March 8, 1938. L. F. BERNAU 2,110,786

CONVERTIBLE CHAIR

Filed Nov. 9, 1934 3 Sheets-Sheet 1

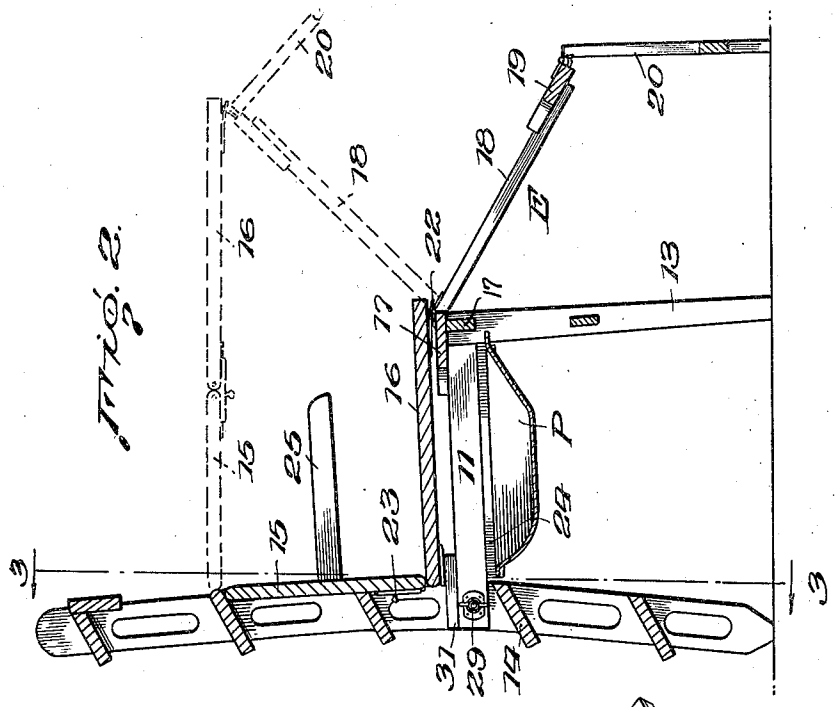


Fig. 2.

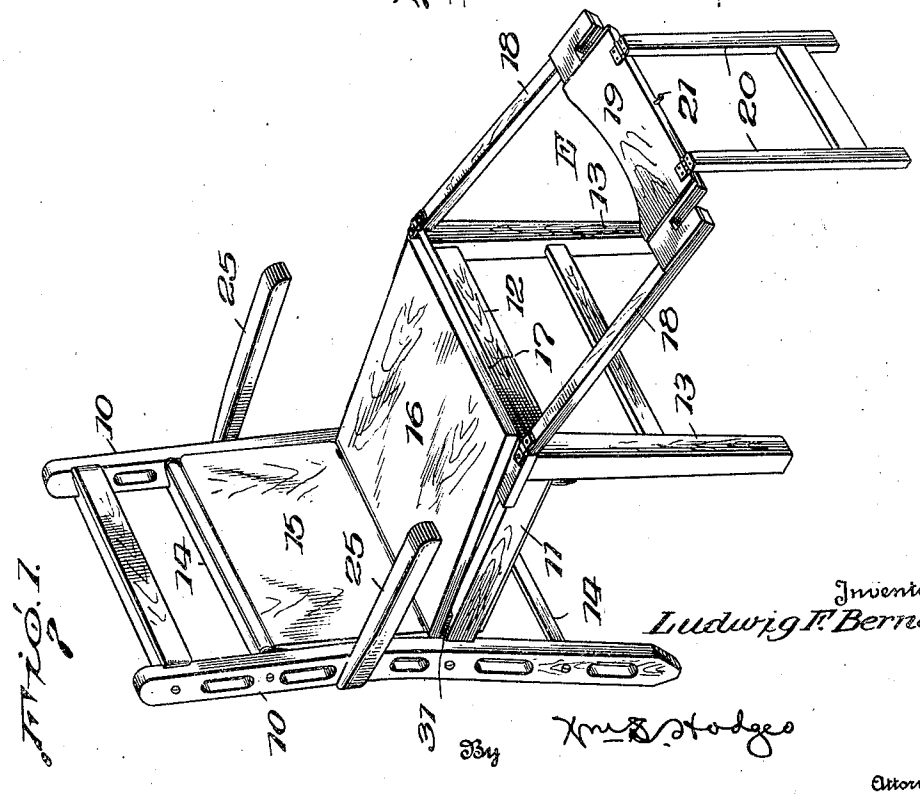


Fig. 1.

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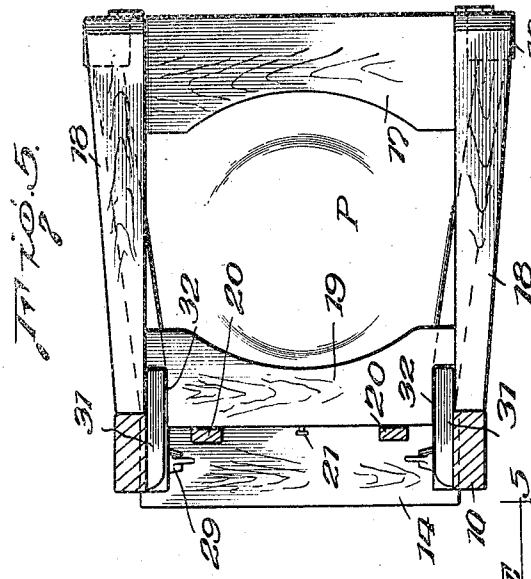


Fig. 5.

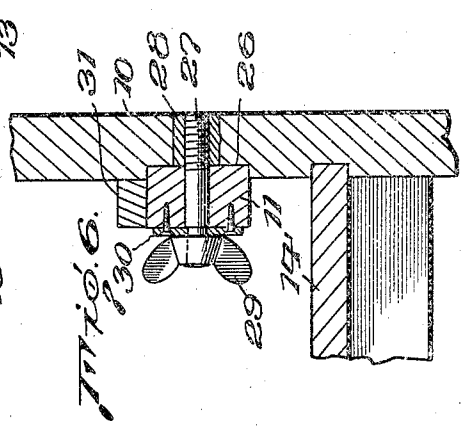


Fig. 6.

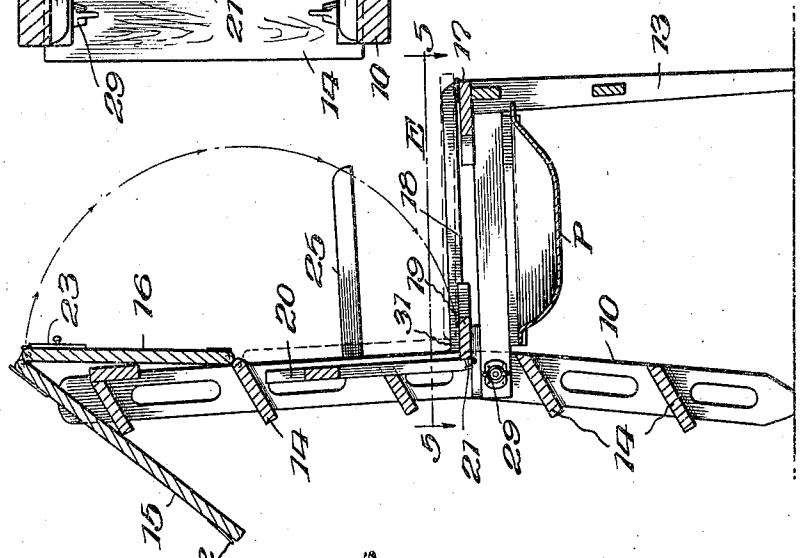


Fig. 4.

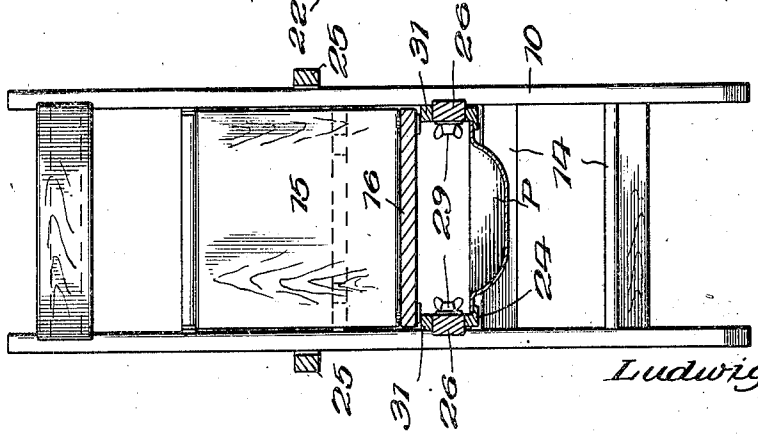


Fig. 3.

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CONVERTIBLE CHAIR

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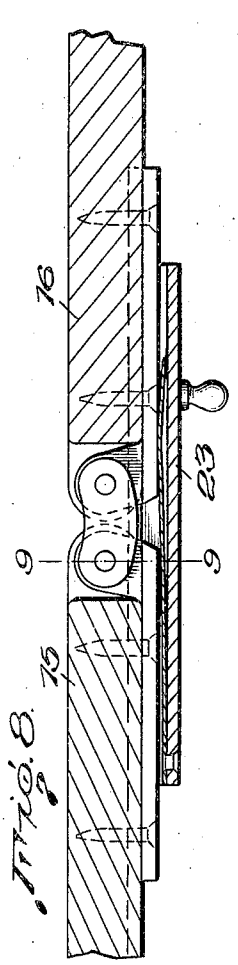


Fig. 8.

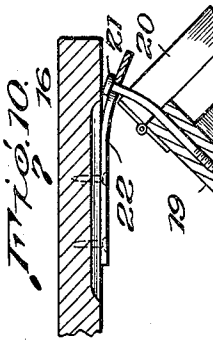


Fig. 10.

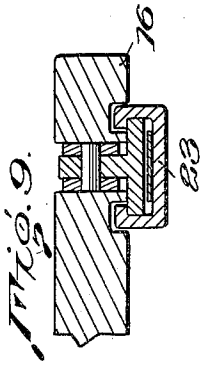


Fig. 9.

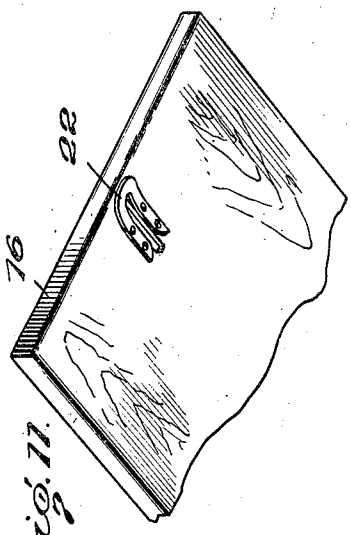


Fig. 11.

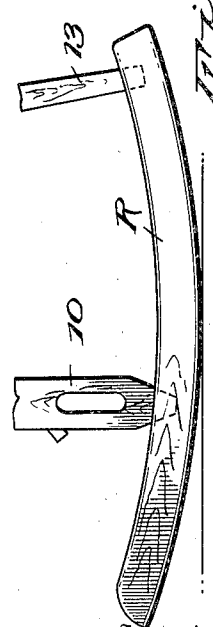


Fig. 12.

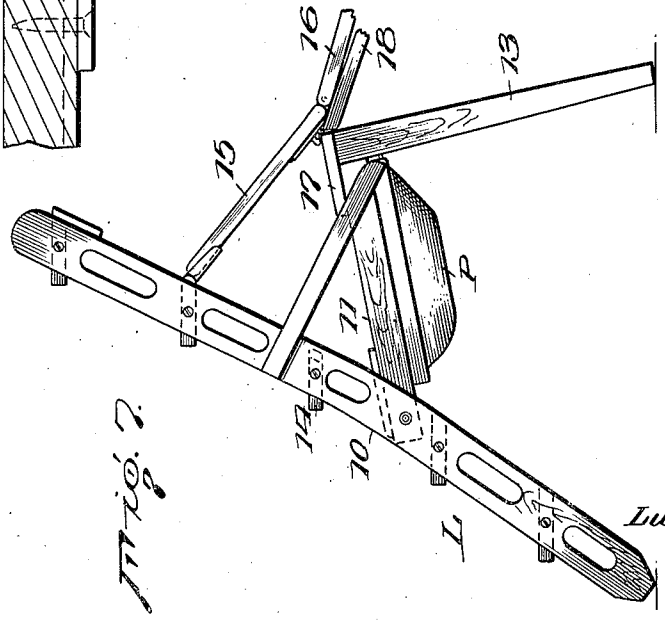


Fig. 7.

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UNITED STATES PATENT OFFICE

2,110,786

CONVERTIBLE CHAIR

Ludwig F. Bernau, Miami, Fla.

Application November 9, 1934, Serial No. 752,329

12 Claims. (Cl. 155—41)

This invention is a convertible chair of the type provided with adjustable parts capable of various corelated uses and adjustments.

One of the objects of the invention is to provide a chair of simple construction provided with adjustable parts so related that the chair may be readily converted into various useful forms, and as readily returned to its normal assembly for ordinary uses. A further object is to provide a main chair portion equipped with various attachments capable of numerous corelated adjustments by means of which the structure may be readily converted from the form of a simple standard type kitchen chair to that of a rocking chair, a lounge chair with foot rest, a toilet chair, an invalid table, a card table, an ironing board, or a step ladder at will.

The invention will be hereinafter fully set forth and particluarly pointed out in the claims.

In the accompanying drawings:

Fig. 1 is a perspective view illustrating the invention in the form of a lounge chair. Fig. 2 is a vertical sectional view of the chair illustrated in Fig. 1, showing in dotted lines the seat and back panels extended to form a table structure. Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 2. Fig. 4 is a vertical sectional view illustrating the parts adapted for use as a toilet chair. Fig. 5 is a horizontal sectional view on the line 5—5 of Fig. 4. Fig. 6 is an enlarged detail sectional view illustrating the clamping means for the step ladder. Fig. 7 is a side elevation illustrating the parts adjusted to use the step ladder. Fig. 8 is a detail sectional view illustrating the hinge between the seat and back panels and the locking means therefor. Fig. 9 is a detail sectional view on the line 9—9 of Fig. 8. Fig. 10 is a detail sectional view illustrating the complemental means for engaging the seat panel and the extension frame. Fig. 11 is a detail view of the engaging plate illustrated in Fig. 10. Fig. 12 is a detail view showing removable rockers applied to the chair structure.

Referring to the drawings, 10 designates back members which are pivotally connected to the side members 11 of a seat frame, said side members being connected by a front cross member 12, the latter being provided with front legs 13. The back members 10 are extended to provide the rear legs of the chair structure. The details of the pivotal connections between the back members 10 and the side members 11 will be more specifically described later, the structure thus far described, while in the position illustrated in Figs. 1, 2, 3, 4 and 5, constituting a frame for a standard type chair.

The back members 10 are connected by cross members or steps 14, which provide a step ladder under adjustments to be later described, said steps serving to rigidly connect said back members.

Pivotally connected to the members 10, adjacent to one of the steps 14, is the upper portion of a back panel 15, and to the lower edge of said back panel is hinged a seat panel 16, said panels being so constructed and arranged that in the position illustrated in Figs. 1 and 2, they constitute the back and seat of the chair. That is, while the back is in its normal depending position, the seat panel occupies a forwardly projected horizontal position.

Extended across the front portion of the chair and resting upon the front cross bar 12 is a cross member 17, to which is hinged the side bars 18 of an extension member E, the free ends of said side bars being connected by a cross member 19, to which legs 20 for the extension member are hingedly connected at one end. While the extension member E and the legs 20 are in extended position as shown in Fig. 1, the chair is converted into a lounge chair, in which the panels 15 and 16 constitute the back and seat respectively, and the cross member 19 constitutes a foot rest supported by the legs 20. While the parts are in folded position, the side bars 18 rest upon the side members 11 of the chair on either side of the seat panel 16, and the cross member 19 rests upon and spans the space between them, beneath the panel 16, the legs 20 occupying a position back of the panel 15, the steps 14 being cut-away to provide clearance. See Fig. 4. To permit folding of the extension member and the legs 20 to these positions, it is first necessary to swing the back panel on its pivot a sufficient distance to elevate the seat panel and to allow the cross member 19 and the legs 20 to be moved to their rearward positions, and after they have been so moved the seat and back panels are returned to their normal positions as shown in dotted lines, in said Figure 4, the legs 20 occupying a position between the side bars 10 of the back and rearwardly of the back panel 15.

It will be noted that the cross member 19 is provided with a lug 21, which is complemental to a keeper plate 22 secured to the underside of the seat panel 16, near the front edge thereof. Said keeper plate is of resilient material and provided with an offset resilient portion provided with a slot complemental to the stud 21, so that

they may be readily engaged or disengaged, as shown in detail in Fig. 10, to provide an interengagement between the extension member E and the seat panel 16. This may be accomplished by swinging the back panel 15 and the seat panel 16 to a horizontal position and locking them against pivotal movement by means of bolts 23 engaging suitable keepers, and then engaging the stud 21 with the keeper plate 22. See Fig. 2. In this form, the seat and back panels constitute a table which may be used as an ironing table, a card table, an invalid's table, or for any other use for which a table may be desired. While in this position, the extension member E firmly braces the table and the front member is allowed to extend as indicated by dotted lines in Fig. 2.

If it is desired to use the chair as a toilet chair, the extension member E is folded back to the position shown in Figs. 4 and 5, and the back and seat panels 15 and 16 respectively, are folded over the back of the chair as indicated in Fig. 4, the legs 20 then constituting the back of the chair. At the same time, the cross members 17 and 19, which are provided with inner curved edges, constitute an open seat. Suitable flanges 24 are secured to the seat side members 11 in such manner as to support a pan P, or if desired, the pan may be omitted and the chair used for taking a vapor bath by placing a vapor producing vessel beneath the opening. For convenience, the back members are provided with arm rests 25, which extend rigidly forward.

The back members 10 form the rear legs of the chair as well as the sides of a step ladder L. Said side members are provided with recesses 26 to receive the free ends of the side members 11, and said members 10 and 11 are pivotally connected by bolts 27 extending through the members 10 and engaging threaded thimbles 28 seated in the back members 10. Said pivot bolts 27 are provided with winged-heads 29, so that they may be readily manipulated. As shown, these heads are formed by extending the stem of the bolt through a standard type wing nut and peening the end of said stem, so that the parts are joined against relative movement. A bearing plate 30 is interposed between each head 29 and the adjacent side member 11, so as to take up the wear. In order to bring the ends of members 11 into engagement with the recesses 26, it is necessary to spring said members outwardly and then to maintain them in the sprung position by the bolts 27. In order to prevent disengagement of the members 11 from the recesses 26 in the event of accidental loosening of the bolts 27, said members are provided with cleats 31, which are engaged by slotted portions 32 of the cross member 19 while the extension member E is in folded position.

When it is desired to use the chair as a step ladder, it is first necessary to move the back panel 15 and seat panel 16 to a forward position, so that the extension member E may be disengaged from the cleats 31, the pivoted seat and back panels being draped over the extension member E as indicated in Fig. 7. The bolts 27 are loosened so that the side members 11 may be moved out of the recesses 26, whereupon the lower ends of the back members 10 may be pulled backwardly so as to tilt said side members by a pivotal movement on the bolts 27. After the desired inclination of the step ladder has been obtained, the bolts 27 are again tightened, so as to prevent relative movement of the back members and the side members, thereby thoroughly bracing the structure for such weight as will normally rest upon it.

If desired, removable rockers R may be provided as shown in Fig. 12, which will serve to additionally lock the back member against pivotal movement while the parts are in their normal chair-functioning positions.

The various adjustments of the chair may be readily understood from the foregoing description. The advantages of the invention will be apparent to those skilled in the art to which it belongs. For instance, it will be observed that a very simple form of main chair section is provided, the same being equipped with various attachments which are capable of numerous co-related adjustments by means of which the structure may be converted to different forms having numerous specific uses, as described. A further advantage is that the parts are of simple construction and may be easily and readily manipulated and adjusted without getting out of order or becoming deranged.

Having thus explained the nature of the invention and described an operative manner of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the forms of its use, what is claimed is:

1. In a convertible chair, the combination with a main chair portion consisting of a seat frame, leg members and back members, of a back panel pivotally supported at its top by the back members in such manner that it will normally depend freely from its pivotal support, a seat panel having its rear edge hinged to the normally lower edge of said back panel, said panels and their hinged connections being so constructed and arranged that while the back panel is in its normal depending position, the seat panel is in a forwardly projected horizontal position, and said panels may be moved into alignment when the lower end of said back panel is moved upwardly out of said normal position, means for preventing relative movement of said panels while they are in alignment, an extension frame hinged at one end to the front edge of the seat frame, the other end of the extension frame being free and movable to a position beneath the seat panel while said panels are in alignment, said extension frame being foldable to a position beneath the seat panel and resting upon the top of the seat frame while the back and seat panels are in their respectively normal back and seat functioning positions, said seat panel and said extension frame having complemental interengageable means.

2. In a convertible chair, the combination with a main chair portion consisting of a seat frame, leg members and back members, of a back panel pivotally supported at its top by the back members in such manner that it will normally depend freely from its pivotal support, a seat panel having its rear edge hinged to the normally lower edge of said back panel, said panels and their hinged connections being so constructed and arranged that while the back panel is in its normal depending position, the seat panel is in a forwardly projected horizontal position and said panels may be moved into alignment when the lower end of said back panel is moved upwardly out of said normal position, means for preventing relative movement of said panels while they are in alignment, an extension frame hinged at one end to the front edge of the seat frame, the other end of the extension frame being free and

movable to a position beneath the seat panel while said panels are in alignment, said extension frame being foldable to a position beneath the seat panel and resting upon the top of the seat frame while the back and seat panels are in their respectively normal back and seat functioning positions, a stud carried by the free end of the extension frame and a slotted resilient keeper carried by the undersurface of the seat panel in a position to be engageable with said stud.

3. In a convertible chair, the combination with a main chair portion having legs, a seat frame and a back frame, of a back panel having its upper end pivoted to the back frame, a seat panel hinged to the lower edge of the back panel in such manner that they are relatively movable with respect to each other, an extension frame having relatively spaced side bars so disposed as to lie on opposite sides of the seat panel while in folded position in such manner as to provide clearance for pivotal movement of the seat panel, and means pivotally connecting the side bars of the extension frame to the front portion of the seat frame.

4. In a convertible chair, the combination with a main chair portion having legs, a seat frame and a back frame, of a back panel having its upper end pivoted to the back frame, a seat panel hinged to the lower edge of the back panel in such manner that they are relatively movable with respect to each other, an extension member having relatively spaced side bars so disposed as to lie on opposite sides of the seat panel while in folded position in such manner as to provide clearance for pivotal movement of the seat panel, means pivotally connecting the side bars of the extension frame to the front portion of the seat frame, and legs hinged to the front portion of the extension member in such manner that they will lie behind the back panel while in folded position and will rest upon the floor while in extended position.

5. In a convertible chair, the combination with a main chair portion having legs, a seat frame and a back frame, of a back panel having its upper end pivoted to the back frame, a seat panel hinged to the lower edge of the back panel, an extension frame having spaced apart side bars hinged to the front portion of the seat frame, said extension member having slots therein, cleats secured to the seat frame in a position to be engaged by said slots while the extension frame is in folded position, and legs pivoted to said extension frame in such position as to occupy the space behind the back panel while the parts are in folded relation.

6. In a convertible chair, the combination with a main chair portion having legs, a seat frame and a back frame, said seat frame having cleats secured thereto near the rear thereof, of a back panel having its upper end pivoted to the back frame, a seat panel hinged to the lower edge of the back panel, an extension frame hinged to the front portion of the seat frame and provided with a cross bar having slots therein complemental to said cleats, and legs hinged to said cross bar in such manner that they will lie behind the back panel while the parts are in assembled relation.

7. In a convertible chair, the combination with a main chair portion having legs, a seat frame and a back frame, of a cross member secured to the front portion of the seat frame, a back panel having its upper end pivoted to the back frame, a seat panel hinged to the lower edge of the back panel, an extension frame having spaced apart side bars pivotally connected to said cross member, said extension frame also having a cross member at its outer end, said cross members being so disposed as to provide an open seat while the seat panel is raised and the extension frame is located in folded position.

8. In a convertible chair, the combination with a main chair portion having legs, a seat frame and a back frame, of a cross member secured to the front portion of the seat frame, a back panel having its upper end pivoted to the back frame, a seat panel hinged to the lower edge of the back panel, an extension frame having spaced apart side bars pivotally connected to said cross member, said extension frame also having a cross member at its outer end, legs hinged to the cross member of said extension frame, said cross members being so relatively positioned as to provide an open seat while the seat and back panels are in raised position and the extension frame in folded position, said legs constituting a back portion for the chair while in the open seat adjustment.

9. In a convertible chair, the combination with a main chair portion consisting of a ladder constituting the back and rear legs thereof, the sides of the ladder having recesses therein, a seat frame having side bars free at their rear ends and positioned to engage said recesses, front legs connected with said side bars, and means pivotally connecting said side bars to the sides of the ladder in such manner as to slightly spring the ends of said side bars into engagement with the recesses, of a back panel pivotally connected to the side bars of said step ladder, a seat panel hinged to the lower edge of the back panel, and an extension frame hinged to the front portion of said side bars, said extension frame and said side bars having complemental means for normally preventing inward movement of the free ends of the side bars while the parts are in folded relation.

10. In a convertible chair, the combination with a main chair portion consisting of a ladder constituting the back and rear legs thereof, the sides of the ladder having recesses therein, a seat frame having side bars free at their rear ends and positioned to engage said recesses, front legs connected with said side bars and means pivotally connecting said side bars to the sides of the ladder in such manner as to slightly spring the ends of said side bars into engagement with the recesses, of a back panel pivotally connected to the side bars of said step ladder, a seat panel hinged to the lower edge of the back panel, an extension frame hinged to the front portion of said side bars, and cleats secured to the rear ends of said side bars, said extension frame having slots positioned to engage said cleats while the extension frame is in folded position.

11. In a convertible chair, the combination with a main chair having an open seat frame, legs and a back, of a back panel pivotally suspended from said back in such manner that its lower edge is free and the panel is adjustable to occupy a vertically disposed depending position or an upwardly projected approximately vertical position, a seat panel pivotally connected to the free edge of the back panel, the pivotal connection of said seat and back panels being such that the seat panel is free to rest upon the seat frame while the back panel occupies its depending position and to swing backwardly over the chair back while the back panel occupies its upwardly

extended position, an extension frame having its rear end pivotally connected to the seat frame, said extension frame also having side bars, the other end of the extension frame being free, said extension frame being movable on its pivotal connection to such position that its side bars rest on said seat frame while the seat panel is swung backwardly over the chair back, and legs movably connected with the free end of said extension frame in such manner that they will rest against said chair back while the extension frame rests upon the seat frame.

12. In a convertible chair, the combination with a main chair portion consisting of a ladder-like back and rear legs, a seat frame having side bars which are free at their rear ends, the sides of said back having recesses therein, cleats on the rear ends of said side bars, pivot bolts carried by the side bars of said seat frame and engaging the sides of said back, and means connected with said bolts for removably retaining the back between the side bars of the seat frame and in engagement with said recesses, the back being of a width to slightly spread the free ends of said side bars while so engaged, and cleats on said side bars, of a back panel pivotally suspended from said back in such manner that its lower edge is free and the panel is adjustable to occupy a vertically disposed depending position or an upwardly projected approximately vertical position, a seat panel pivotally connected to the free edge of the back panel, the pivotal connection of said seat and back panels being such that the seat panel is free to rest upon the seat frame while the back panel occupies its depending position and to swing backwardly over the chair back while the back panel occupies its upwardly extended position, an extension frame having its rear end pivotally connected to the seat frame, said extension frame also having side bars, the other end of the extension frame being free, said extension frame being movable on its pivotal connection to such position that its side bars rest on said seat frame while the seat panel is swung backwardly over the chair back, the side bars of the extension frame having slots therein complemental to and engageable with said cleats to prevent relative inward movement of the last mentioned side bars during such engagement, and legs movably connected with the free end of said extension frame in such manner that they will rest against said chair back while the extension frame rests upon the seat frame.

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