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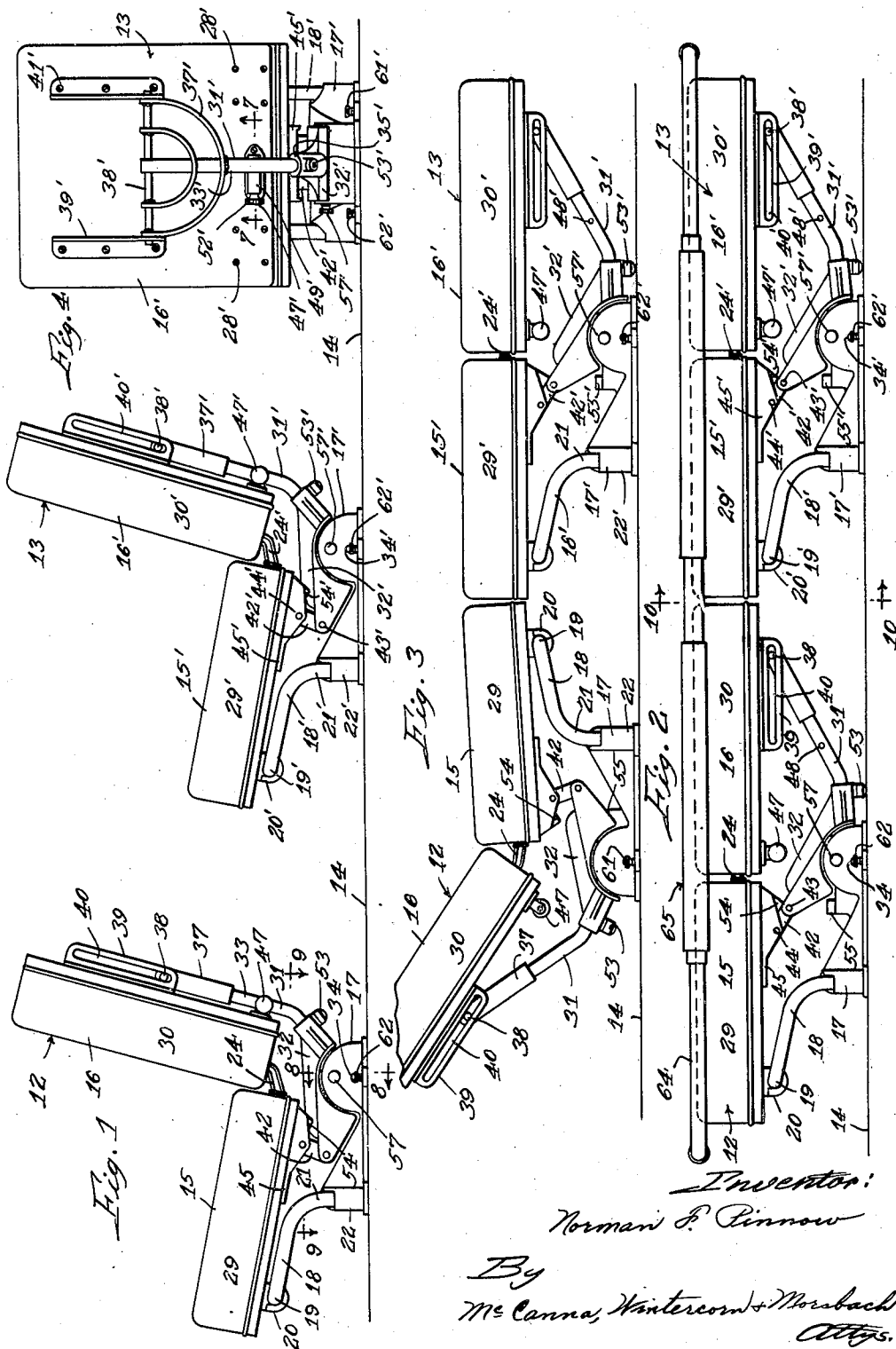
N. F. PINNOW

2,304,199

ADJUSTABLE AMBULANCE CHAIR

Filed Nov. 8, 1940

3 Sheets-Sheet 1



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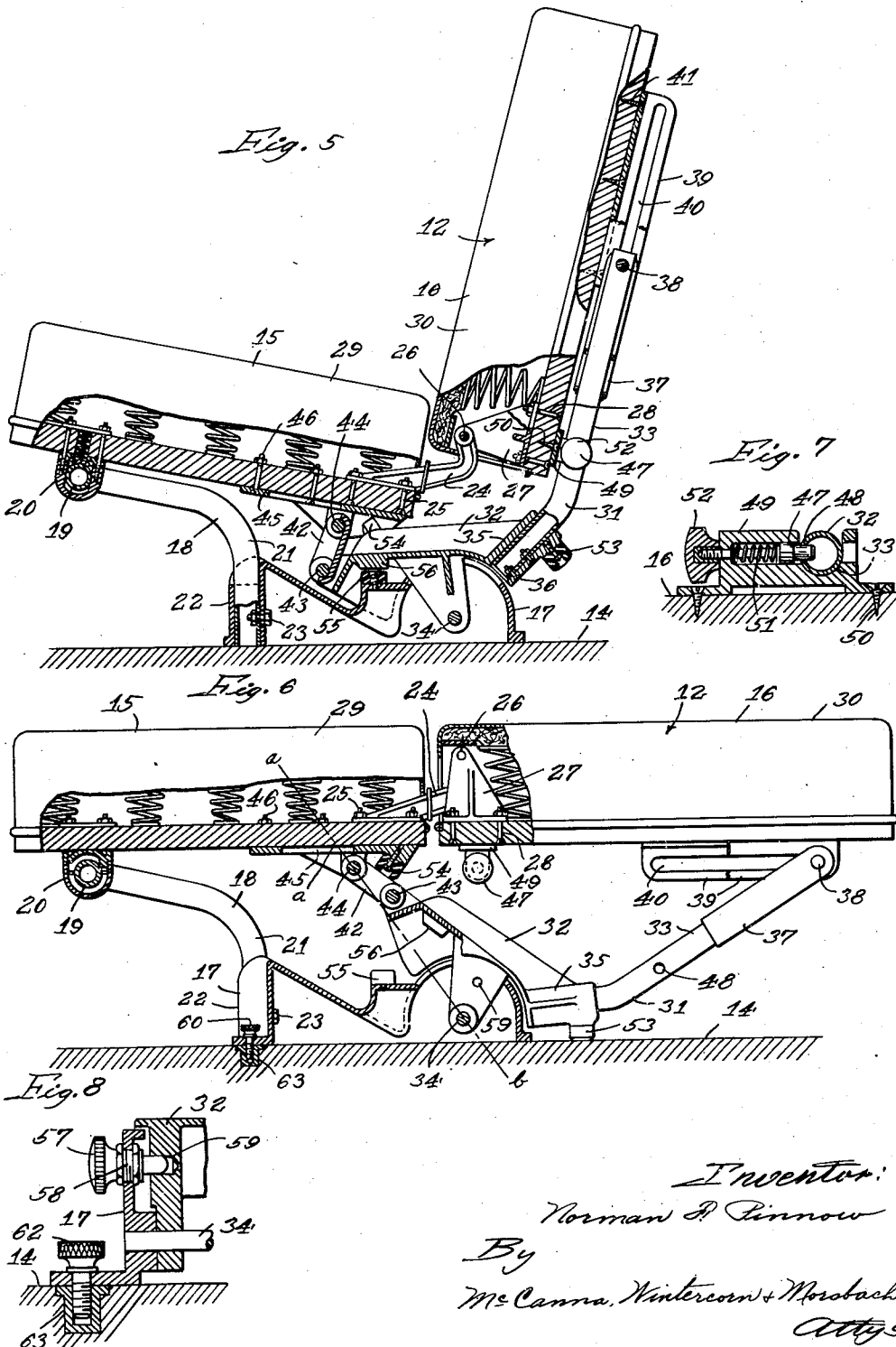
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3 Sheets-Sheet 2



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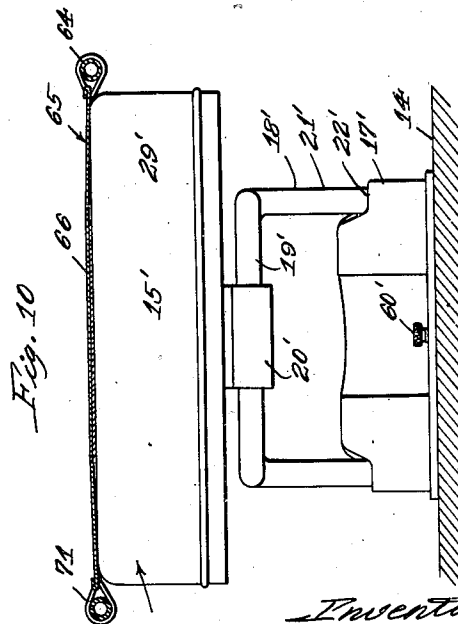
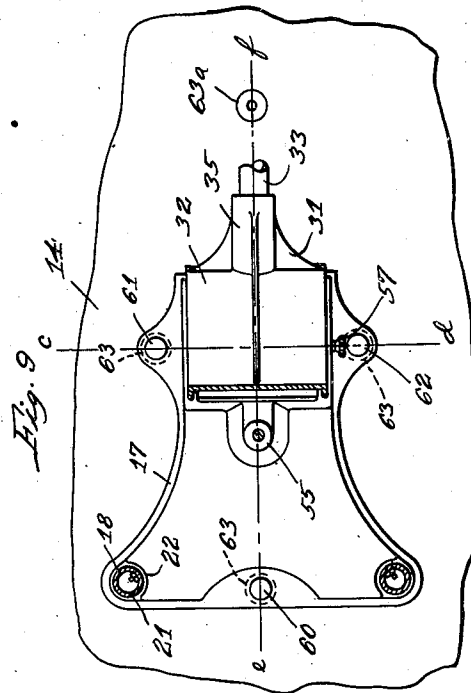
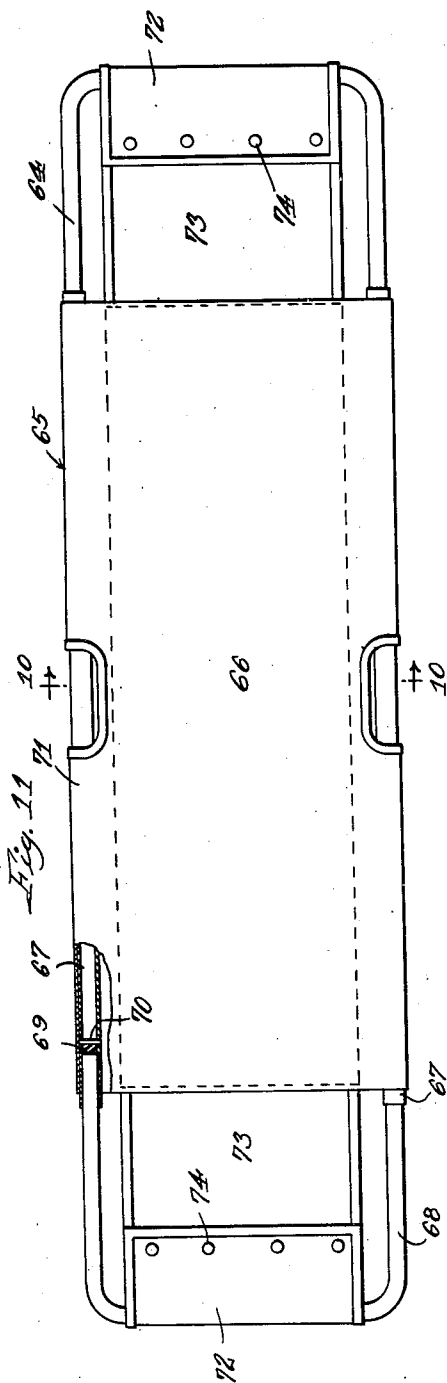
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ADJUSTABLE AMBULANCE CHAIR

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,304,199

ADJUSTABLE AMBULANCE CHAIR

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Application November 8, 1940, Serial No. 364,808

28 Claims. (Cl. 155—7)

This invention relates to a new and improved ambulance chair that has the bottom and back portions thereof adjustable from a normal substantially right angle relationship to horizontally aligned relationship to permit use of two chairs so adjusted as a cot or as a support for a stretcher.

The principal object of my invention is to provide ambulance chairs of the kind mentioned in which the bottom and back portions of a chair are quickly releasably but securely locked in normal substantially right angle relationship with only a single spring pressed manually retractable bolt, which when retracted permits the seat back to drop to substantially horizontal position, the bottom being hingedly connected with the back so as to be raised from an inclined position to a substantially horizontal position in alignment with the back when the chair is unfolded.

A salient feature of the invention consists in the provision of a bell-crank-shaped supporting arm for the seat back pivoted with respect to the floor intermediate its ends and having a pin and slot sliding connection at one end with the seat back and a pivotal link connection at its other end with the rear portion of the seat bottom, in such a way that when the seat back is dropped to horizontal position, the seat bottom is not only moved to horizontal alignment with the seat back but the link in this operation moves past a dead center position, so that downward pressure anywhere on the seat bottom or seat back cannot cause folding of the chair; the chair can be folded only by lifting on the seat back at a point remote from the seat bottom.

Another object of my invention is to provide ambulance chairs of the kind mentioned, in which the bell-crank lever arms are releasably lockable in at least one intermediate position relative to a floor bracket to support the seat back in approximately a mid-position between the raised and lowered positions, as, for example, where the unfolded chairs are being used as a cot and it is desired to have the head rest raised to eliminate necessity for a pillow. In this connection, a further feature of the invention consists in the reversibility of the front one of a pair of chairs so that the seat back or the front chair may be used in the manner stated, where the cot occupant desires to ride head forward and with head rest raised.

Another important object consists in the provision of ambulance chairs of the kind mentioned, the bottom and back portions of which are of a width to fit within the frame of a

stretcher, the bottom and back cushions being moreover designed to lie flush with one another so far as the top and both sides are concerned, so that the stretcher can be placed directly onto the cushions in the handling of emergency cases.

The invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a side view of a pair of ambulance chairs made in accordance with my invention and shown folded;

Fig. 2 is a side view of the same chairs unfolded to form a cot, on which there is indicated a stretcher provided to fit the cot in accordance with the invention;

Fig. 3 is a view similar to Fig. 2, but showing the front chair reversed and with the seat back raised to a mid-position;

Fig. 4 is a rear view of one of the chairs of Fig. 1;

Fig. 5 is a side view of one of the chairs of Fig. 1, on a larger scale and showing parts thereof in section;

Fig. 6 is a side view of the same chair unfolded;

Fig. 7 is a section on the line 7—7 of Fig. 4, on a larger scale;

Fig. 8 is a section on the line 8—8 of Fig. 1, but indicating the bell-crank lever arm in the mid-position, as in Fig. 3;

Fig. 9 is a horizontal section on the line 9—9 of Fig. 1;

Fig. 10 is a vertical section on the line 10—10 of Fig. 2, showing the stretcher in section on the line 10—10 of Fig. 11; and

Fig. 11 is a top view of the stretcher with a portion thereof shown in section for better illustration.

The same reference numerals are applied to corresponding parts throughout the views.

Referring first mainly to Figs. 1 to 4, the reference numerals 12 and 13 designate generally front and rear chairs in an ambulance, only the floor of which is indicated at 14. These chairs are of identical construction and are numbered correspondingly. For example, 15 and 16 designate the bottom and back of the chair 12, while 15' and 16' designate the bottom and back of chair 13, and so on, the same numerals being used in referring to corresponding parts on the chair 13 but being primed.

Referring now to Figs. 1 to 6, chair 12 has a floor bracket 17 on the front of which is a tubular inverted U-shaped support 18, the cross-portion 19 of which is pivotally mounted in a bearing 20 fastened to the bottom 15. The support 18 has

its arms 21 fitting in vertical sockets 22 in the floor bracket 17 and bolted in place, as indicated at 23. A pair of laterally spaced hinge arms 24 fastened as at 25 to the seat bottom 15 project rearwardly from the seat bottom and are pivoted as at 26 on brackets 27 secured as at 28 to the adjacent lower end of the seat back 16. The arrangement is such that the pivotal axis 26 is close enough to the rear upper edge of the seat cushion 29 and the lower outer edge of the back cushion 30 to permit unfolding the chair from the normal substantially right angle form of Fig. 5 to the flat substantially horizontal form of Fig. 6, wherein the cushions 29 and 30 affixed to the seat bottom 15 and seat back 16 have their top surfaces substantially flush with one another and with a very small gap left between the cushions at the hinge connection. A bell-crank-shaped supporting arm 31 is provided, the angularly related portions 32 and 33 of which comprise respectively a cast bracket pivoted as at 34 on the floor bracket and a tubular member entered at its lower or inner bent end in a socket 35 in the bracket 32 and secured in place by bolts 36, the other end of said tubular member having a U-shaped bracket 37 welded or otherwise suitably secured thereon for better support of a cross-rod 38, by means of which the member 33 is slidably and pivotally connected to the seat back 16. A pair of brackets 39 longitudinally slotted, as at 40, and fastened to the seat back, as at 41, in fixed parallel relationship on opposite sides of the arms of the bracket 37 and arranged to be slidably engaged by said arms receive the ends of the cross-rod 38 in the slots 40. The cross-rod 38 slides outwardly in the slots 40 in the unfolding of the chair, as shown in Fig. 6. A link 42 of short but broad cast construction is pivoted at its lower end, as at 43, on the front end of the bracket 32 and is pivoted at its upper end, as at 44, on another bracket 45 secured to the seat bottom, as at 46.

When the chair 12 is in the normal folded condition, a spring pressed bolt 47 carried on the lower end of the seat back 16 is received in a hole 48 provided therefor in the tubular member 33 of the supporting arm 31, as shown in Figs. 5 and 7. The bolt 47 is slidable in one arm of a generally U-shaped bracket 49 secured, as at 50, to the seat back 16 at the lower end thereof, the tubular member 33 being arranged to enter between the arms of the bracket 49 when the seat back is raised, thus permitting the entry of the bolt under pressure of its spring 51. The bolt 47 has a knob 52 provided on its outer end, as shown in Fig. 7, for manual operation thereof. When the chair is folded and the tubular member 33 enters between the arms of the bracket 49, the bolt 47 is automatically forced out of the way by cam action of the tubular member on the beveled inner end of the bolt, but the bolt promptly thereafter enters the hole 48 under action of the spring 51 to lock the seat in the folded position. When the chair is to be unfolded, however, it is only necessary to withdraw the bolt 47 by means of the knob 52, whereupon the seat back 16 will drop of its own accord to the horizontal position. In this same movement, the link connection 42 between the bell-crank-shaped supporting arm 31 and the seat bottom 15 serves to raise the rear portion of the seat bottom so as to move the seat bottom from the inclined position of Fig. 5 to horizontal alignment with the seat back 16. It is important to note that the link 42 in moving from the position of Fig. 5 to

that of Fig. 6 has its pivot 43 moved past a dead center position relative to the pivots 34 and 44, as indicated by the dot and dash line *a-b* in Fig. 6. When the pivot 43 is below the dead center line *a-b*, it is obvious that sufficient downward pressure on the seat bottom 15 or seat back 16 at any point between the pivot points 19 and 38 would necessarily cause the parts 15 and 16 to move in the direction of the folded position of Fig. 5, whereas when the pivot 43 is above the dead center line *a-b*, downward pressure at any point on the parts 15 and 16 has no tendency to cause the chair to fold. The chair can be folded only by lifting the seat back 16 at any point remote from its pivotal connection 26 with the seat bottom 15. When the chair is unfolded, a rubber bumper 53 provided on the rear portion of the bracket 32 is arranged to strike the floor 14 substantially simultaneously with the engagement of another rubber bumper 54 with the back of the link 42, the bumper 54 being secured to the bracket 45 on the seat bottom 15. These bumpers 53 and 54, therefore, limit the unfolding movement in addition to silencing and cushioning the operation. Another rubber bumper 55 on the floor bracket 17 is arranged to be engaged by a fiat pad portion 56 provided on the under side of the bracket 32 at the end of the folding movement, thus providing a limit stop in addition to silencing and cushioning that operation. When the bolt 47 is entered in the hole 48, the pad 56 is held out of engagement with the bumper 55, as indicated in Fig. 5, or at least there is no appreciable compression of the bumper and the bumper is, therefore, not under compression during the long periods of service in which the chairs are folded. In that way there is no unnecessary wear and tear on the bumper 55.

The floor bracket 17 has another bolt 57 provided therein for releasably locking the bracket 32 in an intermediate position between the folded and unfolded positions just described, whereby to lock the seat back 16 or 16', as the case may be, in a position approximately midway between the folded and unfolded positions described, as, for example, as illustrated by the seat back 16 in Fig. 3. Such an adjustment, as previously indicated, is desirable where the patient wants to use the seat back as a head rest, without a pillow. Ordinarily the seat back 16' of chair 13 is adjusted in that way, but in Fig. 3 I have shown the chair 12 reversed from its normal position with the seat back 16 so adjusted, that being desirable where the patient wants to ride head forward or the attending physician indicates such a preference. The reversibility of the chair 12 is more fully described later. The bolt 57 is of an in or out type, not spring pressed like the bolt 47, but preferably provided with suitable detent means for releasably holding the same in either extreme position or else relying simply upon friction in its mounting 58 to insure keeping the bolt in a retracted position, when so desired, so as not to be apt to interfere with free oscillatory movement of the bracket 32 when moving from folded to unfolded position or vice versa. The bracket 32 has a socket 59 provided therein on that side toward the bolt 57 and at the proper radius with respect to the pivot 34 to register with the bolt 57 when the bracket 32 is in an intermediate position corresponding approximately to a 45° position of the seat back 16 or 16' as the case may be. So long as the bolt 57 is entered in the socket 59, it is, of course, obvious that the chair is securely locked

in the intermediate position of adjustment, and when the bolt is withdrawn, the seat back 16 unless held by hand will drop to horizontal position or may be raised to the upright folded position.

The floor bracket 17 for chair 12, as shown in Fig. 9, has three screws 60, 61, and 62 entered through holes in flanges on the bottom thereof and threaded in nuts 63 provided therefor in the floor 14. The nuts for the screws 61 and 62 are on a median line *c-d* midway between the locations of the nut for the bolt 60 and another nut 63a located on a longitudinal center line *e-f* at right angles to the line *c-d*. It is, therefore, evident that upon removal of the screws 60, 61, and 62, the floor bracket 17 may be turned around through 180° and the screw 60 entered in nut 63a, while screws 61 and 62 may be replaced in the same nuts 63 from which they were previously removed. The line *c-d* is incidentally a true transverse center line for the unfolded chair 12 as a whole, so that it makes no difference whether the chair 12 faces forwardly or rearwardly, the same small gap is left in either event between the two chairs in their unfolded condition, as should be evident from comparison of Figs. 2 and 3.

The cushions 29 and 30 are preferably of single seat width so that the generally rectangular frame 64 of a stretcher 65 will fit down over the sides of the cot defined by the two chairs in unfolded condition, as illustrated in Figs. 2 and 10, the canvas webbing 66 of the stretcher under these conditions resting on top of the cushions 29, 30, 29' and 30' for support of the stretcher. In emergency cases where every saving in time is of the utmost importance and where any unnecessary handling of the patient should be avoided, it is of considerable advantage for the attendants to be able to place the stretcher directly on the cot in the manner described, and, of course, it is manifest that there is no likelihood of the stretcher slipping off the cot side-wise or lengthwise once it has been placed thereon, with the frame 64 surrounding the cot as described.

The stretcher 65 is preferably of a knock-down construction so that it can be stored in a small space, but on the other hand can be put together quickly and easily for use. The frame 64 consists of straight tubular side members 67 and U-shaped tubular end members 68, the two arms of which are arranged to have their ends entered in the ends of the side members in abutment with rubber bumpers 69 set in the side members and supported by cross-pins 70 against inward displacement. The side members 67 fit in tubular side portions 71 of the webbing 66, and the cross-portions of the U-shaped end members 68 fit in loops 72 formed on the end extensions 73 of the webbing, the end extensions being folded over the end members 68 and fastened by snap fasteners 74. The webbing 66 can be removed from the carrying frame 64 by unfastening the end portions 73 from the end members 68, after which the end members 68 can be slipped out from the side members 67 and the side members 67 can be slipped out of the tubular side portions 71 of the webbing. The knocked down frame will obviously fit in a much smaller space than the assembled stretcher.

While the invention has been described as applied to chairs for use in ambulances, it should, of course, be understood that the same might be used elsewhere, wherever the features of ad-

justability herein disclosed would be advantageous.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing an operating connection between the rear portion of the seat bottom and the other end of said bell-crank member, and means for detachably rigidly connecting the seat back with the bell-crank member to hold the seat back in upright position substantially at right angles to the seat bottom.

2. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing a support for the hingedly connected portions of said seat bottom and seat back on the other end of said bell-crank member in their unfolded coplanar relationship, and means for detachably rigidly connecting the seat back with the bell-crank member to hold the seat back in upright position substantially at right angles to the seat bottom.

3. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, link means pivotally connected to the other end of the bell-crank member at one end and pivotally connected at its other end to the rear portion of the seat bottom so that the pivot at the first end of the link means moves upwardly toward a dead center line drawn from the pivot at the

other end of the link means to the supporting pivot of said bell-crank member when the seat back is unfolded toward coplanar relationship with the seat bottom, and means for detachably rigidly connecting the seat back with the bell-crank member to hold the seat back in upright position substantially at right angles to the seat bottom.

4. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing an operating connection between the rear portion of the seat bottom and the other end of said bell-crank member, and means for detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom.

5. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing a support for the hingedly connected portions of said seat bottom and seat back on the other end of said bell-crank member in their unfolded coplanar relationship, and means for detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom.

6. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, link means pivotally connected to the other end of the bell-crank member at one end and pivotally connected at its other end to the rear portion of the seat bottom so that the pivot at the first end of the link means moves upwardly toward a dead center line drawn from the pivot at the other end of the link means to the supporting

pivot of said bell-crank member when the seat back is unfolded toward coplanar relationship with the seat bottom, and means for detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom.

7. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing an operating connection between the rear portion of the seat bottom and the other end of said bell-crank member, and means for selectively detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom, or supporting the seat back in an intermediate position between the two extreme folded and unfolded positions.

8. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing a support for the hingedly connected portions of said seat bottom and seat back on the other end of said bell-crank member in their unfolded coplanar relationship, and means for selectively detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom, or supporting the seat back in an intermediate position between the two extreme folded and unfolded positions.

9. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, link means pivotally connected to the other end of the bell-crank member at one end and pivotally connected at its other end to the rear portion of the seat bottom so that the pivot at the first

end of the link means moves upwardly toward a dead center line drawn from the pivot at the other end of the link means to the supporting pivot of said bell-crank member when the seat back is unfolded toward coplanar relationship with the seat bottom, and means for selectively detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom, or supporting the seat back in an intermediate position between the two extreme folded and unfolded positions.

10. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, link means pivotally connected to the other end of the bell-crank member at one end and pivotally connected at its other end to the rear portion of the seat bottom so that the pivot at the first end of the link means moves upwardly toward a dead center line drawn from the pivot at the other end of the link means to the supporting pivot of said bell-crank member when the seat back is unfolded toward coplanar relationship with the seat bottom, resilient bumper means between the seat bottom and the link means to limit movement of the link means in the unfolding of the chair and cushion and silence the unfolding operation, and means for detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom.

11. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, link means pivotally connected to the other end of the bell-crank member at one end and pivotally connected at its other end to the rear portion of the seat bottom so that the pivot at the first end of the link means moves upwardly toward a dead center line drawn from the pivot at the other end of the link means to the supporting pivot of said bell-crank member when the seat back is unfolded toward coplanar relationship with the seat bottom, resilient bumper means between the seat bottom and the link means to limit movement of the link means in the unfolding of the chair and cushion and silence the unfolding operation, another resilient bumper means between the support and bell-crank mem-

ber for limiting the return movement when the seat back is folded and to silence and cushion the folding operation, and means for detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom.

12. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, link means pivotally connected to the other end of the bell-crank member at one end and pivotally connected at its other end to the rear portion of the seat bottom so that the pivot at the first end of the link means moves upwardly toward a dead center line drawn from the pivot at the other end of the link means to the supporting pivot of said bell-crank member when the seat back is unfolded toward coplanar relationship with the seat bottom, resilient bumper means for limiting the unfolding movement, comprising a rubber bumper on the seat bottom arranged to engage the link means at the limit of movement thereof, and another rubber bumper on the bell-crank member arranged simultaneously to engage the floor under the chair at the limit of unfolding movement, and means for detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom.

13. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, link means pivotally connected to the other end of the bell-crank member at one end and pivotally connected at its other end to the rear portion of the seat bottom so that the pivot at the first end of the link means moves upwardly toward a dead center line drawn from the pivot at the other end of the link means to the supporting pivot of said bell-crank member when the seat back is unfolded toward coplanar relationship with the seat bottom, resilient bumper means for limiting the unfolding movement, comprising a rubber bumper on the seat bottom arranged to engage the link means at the limit of movement thereof, and another rubber bumper on the bell-crank member arranged simultaneously to engage the floor under the chair at the limit of unfolding movement, resilient bumper means for

limiting the folding movement, comprising a rubber bumper on the support arranged to be engaged by a portion of the bell-crank member at the limit of folding movement, and means for detachably securing the bell-crank member in a position holding the seat back in an upright position, substantially in right angle relation to the seat bottom.

14. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing a support for the hingedly connected portions of said seat bottom and seat back on the other end of said bell-crank member in their unfolded coplanar relationship, means for detachably rigidly connecting the seat back with the bell-crank member to hold the seat back in upright position substantially at right angles to the seat bottom, and another means on said support for detachably securing the bell-crank member in another position when the last mentioned means is released, whereby to hold the seat back in an intermediate position between the extreme folded and unfolded positions.

15. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing a support for the hingedly connected portions of said seat bottom and seat back on the other end of said bell-crank member in their unfolded coplanar relationship, and means on the support for releasably locking the bell-crank member in a predetermined position of angular adjustment with respect to said support.

16. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, and a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, one end of said bell-crank member having supporting engagement with the seat back and the other end of said bell-crank

member having supporting engagement with the seat bottom.

17. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, and a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, one end of said bell-crank member having supporting engagement with the seat back and the other end of said bell-crank member having a thrust link connection with the seat bottom, said thrust link being movable from one side of a dead-center position to the other side in the movement of the bell-crank member from one extreme position to the other, whereby when the bell-crank member is disposed in one extreme position supporting the seat back in upright position substantially at right angles to the seat bottom, the seat bottom under load exerts thrust through the link on the bell crank member tending to turn it toward the seat back, but when the bell-crank member is disposed in the opposite extreme position supporting the seat bottom and seat back in substantially coplanar relationship, the seat bottom under load exerts thrust through the link on the bell-crank member tending to turn it in the opposite direction away from the seat back.

18. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, one end of said bell-crank member having supporting engagement with the seat back and the other end of said bell-crank member having a thrust link connection with the seat bottom, said thrust link being movable from one side of a dead-center position to the other side in the movement of the bell-crank member from one extreme position to the other, whereby when the bell-crank member is disposed in one extreme position supporting the seat back in upright position substantially at right angles to the seat bottom, the seat bottom under load exerts thrust through the link on the bell-crank member tending to turn it toward the seat back, but when the bell-crank member is disposed in the opposite extreme position supporting the seat bottom and seat back in substantially coplanar relationship, the seat bottom under load exerts thrust through the link on the bell-crank member tending to turn it in the opposite direction away from the seat back, and means for releasably securing said bell-crank member in a position intermediate the aforesaid extreme positions.

19. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to

one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, and means providing support for the rear portion of the seat bottom on the other end of said bell-crank member.

20. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, and means including a thrust link providing support for the rear portion of the seat bottom on the other end of said bell-crank member, said thrust link being movable from one side of a dead-center position to the other side in the movement of the bell-crank member from one extreme position to the other, whereby when the bell-crank member is disposed in one extreme position supporting the seat back in upright position substantially at right angles to the seat bottom, the seat bottom under load exerts thrust through the link on the bell-crank member tending to turn it toward the seat back, but when the bell-crank member is disposed in the opposite extreme position supporting the seat bottom and seat back in substantially coplanar relationship, the seat bottom under load exerts thrust through the link on the bell-crank member tending to turn it in the opposite direction away from the seat back.

21. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, means providing a slidable, substantially horizontal, pivotal connection between one end of said bell-crank member and the seat back, means providing an operating connection between the rear portion of the seat bottom at the other end of said bell-crank member, and means for releasably securing said bell-crank member in a position intermediate the aforesaid extreme positions.

22. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle rela-

tionship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, said bell-crank member having a long arm and a short arm in angular relationship to one another, means providing a sliding pivotal connection between the outer end of the long arm and the seat back, and means providing a link connection between the outer end of the short arm and the rear portion of the seat bottom.

23. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, said bell-crank member having a long arm and a short arm in angular relationship to one another, means providing a sliding pivotal connection between the outer end of the long arm and the seat back, and means providing a link connection between the outer end of the short arm and the rear portion of the seat bottom, said link being movable from one side of a dead-center position to the other side in the movement of the bell-crank member from one extreme position to the other, whereby when the bell-crank member is disposed in one extreme position supporting the seat bottom in upright position substantially at right angles to the seat bottom, the seat bottom under load exerts a force on the bell-crank member tending to turn it toward the seat back, but when the bell-crank member is disposed in the opposite extreme position supporting the seat bottom and seat back in substantially coplanar relationship, the seat bottom under load exerts a force on the bell-crank member tending to turn it in the opposite direction away from the seat back.

24. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, said bell-crank member having a long arm and a short arm in angular relationship to one another, means providing a sliding pivotal connection between the outer end of the long arm and the seat back, and means providing a link connection between the outer end of the short arm and the rear portion of the seat bottom, and means for releasably securing said bell-crank member in a position intermediate the aforesaid extreme positions.

25. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at ad-

joining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, said bell-crank member having a long arm and a short arm in angular relationship to one another, means providing a sliding pivotal connection between the outer end of the long arm and the seat back, means providing a link connection between the outer end of the short arm and the rear portion of the seat bottom, and means for releasably rigidly securing the long arm of the bell-crank member to the seat back holding the seat back in upright position substantially at right angles to the seat bottom.

26. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, said bell-crank member having a long arm and a short arm in angular relationship to one another, means providing a sliding pivotal connection between the outer end of the long arm and the seat back, means providing a link connection between the outer end of the short arm and the rear portion of the seat bottom, and resilient bumper means between the support and the short arm of the bell-crank member for limiting the return movement of said bell-crank member when the seat back is folded and to silence and cushion the folding operation.

27. An adjustable chair of the character described, comprising, in combination, a seat bot-

tom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, said bell-crank member having a long arm and a short arm in angular relationship to one another, means providing a sliding pivotal connection between the outer end of the long arm and the seat back, means providing a link connection between the outer end of the short arm and the rear portion of the seat bottom, and resilient bumper means between the seat bottom and said link means to limit movement of the link means in the unfolding of the chair and to cushion and silence the unfolding operation.

28. An adjustable chair of the character described, comprising, in combination, a seat bottom and a seat back hingedly connected at adjoining edges for pivotal movement relative to one another from substantially right angle relationship to substantially coplanar relationship, a support, means on said support for pivotally supporting the seat bottom on a horizontal axis parallel with the axis of said hinge connection adjacent the front thereof, a bell-crank member pivotally mounted on said support on a horizontal axis substantially parallel with the last-named axis, said bell-crank member having a long arm and a short arm in angular relationship to one another, means providing a sliding pivotal connection between the outer end of the long arm and the seat back, means providing a link connection between the outer end of the short arm and the rear portion of the seat bottom, and resilient bumper means on the long arm of the bell-crank member for engagement with the floor adjacent the support to limit movement of the bell-crank member in the unfolding of the chair and to cushion and silence the unfolding operation.

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