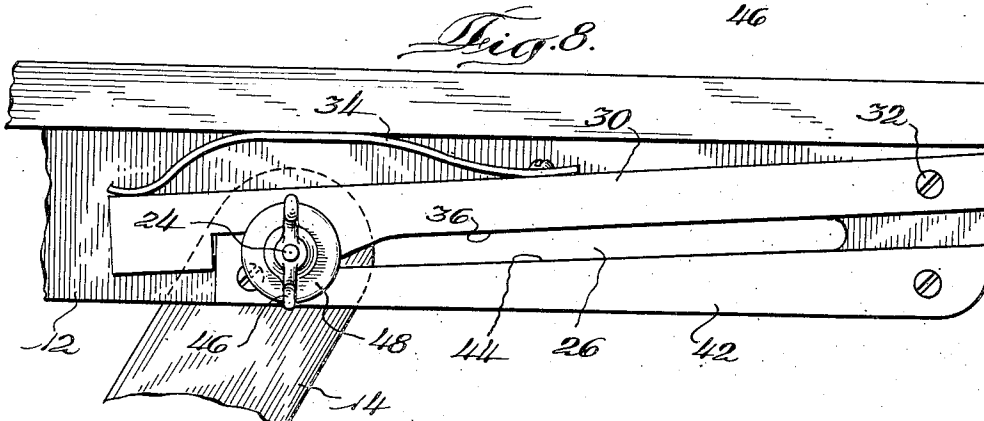
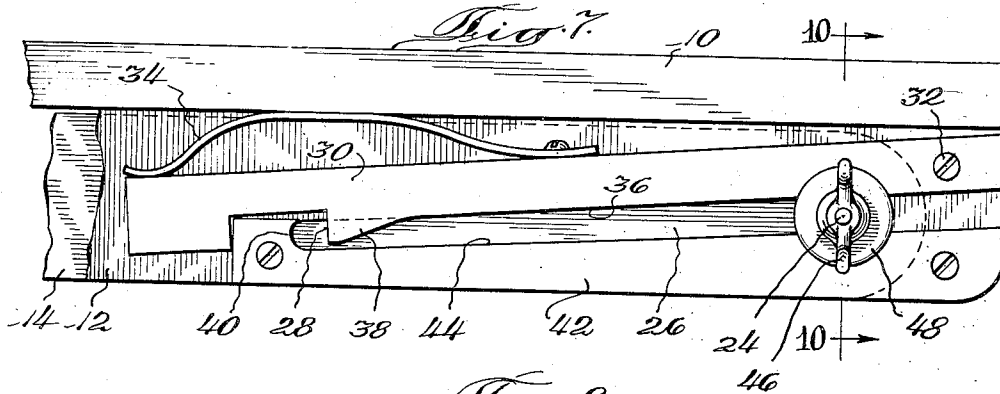
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FOLDING TABLE AND SEAT STRUCTURE

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## UNITED STATES PATENT OFFICE

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## FOLDING TABLE AND SEAT STRUCTURE

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Application August 15, 1946, Serial No. 690,739

10 Claims. (Cl. 155—124)

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This invention relates to folding table structure and particularly to a table having combined therewith certain seating devices in the form of benches attached to the table and also foldable into compact form.

One object of the invention is to provide a relatively light folding table with combined seat structure which can be carried by one person or easily accommodated on a street car or in an automobile for use on picnics, in touring, and on similar occasions where it is desirable to set up the table temporarily and to have it readily collapsible and portable.

Another object of the invention is to provide a folding table structure with friction clamping means readily releasable to permit easy folding movement of the parts, and readily adjustable to secure them firmly at adjusted position without the use of tools.

It is also an object of the invention to provide a folding table and bench structure in which the benches are foldable into a form of no greater thickness than that of the table itself in folded position so as to add a minimum of bulk to that of the folded table.

A further object of the invention is to provide a folding table that will be useful in the home at all times and for almost any occasion, and which includes adjustably attached benches adapting it for use as a card table, but constructed so that one or both benches can be shoved under the table, permitting it to stand against a wall, with one bench pulled out to make the table available for writing, drawing or study.

Other objects and advantages of the invention will appear from the following description, taken in connection with the drawings, in which:

Fig. 1 is a perspective view showing the table and its connected benches unfolded and set up in position for use;

Fig. 2 is a side elevation of the same as seen from the left-hand side of the view of Fig. 1;

Fig. 3 is a face view or elevation of the table and benches in completely folded form;

Fig. 4 is an end elevation of the parts in the position shown in Fig. 3;

Fig. 5 is an elevation of the table in folded form showing the opposite side from that seen in Fig. 3;

Fig. 6 is an enlarged detail sectional view of an abutment or stop device taken as indicated at line 6—6 on Fig. 2;

Fig. 7 is an enlarged detail being a fragmentary end elevation of a portion of the table top, and a latching device attached thereto as it appears when the table is folded;

Fig. 8 is a view similar to Fig. 7, showing the latching device in latching position;

Fig. 9 is an enlarged detail view of the frictional locking device with parts shown in section;

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Fig. 9a is a perspective view of the toggle device forming a part of the frictional locking mechanism shown in Fig. 9; and

Fig. 10 is a detail section taken as indicated at line 10—10 on Fig. 7.

The embodiment of this invention illustrated in the drawings includes a rectangular table top 10 having cleats or cross members 12, depending from its under surface near each end and having one pair of legs 14, 14 pivotally connected to these cleats. The other pair of legs 16, 16 are pivoted respectively to the legs of the first pair as seen at 18 in Fig. 1, and when the table is set up, the legs 16 cross the legs 14 forming X-shaped supports for each end of the table. The legs 16, 16 are connected at their upper ends by a tie member 20, which is shown as a round rod, and when the table is erected this member engages stop or abutments 22 in the form of hooks attached to the underside of the table, one of said hook-shaped abutments being visible through the broken out portion of the table top in Fig. 1.

The abutments 22 are preferably spaced inwardly from the edge 10a of the table top by a substantial distance and in supporting position the upper ends of the legs 14 are spaced inwardly from the edge 10b of the table top by a similar distance. But since the legs 14 are somewhat longer than the width of the table top, it is desirable, when the top is folded, to bring the ends of the legs near one edge of the table top and for this reason the pivot bolts 24, by which the legs 14 are attached to the cleats 12, are slidable in slots 26 in said cleats so that when the table is folded said pivots 24 can be moved to positions near the edge 10b of the table top. When the table is unfolded, said pivots 24 are slid inwardly from the edge 10b to the opposite ends of their slots 26 at which they are retained by the abutment shoulders 28 of latch bars 30, shown in Figs. 7 and 8.

Each of the latches 30 is pivoted at 32 to the cleat 12 on which it is mounted and is held yieldingly in latching position by a spring 34 reacting against the under surface of the table top 10. The lower edge 36 of the latch 30 is normally aligned with the upper edge of the slot 26 in the cleat 12, with its latching tooth 38 depending across the slot, as seen in Fig. 7; but when the pivot bolt 24 is shifted from the outer end of the slot toward the inner end, it encounters the sloping face of the tooth 38 and momentarily displaces the latch 30 until said pivot bolt encounters the end of the slot 26 and the stop shoulder 40 of a member 42, which is secured fixedly against the cleat 12 and has its upper edge 44 aligned with the lower edge of the slot 26. Preferably the pivot bolts 24 are fitted with wing nuts 46 and washers 48 which overlie the parts 30 and 42, so that the bolts may be clamped firmly at either

end of the slots 26, but in the erected position of the table, independently of such clamping means, the latches 30 will retain the upper ends of the legs in their proper positions.

The upper ends of the other legs 16 are held in place by engagement of the tie member 20 in the hook-shaped abutments 22 as seen in Figs. 1 and 6, and because of the hooked form of these abutments, the table, when erected, may be picked up by its top and carried about without dislocation of the legs 16 and tie member 20. The legs 16 are disposed respectively against the inner faces of the legs 14 so that said legs 16 and their tie member 20 will swing between the legs 14 in folded position as seen in Fig. 3.

Each of the bench seats 50, 50 seen in Fig. 1 is provided with a pair of legs 52 connected by a tie member 54 and hingedly or pivotally attached to the underside of the bench seat 50. The seat member is connected to the table by a pair of horizontally extending arms 56 having slots 58 which engage the pivotal means 18 connecting the crossed legs 14 and 16. These arms are secured to the under surface of the seat 50 and the legs 52 may be pivotally attached by screws or bolts to said arms and preferably between them, that is, against their inner faces to facilitate folding of the parts as seen in Fig. 3. A folding knee brace 60 connects each leg 52 with the adjacent arm 56 and holds the leg rigidly at right angles to the arm in unfolded position.

The pivotal connection 18 between the crossed legs is preferably in the form of a rod 62 which extends through both pairs of legs and also supports both sets of arms 56 for the benches. As shown in detail in Fig. 9 and Fig. 9a, this rod carries a pair of sleeves 64 and 66 between which a toggle device is mounted on the rod by sleeve portions 68, 68 to which the links 70 and 72 of the toggle are respectively pivoted. Said links are connected together by a pivot 74 and the extended end portion of the link 72 has a thumb piece 76 by which the toggle may be actuated. When positioned as shown in Fig. 9a and in full lines in Fig. 9, the toggle device exerts pressure endwise against the sleeves 64 and 66 which transmit said pressure through washers 78 and springs 80 to the assembly of legs 14 and 16 and the arms 56 at each end of the table, forcing said assemblies against the head 82 and the nut 84 at opposite ends of the rod 62 respectively. This provides a friction lock which holds said legs and arms flatly against each other when the table and benches are set up in Fig. 1, and thus contributes to the stability of the outfit. When the parts are in folded position, as shown in Fig. 3, the friction lock tends to retain them in that position and the rod 62 serves as a convenient carrying handle. Whenever the parts are to be folded or unfolded, the friction clamp is readily released by swinging the member 72 to the position shown in dotted lines in Fig. 9. To maintain parallel relation of the arms 56 and accommodate each pair of arms together with the legs 52, spacers 86 are carried on the rod 62 as seen in Fig. 3.

The slots 58 of the arms 56 permit the bench seats 50 to be positioned at convenient distances from the edges 10a and 10b of the table top or to be shifted to positions under the table where they may serve as shelves for temporary storage, if desired. This adapts the structure to be used, for example, in the kitchen as a general

utility table between meals, and as a dining table at mealtime, if desired.

When the table is to be folded, the friction clamp is released by swinging the toggle lever 72 to the position shown in dotted lines of Fig. 9. The knee braces 60 are then buckled to permit swinging the legs 52 into alignment with the arms 56 and the friction in the joints of the braces 60 will be sufficient to retain the legs in these positions. The slotted arms 56 are slid inwardly on the pivot rod 62 far enough to permit the seat members 50 to be swung down into positions in which they lie against the inclined legs 14 and 16, as indicated in dotted outline at 50a in Fig. 1. The friction clamp is then tightened. The crossed legs 14 and 16 are swung into alignment, releasing the tie member from the hook shaped abutments 22. A person standing adjacent to the edge 10b of the top 10 may control the movement of the top by grasping its ends with his two hands and as the edge 10a swings downwardly about the pivots 24, he will extend one finger of each hand for releasing the latches 30, thus allowing the table top to drop into the position shown in Fig. 5 with its edge 10a engaging the upper edge of one of the bench seats 50. The other bench seat will occupy a position directly opposite the first seat as shown in Fig. 4. Preferably the cleats 12, legs 14 and 16, the legs 52 and the arms 56 are all made of similar stock, that is of like cross section, so that these parts are all of the same width and when nested in folded position, as shown in Figs. 3 and 4, they form a package having a total thickness composed of the width of one of these pieces, such as the width of the cleat 12, plus the thickness of the table top, and the thickness of one bench seat 50. The other bench seat 50 lies in the same plane as the table top 10, as clearly shown in Fig. 4. The area of the package consists of the area of the tabletop 10 plus the area of one seat 50, as seen in Fig. 5. To enable the bench legs 52 to nest properly, one of the tie members 54 is mortised into the legs as seen at the left-hand side of Fig. 1, while the other tie member 54 is lapped on to the inner edges of the legs.

In the form illustrated herein, it may be assumed that the table top 10 is about 24 in. wide by 36 in. long, the benches being about 8 in. by 36 in. When folded as shown in Fig. 5, this forms a package about 32 in. high and 36 in. long with a maximum thickness of about three inches between the outer faces of the parts 50, 50, as seen in Fig. 4. When unfolded and set up as shown in Fig. 1, the table stands about 28 in. high. Preferably the table top, benches, legs, etc., are made of wood which makes the structure relatively light and strong, and can be easily fabricated by ordinary shop processes. However, it may be understood that the entire construction may be made of metal or other material, if preferred, and that the details of construction may be varied in accordance with the judgment of the designer or for convenience in manufacture. Accordingly, while there is shown and described herein certain structure embodying the invention and illustrative hereof, it is to be understood that the invention is not limited thereto or thereby but includes all modifications, variations and equivalents which may come within the scope of the appended claims.

I claim:

1. In a folding table and seat structure, a table top, a pair of legs and pivots connecting their

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upper ends to said top near opposite ends thereof, a second pair of legs, respectively crossing the legs of the first pair and pivoted to them, a tie member connecting the upper ends of said second pair, abutment means on the under side of the table top and located at a substantial distance inwardly from one edge of said top to engage said tie member when the table is set up, guide means on the under side of the top in which the pivots of the first pair of legs are movable from positions closely adjacent the opposite edge of the top to positions at a substantial distance inwardly from said edge, means to retain said pivots at the latter positions, a pair of benches adapted to be disposed at opposite sides of the table when the structure is set up, each bench comprising a seat extending parallel to one edge of the table, foldable legs attached to said seat, and a pair of arms extending rigidly from said seat and engaged with the pivotal means by which the crossed legs are connected, said arms having longitudinal slots whereby the arms are pivotally and slidably engaged with said pivotal means by which the table legs are connected, said slots being dimensioned to permit the arms and the seat to be swung and shifted to a position in which the arms are aligned with one pair of table legs and the seat is disposed within the length of said legs, one pair of legs being foldable about said pivotal means and into alignment with the other legs, and all the folded arms and legs being collapsible against the under side of the table top, said guide means permitting the collapsed legs to be shifted relative to the table top so that one of the seats is disposed in the same plane as said top and with one edge of the seat abutting one edge of the top.

2. In combination, a table comprising a top, a pair of legs having their upper ends pivotally connected to said top near opposite ends thereof, a second pair of legs respectively crossing the legs of the first pair intermediate their ends, pivotal means connecting one leg of each pair to one leg of the other pair, a tie member connecting the upper ends of said second pair of legs, abutment means on the under side of the table top to engage said tie member when the table is set up, and a pair of benches adapted to be disposed at opposite sides of the table when the structure is set up, each bench comprising a seat extending parallel to one edge of the table, foldable legs attached to said seat, and a pair of arms extending rigidly from said seat and engaged with the pivotal means by which the crossed legs are connected, the legs and arms of one bench being spaced inwardly from the adjacent ends of the seat by greater distances than the legs and arms of the other bench so that in their collapsed position the first mentioned legs and arms are disposed between those of the other bench.

3. In combination, a table comprising a top, a pair of legs having their upper ends pivotally connected to said top near opposite ends thereof, a second pair of legs respectively crossing the legs of the first pair intermediate their ends, pivotal means connecting one leg of each pair to one leg of the other pair, a tie member connecting the upper ends of said second pair of legs, abutment means on the under side of the table top to engage said tie member when the table is set up, and a bench comprising a seat extending parallel to one edge of the table top, foldable legs attached to said seat and a pair of arms extending rigidly from said seat and engaged with the pivotal means by which the crossed legs are con-

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nected, said arms having longitudinal slots whereby the arms are pivotally and slidably engaged with said pivotal means by which the table legs are connected, said slots being dimensioned to permit the arms and the seat to be swung and shifted to a position in which the arms are aligned with one pair of table legs and the seat is disposed within the length of said legs in preparation for collapsing the entire structure into compact folded form.

4. In combination, a table comprising a top, a pair of legs having their upper ends pivotally connected to said top near opposite ends thereof, a second pair of legs respectively crossing the legs of the first pair intermediate their ends, pivotal means connecting one leg of each pair to one leg of the other pair, a tie member connecting the upper ends of said second pair of legs, abutment means on the under side of the table top to engage said tie member when the table is set up, and a bench comprising a seat extending parallel to one edge of the table top, foldable legs attached to said seat and a pair of arms extending rigidly from said seat and engaged with the pivotal means by which the crossed legs are connected, said arms having longitudinal slots whereby the arms are pivotally and slidably engaged with said pivotal means by which the table legs are connected, said slots being dimensioned to permit the arms and the seat to be swung and shifted to a position in which the arms are aligned with one pair of table legs and the seat is disposed within the length of said legs, one pair of legs being foldable about said pivotal means and into alignment with the other legs and all the folded arms and legs being collapsible against the under side of the table top.

5. In combination, a table comprising a top, a cross-leg supporting structure for said top including a first and second pair of legs, a pivot and slot connection securing the upper end of said first pair of legs to said top for linear movement from an operative position inwardly of one edge of said top to a position adjacent said edge and for pivotal movement to a collapsed position in superposed relation with respect to said top, means securing said second pair of legs to said first pair of legs for pivotal movement between an operative position and a collapsed position in substantially coextensive relation with the collapsed first pair of legs, co-operating means on said table top and second pair of legs for locking the same in operative crossed relation with the first mentioned pair of legs, and a bench including a seat, collapsible supporting legs for said seat, and arms co-operating with said collapsible legs to hold said seat in operative position, said bench legs and arms being movable to a collapsed position in superposed relation to said top and in side-by-side relation with the collapsed leg structure.

6. In combination, a table comprising a top, a cross-leg supporting structure for said top including a first and second pair of legs, anchor means for said first pair of legs having a slot extending transversely of said top, pivot means extending into said slot and securing the upper end of said first pair of legs to said top for linear movement between an operative position inwardly of one edge of said top and a position adjacent said edge and for pivotal movement to a collapsed position in superposed relation with respect to said top, means securing said second pair of legs to said first pair of legs for pivotal movement between an operative position and a

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collapsed position, co-operating means on said table top and second pair of legs for locking the same in operative crossed relation with the first mentioned pair of legs, and a bench including a seat, collapsible supporting legs for said seat, and arms pivotally connected to said legs to hold said seat in operative position, said bench legs and arms being movable to a collapsed position in superposed relation to said top and in side-by-side relation with the collapsed leg structure.

7. In combination, a table comprising a top, a cross-leg supporting structure for said top including a first and second pair of legs, anchor means for said first pair of legs having a slot extending transversely of said top, pivot means extending into said slot and securing the upper end of said first pair of legs to said top for linear movement between an operative position inwardly of one edge of said top and a position adjacent said edge and for pivotal movement to a collapsed position in superposed relation with respect to said top, means for locking said pivot means at either end of said slot, means securing said second pair of legs to said first pair of legs for pivotal movement between an operative position and a collapsed position, co-operating means on said table top and second pair of legs for locking the same in operative crossed relation with the first mentioned pair of legs, and a bench including a seat, collapsible supporting legs for said seat, and arms pivotally connected to said legs to hold said seat in operative position, said bench legs and arms being movable to a collapsed position in superposed relation to said top and in side-by-side relation with the collapsed leg structure.

8. In combination, a table comprising a top, a cross-leg supporting structure for said top including a first and second pair of legs, means for permanently securing the upper end of said first pair of legs to said top for movement between an operative position and a collapsed position in superposed relation with respect to said top, means securing said second pair of legs to said first pair of legs for pivotal movement between an operative position and a collapsed position, co-operating means for locking the second pair of legs in operative crossed relation with the first mentioned pair of legs including a tie member connecting said pair of legs adjacent their upper ends and generally hook-shaped abutment means on the under side of said table top opening inwardly with respect thereto and having a body adapted to receive said tie member including a free end extending around the lower side of said tie member when the second pair of legs is in operative position for locking the same in said position when the table is standing on its legs and when it is lifted by its top, and a bench including a seat, collapsible supporting legs for said seat, and arms pivotally connected to said legs to hold said seat in operative position, said bench legs and arms being movable to a collapsed position in superposed relation to said top and in side-by-side relation with the collapsed leg structure.

9. In combination, a table comprising a top, a cross-leg supporting structure for said top including a first and second pair of legs, means for securing the upper end of said first pair of legs to said top for movement between an operative position and a collapsed position in superposed relation with respect to said top, pivot

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means securing said second pair of legs to said first pair of legs for pivotal movement between an operative position and a collapsed position in substantially coextensive relation with the collapsed first pair of legs, co-operating means on said table top and second pair of legs for locking the same in operative crossed relation with the first mentioned pair of legs, and a bench including a seat, collapsible supporting legs for said seat, and arms co-operating with said collapsible legs to hold said seat in operative position, said arms each having a longitudinally extending slot adapted to be slidably received upon said pivot means to permit adjustment of the bench by lateral movement thereof between a position in which it is disposed outwardly of the edge of said table and a position in which said bench is disposed inwardly of the edge of the table.

10. In combination, a table comprising a top, a cross-leg supporting structure for said top including a first and second pair of legs, means securing the upper end of said first pair of legs to said top for movement between an operative position inwardly of one edge of said top and a position adjacent said edge and for pivotal movement to a collapsed position in superposed relation with respect to said top, a tie rod securing said second pair of legs to said first pair of legs for pivotal movement between an operative position and a collapsed position in substantially coextensive relation with the collapsed first pair of legs, co-operating means on said table top and second pair of legs for locking the same in operative crossed relation with the first mentioned pair of legs, a bench including a seat, collapsible supporting legs for said seat, and arms co-operating with said collapsible legs to hold said seat in operative position, said arms being mounted adjacent their inner ends upon said tie rod adapting the bench for movement between an operative position and a collapsed position in superposed relation to said top, and means on said tie rod for locking said legs and bench structure in operative or collapsed position including a pair of sleeves, toggle means connected to adjacent ends of said sleeves operable simultaneously to force the sleeves in opposite directions for clamping said arms and legs against the ends of said tie rod, and resilient means between the ends of said sleeves and said leg and arm structure.

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