

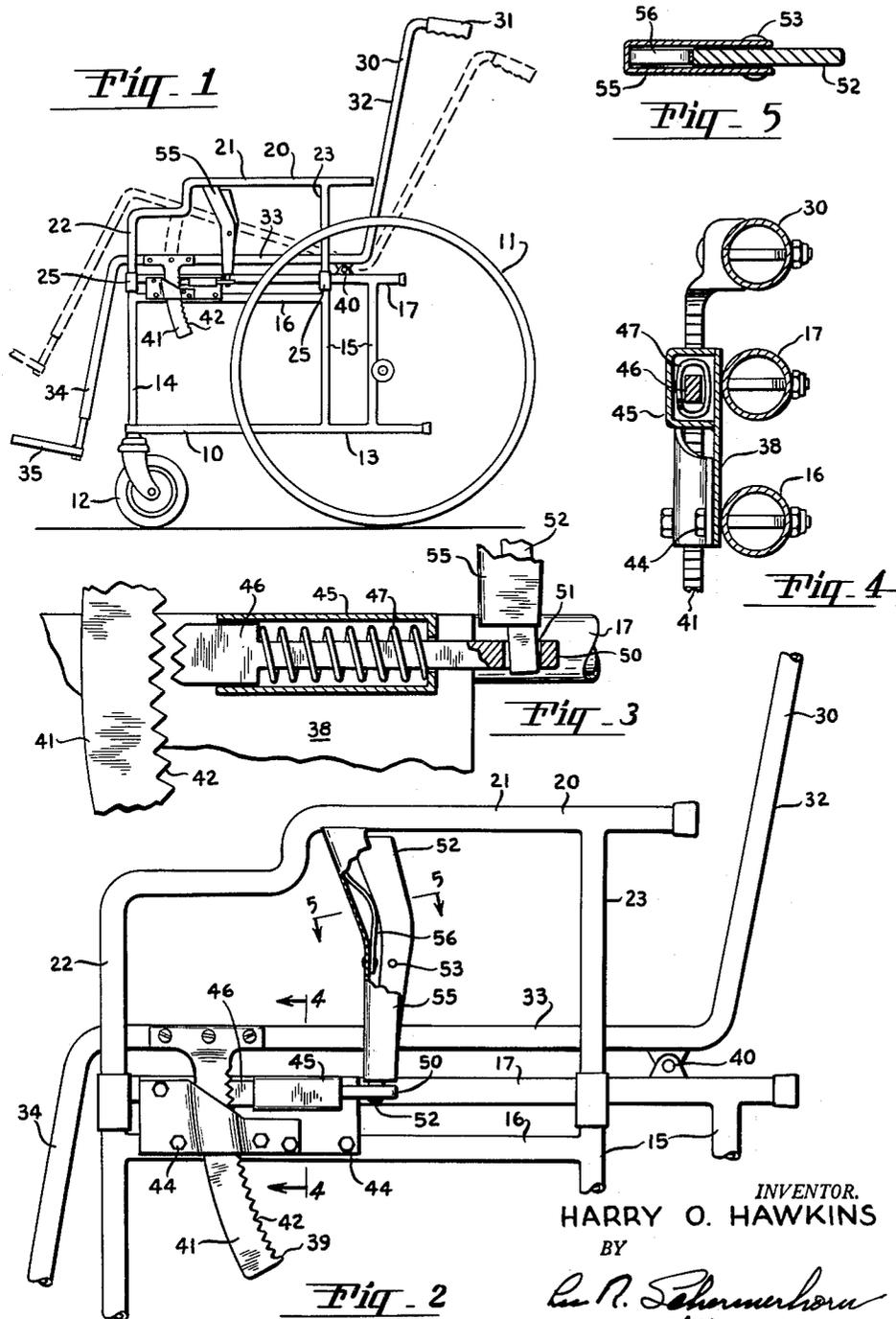
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WHEEL CHAIR WITH POSTURE ADJUSTMENT

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WHEEL CHAIR WITH POSTURE ADJUSTMENT

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This invention relates to improvements in a wheel chair and has particular reference to novel means for varying the posture of the occupant.

A person confined to a wheel chair finds it very tiresome to sit continuously in the same position. Much relief is afforded by changing the posture as much as possible as by tilting backward, rocking and by raising one leg relative to the other.

The general object of the present invention is to provide adjustments which will afford such movements and changes in position of the occupant. More specific objects are to provide improvements in wheel chair construction permitting the seat, back and foot rest to tilt and rock, to provide a flexible seat portion wherein one side may be raised relative to the other, to provide fail-safe locking means for such adjustments, to provide a simple and convenient mechanism whereby the occupant himself may impart a rocking movement and effect the various adjustments described, to provide a novel arrangement incorporating lock release means in removable arm rests and to incorporate the various new and improved features above mentioned into a conventional folding wheel chair in such a way as to present no conflict with the folding action of the chair and so as not to appreciably increase the cost of the chair.

In the present chair the seat, back and foot rest are arranged to tilt as a unit on the wheeled base frame and suitable hand grips are provided in a convenient location so that the operator can adjust the tilting position himself and can even rock himself on a pivotal back and seat support. The tilting movement is locked individually on opposite sides of the seat by safety latches so that if the occupant should lose his grip or lose consciousness, the tilting movement will be automatically locked. The seat has sufficient flexibility to permit one side to be elevated somewhat higher than the other side to shift the weight of the occupant laterally to some extent. Release levers for the latch devices are incorporated in hand grips, these hand grips being mounted on removable arm rests and arranged so as not to interfere with the folding movement of the chair.

The invention will be better understood and still other objects and advantages will become apparent from the following description of the preferred embodiment illustrated on the accompanying drawings. Various changes may be made, however, in the details of construction and arrangement of parts and all such modifications within the scope of the appended claims are included in the invention.

In the drawing:

FIGURE 1 is a side elevation view of a wheel chair embodying the invention;

FIGURE 2 is a fragmentary enlarged view similar to FIGURE 1 with parts broken away;

FIGURE 3 is a fragmentary enlarged side elevation view with parts broken away, showing the latch device;

FIGURE 4 is a sectional view taken on the line 4—4 of FIGURE 3; and

FIGURE 5 is a sectional view taken on the line 5—5 of FIGURE 2.

The present improvements are incorporated in a conventional type of folding wheel chair having a pair of opposite base frames 10, each equipped with a large rear wheel 11 and a front caster wheel 12. These side frames of the base are interconnected with the usual scissors

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linkage allowing them to collapse together for convenience in carrying and storage. This folding mechanism is not illustrated since it is well understood in the art and is not involved in the present improvements. Each frame 10 comprises a horizontal bottom rail 13, a front vertical post 14 and a pair of rear vertical posts 15. The upper ends of these posts are connected to one or a pair of upper longitudinal rails as exemplified by the rails 16 and 17. The frame members just described are preferably of tubular metal construction for strength and light weight.

The numeral 20 designates a removable arm rest. The arm rest comprises an upper bar 21 which is bent down at its front end to form a vertical post 22. The rear end of the rail is supported on an integral post 23. These parts are also preferably formed of tubular metal and the bottom ends of posts 22 and 23 fit into tubular sockets 25 on the upper ends of posts 14 and 15 whereby the arm rest may be readily lifted out of these sockets when it is not needed.

The main structural elements of the tilting seat unit comprise a pair of left and right side tubular frame members 30. The upper ends of these members are bent rearwardly and equipped with hand grips 31 for pushing the chair. An upright portion 32 carries the back of the chair, a horizontal portion 33 carries the seat portion and a downwardly bent leg portion 34 supports an adjustable foot rest 35 in the conventional manner. Flexible seat and back members span the upright and horizontal portions 32 and 33 in conventional manner, these parts being constructed to permit collapsing of the chair since the right and left frame members 30 collapse together along with the frame members 10 when the chair is folded. If necessary for frame stability and alignment, the front ends of the horizontal members 17 may be spanned by a fabric band about six inches in width.

The seat portion 33 of each bar 30 is pivotally connected at 40 with one of the top frame rails 17 slightly forward from the axis of rear wheels 11. This permits the seat, back and foot rests to tip back as an integral unit as shown in broken lines in FIGURE 1. Attached to the forward end of each seat portion 33 of the bar 30 is a depending arcuate latch bar 41 having a toothed edge 42 and a stop lug 39 on its lower end. This bar travels in a slot between a plate 38 on upper frame members 16 and 17 and a guard plate 43 which is secured at its front end to these members by bolts 44 or other suitable means. The guard plate curves outward to provide the slot for bar 41, which slot is not long enough to pass the stop lug 39. The rear end of guard plate 43 is bolted to plate 38. Plate 38 is mounted on members 16 and 17 by bolts 44 or other suitable means.

Secured to the rear end of plate 38 is a guide housing 45 for a slidable serrated latch dog 46. The latch dog is normally urged forward into engagement with latch bar 41 by a compression spring 47 which is confined between the rear end of the latch dog and rear end of housing 45. The latch dog has a rearward extension 50 which extends through spring 47 and out of the rear end of housing 45. The rear end of this rod has a vertical opening 51 to receive the lower end of a release lever 52 as shown in FIGURE 3. The movable latch mechanism is preferably made as a unit on mounting plate 38.

Release lever 52 is mounted intermediate its ends on a pivot 53 in vertically extending hand grip 55 depending from a forward portion of the upper bar 21 of arm rest 20. The upper end of lever 52 is normally urged rearward by a leaf spring 56 mounted on grip 55. Grip 55 is preferably U-shaped in cross section as shown in Figure

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5 and is open on its rear side to receive the forward edge of level 52 with the upper end portion of the lever projecting rearward therefrom. The lower lip of grip 55 may be connected to a fairly wide horizontal metal band which is fastened at its ends to the posts 22 and 23. This would rigidify the posts and hand grips but is not illustrated because it does not affect the operation of the chair. The right side of the chair is equipped with an identical latch device and release lever and is constructed the same as the left side which is illustrated. The present tilting, latching and release mechanisms are designed for incorporation into existing chairs as well as the manufacture of new chairs.

When an occupant of the chair wishes to tilt back he merely grasps the hand grips 55 with both hands at their upper ends just under the top rail 21 and squeezes the release levers 52 to withdraw both latch dogs 46 from the latch bars 41 on opposite sides of the chair. The seat, back and foot rest portions are then free to pivot and by pushing forward with his hands, he can tilt the seat and back to the limit of movement allowed by stop lugs 39. The seat and back are automatically locked in any desired position by merely relaxing the grasp on hand grips 55. The patient can also rock himself and exercise his arms by merely holding the release levers 52 in retracted position while he grasps the hand grips 55. The hands grips being directly under the arm rests and above the level of the seat are in the most advantageous position for the occupant to pull himself forward to upright position with a minimum of effort after being tilted back.

He can also shift his weight to some extent from one hip to the other by releasing the latch dog on only one side and then pushing back against that hand grip 55 while he raises his leg on that side. This will cause one frame member 30 to pivot a small amount relative to the opposite frame member which is latched since the two members 30 are not connected rigidly together. The resulting distortion in the seat causes the front edge of the seat to tilt slightly to one side. Although only a relatively small side tilt can be accomplished in this manner, the resulting shifting of the weight is relaxing when the action is reversed from time to time.

Either one or both arm rests may be removed in any position of the seat and back members without interfering with the locking function. When an arm rest is lifted out of its supporting sockets 25, the lower end of release lever 52 lifts out of opening 51 in latch dog extension 50, leaving the latch dog 46 held forward in latching position by the action of its spring 47. Spring 56 holds release lever 52 in a normal position to engage the opening 51 when the arm rest is replaced in its socket 25. Thus, the latch mechanism is not disturbed and there are no special manipulations to perform on the latch mechanism when the arm rest is removed or replaced. When the seat and back portion of the chair is latched in forward position, the chair operates as a conventional wheel chair with or without the arm rests and cannot tilt back inadvertently whereby it is entirely safe at all times. Posts 22 and 23 and hand grip 55 may be offset outwardly sufficiently to cause the seat frame portions 33 to clear the occupant's hands on the hand grips when the seat tilts back.

Pivot points 40 are preferably located forward from the rear wheel axis and angle of tilt must be limited so that the whole chair will not tip over backward. These considerations for stability will depend upon the wheel base of the chair.

Thus, the present posture adjusting mechanism does not add appreciably to the cost or weight of the chair and does not impair the facility of collapsing it or removing the arm rests when desired. Also, it does not interfere in any way with the normal use of the chair since the release levers 52 are unobtrusively mounted in the arm rests. At the same time the location of hand grips 55 above the seat and forward from pivots 40 affords the

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most convenient and effective thrusting and pulling points in normal grasping positions for tilting or rocking the seat unit with a minimum of effort by an occupant of the chair.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. A wheel chair comprising a wheeled base frame, a seat, back and foot rest frame pivotally mounted for backward tilting on said base frame, a toothed latch bar on said pivoted frame, a latch dog on said base frame engageable with said latch bar, vertical sockets on said base frame, an arm rest detachably mounted in said sockets, a rigid hand grip on the under side of said arm rest providing a thrusting and pulling point for an occupant to tilt said pivoted frame, a squeeze-type release lever for said latch dog mounted in said hand grip, and a connection between said release lever and latch dog which is detachable when the arm rest is lifted out of said sockets.

2. A wheel chair comprising a wheeled base frame, a seat, back and foot rest frame pivotally mounted for backward tilting on said base frame, a toothed latch bar depending from a forward part of the seat portion of said pivoted frame, a spring actuated sliding latch dog on said base frame engageable with said latch bar, an apertured extension of said latch dog, front and rear vertical sockets on said base frame, an arm rest having front and rear supporting posts detachably seated in said sockets, a rigid channel-shaped vertical hand grip having an open rear side depending from said arm rest between said supporting posts providing a thrusting and pulling point which an occupant may grasp to tilt said pivoted frame, a vertical release lever pivotally mounted intermediate its ends in the channel of said hand grip, said release lever having a lower end projecting into said extension aperture for retracting said latch dog and being detachable from said latch dog when said arm rest is removed, an upper end on said release lever disposed in said channel, and a spring arranged to project said upper end partially from said channel whereby a grasp on the upper end of said hand grip retracts said latch dog so that said pivoted frame may be tilted, release of said hand grip and release lever allowing said springs to engage said latch dog with said latch bar in adjusted position of said pivoted frame.

3. A wheel chair comprising right and left wheeled base frames, a seat, back and foot rest frame pivotally mounted on each base frame for tilting backward, a toothed latch bar on each side of said pivoted frames, a latch dog on each base frame engageable with one of said latch bars, an apertured extension on each latch dog, a pair of arm rests, sockets on said base frames for detachably mounting said arm rests, a rigid hand grip on the under side of each arm rest, and a squeezable release lever mounted in each hand grip and projecting downward into said apertured extension for disengagement therefrom when the arm rest is removed.

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