

July 15, 1952

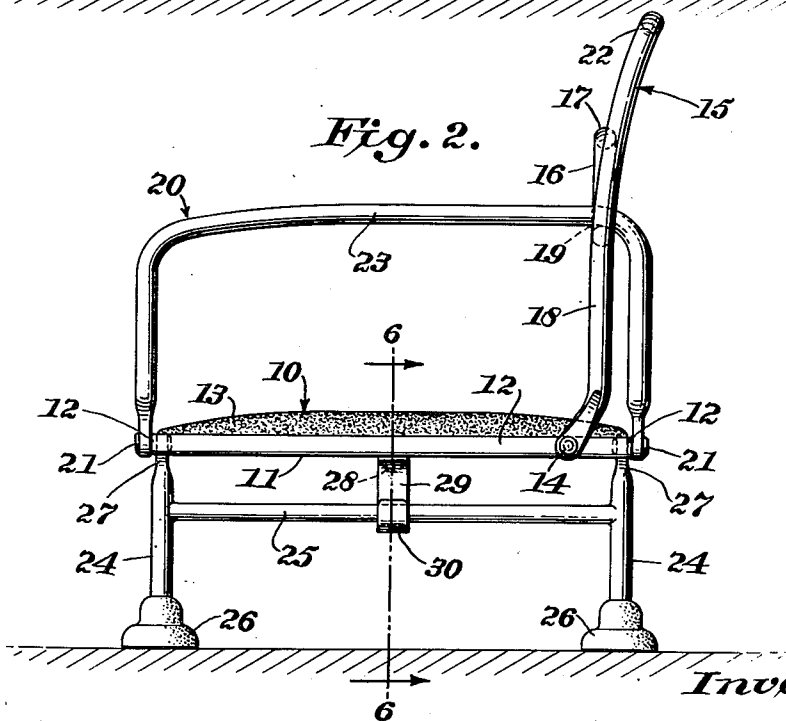
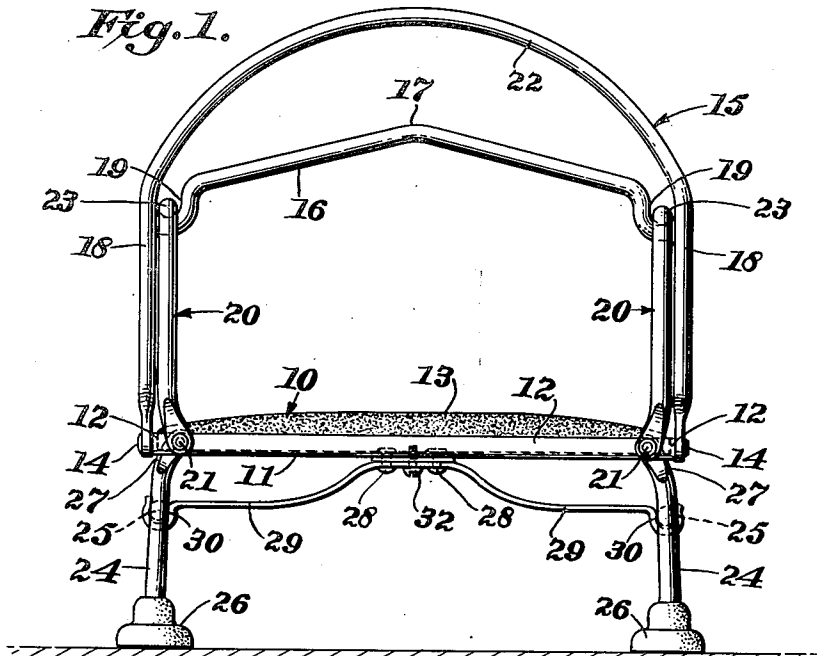
F. H. McCLERNON

2,603,274

FOLDABLE CHAIR

Filed July 23, 1945

4 Sheets-Sheet 1



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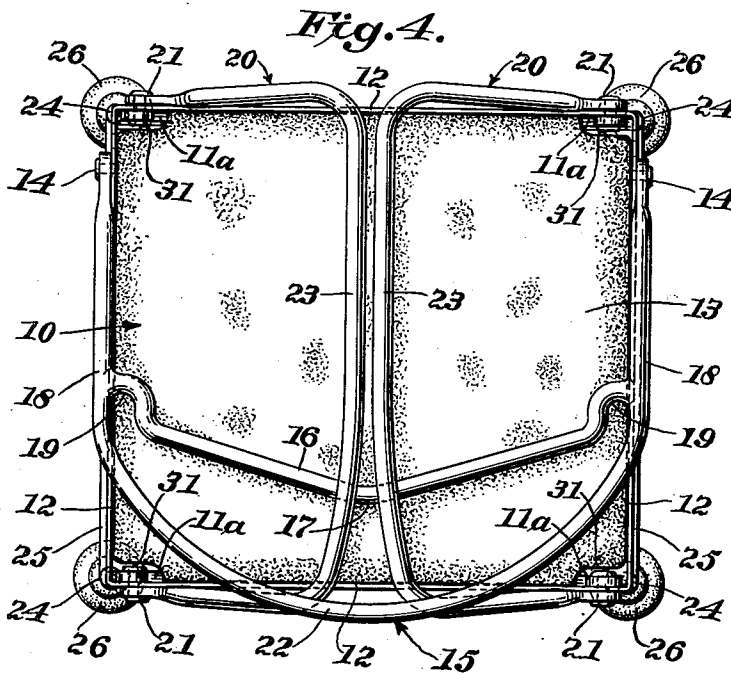
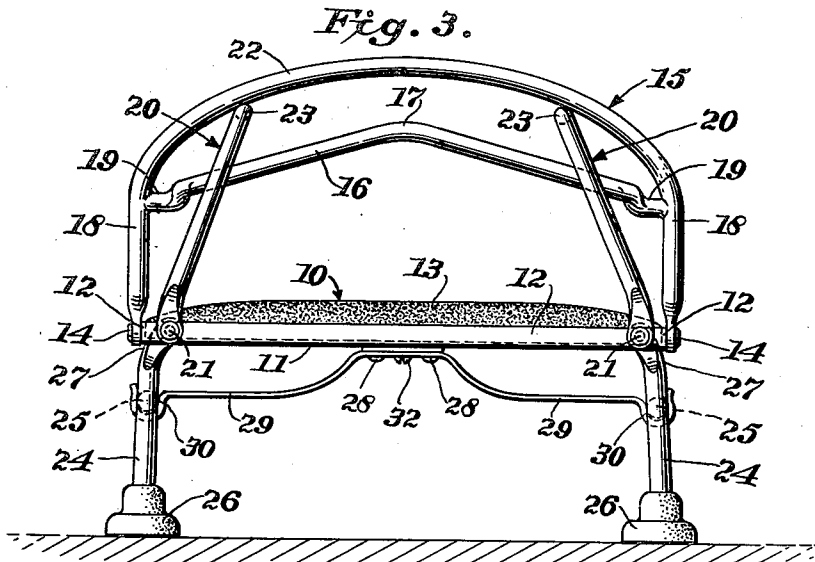
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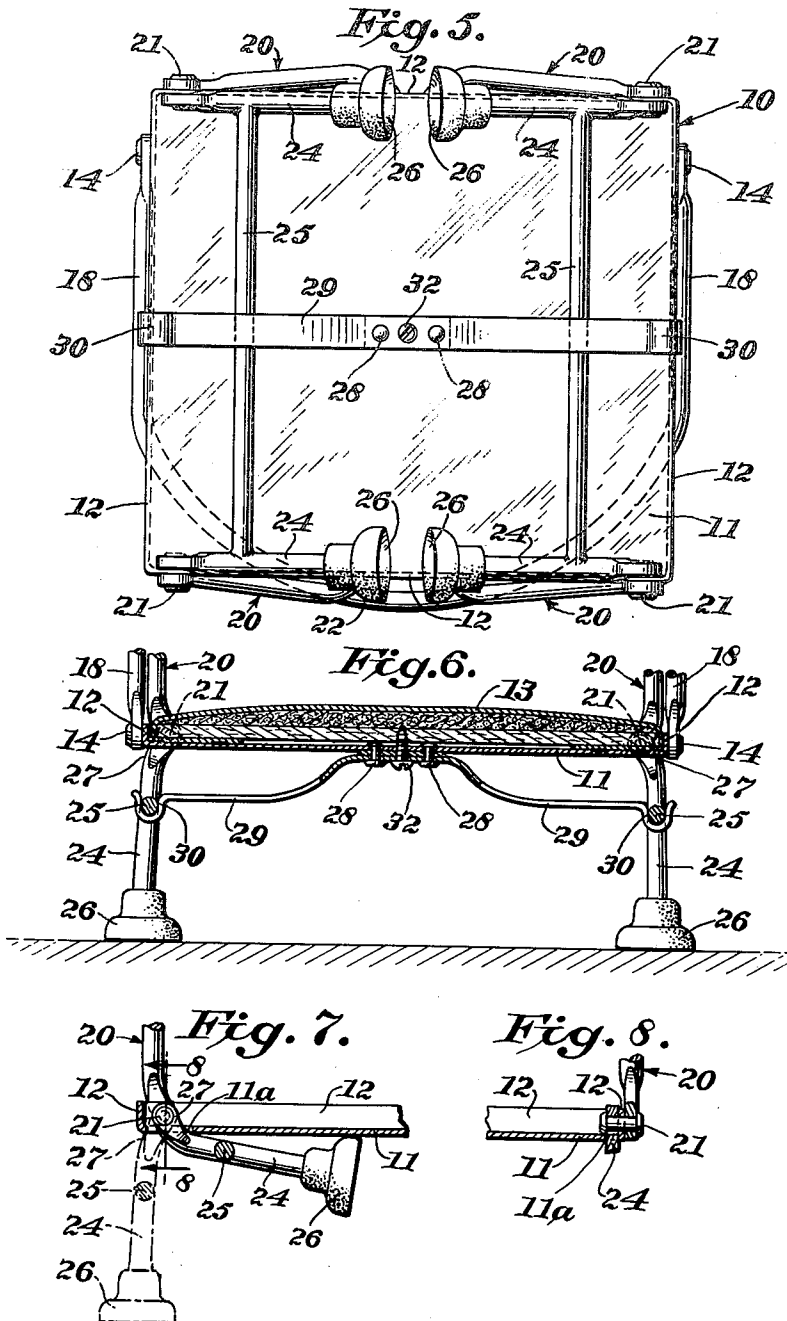
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4 Sheets-Sheet 4

Fig. 9.

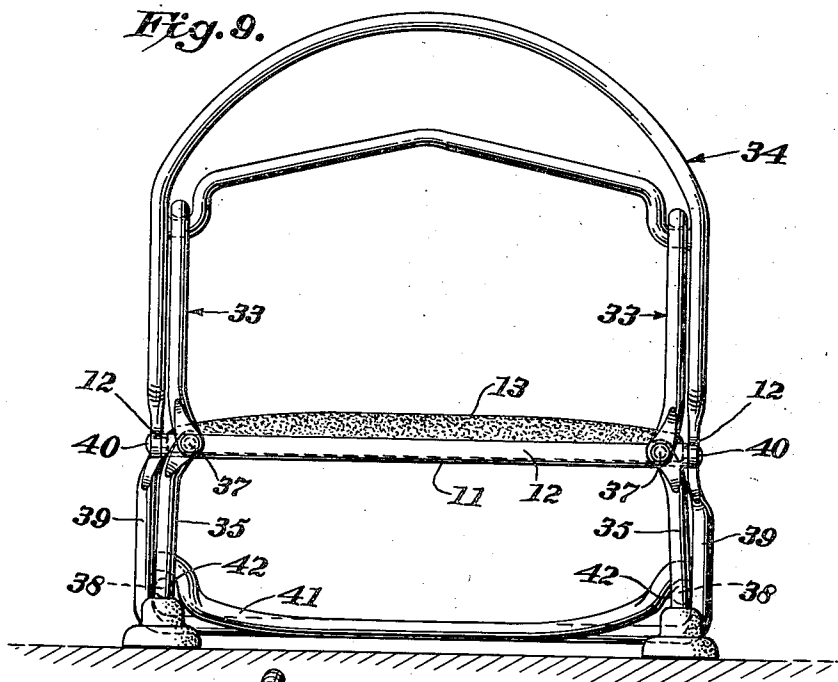


Fig. 10.

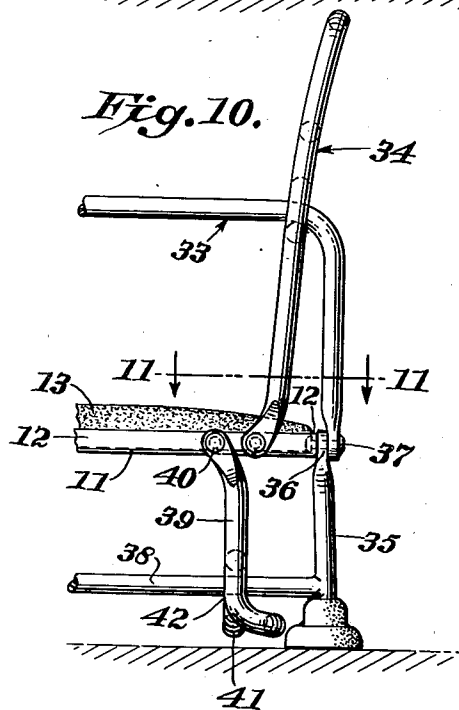
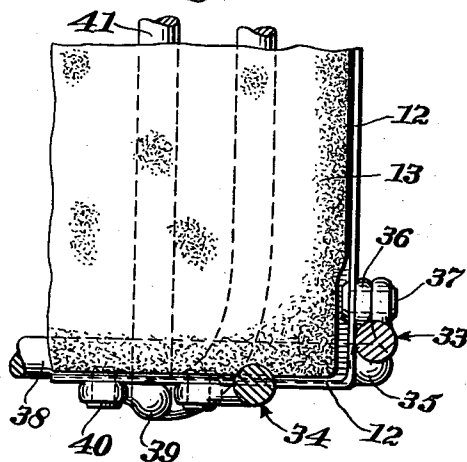


Fig. 11.



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UNITED STATES PATENT OFFICE

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FOLDABLE CHAIR

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13 Claims. (Cl. 155—152)

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This invention has to do with chairs of the folding type. Its purpose is to provide a folding chair having a back rest, side arms, and legs, all of which are foldable against the top and bottom of the seat so as to provide a closely assembled compact relation of the parts which will permit the chair, in folded condition, to be readily packed and transported; but which parts, when unfolded and in extended position, provide a sturdy chair.

The invention contemplates, further, a relation between hinged and foldable members and other pivotally mounted members, such as pivoted arm and leg portions, which, when the hinged members are folded or unfolded will automatically actuate the pivotally mounted arm and leg portions and bring them to folded or unfolded positions.

In the drawings is illustrated one physical embodiment of the invention, and in said drawings:

Figure 1 is a view in front elevation of a chair embodying the improvements, the parts being shown in their unfolded or extended positions.

Figure 2 is a view in side elevation of the chair shown in Fig. 1.

Figure 3 is a view in front elevation showing the back and side arms in partially folded positions.

Figure 4 is a top plan view showing the back and side arms completely folded on the seat.

Figure 5 is a bottom plan view showing the chair legs in completely folded position.

Figure 6 is a cross-sectional view of the chair bottom showing the leg holding means and the seat pad securing means.

Figure 7 is a detail to show the common pivot for side arm and leg units and slotted bottom for leg clearance.

Figure 8 is a detail of the leg and side arm pivot, showing its attachment to the seat flange, on line 8—8 of Fig. 7.

Figure 9 is a view in front elevation showing means for automatically folding, unfolding, and holding in place the side arms and leg members of the chair.

Figure 10 is a view in side elevation of a portion of a chair showing the mounting of the arms and leg actuating members.

Figure 11 is an enlarged plan view on substantially the line 11—11 of Figure 10 of a portion of a chair showing the pivotal mountings of the parts.

Referring to the drawings by numbers, the same numbers designating the same parts in the several views, 10 is the seat portion of the chair

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which may be of any desired design insofar as shape, finish, and the like are concerned. The seat 10 is made up of a main bottom portion 11 having at its edges upturned side and end flanges 12, so as to form a support for a suitable seat pad 13. Further, flanges 12 provide means for pivotally mounting the back, side arms, legs, and leg-actuating means, as will be hereinafter described. Pivotally mounted at suitable points on a side flange 12, is a back portion 15, which back portion 15 may be swung on its pivots 14 to open or closed positions. The make-up of the back may be varied according to the needs or design of the maker, it being essential, however, that it have an upper reach or bar which will be curved for a purpose which will presently be stated, and a transversely disposed bar 16 sloping outwardly from a high center point 17 to the uprights 18 of the back to give substantially a wedge formation. At the point of junction of the ends of the bar 16 with the uprights 18, bar 16 will be provided with abrupt bends or notches 19 to receive the side arms of the chair when the parts are brought to upright position.

The side arms 20 are made up of a top limb and vertical limbs coupled together in any suitable manner to form a rigid structure, being here shown as integral. The vertical limbs of the side arms are pivotally mounted on suitable pivots 21 on the end flanges 12 of the bottom, the pivoted ends of the arms 20 being disposed exteriorly of the flanges 12 so as to leave the interior of the flanged bottom unobstructed for the introduction of the seat pad 13, and, further, as will presently appear, to permit the mounting of the chair legs on the same pivots 21 that are used to pivotally support the side arms 20. The ends of the upright bars of the side arms 20 are slightly offset by curving them, so that they may be engaged with the pivots 21 and yet, when in unfolded, open position, be offset slightly so as to be in line with the margin of the seat 10 and provide full seat width.

The top bars of the side arms 20 engage the bar 16 of the back 15, and when the back is swung to open position, ride down the inclined portions of the bar from its high center point 17 until they drop into the abrupt bends or notches 19, where they will be held against accidental displacement, and a rigid back and side arm set-up provided. The back 15 will be inclined rearwardly past the perpendicular, in its open position, so that even if folding pressure were exerted on the side arms 20, the position of the parts is such that they will resist folding

action until the back 15 is thrown forwardly past the perpendicular.

When the back 15 is moved from its open toward its closed position the curved upper reach or bar 22 will engage the horizontal upper bars 23 of the side arms 20 as they leave the bends or notches 19 and carry them to folded position against the seat. The overall length of the back 15 will preferably be such that it will not extend, when folded, substantially beyond the margin or boundary of the seat 10, ensuring a compact, symmetrical folded position.

It will be seen that important features of this arrangement are the curved upper reach or bar 22 of the back 15 to bring about folding of the side arms 20 when the back is folded, and the transverse intermediate bar 16, sloping in opposite directions from its high center 17 to provide a wedging angle, so as to effect unfolding of the side arms when the back is opened.

The folding legs are made up of substantially H-shaped members having two upright leg portions 24 which are connected by a transversely disposed bar or rung 25, so that there is provided a single leg unit for each side of the chair. The floor ends of the leg portions 24 may be provided with any suitable feet, but suction cup feet 26 are preferably provided for the reason that they give stability to a relatively light chair, and more particularly, where a small, child's chair is fashioned, a greater degree of safety from upsetting is secured.

The upper ends of the leg portions 24 are preferably pivoted on the same pivots 21 on which the side arms 20 are mounted, the leg ends extending upwardly, inside of the end flanges 12, through slots 11a in the bottom 11 of seat 10, which slots are extended so as to provide clearance for the leg ends as they swing from open to closed positions, these slots insuring sufficient room for play of the slightly curved ends 27 of the legs. It will be seen that the curved ends 27 of the legs bring them to position to engage pivots 21, and yet offset the legs slightly to bring them to proper position under the outer boundary of the seat 10 for wide support and better stability. By using the same pivots for the side arms and the leg units, the construction, number of parts, and assembly of the parts is simplified and a compact structure developed.

The cross bar or rung 25 not only ties the legs 24 together so as to provide a leg unit which is manipulated as a single member, but also has the further function of acting as a locking bar to hold the leg units in extended position. Secured to the bottom of the seat 10 (see Figs. 1 and 6) in any suitable manner, as by rivets 28, is a spring member 29 having bar-engaging hooked ends 30. When the leg units are moved to extended supporting position the bar 25 will slide out along the spring 29 and snap into the hooked ends 30. The legs will be firmly held in extended position, but can be readily released by springing the ends of member 29 to release the bar or rung 25, and permit the leg unit to be folded against the bottom of the seat. In order to give room for the ends 27 of the legs which engage the pivots 21 on the inside of the flanges 12, the cushion or pad 13 may be reduced or cut away slightly, as at 31, so that no interference with opening or folding movement of the legs will occur. The pad 13 may be secured against accidental displacement by providing a screw 32 which may be inserted through the bottom 11 and engaged with the bottom of the pad.

In Figs. 9 to 11, inclusive, a modified construction is shown. The side arms 33 and back 34 are identical in construction and operation with those heretofore described. The leg portions 35 are pivoted at 36 on a pivot 37 common to the legs and side arms as hereinbefore pointed out. The leg portions 35 are of the same general H-formation shown and described, but the transversely disposed bars or rungs 38 are disposed at a lower level or nearer the feet of the vertical leg members. These bars and rungs 38 are engaged by an actuating member 39 pivoted at 40 on the flange of the chair bottom and having a transverse actuating bar 41 to engage the bars or rungs 38, and fold or unfold them in the same way that the back 34 folds and unfolds the side arms 33, as described hereinbefore and illustrated in the drawings. At its ends where it joins the vertical limbs of the actuating member 39, the transverse bar 41 has notched or offset portions 42 to receive the rungs 38 and hold them against accidental displacement. When brought to extended position by operation of the actuating member 39 the leg portions will be held in place until the member 39 is folded and they are swung to folding position in the same general manner in which the side arms are manipulated by the notched bar on the pivoted back portion, as shown and described. Except for form and design the parts are the same, and the mechanical action in folding and unfolding the side arms and leg portions is practically identical.

By the practice of this invention a compact, serviceable chair construction is provided, which, when set up in its extended position, gives a sturdy, rigid, and safe seat and, when folded, can be conveniently packed and transported.

Mechanical departures from the construction and assembly here specifically shown and described may be made and still fall within the range of the invention as defined in the appended claims.

I claim:

1. A folding chair comprising a seat; a pair of inwardly foldable, pivotally mounted chair arms, attached one at each side of said seat; a single inwardly foldable member pivotally mounted on said seat at right angles to said pair of arms, and arm actuating bars on said single member engaging each of said pair of arms at right angles to move them to and from folded and unfolded positions when said single member is moved to and from its folded and unfolded positions.
2. A folding chair comprising a seat; a pair of inwardly foldable, pivotally mounted chair arms, attached one at each side of said seat each having horizontal bars; a single inwardly foldable member pivotally mounted on said seat at right angles to said pair of arms, and a plurality of arm actuating bars integral with said single member for moving engagement with the horizontal bars of each of said pair of arms to move them to and from folded and unfolded positions when said single member is moved to and from its folded and unfolded positions.
3. A folding chair comprising a seat; a pair of inwardly foldable, pivotally mounted chair arms, attached one at each side of said seat each having horizontal bars; a single inwardly foldable member pivotally mounted on said seat at right angles to said pair of arms, a plurality of arm actuating bars on said single member for moving engagement with the horizontal bars of each of said pair of arms to move them to and from folded and unfolded positions when

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said single member is moved to and from its folded and unfolded positions, one of said bars on said single member having bends at its ends to engage the horizontal bars and hold the pairs of arms in unfolded position.

4. A chair comprising a seat, a back pivotally mounted on said seat, side arms pivotally mounted on said seat, a transverse bar on said back to engage said side arms and fold them from upright to folded position when said back is folded, and a second transverse bar on said back spaced from said first mentioned bar to engage said side bars and raise them when said back is raised.

5. A chair comprising a seat, a back pivotally mounted on said seat, side arms having horizontal and vertical limbs pivotally mounted on said seat, a curved transverse bar on said back to engage the horizontal limbs of said side arms and move them to folded position when said back is folded, and a second transverse wedge-shaped bar on said back spaced from said first named bar to engage said side bars and raise them when said back is raised.

6. A chair comprising a seat, a bottom, side and end flanges extending perpendicularly from said bottom; a back pivotally mounted on said side flanges; side arms pivotally mounted on said end flanges; a transverse bar on said back to engage the said side arms and move them to folded positions when said back is folded, and a second transverse bar on said back spaced from said first named bar to engage said side bars and raise them when said back is raised.

7. A chair comprising a seat, a bottom, side and end flanges extending perpendicularly from said bottom; a back pivotally mounted on said side flanges; side arms pivotally mounted on said end flanges; an upper curved transverse bar on said back to engage the said side arms and fold them on said seat when said back is folded, and a lower wedge-shaped transverse bar on said back spaced from said first named bar to engage said side bars and raise them when said back is raised.

8. A chair comprising a seat having a bottom, side and end flanges extending perpendicularly upward from said bottom to form a pad recess; a back having arms curved at their ends to offset said back relative to said seat pivotally mounted on said side flanges; side arms of substantially inverted U-shape having horizontal limbs and vertical limbs with curved ends pivotally mounted on said end flanges to offset said side arms relative to said seat; an integral curved upper bar on said back to engage the horizontal limbs of said side arms and move them from upright to folded positions when said back is folded, and an integral lower wedge-shaped bar spaced from said upper bar to engage the horizontal limbs of said side arms and raise them when said back is raised.

9. A chair comprising a seat, a back pivotally mounted on said seat, side arms pivotally mounted on said seat, an integral transverse bar on said back to engage said side arms and fold them from upright to folded position when said back is folded, a second transverse bar on said back spaced from said first named bar to engage said side bars and raise them when said back is raised, and interlocking means on said second bar to engage said side arms and hold them in upright positions.

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10. A chair comprising a seat, a back pivotally mounted on said seat, side arms pivotally mounted on said seat, an integral transverse bar on said back to engage said side arms and fold them from upright to folded position when said back is folded, a second transverse bar on said back spaced from said first named bar to engage said side bars and raise them on said seat when said back is raised, and side arm interlocking means at the ends of said second transverse bar to hold them in upright position.

11. A chair comprising a seat, a back pivotally mounted on said seat, side arms pivotally mounted on said seat, an integral transverse bar on said back to engage said side arms and fold them from upright to folded position when said back is folded, a second transverse bar on said back spaced from said first named bar to engage said side bars and raise them on said seat when said back is raised, and side arms receiving bends at the ends of said second transverse bar to hold them in upright position.

12. A chair comprising a seat, a back pivotally mounted on said seat, side arms pivotally mounted on said seat, an integral transverse bar on said back to engage said side arms and fold them from upright to folded position when said back is folded, a second transverse bar on said back spaced from said first named bar to engage said side bars and raise them on said seat when said back is raised, side arms receiving bends in the ends of said second transverse bar to hold them in upright position, and foldable legs pivotally mounted beneath said seat.

13. A chair comprising a seat having a bottom provided with slots at its side edges, pad retaining flanges rising from said bottom in proximity to the bottom slots, pivots extending inwardly from the side flanges of said seat adjacent the bottom slots, pivotally mounted side arms independently mounted on said seat pivots, a back pivotally mounted on said seat, an integral transverse bar on said back to engage said side arms and fold them from upright to folded position when said back is folded, a second transverse bar on said back spaced from said first named bar to engage said side bars and raise them on said seat when said back is raised, foldable legs pivotally mounted beneath said seat, and a pad disposed within said flanges and having its corners fashioned to provide clearance for the pivoted ends of said foldable legs.

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