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3,099,480

HINGE MEANS FOR FOLDING TABLE AND SEAT STRUCTURE

Filed April 5, 1961

3 Sheets-Sheet 1

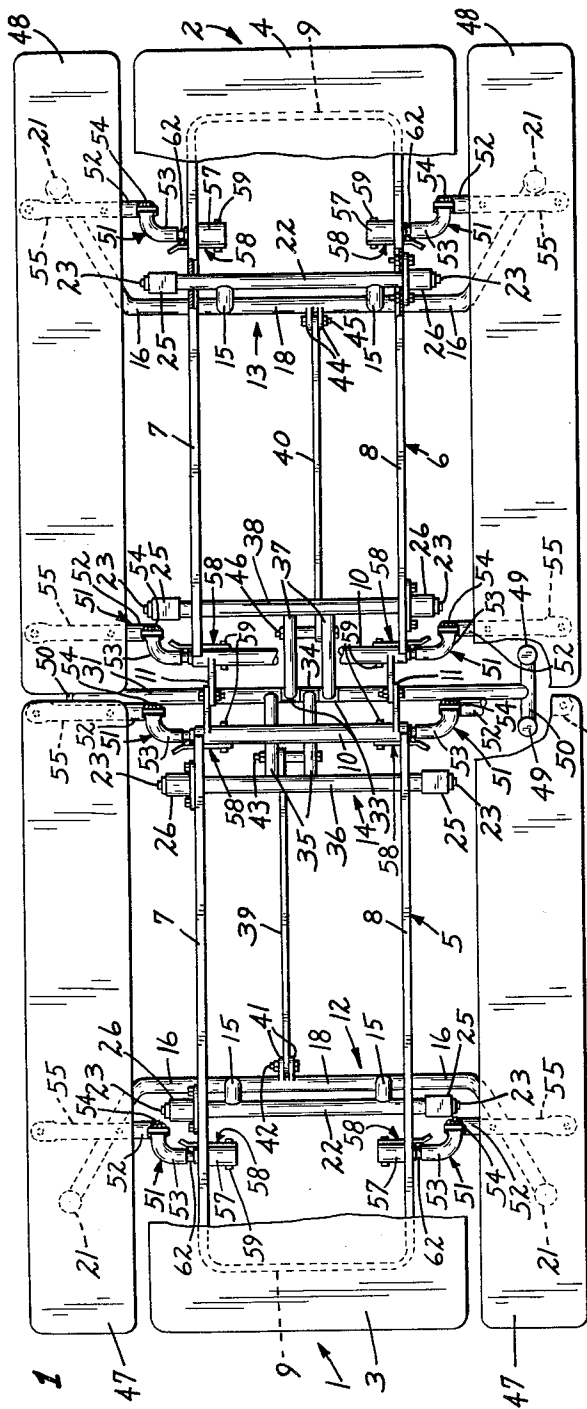


Fig. 1

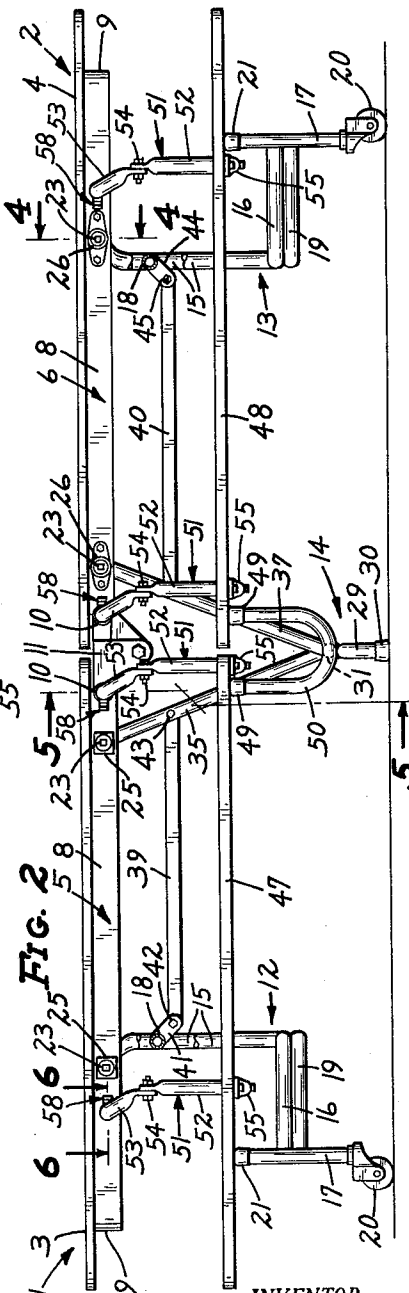


Fig. 2

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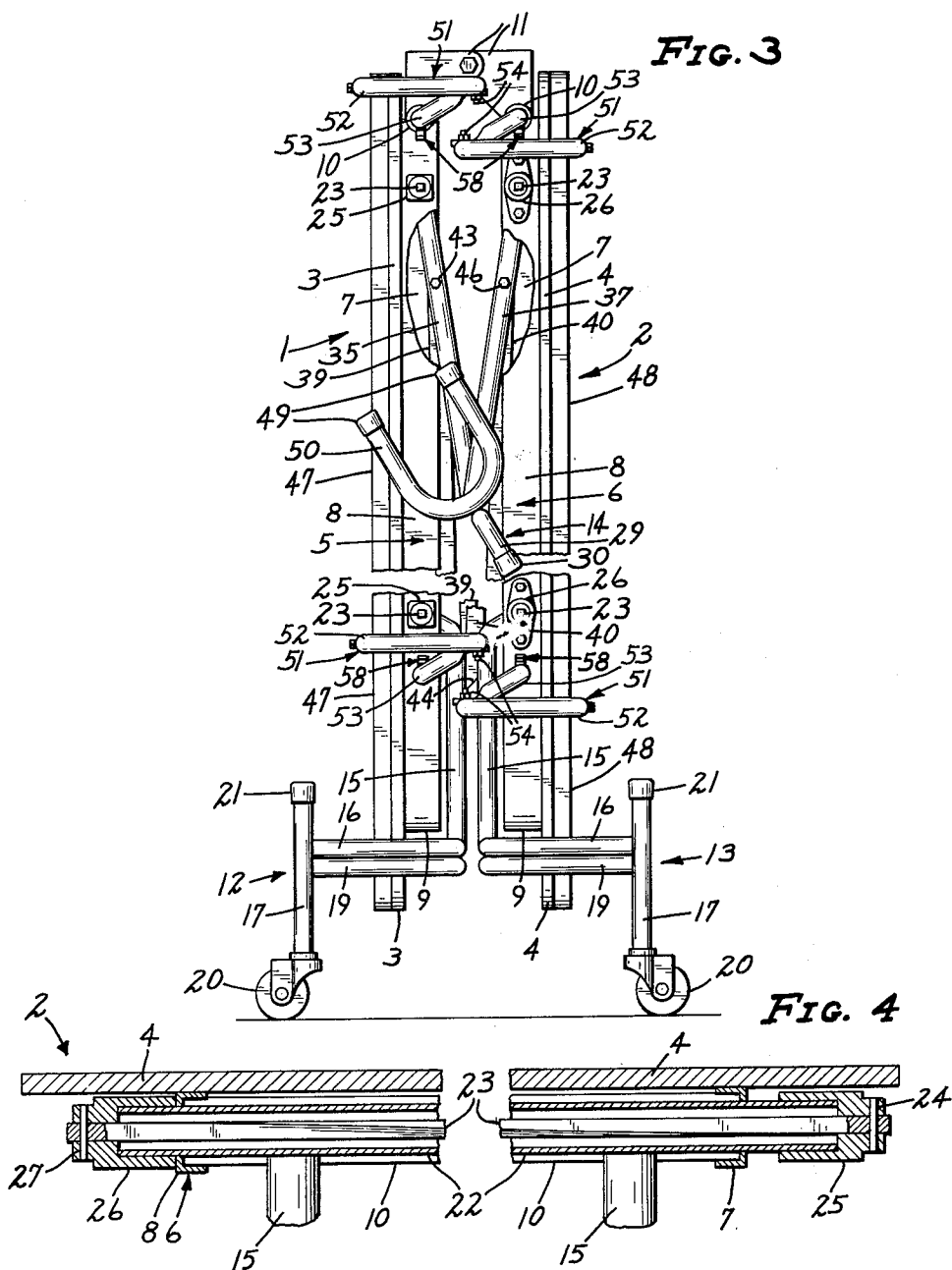
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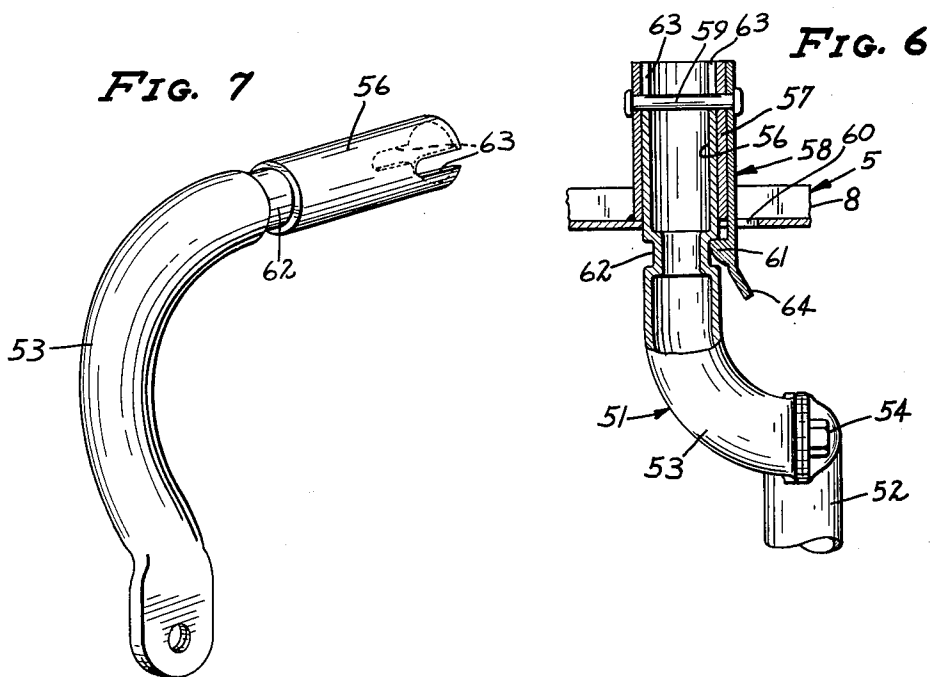
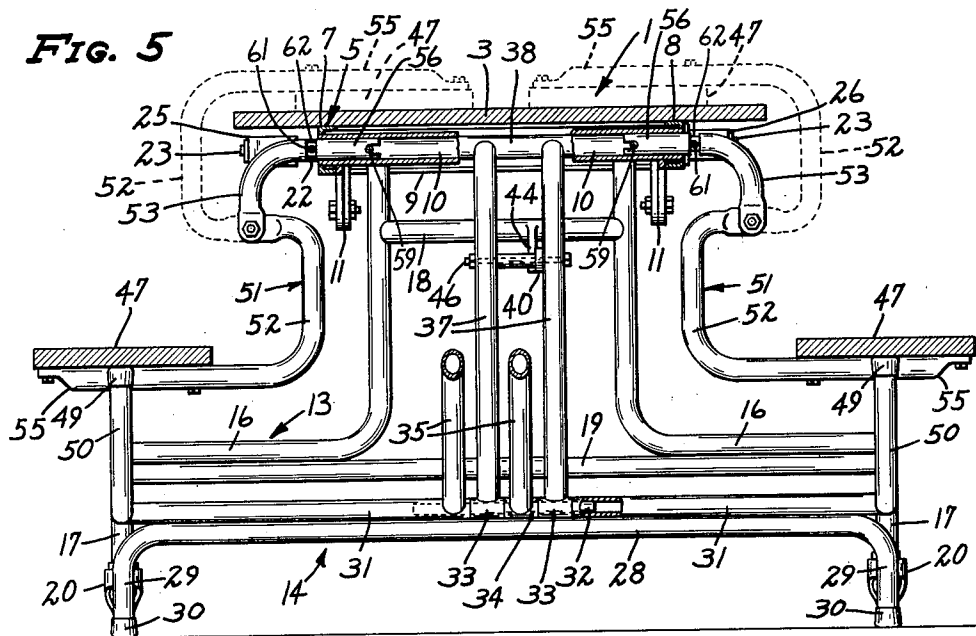
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3 Sheets-Sheet 3



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HINGE MEANS FOR FOLDING TABLE AND SEAT STRUCTURE

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2 Claims. (Cl. 297-159)

My invention relates generally to table and seat structures, and more particularly to improvements in the construction of folding table and seat structures.

More specifically, my present invention is in the nature of an improvement on table and seat structures generally of the type disclosed in my United States Letters Patents 2,702,585, issued February 22, 1955, and 2,721,778, issued October 25, 1955.

In large multi-purpose rooms which are utilized at various times as dining rooms, meeting halls, dancing areas and the like, it is desirable that multi-purpose furniture be used. Such furniture normally includes tables, chairs, benches and the like, or table and seat combinations. Such furniture is preferably of the folding type, so as to be stored in a minimum of space. In instances where, in a given room, floor space must be conserved, table and bench combinations are most desirable inasmuch as they utilize the available space most efficiently, such as for dining purposes or the like. However, when the same room is to be occupied by a relatively small group of people, it is sometimes desired that the tables be equipped with chairs having backs thereon, for greater seating comfort.

An important object of my invention is the provision of a table and seat structure in which the seat structure is secured to the table structure for folding movements relative to the table structure, and having novel means whereby the seat structure may be quickly and easily removed completely from the table structure and as quickly and easily secured thereto.

Another object of my invention is the provision of novel means for releasably locking a seat element to a table structure, and which permits free movement of the seat element between an operative position at one side of the table structure and an inoperative folded position laterally inwardly disposed with respect to said operative position of the seat element.

Another object of my invention is the provision of a hinge mounting and locking means for releasably and foldably mounting a seat structure to a table structure, which means is relatively simple and inexpensive to produce, which is highly efficient in operation, and which is rugged in construction and durable in use.

The above, and still further highly important objects and advantages of my invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings, which illustrate the invention, and in which like reference characters indicate like parts throughout the several views:

FIG. 1 is a view in plan of a folding table and seat structure, made in accordance with my invention, some parts being broken away;

FIG. 2 is a view in side elevation;

FIG. 3 is an enlarged view corresponding to FIG. 2, but showing the table and seat structure in a folded position;

FIG. 4 is an enlarged fragmentary section taken on the line 4-4 of FIG. 2;

FIG. 5 is an enlarged transverse section taken substantially on the line 5-5 of FIG. 2;

FIG. 6 is a still further enlarged fragmentary section taken substantially on the line 6-6 of FIG. 2; and

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FIG. 7 is a view in perspective of one of the hinge elements of my invention.

Referring with greater detail to the drawings, table top means is shown as comprising a pair of normally horizontally disposed top sections 1 and 2 in substantially end-to-end relationship, the top sections each comprising flat top elements 3 and 4 respectively and underlying generally rectangular frames 5 and 6 respectively. The frames 5 and 6 are preferably made from cross sectionally channel shaped metallic members bent into generally U-shape to provide side rails 7 and 8 and outer end rail portions 9. The inner ends of the frames 5 and 6 comprise tubular members 10 that extend transversely of their overlying top elements 3 and 4, and which are welded or otherwise rigidly secured at their opposite ends to the adjacent ends of their respective side rail portions 7 and 8. The top sections 1 and 2 are pivotally secured together at their inner end portions by hinges 11 that are welded or otherwise rigidly secured to the tubular members 10, for swinging movements of the top sections 1 and 2 between their horizontally disposed operative position of FIG. 2 and their generally vertically disposed folded positions of FIG. 3. The top elements 3 and 4 are rigidly secured to their respective frames 5 and 6, by any suitable means not shown.

The top sections 1 and 2 are supported adjacent their outer ends by outer leg structures 12 and 13 respectively, and adjacent their inner ends by common inner leg structure, indicated generally by the numeral 14. The outer leg structures 12 and 13 each comprise laterally spaced generally vertically disposed upper leg sections 15 disposed laterally inwardly of the vertical planes of the longitudinal side edges of their respective top elements 3 and 4, transversely extending horizontally disposed sections 16, and vertically disposed lower leg sections 17 positioned laterally outwardly with respect to the vertical planes of the longitudinal side edges of their respective top elements 3 and 4, see particularly FIG. 5. The upper leg sections 15 are joined intermediate their ends by upper cross bars 18, and the horizontally disposed portions 16 and lower leg sections 17 of each leg structure 12 and 13 are joined by horizontally disposed lower cross bars or the like 19, the cross bars 18 and 19 being rigidly connected to their respective leg sections and portions by suitable means, such as welding or the like. The lower ends of the lower leg sections 17 are provided with ground or floor engaging caster wheels 20, the upper ends of said leg sections 17 being provided with rubber-like caps or tips 21 for a purpose which will hereinafter become apparent.

The upper ends of the upper leg sections 15 are welded or otherwise rigidly secured to tubular housings 22 that extend transversely of and are journaled at their opposite end portions in the side rail portions 7 and 8 of the frames 5 and 6. Each of the housings 22 has axially extending therethrough a torsion bar 23, see FIG. 4, that is pinned, as indicated at 24, or otherwise rigidly secured to an end cap 25 welded or otherwise rigidly secured to the adjacent end of the tubular housing 22. The opposite end of the tubular housing 22 is journaled in a bearing 26 that is bolted or otherwise rigidly secured to the adjacent side rail portion of a respective one of the frames 5 and 6, the adjacent end of the torsion bar 23 being anchored to the bearing 26 by a pin or the like 27.

The inner leg structure 14 comprises an inverted generally U-shaped member including a transverse horizontal portion 28 and depending leg portions 29 which terminate at their lower ends in floor engaging tips or the like 30. A pair of axially aligned tubular cross bars 31 are welded or otherwise rigidly secured to the horizontal portion 28 and are joined by a shaft 32 on which are journaled a pair of axially spaced tubular end members 33

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and a third tubular end member 34 intermediate the end members 33. A pair of laterally spaced upper leg sections 35 have their lower ends each welded or otherwise rigidly secured, one to the tubular end member 34 and the other to one of the cross members 31, and extend angularly upwardly and longitudinally outwardly therefrom, the upper ends of the upper leg sections 35 being rigidly secured to the intermediate portion of a tubular housing 36 that is identical to the tubular housings 22. The tubular end members 33 are welded or otherwise rigidly secured to the lower ends of a pair of laterally spaced parallel upper leg sections 37 which extend angularly upwardly in diverging relationship to the upper leg sections 35, and which are rigidly secured at their upper ends to a second tubular housing 38. With reference particularly to FIG. 1, it will be seen that the tubular housing 36 is journaled in the side rail portions 7 and 8 of the frame 5 adjacent its inner ends, and that the tubular housing 38 is journaled in the side rail portions 7 and 8 of the frame 6 adjacent its inner end. Like the tubular housings 22, the housings 36 and 38 are provided with torsion bars 23, end caps 25, and bearings 26.

The torsion bars 23 associated with the top section 1 are disposed to yieldingly urge the outer leg structure 12 and the upper leg sections 35 of the inner leg structure 14 in a clockwise direction of pivotal movement with respect to FIG. 2, while the torsion bars 23 associated with the top section 2 are disposed to yieldingly urge the outer leg structure 13 and upper leg sections 37 of the inner leg structure 14 in a counterclockwise direction of rotation with respect to FIG. 2, whereby to yieldingly urge the top sections 1 and 2 in a direction of swinging movement relative to the leg structure toward their folded positions of FIG. 3. For the purpose of maintaining the outer leg structures 12 and 13 in a substantially vertical position during all positions of movement of the top sections 1 and 2 between their horizontal and vertical positions, I provide rigid control links 39 and 40, the former of which is pivotally connected to a pair of ears 41 attached to the upper cross bar 18 of the leg structure 12, and as indicated at 42, and at its other end to a cross shaft 43 extending transversely between the leg sections 35, see FIGS. 1 and 2. The control link 40 is likewise pivotally connected at one end between a pair of ears 44 rigidly connected to the upper leg sections 15 of the leg structure 13, and as indicated at 45, and at its other end to a cross shaft 46 extending transversely between the leg sections 37. With this arrangement, the top sections 1 and 2 together with their respective upper leg sections 15, 35 and 37, and their respective control links 39 and 40, provide a parallelogram arrangement which maintains the outer leg structures 12 and 13 vertically disposed when the top sections 1 and 2 are vertically positioned as shown in FIG. 3, as well as when the same are horizontally positioned as shown in FIG. 2.

A pair of elongated seat or bench elements 47 are normally horizontally disposed adjacent opposite longitudinal side edges of the top element 3 and below the level thereof, and a second pair of longitudinally extending normally horizontally disposed seat or bench elements 48 are disposed each adjacent an opposite longitudinal side edge of the top element 4 and at a common level with the seat or bench elements 47. The outer end portions of the seat elements 47 and 48 are adapted to rest upon the cushion tips 21 of the leg structure 12 and 13 respectively, the inner end portions of the seat elements 47 and 48 being adapted to rest upon similar cushions or tips 49 mounted on opposite ends of a pair of U-shaped supporting members 50 that are welded or otherwise rigidly secured to the outer ends of the cross members 31. The seat elements 47 and 48 are each pivotally connected to the table by a pair of hinges, said hinges being designated in their entirety by the numeral 51, each of the hinges 51 comprising cooperating hinge elements 52 and 53 pivotally connected together as indicated at 54. Each

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of the hinge elements 52 includes an extension portion 55 which underlies an end portion of an adjacent seat element 47 or 48 and which is bolted or otherwise rigidly secured thereto. With reference particularly to FIGS. 1 and 2, it will be seen that some of the hinges 51 are disposed adjacent the inner ends of the top sections 1 and 2, the hinge elements 53 thereof having extension portions 56 that are axially slidably movable into the open end portions of the adjacent tubular members 10. Adjacent their outer ends, the frames 5 and 6 of the top sections 1 and 2 are provided with relatively short tubular members 57 which define recesses for axial sliding reception of the extension portions 56 of adjacent hinge elements 53, see particularly FIGS. 1 and 6. With reference to FIG. 5, it will be seen that the hinges 51 mount the seat elements 47 and 48 for swinging movements of said seat elements between operative positions at opposite side of and below the level of the top elements 3 and 4, wherein the seat elements rest upon the tips or cushions 21 and 49, and inoperative folded positions wherein the seat elements 47 and 48 are disposed in overlying face to face relation with their respective top elements 3 and 4, as indicated by dotted lines in FIG. 5.

For the purpose of releasably locking the hinge elements 53 against removal of their extension portions 56 from the tubular members 10 and 57, I provide a plurality of latch members 58, preferably made from flexible resilient material such as spring steel or the like, each of the latch members 58 being secured at their inner ends to one of the tubular members 10 and 57 by means of rivets or the like 59 extending diametrically through the members 10 and 57. As shown in FIG. 6, the latch members 58 extend longitudinally alongside their respective tubular members and outwardly through openings 60 in the adjacent side rail portions of the frames 5 and 6, the latch members 58 being provided at their outer end portions with hook or detent portions 61 that are received in strike forming annular grooves 62 in the extended portions 56 of the hinge element 53. The extension portions 56 are formed to provide diametrically opposed axially outwardly opening slots 63 which receive the rivets 59 of their adjacent tubular members 10 and 57 whereby to limit inward movement of the extension portions 56 into the recesses defined by the tubular members 10 and 57, and to prevent rotary movement of the hinge elements 53 relative to the top sections 1 and 2 associated therewith. The ends of the latch elements 58 adjacent the latch hook or detent portions 61 are out-turned, as indicated at 64, to facilitate grasping thereof to release the latch hook or detent portion 61 from the strike forming groove 62.

In instances where it is desirable that the above described table be used without the seat elements 47 and 48, such as when it is desired that individual backrest equipped chairs be used in connection with the table, it is a simple matter to remove the seat elements 47 and 48, with their respective hinges 51 from the table. The latch elements 58 are merely bent outwardly to disengage the detent or latch hook portions 61 from the strike forming grooves or channels 62, and the hinge elements 63 are pulled axially outwardly from engagement with their respective tubular members 10 and 57. The seat elements 47 and 48 may then be moved to a suitable place for storage, leaving the table free to be used with chairs or in any desired manner.

From the above, it will be seen that I have provided a table and seat combination fully capable of accomplishing the objectives set forth; and, while I have shown and described a preferred embodiment of table and seat structure, it will be understood that the same is capable of modification without departure from the spirit and scope of the invention, as defined in the claims.

What I claim is:

1. In a table and seat structure, normally horizontally disposed table top means, comprising a flat top ele-

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ment and an underlying supporting frame secured to said top element, leg structure secured to said frame and normally depending therefrom, a normally horizontally disposed seat element, a mounting device mounting said seat element to said frame for swinging movements of said seat element on a horizontal axis and between a horizontal disposed operative position at one side of and below the level of said top element and an inverted inoperative storage position in face-to-face engagement with the top surface of said top element, said mounting device comprising a pair of cooperating hinge elements one of which is secured to said seat element, said frame defining a socket immediately below the bottom surface of said top element and inwardly spaced from the adjacent edge of said top element, the other of said hinge elements having an extended portion receivable in said socket, and means for releasably locking said extended portion in said socket.

2. In a table and seat structure, normally horizontally disposed table top means including a frame and a flat top element having its bottom surface resting on and secured to said frame, supporting leg structure for said top means attached to said frame, a normally horizontally disposed seat element, a mounting device mounting said seat element to said top means for swinging movements of said

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seat element between a normally horizontally disposed operative position at one side of and below the level of said top means and an inoperative storage position in laterally inwardly spaced relation to said operative position thereof, said mounting device comprising a pair of cooperating hinge elements one of which is secured to said seat element, said top means and the other of said hinge elements having interengaging portions disposed immediately below the bottom surface of said top element and laterally inwardly spaced from the adjacent edge of said top element, and locking mechanism releasably locking said inter-engaging portions against disengagement thereof.

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