April 8, 1952 J. J. BLOCK 2,591,911

CHAIR FOR HANDICAPPED PERSONS

Filed Sept. 19, 1946 2 SHEETS—SHEET 1

FIG. 1

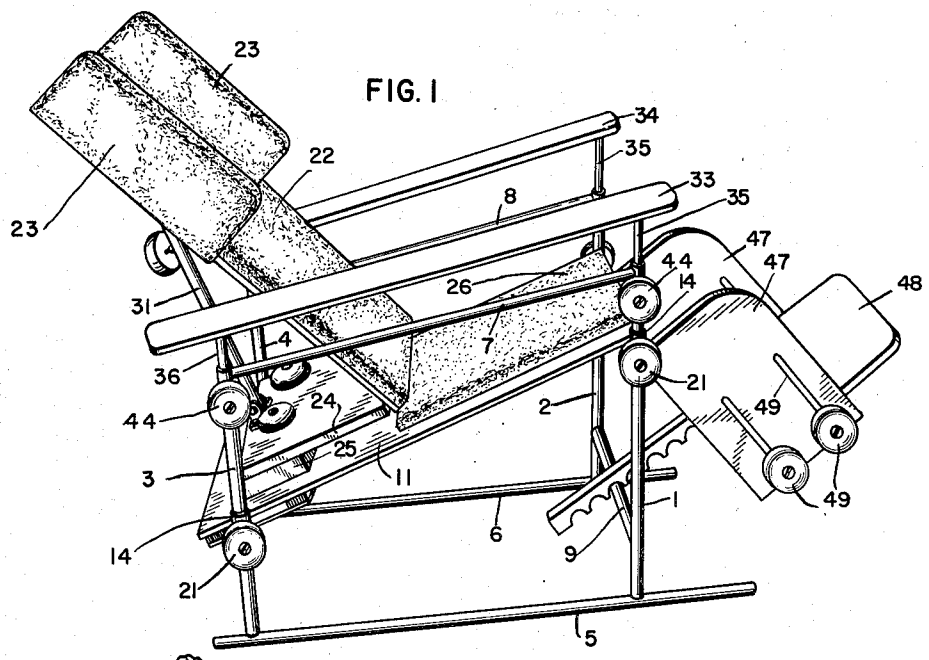
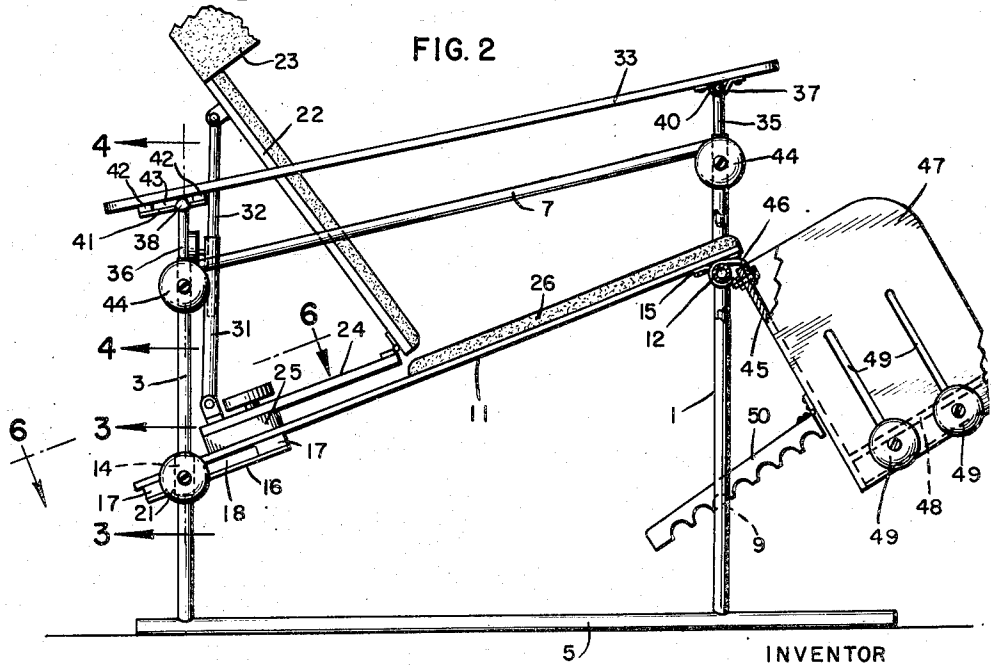


FIG. 2



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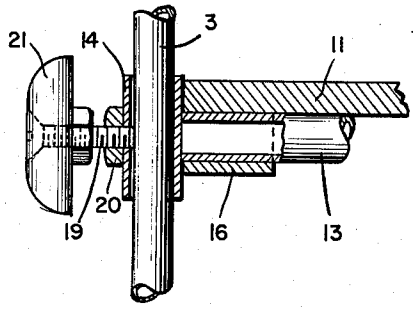
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FIG. 3



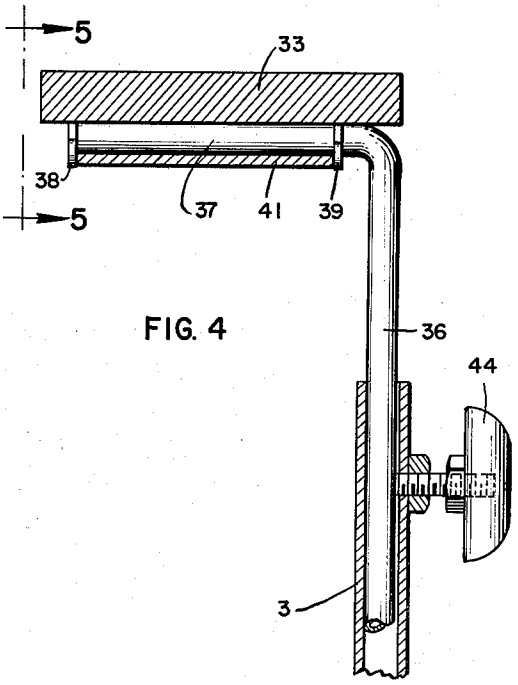


FIG. 4

FIG. 5

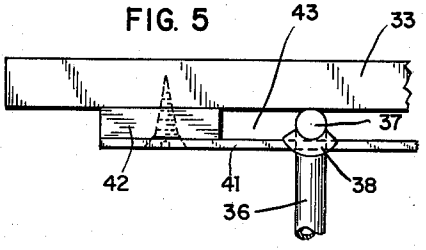


FIG. 6

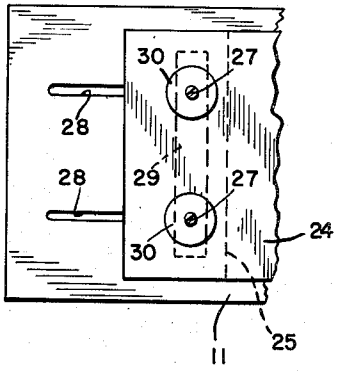
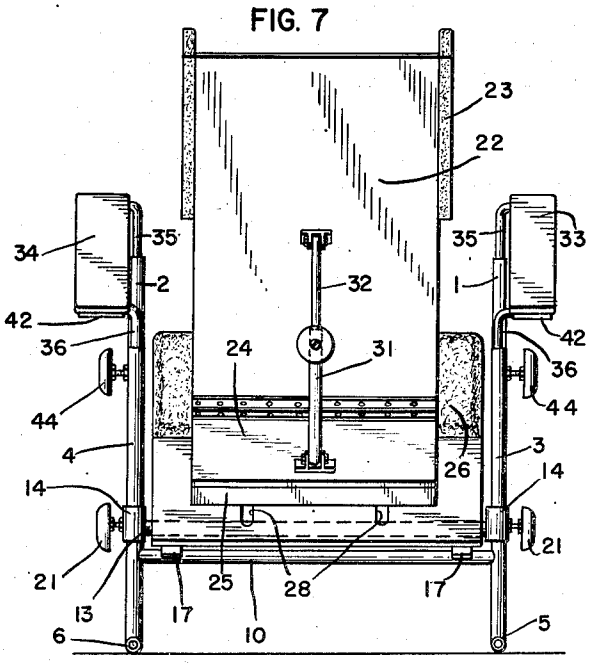


FIG. 7



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CHAIR FOR HANDICAPPED PERSONS

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7 Claims. (Cl. 155—28)

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This invention relates to adjustable chairs and similar devices for invalid and handicapped persons and particularly to improvements in the construction of such devices to increase the flexibility of adjustment thereof to suit the particular needs of the user.

The main objects of this invention are to provide an improved chair, for crippled or handicapped persons, that is adjustable in all of its body supporting elements in order to accommodate the individual peculiarities and requirements of the persons using the device; to provide such a device in which each body supporting element is individually adjustable to suit the comfort of the user in substantially all sitting or reclining positions; to provide an improved chair for invalid persons in which the seat or chair bottom can be readily adjusted to substantially any angle of fore and aft inclination; to provide an improved chair for invalid persons having individually adjustable armrests which may be set at substantially any height and angle of fore and aft inclination to suit the desires of the user; to provide an adjustable chair for handicapped persons having improved frictional clamping means, for each adjustable part, which may be quickly and easily loosened and tightened with but little physical effort on the part of the adjustor; to provide improvements in construction details of body supporting devices for handicapped persons whereby a wide range of adjustment to suit individual characteristics and desires may be more quickly and easily obtained; and to provide an improved fully adjustable chair which can be employed for posture correction purposes through periodic changes of position of the severial body supporting elements.

A specific improvement of this invention is shown in the accompanying drawings in which:

Figure 1 is a perspective side view of a chair embodying the invention.

Fig. 2 is a view in side elevation of the device shown in Fig. 1, showing construction details.

Fig. 3 is a fragmentary sectional view as taken on line 3—3 of Fig. 2 showing details of an improvide clamping device for the relatively adjustable parts.

Fig. 4 is a fragmentary sectional view as taken on line 4—4 of Fig. 2 showing details of the adjustable arm rest supporting member.

Fig. 5 is a fragmentary view of the same as taken on line 5—5 of Fig. 4.

Fig. 6 is a fragmentary plan view as taken on line 6—6 of Fig. 2 showing an arrangement for the fore and aft adjustment of the backrest, and

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Fig. 7 is a rear view of the improved chair with parts broken away to show the construction.

In the form shown in the drawings the improved chair for handicapped or invalid persons comprises a rectangular or quadrangular frame preferably constructed from tubular metal stock and having four hollow upright frame members 1, 2, 3, and 4 extending upwardly from a pair of skid members 5 and 6 and connected at their upper ends by side bars 7 and 8. The forward and rear pairs of upright members are also connected by transverse bars 9 and 10 respectively, which are located adjacent the lower ends of the upright members but spaced upwardly from the skid members 5 and 6.

As shown the skid members 5 and 6 project beyond the quadrangular frame, defined by the upright members 1, 2, 3, and 4, in the fore and aft direction, the forward extension being somewhat greater than the rearward extension to prevent forward tipping of the chair.

A platform or seat 11 is disposed within the frame between the upright members and is supported on horizontal transversely extending cross bars 12 and 13 which are in turn slidably mounted on the upright members 1, 2 and 3, 4, respectively, by means of hollow fittings 14, one at each end of each cross bar, which are telescopingly fitted on the respective upright member so as to be adjustable therealong. Each fitting 14 is also provided with a clamping means for frictionally locking the fitting in any position to which it may be set.

As shown the platform 11 is pivotally attached at its forward end to the cross bar 12 by means of a plurality of U-shaped clips 15, which are looped over the crossbar and fastened to the platform at their ends, so that the platform is capable of a hinged movement with respect to the cross bar 12. The rearward end of the platform 11 is rested upon the cross bar 13 and held thereon by securing means at each side, each securing means comprising a plate 16 which spans the cross bar 13 beneath the same, and is spaced from the underside of the platform 11 by means of spacer block 17 so as to provide a longitudinally extending slot or slideway 18 in which the cross bar 13 may slide in the fore and aft direction.

Thus the platform 11 is pivotally hinged to the forward cross bar 12 and is pivotally mounted at its rearward end in such a manner that the pivoted connection is slidable in the fore and aft direction so as to accommodate substantially any fore and aft angular tilt or position of the

platform 11, which may be accomplished by relative vertical adjustment of the cross bars 12 and 13 on the upright members.

The clamping means for frictionally holding the cross bar end sleeve 14 at any position on the respective vertical member, is shown in detail in Fig. 3, and as shown comprises a securing means or member 19 in the form of a screw which extends laterally through the sidewall of the fitting 14 so as to engage the vertical member on which the fitting 14 slides. The screw 19 has threaded engagement with the fitting 14 through a boss or enlargement 20 on the sidewall of the fitting, which boss may be formed by welding or otherwise securing a nut onto the side of the fitting 14.

As shown, the screw 19 terminates at its outer end in a handwheel 21 which is a solid rounded member of a size to fit the palm of an adult hand, and which may be similar in size and shape to the usual handwheel provided on radiator valves. The handwheel 21 is fast on the outer end of the screw 19 and its object is to provide a means for applying considerable torque or turning movement to the screw 19, with but little effort on the part of the operator, so that the securing means can be readily tightened or loosened by a person who may have little strength in his hands.

In the operation of this securing or clamping means, the screw 19, which is mounted on the outer one of the two telescopingly slidable elements, engages the inner one of such elements and forces the same against the opposite inner wall of the outer element, thus the inner element is clamped between the screw and the inner wall surface of the outer element and the relatively large surface engagement so accomplished provides a secure friction lock with comparatively little turning pressure on the handwheel 21.

As shown the improved invalid chair is provided with an adjustable back 22 having suitable side rests 23 and arranged for angular adjustment relative to the platform or seat 11. The backrest 23 is hingedly connected at its bottom end to a support 24 disposed parallel with the surface of the platform 11 and mounted on a spacer block 25 slidably secured to the platform 11 so as to be adjustable in the fore and aft direction. The support 24 is spaced above the platform 11 so as to be slid over the seat cushion 26, disposed at the forward part of the platform 11, whereby the depth of the seat can be adjusted to accommodate the size of the person using the chair.

As shown in Fig. 6, the support 24 and spacer block 25 are secured to the platform 11 by means of a pair of bolts 27 which extend through longitudinal slots 28, formed in the platform 11, and into a clamping bar 29 wherein the screws 27 have threaded engagement. The upper end of each of the screws 27 terminates in a handwheel 30 for easy manipulation and adjustment.

Angular adjustment of the brackrest 22 is afforded by means of a pair of telescoping members 31 and 32 fastened respectively to the backrest support 24 and to the backrest 22 by means of suitable pivoted connections. The telescoping members 31 and 32 are secured in any desired relative position by means of a screw clamping device mounted on the outer member 31 and of the same construction and arrangement as the clamping means for the platform support fittings 14 shown in Fig. 3.

The adjustable armrests 33 and 34 which extend along each side of the chair frame between the upright members 1, 3 and 2, 4 respectively, are each mounted on a pair of downwardly extending supports 35 and 36 which are slidably telescoped into the respective upright frame members, the hollow frame members being open at their upper ends to receive the said armrest supports.

The armrest supports 35 and 36 are identical and each is provided with a laterally extending portion 37 at its upper end upon which the armrest sets. As shown in Figs. 4 and 5 the laterally extending portion 37 of the armrest support terminates in a downwardly projecting radial flange 38 and is provided with a second inner radial flange 39 adjacent the vertical portion of the support.

As shown in Fig. 2 the forward end of the armrest is pivotally connected to the laterally extending portion 37 of the armrest support 35 by means of a suitable U-shaped clip 40 which permits a hinged movement between the armrest and the armrest support; and the rearward end of the armrest is provided with a sliding pivoted connection with the laterally extending portion of the support member 36.

The rearward sliding pivoted connection for the armrest and the vertical support 36 is shown in detail in Figs. 4 and 5 and is of the same construction as the sliding connection between the platform 11 and the rearward cross bar 13. As shown in Figs. 4 and 5, the armrest 33 is secured to the lateral portion 37 of the support member 36 by means of a plate 41 which spans the lateral portion on its under side and is spaced from the armrest 33 by means of suitable spacers 42. The spacers 42 are located a suitable distance apart in the longitudinal direction of the armrest, to provide a slot 43 in which the lateral portion 37 of the support 36 may slide.

The spanning plate 41 of the rearward armrest connection and the clip 40 at the forward end are disposed between the downwardly projecting flanges 38 and 39 on the respective lateral portions 37, and the flange portions are arranged to overlap the edges of the plate 41 and the clip 40 so as to prevent lateral displacement of the armrest 33. Preferably the flange portions 38 and 39 are quadrant shaped and project radially from the lower side only of the lateral portion 37.

Vertical adjustment of the supports 35 and 36 is obtained through the use of the same type of frictional clamping means as shown in Fig. 3, and heretofore described in connection with the sliding fittings 14, the only difference being that in the case of the armrest supports, the frictional clamping means is mounted on the stationary member. The operation, however, is the same. Such frictional clamping means for the armrest supports is indicated in the drawings by the numeral 44.

An adjustable foot and leg support is also provided on the improved invalid chair, which support comprises a back member 45 hooked onto the adjustable cross bar 12 by means of suitable brackets 46 and having side boards 47 between which is mounted an adjustable step or footrest 48. The footrest 48 is adjustable up and down along the back member 45 and between the side boards 47 so as to accommodate the leg length of the patient using the chair. Such adjustment of the footrest 48 is obtained by means of bolts which extend through slots 49 in the side boards 47 and into threaded engagement with suitable backing blocks, not shown, fastened to the underside of the footrest 48. The bolts which secure the footrest 48 terminate outwardly in hand-

wheels 49 which are fastened on to the ends of the bolts and by means of which they can be tightened or loosened readily to adjust the height of the footrest 46. Angular adjustment of the footrest is obtained by means of a notched bar 50, which is suitably fastened to the back member 45 and the notches of which are arranged to engage the forward cross bar 9.

The operation of the herein described invalid chair will be readily understood from the foregoing description and it will be apparent that all portions of the chair which support the body of the patient, or the user, are adjustable both for elevation and angle with reference to the horizontal plane upon which the chair rests. Thus no matter how contorted the most comfortable position for the patient may be, each body or limb supporting element of the chair can be set at the proper height and angles to most comfortably support the patient; and change of position of the body supporting elements of the chair can be readily made whenever the patient may desire that his position be changed.

Such adjustability of the device is brought about mainly by the construction wherein the adjustable elements are telescopingly slidable relative to each other and by the improved arrangement for frictionally clamping or securing the adjustable elements once they have been set to the desired position. In this regard the clamping means is especially important and it will be apparent that the arrangement of the clamping means is such that a great amount of frictional pressure engagement between the relative slidable members may be had by a relatively small amount of force or effort on the part of the person making the adjustment.

In use for posture correction purposes, particularly in the case of cerebral palsy or spastic patients, the chair is first adjusted to an extreme position wherein the patient is suitably balanced without undue strain, as with a high front elevation of the seat and an acute angular relation of the back. Then as the patient strengthens and begins development of muscle use the seat, back and armrests are gradually changed toward a normal sitting position until finally, after a period of time, a more normal use of the patient's muscles can be obtained or developed.

The main advantages of this invention reside in its versatility of adjustment to accommodate the most comfortable position for the user. Other advantages of the improved construction reside in the easy adjustabliity of all of the elements which enter into the support of the patient's body and limbs; and in the improved arrangement for frictionally clamping the relative adjustable parts of the device.

Still further advantages are to be found in the simple construction and arrangement of the improved chair which readily lends itself to the use of light weight tubular metal stock whereby the overall weight of the chair is considerably lessened and the cost of manufacture materially reduced.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. A chair for invalid persons comprising a frame having four hollow quadrangularly spaced upright members, a platform disposed within said frame, a fitting slidably mounted on each of said upright members and having pivoted supporting connection with said platform, clamping means on each of said fittings adapted to hold the fitting at any desired position on the respective upright member, a backrest mounted on said platform and adjustable to vary its vertical angle relative thereto, an arm rest extending from front to rear along each side of said chair frame and having pivotally connected supporting members telescopingly slidable in the respective hollow upright members, and means on said upright members arranged to clamp and hold said supporting members in any position of telescoping engagement.

2. A device of the class described comprising a quadrangular frame having a hollow upright member at each of its corners, a platform suspended between said upright members and secured thereto by means of hollow fittings each of which is slidable on its respective upright member and is provided with frictional means to clampingly engage the upright member, a backrest mounted on said platform and adjustable forward and backward thereon, means to adjust the angular position of said backrest relative to said platform, an armrest disposed at each side of said frame and hingedly mounted on supporting members telescopingly fitted into the respective upright members, and clamping means on each upright member arranged to frictionally hold said supporting members.

3. A device of the class described comprising a frame having four quadrangularly spaced hollow upright members, a cross bar extending between the forward pair of upright members, a second cross bar extending between the rearward pair of upright members, each of said cross bars having a hollow fitting at each end fitted over and slidable along the respective upright member, clamping means on each said fitting arranged to frictionally hold the respective upright member, a platform disposed in said frame and hingedly connected to each of said cross bars, a backrest mounted on said platform and adjustable forwardly and rearwardly along the same, means to vary the angular position of said backrest relative to said platform, a supporting member telescopingly fitted into and slidable in each of said upright members, an armrest disposed at each side of said frame and mounted on respective ones of said supporting members, each supporting member having pivoted connection with the respective armrest and clamping means on each upright member arranged to frictionally hold the respective supporting member.

4. In a chair having four quadrangularly spaced upright frame members, an adjustable seat comprising a rigid platform disposed between said upright members, a sleeve slidably mounted on each of said upright members, said sleeves having a horizontal supporting means for said platform extending transversely thereof, means connecting said supporting means to said platform adapted for pivotal movement of the platform on the horizontal axes of the supporting means, and the connecting means at one end of the platform having a longitudinal slideway for slidable movement of the platform relative to the supporting means in the fore and aft direction of the chair, and releasable clamping means on each sleeve adapted to hold the sleeve against sliding movement on the respective upright member.

5. In a chair having four quadrangularly

spaced upright frame members, an adjustable seat comprising a platform disposed between said upright members, a cross bar extending between the forward upright members and having a sleeve at each end slidably mounted on the respective upright member, the forward portion of said platform being supported on and hingedly connected to said cross bar, a second cross bar extending between the rearward upright members and having a sleeve at each end slidably mounted on the respective rearward upright member, means connecting said platform to said second cross bar and arranged for forward and backward sliding movement of said platform relative to said second cross bar and releasable clamping means on each of said sleeves adapted to hold the sleeve against sliding movement on the respective upright member.

6. In a device of the class described having forward and rear hollow upright frame members, an adjustable armrest extending between said frame members and having a downwardly extending support adjacent each end slidably telescoped into the respective frame member, each of said supports having a rigid horizontal portion extending transversely of the armrest, means for connecting each horizontal portion to said armrest and adapted for pivotal movement of the armrest about the axis of the horizontal portion, one of the connecting means having a longitudinal slideway to receive the respective horizontal portion for relative sliding movement of the armrest in the longitudinal direction thereof, and releasable clamping means on each frame member adapted to hold the respective support frictionally against sliding movement in the frame member.

7. In a device of the class described having

forward and rear hollow upright frame members, an adjustable armrest extending between said frame members and having a downwardly extending support adjacent each end slidably telescoped into the respective frame member, each of said supports having a laterally extending portion at its upper end terminating in a radial flange, means hingedly connecting the lateral portion of the forward support to said armrest and disposed between the flange and the downwardly extending portion of said support, a securing means adjacent the rearward end of said armrest transversely spanning the lateral portion of the rear support within the end flange thereof, said securing means having a horizontal slideway extending lengthwise of said armrest along which the lateral portion of the rear support may shift, and releasable clamping means on each frame member arranged to hold the respective support frictionally against sliding movement in the frame member.

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