

June 22, 1954

P. MAURER
RECLINING CHAIR

2,681,691

Filed March 6, 1953

4 Sheets-Sheet 1

Fig. 1

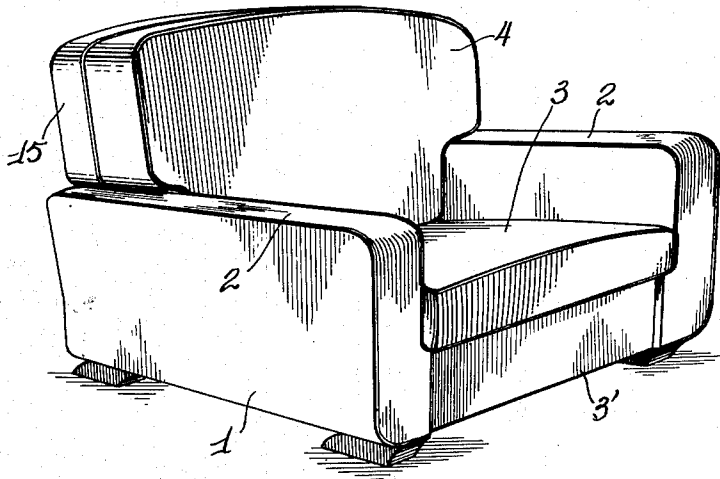


Fig. 2

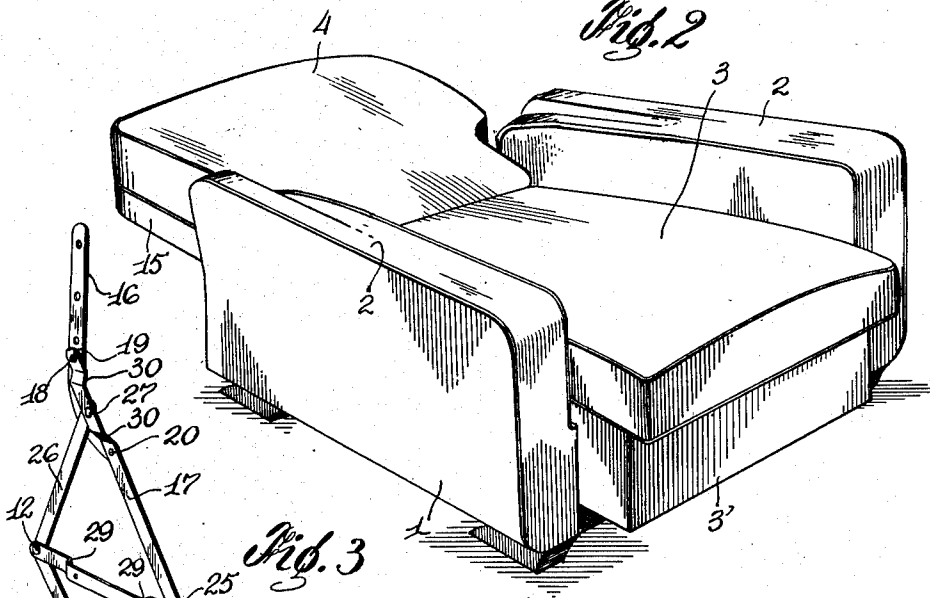
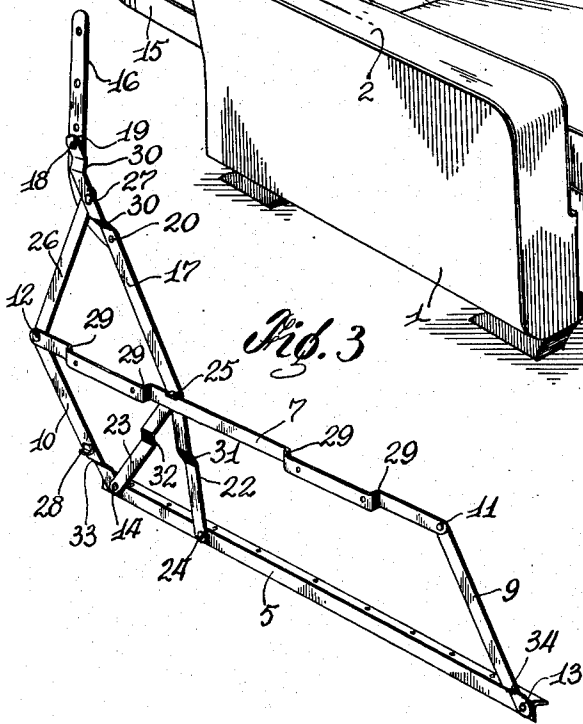


Fig. 3



Inventor
Pierre Maurer
by *Robie D. Burtier*
Attorneys

June 22, 1954

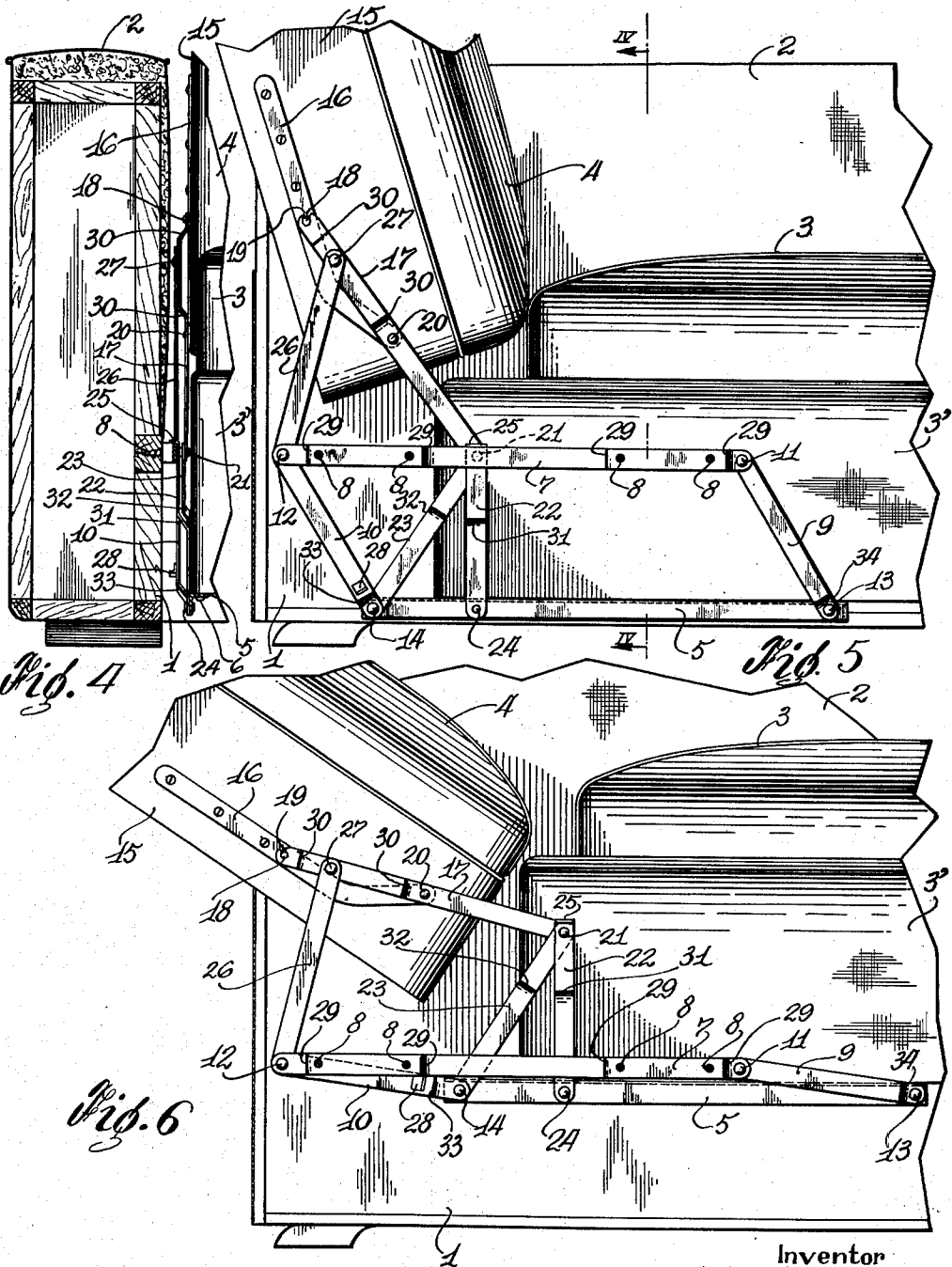
P. MAURER

2,681,691

RECLINING CHAIR

Filed March 6, 1953

4 Sheets-Sheet 2



Inventor
Pierre Maurer

by *Mobio & Dastier*
Attorneys

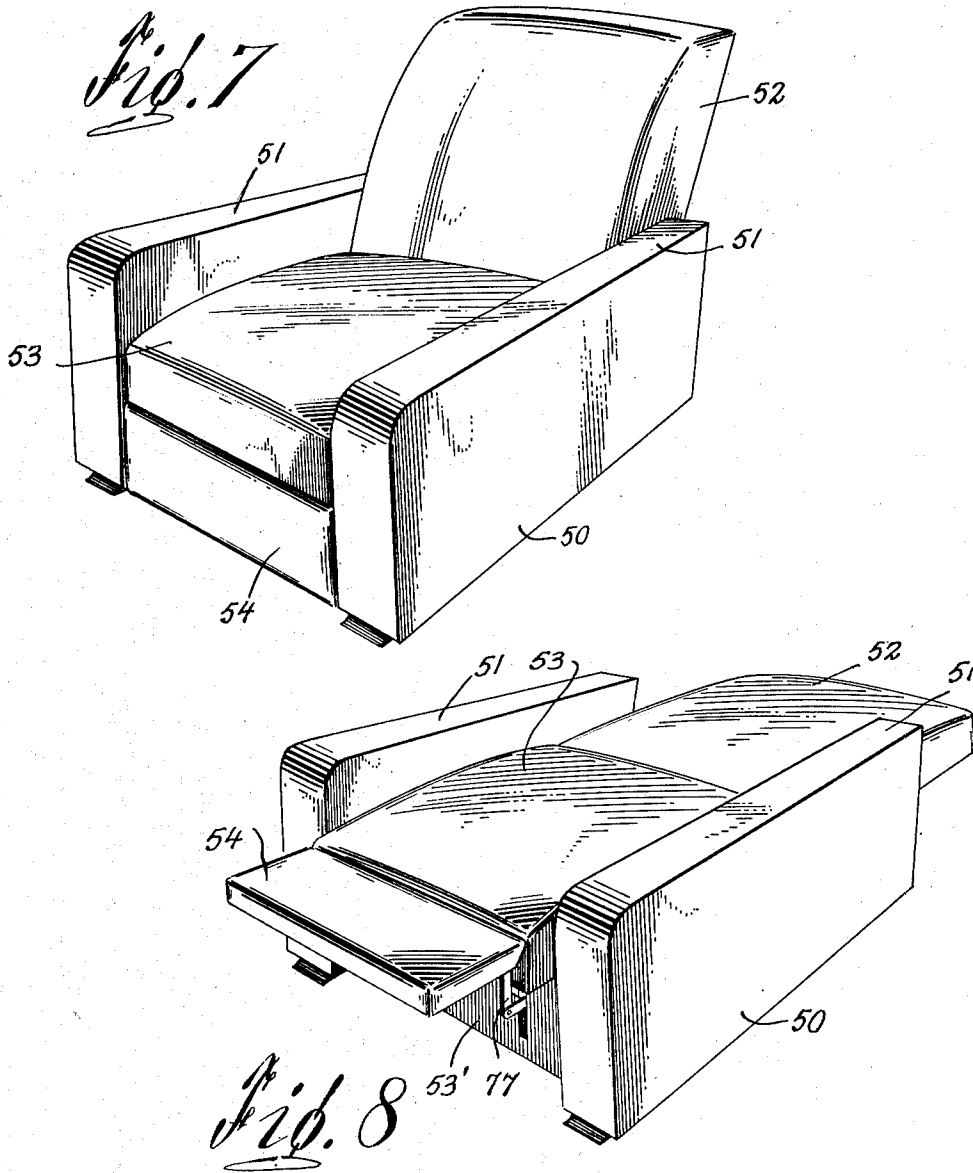
June 22, 1954

P. MAURER
RECLINING CHAIR

2,681,691

Filed March 6, 1953

4 Sheets-Sheet 3



Inventor
Pierre Maurer
Robie & Bastien
Attorneys

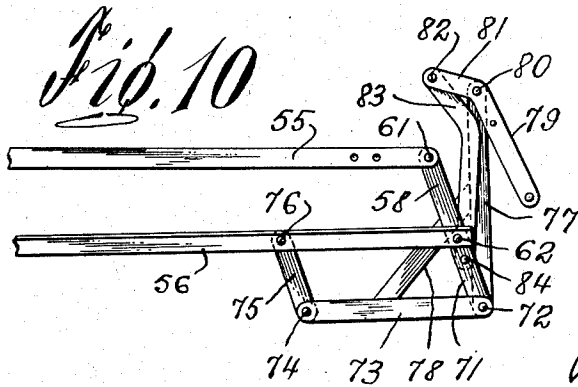
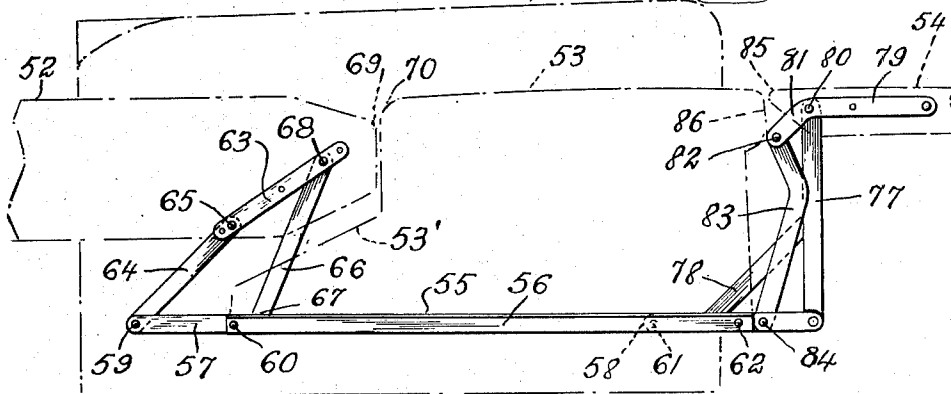
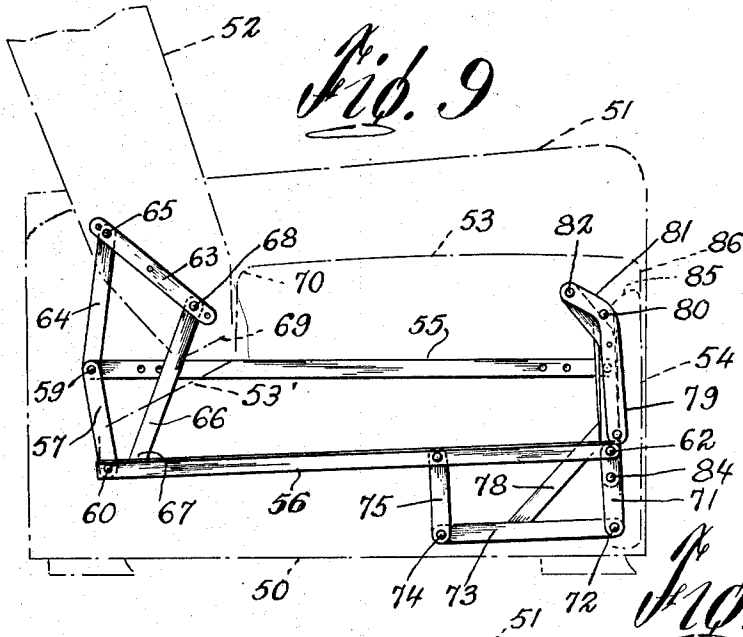
June 22, 1954

P. MAURER
RECLINING CHAIR

2,681,691

Filed March 6, 1953

4 Sheets-Sheet 4



Inventor
Pierre Maurer

Bobie & Bastier
Attorneys

UNITED STATES PATENT OFFICE

2,681,691

RECLINING CHAIR

Pierre Maurer, Rosemont, Montreal, Quebec,
Canada

Application March 6, 1953, Serial No. 340,690

10 Claims. (Cl. 155-106)

1

The present invention relates to an article of furniture and more particularly to a sitting and reclining chair.

The chair, according to the invention, is of the type in which the seat and the back are so mounted that when a person is leaning back in the chair, it will take a more or less reclining position with the back tilted to the desired angle and with the seat thereby elevated into a more or less raised position.

The general object of the present invention is the provision of a chair of the character above mentioned having a novel and improved construction whereby it will be comfortable either in upright position like an ordinary chair with a practically upright back or in reclining position, and wherein the back may reach a practically horizontal position to provide a semi-couch effect.

Another important object of the present invention is the provision of a system of supporting links, arms and bars for the movable back and seat of the chair wherein the number of component parts of said system is reduced to a minimum.

Yet another important object of the present invention is the provision of a chair of the character described, wherein the system above mentioned is so arranged that the back of the chair being in its normal sitting position will tilt backwards to an angle which will be in relation to the backward pressure exerted thereon supplemented by the normal forward thrust exerted on the seat while reclining to the desired comfortable position; by a reciprocal movement the chair is brought back into its normal sitting position.

Yet another important object of the present invention is the provision of a chair of the character described which is of strong and inexpensive construction.

Still another important object of the present invention is the provision of a chair of the character described provided with a leg rest pivotally mounted at the forward portion of the chair and movable from a downwardly extending position corresponding to the upright position of the chair, to a substantially horizontal position corresponding to the limit reclined position of the chair.

Yet another important object of the present invention is the provision of a chair of the character described provided with a leg rest and in which the means for pivoting leg rest are very simple and strong in construction.

The foregoing and other important objects of the present invention will become more apparent

2

during the following disclosure and by referring to the drawings in which:

Figure 1 is a perspective view of the chair showing the back in upright position;

Figure 2 is a perspective view of the chair showing the back in inclined position;

Figure 3 is a perspective view of the system of links and arms of the invention;

Figure 4 is a partial cross-section along line IV—IV of Figure 5;

Figure 5 is a side elevation of the system of links and arms in the position taken when the back is upright;

Figure 6 is a side elevation of the system of links and arms in the position taken when the back is inclined.

Figure 7 is a perspective view of a second embodiment of the chair according to the invention, in upright position.

Figure 8 is a perspective of the same chair in inclined position.

Figure 9 is a side elevation of the system of links and bars provided in the chair in the position according to Figure 7.

Figure 10 is a side elevation of the system of links and bars shown in an intermediate position; and

Figure 11 is a side elevation of the same system of links and bars shown in the position taken when the chair is in fully reclined position.

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, the invention comprises a chair body 1 of any suitable shape or character, and provided with arm rests 2 on the sides thereof. The body 1 forms a rigid frame on which the seat 3 and the back 4 are mounted by means of a system of links, arms and bars described hereinafter.

The seat 3 and back 4 are preferably upholstered and may be finished in any manner or style.

The seat 3 has a rigid frame 3' to both lateral sides of which are secured a horizontal angle bar 5 by means of screws 6. A horizontal support bar 7 is secured to the chair body 1 by means of screws 8 on each side of said chair. Front and back links 9 and 10 of equal length are pivoted at their upper ends to the support bar 7 as at 11 and 12 respectively and at their lower ends to the angle bar 5 as at 13 and 14 respectively. Thus the arrangement comprising members 5, 7, 9 and 10 forms a deformable parallelogram which when actuated causes the seat

3

3, which is secured to bars 5, to move forwardly and upwardly.

The back of the chair has a rigid frame 15 on both sides of which is rigidly and longitudinally secured a bent bar 16 which is removably but rigidly mounted on an arm 17 in the following manner: a locking lug 18 projects outwardly from the bar 16 to engage the recess 19 made at the upper end of the arm 17 and a bolt 20 secures the lower end of the bent bar 16 to the intermediate portion of the arm 17.

The arm 17 extends downwardly and forwardly from the back frame 15 and its lower end is connected by the pivot 21 to the upper end of a right angle triangular frame comprising the upright member 22 and inclined member 23 secured at their lower ends to the horizontal angle bar 5 at 24 and 14 respectively. The upper end of the upright member 22 forms a stop lug 25 adapted to abut the top of the support bar 7 in the lowermost position of angle bar 5.

A support member 26 is pivoted at its lower end on the pivot 12 of the support bar 7 and at its upper end to the upper portion of arm 17 as at 27.

It will be understood that the pivot 27 forms a movable axis for the back 4, that is, said pivot 27 will move forward as the back 4 pivots around it to take an inclined position. The pivotal reclining movement of the back 4 about the pivot 27 will cause arm 17 to pull upwardly on the triangular frame 22, 23 thereby causing the forward and upward movement of the lower angle bar 5 and its associated seat 3.

The link 10 is provided with a stop lug 28 for abutting the underside of support bar 7 when the chair takes its inclined limit position.

The various links, bars and arms forming the mechanism according to the invention, are suitably offset as shown at 29, 30, 31, 32, 33 and 34 to allow a suitable clearance between themselves and the frames in order that they may accomplish their individual movement without interference.

The point of attachment 24 of the upright member 22 to the horizontal angle bar constitutes a balance point which changes at all positions of the seat 3 and back 4.

It will be understood that during the forward movement of the seat 3, the arm 17 becomes more and more horizontal whereby a progressively increasing thrust is needed to progressively incline the back 4.

Thus the chair, according to the invention, will assume automatically any desired inclination depending on the degree of backward or forward thrust by the occupant of the chair.

Figures 7-11 show another embodiment of the chair according to the invention which is provided with an articulated leg rest. In this embodiment, 50 indicates the body frame, 51 the arm rests rigidly secured to the body frame, 52 the back frame, 53 the seat supported by the seat frame 53' shown in dotted line Figures 9 and 11, and the numeral 54 indicates the leg rest mounted at the forward end of the chair and capable of a complex pivotal, forward and upward movement from an inoperative downwardly extending position shown in Figure 7 taken when the chair is in upright position, to an elevated substantially horizontal position aligned with the seat 53 and back 52, as shown in Fig. 8, taken when the chair is in reclined limit position.

The second embodiment of the chair according to the invention is provided with a system of links

4

and bars disposed on the each side of the seat and back frames 53' and 52 respectively. Each system of links and bars comprises a first horizontal bar 55 rigidly secured to an arm rest 51 and a second substantially horizontal bar 56 disposed underneath the first bar 55 and rigidly secured to and supporting the seat frame 53'. The second bar 56 is suspended from the first bar 55 by means on a back link 57 and front link 58. The back link 57 is pivoted at 59 to the rear end of the first bar 55 and at 60 to the rear end of the second bar 56. The front link 58 is pivoted at 61 to the forward end of the bar 55 and at 62 to the forward end of the lower bar 56.

Although the corresponding parts of the first embodiment were shown as a deformable parallelogram, it will be understood that said arrangement may be a deformable quadrilateral system such as shown in the second embodiment. In this case, the lower bar 56 is shorter than the upper bar 55 while the front link 58 is shorter than the back link 57. Thus when the chair is in upright position as shown in Figure 9, the lower bar 56 will be slightly inclined relatively to the horizontal. But in order that the lower bar 56 may raise to its upper limit position shown in Figure 11 at the same level as that of the upper bar 55, it is necessary that the sum of the lengths of the upper bar 55 and front link 58 be equal to the sum of the lengths of the lower bar 56 and back link 57.

A straight bar 63 is rigidly secured to the back frame 52 at the lower forward end thereof while a straight support arm 64 is pivoted at 59 to the rear end of the upper bar 55 and at 65 to the rear upper end of the bar 63. A side arm support 66 is rigidly secured at 67 to the lower bar 56 near the pivot 60 and extends upwardly at an angle with said lower bar 56 to be pivotally connected at its upper end 68 to the back frame bar 63.

Referring to Figures 9 and 11, it will be apparent that the pivot connection 65 forms a movable axis for the back frame 52, and will be displaced forwardly upon reclining movement of the latter whereby the lower edge 69 of the back frame 52 will remain in contact with the rear edge 70 of the seat 53 during reclining movement of the chair and despite the fact that the seat moves forwardly during said reclining movement.

The leg rest 54 is mounted on the chair as follows. The front link 58 extends downwardly from the lower bar 56 as shown at 71 and its lower end is pivotally connected at 72 to a substantially horizontal short bar 73 the rear end of which is pivotally connected at 74 to a short link 75 extending parallel to the front link extension 71 and pivoted at its upper end 76 to the second bar 56. Thus the system comprising the bars 56 and 73, and the links 75 and 71 constitute a deformable parallelogram whereby the lower bar 73 will be displaced forwardly and upwardly upon reclining movement of the chair.

In the limit reclined position of the chair, the third bar 73 will be aligned with the bars 56 and 55 as shown in Figure 11.

An upwardly extending arm 77 is rigidly secured to the short bar 73 and is reinforced by the diagonal brace 78 welded at its upper end to the arm 77 and at its lower end to the short bar 73.

The leg rest 54 is provided on both sides thereof with crank arms 79 extending longitudinally

5

thereof and each pivoted at 80 to the upper end of the arm 77. The crank extension 81 of the said arm 79 is pivotally connected at 82 to the upper end of a link 83 which is pivoted at its lower end 84 to the link extension 71.

Upon reclining movement of the chair, the leg rest 54 will describe a complex movement from the down inoperative position shown in Figure 9 to a substantially horizontally elevated position shown in Figure 11. During this complex movement, the leg rest 54 moves forwardly and upwardly and at the same time pivots around the movable axis 80. Therefore the inner edge 85 of said leg rest will move from a position underneath the forward part 86 of the seat 53 when in inoperative position, to a position aligned and adjacent to said forward part 86 as shown in Figure 11.

While a preferred embodiment according to the invention has been illustrated and described it is understood that various modifications may be resorted to without departing from the spirit and scope of the appended claims.

What I claim is:

1. In a sitting and reclining chair, a body frame, a seat frame, a back frame pivoted on a movable axis, the latter being movable relative to the body frame by the backward tilting of the back frame, and a pair of side units hung on the body frame, one at each side of the chair for supporting the seat frame and back frame for movement from a sitting to a reclining position, automatically, by pressure against the back, each unit having links pivotally connected to said seat and body frames for suspending said seat frame from said body frame, an arm which is rigid with the back frame, a support pivoted at said movable axis on the upper and rear portion of the arm, said support pivoted at its lower end at the rear end of said body frame, and a member rigidly secured to said seat frame and to which the front and lower portion of said arm is pivotally connected whereby said pivotal point of said arm to said member is stationary relatively to said seat frame and pivotal movement of said arm about said movable axis will cause said arm to displace said seat frame.

2. A sitting and reclining chair, having a body frame, a seat frame and a back frame, said seat frame mounted on said body frame for forward and upward movement, said back frame mounted on said body frame for tilting backward movement when reclining from normal sitting position and reciprocally for return movement, a first bar on each side of said body frame and secured thereto, a second bar on each side of the body frame secured to said seat frame, links pivotally connecting said two bars for suspending said seat frame from said body frame, an arm rigidly secured to said back frame, a member rigid with said second bar, said arm pivotally connected at its lower end to said member, a support arm pivotally connected at its lower end to the back end of said first bar and at its upper end to the upper portion of said back frame arm whereby said last mentioned pivotal connection forms a movable axis for said back frame and tilting of said back frame causes movement of said movable axis and corresponding movement of said back frame arm and forward and upward movement of said seat frame.

3. A sitting and reclining chair as claimed in claim 2 including a leg rest mounted at the forward end of said seat frame for pivotal movement from a downward position corresponding

6

to the normal sitting position of the chair to a substantially horizontal position corresponding to the reclining limit position of said chair.

4. A sitting and reclining chair as claimed in claim 3 further including a third bar disposed underneath said second bar, links pivotally connecting said third and second bars, one of said last named links being a downward extension of one of said first mentioned links, an upwardly extending support rigidly secured to said third bar, said leg rest being pivoted to the upper end of said support and a link pivoted to said leg rest at a point spaced from its pivot connection to said support, said last named link pivoted at its other end to one of said links, whereby forward and upward movement of said seat frame will cause forward, upward and pivotal movement of said leg rest from said downward position to said substantially horizontal position.

5. A sitting and reclining chair as claimed in claim 4 wherein said second and third bars form a deformable parallelogram, and further including a diagonal brace rigidly secured to said leg rest support and to said third bar.

6. A sitting and reclining chair as claimed in claim 5 wherein the links connecting said first and second bars have unequal lengths and said first and second bars have also unequal lengths.

7. A sitting and reclining chair as claimed in claim 6 wherein the sum of the lengths of said first bar and one of its connecting links is equal to the sum of the lengths of said second bar and of the other of said connecting links.

8. A sitting and reclining chair, having a body frame, a seat frame and a back frame, said seat frame mounted on said body frame for forward and upward movement, said back frame mounted on said body frame for tilting backward movement when reclining from normal sitting position and reciprocally for return movement, a horizontal bar on each side of said body frame and secured thereto, a second horizontal bar on each side of the body frame secured to said seat frame, links pivotally connecting said two bars for suspending said seat frame from said body frame, an arm extending downwardly and forwardly from said back frame and rigid therewith, a frame rigid with said second bar, said arm pivotally connected at its lower end to said frame, a support arm pivotally connected at its lower end to the back end of said first bar and at its upper end to the upper portion of said downwardly extending arm whereby said last mentioned pivotal connection forms a movable axis for said back frame and tilting of said back frame causes forward movement of said movable axis and corresponding forward and upward movement of the front portion of said downwardly extending arm and forward and upward movement of said seat frame.

9. A reclining chair comprising a body frame, a deformable parallelogram arrangement disposed on each side of said body frame and comprising an upper horizontal member secured to said body frame, a lower horizontal member movable upwardly and forwardly respectively to said body frame, and a back and a front link pivotally connecting said upper and lower horizontal members, a seat frame secured to said lower horizontal member, a back frame, an arm rigidly secured to said back frame and extending downwardly and forwardly therefrom, a support arm pivotally connected at its lower end on the pivotal connection of said back link and of said upper horizontal member and at its upper end to the up-

7

per portion of said downwardly extending arm, a triangular frame secured to said lower horizontal member and rigid therewith, the lower end of said downwardly extending arm being pivotally connected to the apex of said triangular frame, said apex lying substantially at the level of said upper horizontal member when said lower horizontal bar is in its downward limit position and lying intermediate the ends of said deformable parallelogram.

10. A reclining chair as claimed in claim 9 further comprising a stop lug at the apex of said triangular frame to abut said upper horizontal

8

member in the downward limit position of said lower horizontal member.

References Cited in the file of this patent

5 UNITED STATES PATENTS

Number	Name	Date
2,240,850	Knabusch -----	May 6, 1941
2,276,053	Luckhardt -----	Mar. 10, 1942

10 FOREIGN PATENTS

Number	Country	Date
196,317	Switzerland -----	June 1, 1938