Oct. 17, 1950 J. H. DENNEY 2,525,876

FOLDING ARMCHAIR

Filed June 25, 1947 2 Sheets-Sheet 1

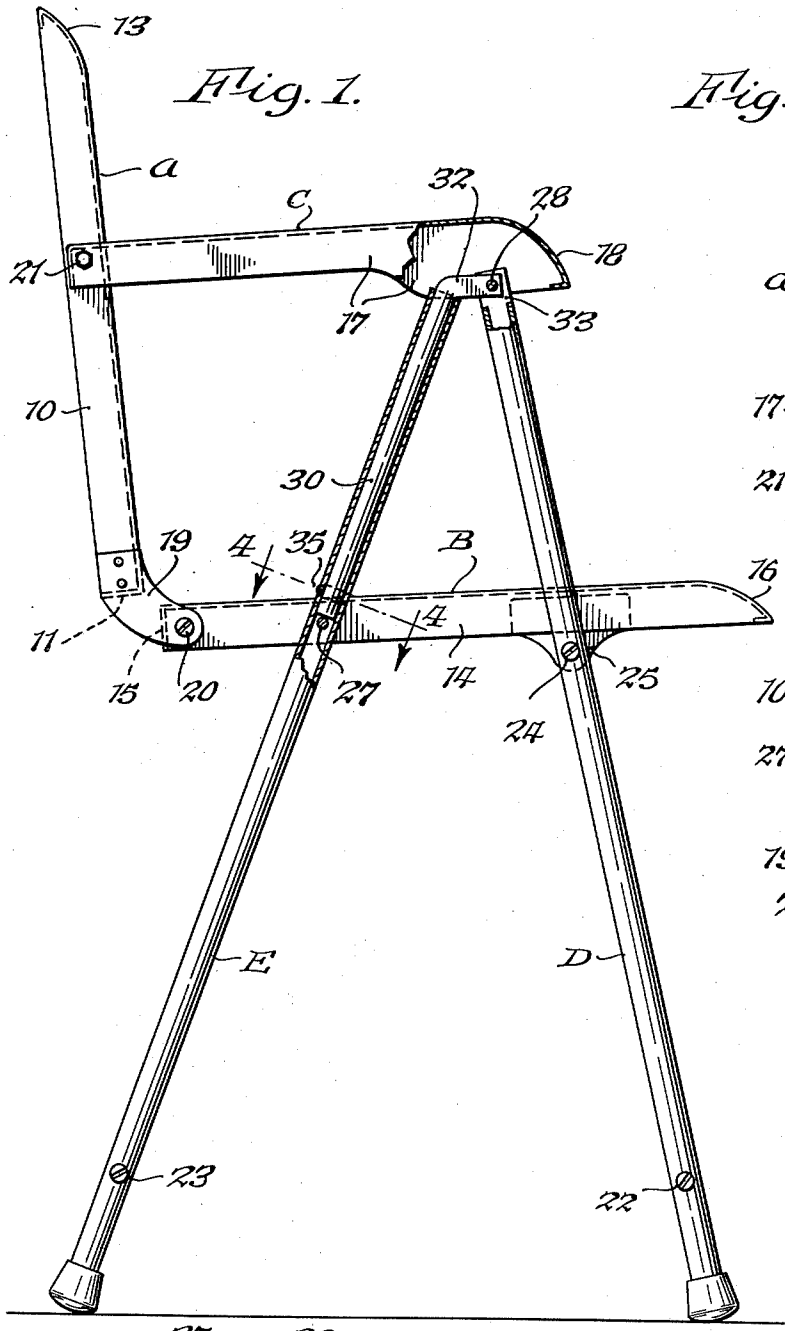


Fig. 1.

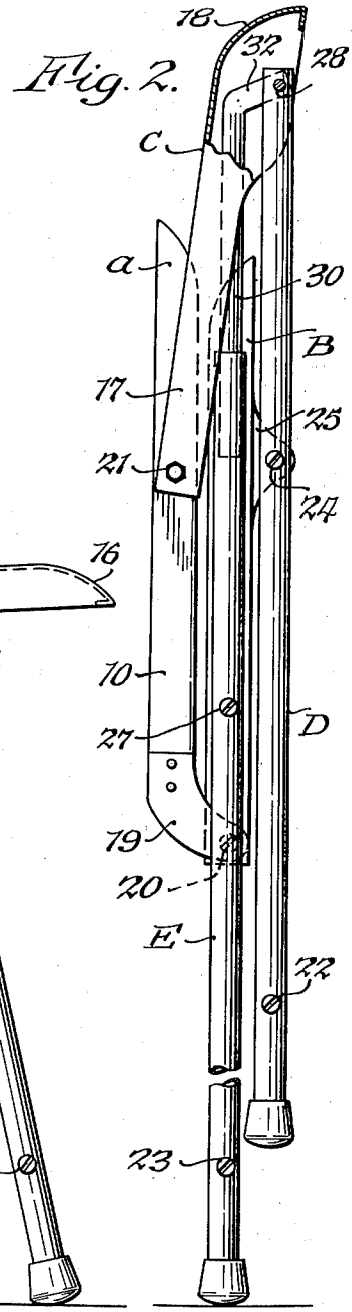


Fig. 2.

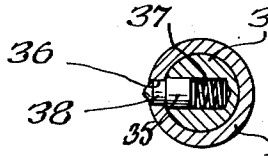


Fig. 4.

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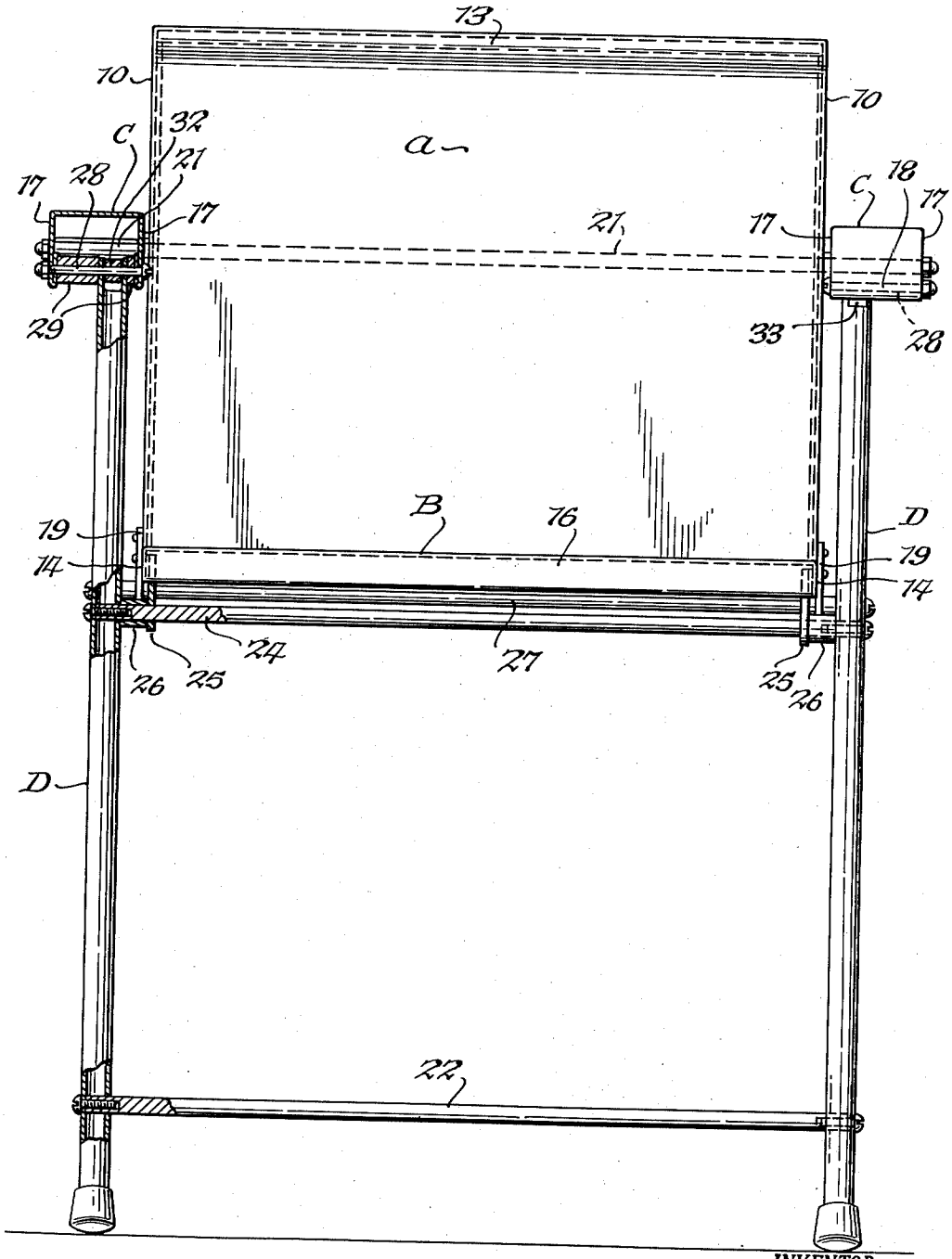


Fig. 3.

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FOLDING ARMCHAIR

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10 Claims. (Cl. 155—139)

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This invention relates to improvements in folding chairs and particularly portable folding arm chairs that are suitable for use, for instance, as lawn or card table chairs, and chairs which are adapted to be readily positioned for use in places where people may assemble and folded into compact condition or flat shape suitable for stacking or storing in small space, or for shipping or transportation purposes.

Special objects of the invention are to provide a portable arm chair which can be folded into compact form or flat shape and opened or set up for seating use quickly and with little effort, but which nevertheless will provide a sturdy, stable seat; which is of improved construction adapted to be folded in a compact flat form with the seat, back, arms and legs positioned close to each other, and preferably with the seat, arms and legs arranged to fold upwardly and rearwardly substantially parallel with the back; which is of strong and durable but exceedingly simple construction composed of the minimum number of parts that will not get out of order; in which the parts, in the operative condition of the chair, are held firmly and rigidly in position against looseness or movement that would make an unsteady or unstable seat and cause objectionable rattling, squeaking or noise.

Further objects and advantages of the invention will appear from the following specification of the preferred embodiment of the invention shown in the accompanying drawings, and the novel features of the invention are set forth in the appended claims.

In said drawings:

Fig. 1 is a side elevational view of a chair embodying my invention, showing the operative or seating position of the same, portions of the arm rests and rear legs being shown in vertical section.

Fig. 2 is a side elevation of the chair in its folded or collapsed condition.

Fig. 3 is a front elevation, partly in vertical section, of the chair in its operative position.

Fig. 4 is a transverse section, enlarged, on line 4—4, Fig. 1.

The chair comprises a back A, a seat B hinged or pivoted at its rear to the lower portion of the back so as to fold upwardly and rearwardly toward the back, arm rests C at opposite sides of the chair pivoted to the back above its lower end and extending forwardly therefrom, and a pair of supporting legs at each side of the chair. The front and rear legs D and E of each pair are pivoted between their ends to the adjacent side of the seat and extend upwardly past the seat to the adjacent arm rest, to which they are pivotally connected at their upper ends, one of the legs having upper and lower telescopically or longitudinally slidably associated sections of which the lower section is pivoted to the seat and the upper section is pivoted to the arm rest. Preferably, the legs converge upwardly from their lower ends to a common pivotal connection with the forward portion of the arm rest, and the rear leg is the telescopic leg. Also, preferably the arm rests are located beside or outwardly beyond the side edges of the back to adapt them to swing upwardly at opposite sides of the back into the upright plane thereof, and the legs of each pair are disposed one in front of the other in the vertical plane of the arm rest to which they are connected. The seat is adapted to fold upwardly against the front face of the back, and the arm rests to fold upwardly to standing positions at opposite sides of the back in the plane thereof, with the legs of each pair extending upwardly, one in front of and substantially parallel with the other, and in front of and close to the connected arm rest, as shown in Fig. 2.

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In chairs embodying my invention, the parts, including the back, seat, arm rests and legs, may be made of different forms, constructions or materials. According to the embodiment illustrated, the chair is constructed as follows: The back, seat and arm rests are made of sheet metal, the back being pressed or shaped to provide rearwardly extending flanges 10 and 11 at its side and bottom edges respectively, and a rearwardly curved top flange 13 with inturned edge; and the seat being pressed or shaped to provide downwardly extending side and rear edge flanges 14 and 15 respectively, and a downwardly curved front flange 16 with inturned edge. Each arm rest is of channel shape in cross section arranged with its opposite side flanges 17 extending downwardly, and preferably has a downwardly curved or rounded front end 18 with inturned edge. Legs of tubular formation are shown.

The back, as shown, has fixed hinge brackets 19 projecting forwardly from the opposite side edges of its lower end portion between which brackets the rear end of the seat is pivoted, as by bolts 20, so that the seat can fold upwardly flat against the front face of the back, and the arm rests are pivoted at their rear ends to the back at the outer sides of its side edges, preferably on the outwardly projecting opposite ends of a rod 21 which extends transversely of the back through registering holes in the side flanges

of the back and the side flanges of the arm rests. Thus, the arm rests can fold upwardly to standing positions at opposite sides of and substantially in the upright plane of the back.

The front legs D at the opposite sides of the chair are rigidly connected with each other below the seat, as by a bottom cross rod **22**, and similarly, the lower portions of the opposite rear legs E are rigidly connected with each other, as by a cross rod **23**. The front legs are pivoted to the seat by pivots that project outwardly beyond the side edges of the seat, and which pivots are preferably formed by the opposite ends of a cross rod **24** which extends transversely beneath the seat through holes in bearing brackets **25** welded or otherwise rigidly attached, as to the side flanges of the seat, and projecting downwardly therefrom. Spacing sleeves **26** surrounding the rod **24** between the legs and the bearing brackets, prevent lateral play of the legs. The rear legs are pivoted to the seat by pivots which project outwardly beyond the side edges of the seat, and are preferably formed by the opposite ends of a rod **27** extending transversely beneath the seat through bearing holes in its side flanges into holes in the lower sections of the rear legs. Spacing sleeves may be provided also on the rod **27** between the rear legs and side edges of the seat. The upper ends of the front legs are pivoted to the front portions of the arm rests, between their depending side flanges, as by pivot bolts **28** extending transversely of the arm rest through holes in the upper ends of the legs and secured in holes in the side flanges of the arm rests. Spacing sleeves **29** may be used on the bolts **28** between the legs and the side flanges of the arm rests to properly aline vertically the pivotal connections of the legs with the seat and arm rests and prevent lateral play between the legs and arm rests. The upper ends of the telescoping upper sections **30** of the rear legs are pivoted to the arm rests, as shown, by the pivot bolts **28** for the front legs, the rear leg sections **30** being provided with forwardly projecting upper end portions **32** which may extend into slots **33** in the upper ends of the front legs and have transverse holes through which the pivot bolts **28** pass.

By this construction, the rear leg of each pair is disposed in the same plane as, and in rear of the companion front leg, and a single pivot serves to connect the two legs to the arm rest, and when the chair is folded, the front legs can occupy positions parallel with the rear legs, with the rear legs close to and substantially parallel with the arm rests, as shown in Fig. 2. However, the front and rear legs could be separately pivoted to the arm rest.

Stops are provided to limit the inward or downward movement of the telescoping sections of the rear legs in the operative position of the chair. As shown for this purpose, the lower ends of the telescoping upper sections **30** of the legs are adapted to engage the pivot rod **27** by which the rear legs are pivoted to the seat, as shown in Fig. 1, but the inward movement of the telescoping sections could be arrested in any other suitable manner, as for instance, by the engagement of the forwardly projecting upper ends **32** of the telescoping sections with the upper ends of the tubular main sections of the legs.

When the chair is unfolded or set up in the operative position shown in Fig. 1, the engagement of the telescoping sections of the rear legs with their stops will prevent further movement of the members of the chair in the opening direction and ensure rigid retention of the members of the chair in their intended operative positions. Since, when the chair is occupied by a person, or is in its operative position, the upper sections of the rear legs extend a considerable distance, practically their full length, down into the main tubular sections of the legs, and have a relatively close sliding fit therein, the two sections will be held firmly from relative deflection or lateral play or looseness, and so will prevent possible sway, weaving or lateral motion of the arm rests or parts of the chair which might occur with link or other forms of connections between the rear legs and the arm rests.

The chair is shown as equipped with a catch **35**, Figs. 1 and 4, which acts automatically to retain the chair in its operative condition, shown in Fig. 1, against unintentional folding or collapsing movement except by first releasing the catch. A simple inconspicuous catch is shown, consisting of a plunger slidable in a transverse socket in the upper section **30** of one of the telescopic legs and adapted to be projected into a hole **36** in a side wall of the lower leg section by a spring **37** confined in a cavity in the plunger. The plunger has a reduced outer portion which is conical or tapered at its end and of cylindrical or straight sided shape at **38** inwardly from its conical end. In its projected locking position the spring **37** holds this cylindrical portion of the plunger in the straight edged hole **36** and positively prevents relative longitudinal movement of the sections of the telescopic leg, and so prevents folding movement of the chair, but by pressing the outer end of the plunger slightly inward, its conical end will be located in the hole **36**, and because of the engagement of its conical end with the edges of the hole will permit retraction of the catch plunger and allow the chair to be folded by pressure of the seat upwardly toward the back.

A chair of the construction disclosed, having one pair of legs formed of telescopic or longitudinally slidably related sections with the main sections directly pivoted to the chair seat and the upper sections directly pivoted to the arm rests, is composed of a minimum number of parts and provides an arm chair capable of folding as described; all of which parts and their connections may be of strong and simple construction ensuring that the chair structure as a whole, when in its open, operative position, will form a sturdy, steady seat for the occupant, free from parts so associated or related as to cause or permit rattling or noise, or looseness that would allow swaying, weaving or instability of the chair.

I claim as my invention:

1. A folding chair comprising a back, a seat pivotally connected at its rear portion to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted at their rear portions to the back and normally extending forwardly from the back, a pair of supporting legs at each side of the chair which extend upwardly one in advance of the other past the seat to the related arm rest, with one leg pivoted between its ends to the seat and pivoted at its upper end to the arm rest, and the other leg comprising upper and lower telescopic sections of which the lower section is fixedly pivoted to the seat-back unit and the upper section is fixedly pivotally connected with the arm rest, whereby the seat and arm rests are adapted to fold upwardly and rearwardly toward the back

with the legs extending upwardly adjacent to each other and to the back.

2. A folding chair comprising a back, a seat pivotally connected at its rear portion to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted at their rear portions to the back beside opposite side edges of the back and normally extending forwardly from the back, a pair of supporting legs at each side of the chair which extend upwardly one in front of the other past the seat to the related arm rest and are disposed in the vertical plane of the arm rest with one leg pivoted between its ends to the seat and pivoted at its upper end to the arm rest, and the other leg comprising upper and lower telescopic sections of which the lower section is fixedly pivoted to the seat back unit and the upper section is fixedly pivotally connected with the arm rest, whereby the seat and arm rest are adapted to fold upwardly and rearwardly toward the back with the legs extending upwardly adjacent to each other and to the arm rest.

3. A folding chair comprising a back, a seat pivotally connected at its rear portion to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted at their rear portions to the back and normally extending forwardly from the back, a pair of supporting legs at each side of the chair which extend upwardly one in advance of the other past the seat to the related arm rest, with one leg pivoted between its ends to the seat and pivoted at its upper end to the arm rest, and the other leg comprising upper and lower telescopic sections of which the lower section is fixedly pivoted to the seat back unit and the upper section is fixedly pivotally connected with the arm rest, said arm rests and pairs of legs being disposed in vertical planes outwardly beyond the side edges of the back and seat, whereby the seat and arm rest are adapted to fold upwardly and rearwardly toward the back with the seat, arm rests and legs substantially parallel with each other and the arm rests at opposite sides of and in the plane of the back.

4. A folding chair comprising a back, a seat pivotally connected at its rear portion to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted at their rear portions to the back and normally extending forwardly from the back, front and rear supporting legs at each side of the chair which converge upwardly past the seat to the related arm rest and are pivotally connected between their ends to the seat, and pivotally connected at their upper ends with the forward portion of the arm rest, and said rear leg comprising upper and lower telescopic sections of which the lower section is fixedly pivoted to the seat back unit and the upper section is fixedly pivotally connected at its upper end with the arm rest, whereby the seat, arm rests and leg are foldable upwardly close to the back.

5. A folding chair comprising a back, a seat pivotally connected at its rear portion to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted at their rear portions to the back and normally extending forwardly from the back, front and rear supporting legs at each side

of the chair which converge upwardly past the seat to the related arm rest and are pivotally connected between their ends to the seat and pivotally connected at their upper ends with the forward portion of the arm rest, said rear leg comprising upper and lower telescopic sections of which the lower section is fixedly pivoted to the seat back unit and the upper section is fixedly pivotally connected at its upper end with the arm rest, whereby the seat, arm rests and leg are foldably upwardly close to the back, and stop means for arresting the downward telescopic movement of the upper section of the rear legs in the operative positions of said parts of the chair.

6. A folding chair comprising a back, a seat pivotally connected at its rear portion to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted at their rear portions to the back and normally extending forwardly from the back, front and rear supporting legs at each side of the chair which converge upwardly past the seat to the related arm rest and are pivotally connected between their ends to the seat, the upper ends of the legs being connected by a common pivot to the arm rest, and said rear leg comprising telescopic upper and lower sections of which the lower section is fixedly pivoted to the seat back unit and the upper section is fixedly pivoted at its upper end to the arm rest.

7. A folding chair comprising a back, a seat pivotally connected at its rear portion to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted at their rear portions to the back and normally extending forwardly from the back, front and rear supporting legs at each side of the chair which converge upwardly past the seat to the related arm rest and are pivotally connected between their ends to the seat, a pivot pivotally connecting the upper end of the front leg to the arm rest, and said rear leg comprising upper and lower telescopic sections of which the lower section is fixedly pivoted to the seat back unit and the upper section has a forwardly extending upper end portion which is fixedly pivoted to said pivot for the front leg.

8. A folding chair comprising a back, a seat pivotally connected at its rear to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted to the back between the ends thereof and normally extending forwardly from the back, front and rear supporting legs at each side of the chair which extend upwardly past the seat to the related arm rest, one of said legs being pivoted between its ends to the seat and pivoted at its upper end to the arm rest, and said other leg comprising a lower section which is fixedly pivoted to the seat back unit, and an upper section which has a longitudinal sliding engagement with said lower section and is fixedly pivoted at its upper end to the arm rest, whereby said seat, arm rests and legs are foldable upwardly toward said back, and stop means for arresting downward sliding movement of said upper leg section in the normal use positions of said parts of the chair.

9. A folding chair comprising a back, a seat pivotally connected at its rear to the lower portion of the back to fold upwardly toward the

back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted to the back between the ends thereof and normally extending forwardly from the back, front and rear supporting legs at each side of the chair which extend upwardly past the seat to the related arm rest, said front leg being pivoted between its ends to the seat and pivoted at its upper end to the arm rest, said rear leg comprising a lower section which is fixedly pivoted to the seat back unit and an upper section which has a longitudinal sliding engagement with said lower section and is fixedly pivoted at its upper end to the arm rest, whereby said seat, arm rests and legs are foldable upwardly toward the back, and stop means for arresting downward sliding movement of the upper section of the rear leg in the normal use positions of said parts of the chair.

10. A folding chair comprising a back, a seat pivotally connected at its rear to the lower portion of the back to fold upwardly toward the back, said seat and back thereby comprising a seat-back unit, arm rests at opposite sides of the chair pivoted to the back between the ends thereof and normally extending forwardly from the back, front and rear supporting legs at each side of the chair which converge upwardly past

the seat to the related arm rest, said front leg being pivoted between its ends to the seat and pivoted at its upper end to the forward portion of the arm rest, said rear leg comprising a lower section fixedly pivoted to the seat back unit and an upper section which has a longitudinally sliding engagement with said lower section and is fixedly pivoted at its upper end to the forward portion of the arm rest, whereby said seat, arm rests and legs are foldable upwardly close to the back, and stop means for arresting the downward sliding movement of the upper section of the rear leg in the normal use positions of said parts of the chair.

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