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RECLINING CHAIRS

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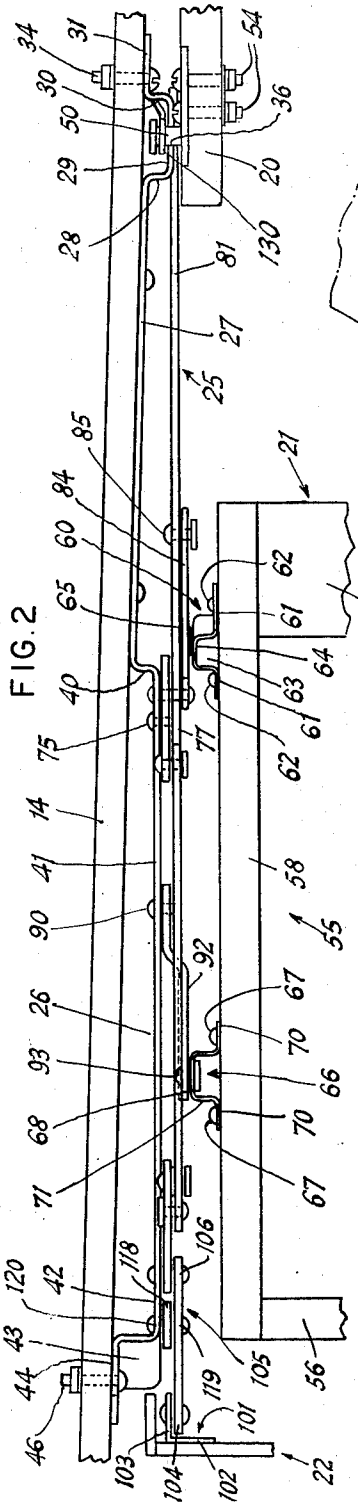


FIG. 2

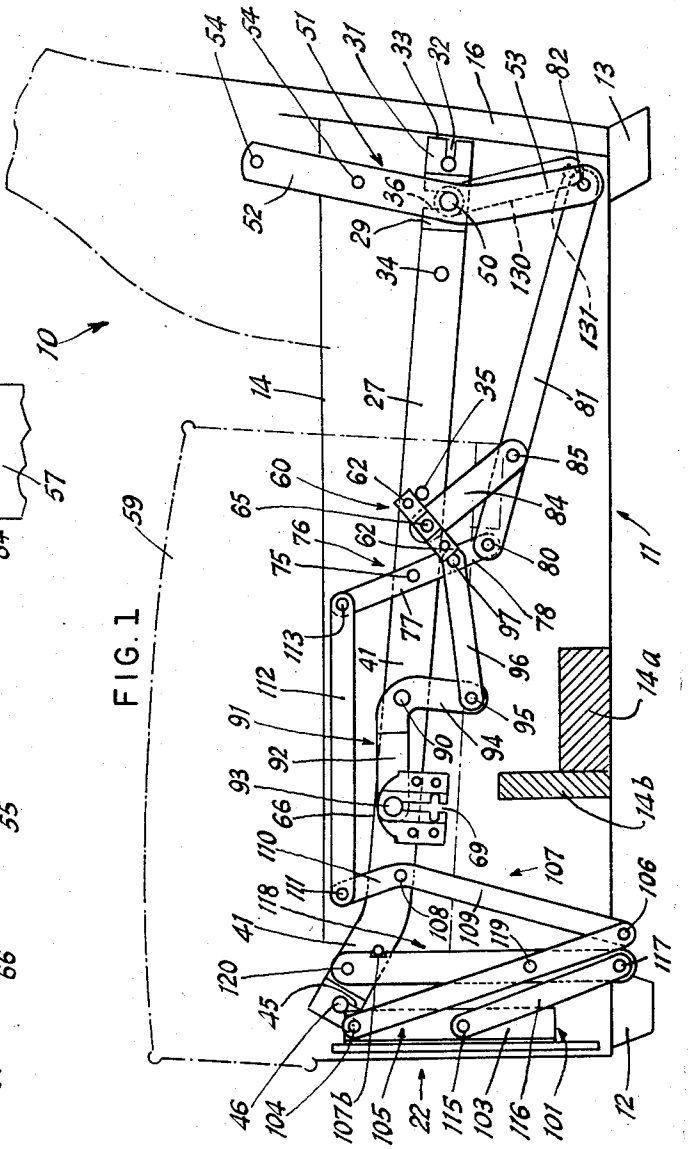


FIG. 1

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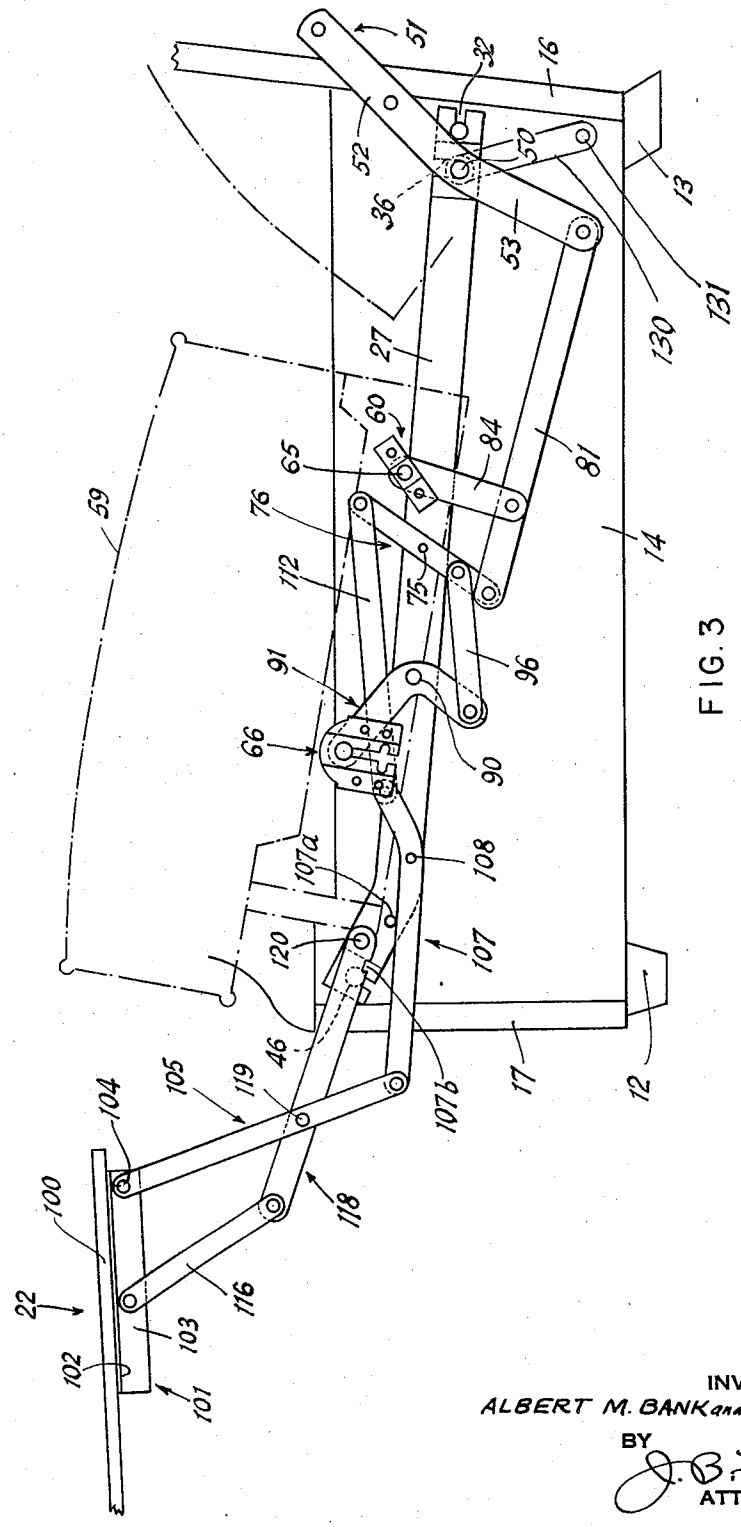



FIG. 3

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2,853,120

# RECLINING CHAIRS

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Application July 22, 1955, Serial No. 523,903

9 Claims. (Cl. 155—106)

This invention relates to reclining chairs and the like articles of furniture.

An object of the present invention is to provide a highly improved reclining chair in which the backrest and seat are not fixed relative to one another, but have independent movement, said chair being provided with a footrest and means to tilt the front end of the seat upwardly when the backrest is reclined, and at the same time, to project the footrest forwardly and upwardly, thereby elongating the length of the chair and increasing the comfort of the user.

Still another object of this invention is to provide in a chair of the character described means to removably support the backrest so that the backrest may be lifted bodily out of the chair frame.

Yet a further object of this invention is to provide in a construction of the character described, means to removably engage the front end of the seat with the mechanism for tilting the front end of the seat upwardly upon reclining the backrest.

Yet another object of this invention is to provide a reclining chair of the character described which shall be relatively inexpensive to manufacture, easy to manipulate, comfortable to use, which shall comprise relatively few and simple parts, and which shall yet be practical to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of invention will be indicated in the following claims.

In the accompanying drawings in which is shown various illustrative embodiments of this invention:

Fig. 1 is a vertical longitudinal view from front to rear, showing the mechanism on one side of a reclining chair embodying the invention, and showing the chair in upright position;

Fig. 2 is a top plan view showing the mechanism at one side of the reclining chair; and

Fig. 3 is a view similar to Fig. 1 but illustrating the reclining position of the chair.

Referring now in detail to the drawing, **10** designates a reclining chair embodying the invention. The same comprises a frame **11** which may be of usual construction.

Said frame may be made of wood and comprises front legs **12**, rear legs **13**, side walls **14** supported thereby, and a back wall **16**. At the front ends of the side walls are front arm walls **17**. The side walls **14** shown in Fig. 2 are somewhat divergent forwardly being inclined to the longitudinal axis of the chair. Said side walls are interconnected by a horizontal transverse brace member **14***a* and a vertical transverse brace member **14***b*.

The chair further comprises a backrest **20**, a seat **21**, and a footrest **22**. The backrest, seat and footrest are controlled by similar symmetrically disposed mechanisms **25** located at opposite sides of the chair. These mechanisms **25** are similar. Only one of said mechanisms will be described herein.



The mechanism **25** comprises an elongated supporting bar **26**, attached to the inner side of one of the side walls **14**. The supporting bar **26** comprises an elongated flat portion **27** contacting the inner side of said wall **14** of the frame. Said portion **27** is somewhat inclined forwardly and upwardly. Extending from the rear end of portion **27** is an inwardly projecting flange **28** from which extends a web **29** parallel to wall **14**. Extending outwardly from web **29** is a flange **30** from which extends a flat portion **31** contacting the inner surface of wall **14**. The portions **28**, **29**, **30** and **31** are generally in alignment with the portion **27**. Portion **31** is formed with a longitudinal slot **32** extending to its outer edge **33** for receiving a bolt **34** which serves to attach supporting bar **26** to the frame. Portion **27** of the supporting bar is bolted to the frame **14** by bolts **34** and **35**. The web **29** is formed with a slot **36** extending to its upper edge for the purpose hereinafter appearing.

The web **29**, it will be noted, is not inclined to the longitudinal axis of the chair as are the side walls **14** and portions **27** of the supporting bars **26**, but instead is parallel to the longitudinal axis of the chair as shown in Fig. 2 of the drawing.

Extending from the forward end of portion **27** of the bar **26** is an inwardly extending arm **40** from which extends forwardly a longitudinal portion **41** parallel to the axis of the chair, but inclined forwardly and upwardly, the same as portion **27**. Extending from the forward end of said portion **41** is a portion **42** in the plane of portion **41** but inclined upwardly and forwardly at a greater angle to the horizontal. Extending from the front end of portion **42** is an outwardly bent back arm **43** inclined upwardly and rearwardly; and extending therefrom is a flange **44** contacting the inner surface of side wall **14** and formed with a slot **45** extending upwardly from its lower edge. Extending through the slot **45** is a bolt **46** serving to attach the front end of the supporting bar **26** to the side wall **14**. Extending through the slot **36** is a pivot pin **50** fixed to a lever **51**. Pivot pin **36** rests in the bottom of the slot. The lever **51** has an upwardly extending arm **52** disposed above the pivot **50**, and a downwardly extending arm **53** projecting below said pivot. The frame of the backrest **20** is bolted to the upwardly extending frame **52** by bolts **54**. The backrest can be lifted up bodily by bringing pivot **50** out of slot **36**. The backrest can be prefabricated separately and then assembled with the frame. When the backrest is reclined from the upright position of Fig. 1 to the reclining position of Fig. 3, the lever **51** is rotated in a clockwise direction. The seat **21** comprises a frame **55** having a front wall **56** and a rear wall **57** interconnected by side walls **58**.

The seat frame **55** may be upholstered as at **59** by any suitable construction. The seat **21** is located between the two opposite supporting bars **26**. Attached to the outer sides of the side walls **50** of the seat frame **55** are channel-shaped brackets **60**. Each bracket **60** has outwardly extending feet **61** fixed to the outer side of the side wall **50** by screws or other fastening members **62**. The feet **61** are interconnected by a U-shaped channel portion comprising side flanges **63** interconnected by a web **64**. The web **64** carries a pivot pin **65** for the purpose hereinafter appearing.

It will be noted that the brackets **60** are located adjacent the rear ends of the seat frame. Attached to the outer side of side wall **58** of the seat frame **55** is bracket **66**, attached to said side wall by screws **67**. Each of the brackets **66** has a web **68** formed with a slot **69** extending from its upper end for the purpose hereinafter appearing.

It will be noted that the web 69 is connected to the flanges 70 of the bracket 66 by arms 71.

Pivoted to portion 41 of the supporting bar 26 as on pivot pin 75, is a lever 76 having an upwardly extending arm 77 and a downwardly extending arm 78. The lower end of the arm 78 carries a pivot pin 80 connected by link 81 to a pivot pin 82 at the lower end of arm 53 of the lever 51. Pivoted to the pivot pin 65 on the bracket 60 is an arm 84. The lower end of the arm 84 is pivoted as by pivot pin 85 to an intermediate portion of the link 81, being pivoted closer to the front end of said link than to the rear end.

Portion 41 of the supporting bar 26 carries a pivot pin 90 disposed forwardly of the pivot pin 75. Pivoted to the pivot pin 90 is a bell crank 91 having a forwardly extending arm 92 carrying at its front end, a headed pin 93 passing through the slot 69. The bell crank lever 91 also comprises a downwardly extending arm 94 carrying at its lower end a pivot pin 95. Pivoted to the pivot pin 95 is one end of a link 96. The other end of the link 96 is pivoted as by pivot pin 97 to the arm 78 of the lever 76 between the pivot 75 for said lever and the pin 80 which connects the lower end of said lever to the link 81.

It will now be understood that when the backrest is reclined from the position of Fig. 1 to the position of Fig. 3, lever 51 is rotated in a clockwise direction, thereby pushing the link 81 forwardly and rotating the lever 76 in a clockwise direction. During such movement, the pivot pin 65 will move from the position shown in Fig. 1 to the position shown in Fig. 3, thereby moving the rear end of the seat somewhat upwardly and rearwardly. Rotary movement of the lever 76 in a clockwise direction will also move the link 96 to the left, looking at Fig. 1, or forwardly, thereby rotating the bell crank 91 in a clockwise direction and causing the front end of the seat to be tilted upwardly by reason of the engagement of the pin 93 on the forward end of arm 92 of said bell crank, with the bracket 66 attached to the front end of said seat.

It will be noted that when the chair is in upright position, the footrest 22 is in substantially vertical position, extending downwardly from the front end of the seat. Said footrest 22 may comprise a transverse member 100, to the ends of which are attached angle-shaped brackets 101. Each angle-shaped bracket 101 comprises a flange 102 contacting the rear surface of the transverse member 100 and a flange 103 at right angles thereto. Carried by the upper end of flange 103 is a pivot pin 104. Pivoted thereto is the upper end of a lever 105. The opposite end of lever 105 carries a pivot pin 106. Pivoted to the pivot pin 106 is one end of a lever 107. Said lever 107 is pivoted at an intermediate point thereof, by pivot pin 108 to the forward end of portion 41 of supporting bar 26. The lever 107 has an arm 109 extending downwardly from the pivot pin 108 and an arm 110 extending upwardly from said pivot pin. At the upper end of arm 110 is a pivot pin 111 connected by link 112 to a pivot pin 113 at the upper end of arm 77 of lever 76.

Carried by the flange 103 below the pivot pin 104 is another pivot pin 115. Pivoted thereto is one end of a link 116.

Carried by the opposite end of the link 16 is a pivot pin 117. Pivoted to the pivot pin 117 is one end of a lever 118. The lever 118 crosses the lever 105 and is pivoted thereto by a pivot pin 119. The lever 118 is pivoted at its upper end as by pivot pin 120 to the portion 41 of the supporting bar 26 adjacent the flange or arm 43. Any suitable upholstery may be applied to the transverse member 100 of the footrest 22.

It will now be understood that when the seat is moved from the upright position of Fig. 1 to the reclining position of Fig. 3 and the front end of the seat is tilted upwardly, link 112 will be moved rearwardly thereby causing lever 107 to rotate in a clockwise direction about its pivot pin 108 thereby moving the pivot pin 104 forwardly and upwardly and thereby causing the lever 118 to rotate about the pivot pin 120 in a clockwise direction thereby projecting the link 116 forwardly. Such action causes the footrest 22 to be swung forwardly and upwardly. Rotation of lever 118 in a counter-clockwise direction may be limited by a stop pin 107*a* fixed to portion 41 of member 26 entering notch 107*b* in said lever to retain the footrest in a vertical position projecting down from the front end of the upholstered portion of the seat. Said stop pin 107*a* will also be contacted by lever 107 when the latter is swung upwardly to limit its rotation when the footrest is almost in horizontal position, slightly tilting downwardly.

It will be noted that the footrest as a whole moves forwardly relative to the frame 11 thereby elongating the chair and adding to the comfort of users, especially if they are taller people.

When the person sitting in the chair in reclining position wishes to move the chair to upright position, the weight is shifted forwardly to the front end of the seat, thereby causing the bell crank 91 to move in a counter-clockwise direction. Such action will cause the lever 51 to move in a counter-clockwise direction from the position of Fig. 3 to the position of Fig. 1, to move the backrest to upright position. Such action, furthermore, will cause the link 112 to be moved forwardly thereby causing lever 107 to swing in a counter-clockwise direction, whereby the footrest is retracted back to the position of Fig. 1.

To prevent the backrest from moving upwardly or becoming disengaged from the supporting bar 26, there is pivoted to each of the pivot pins 50 a tail bar 130. The tail bars project downwardly from the pivot pins 50 and they are each formed at their lower ends with through openings 131 to receive any suitable nail or fastening member for fastening the lower end of the tail bar to the wood supporting frame of the chair. Thus, after the pivot pins 50 have been inserted into the slots 36, the lower ends of the tail bars may be fastened to the frame to prevent accidental lifting up of the backrest while permitting the backrest to rotate.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the condition of practical use.

As possible embodiments might be made in the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

We claim:

1. In a reclining chair, in combination, a frame, a backrest pivoted thereto, an arm fixed to the backrest and extending downwardly below the pivot point for said backrest, a lever pivoted to the frame and having an upwardly extending arm and a downwardly extending arm, a first link interconnecting the downwardly extending arm of the lever with the downwardly extending arm on the backrest, a second link interconnecting an intermediate portion of the first link to the seat adjacent the rear end thereof, a bell crank pivoted to the frame and having a forwardly extending arm and a downwardly extending arm, means to pivot the forwardly extending arm of the bell crank to the seat forwardly of the connection of the second link to said seat, a third link connecting the downwardly extending arm of the bell crank with the downwardly extending arm of said lever.

2. The combination of claim 1, in combination with a footrest, a second lever pivoted to said frame, said second lever having an upwardly extending arm and a downwardly extending arm, a fourth link interconnecting the upwardly extending arm of the second lever with the upwardly extending arm of the first lever, a pair of cross-

ing interpivoted levers, means to pivot one end of one of said crossing levers to the downwardly extending arm of the second lever, means to connect the other end of said first crossing lever to the upper end of the footrest, means to pivot one end of the second crossing lever to said frame, and a fifth link connecting the other end of said second crossing lever to said footrest below the upper end of the latter.

3. In a reclining chair, a frame, a backrest pivoted to the frame, an arm fixed to the backrest and extending below the pivot point for the backrest, a lever pivoted to the frame and having an upwardly extending arm and a downwardly extending arm, a first link connecting the downwardly extending arm of the lever to said arm on said backrest, a bell crank pivoted to the frame and having a forwardly extending arm and a downwardly extending arm, means to pivot the forwardly extending arm of said bell crank to the seat, link means to connect the downwardly extending arm of said bell crank to said lever, means to support the rear end of the seat, a second lever pivoted to said frame and having an upwardly extending arm and a downwardly extending arm, a link interconnecting the upwardly extending arm of the second lever with the upwardly extending arm of the first lever, a pair of crossing interpivoted levers, means to pivot one end of one of the crossing levers to the downwardly extending arm of the second lever, a footrest, means to pivot the other end of the first crossing lever to the upper end of the footrest, means to pivot one end of the other crossing lever to the frame, and a link interconnecting the other end of the second crossing lever with the footrest below the upper end thereof.

4. A reclining chair comprising a frame, a backrest pivoted thereto, an arm fixed to the backrest and extending downwardly below the pivot point of said backrest to the frame, a first lever pivoted to the frame and having an upwardly extending arm and a downwardly extending arm, a link connecting the downwardly extending arm of the lever with the arm on said backrest, a second lever pivoted to said frame and having an upwardly extending arm and a downwardly extending arm, a link interconnecting the upwardly extending arm of the first lever with the upwardly extending arm of the second lever, a pair of crossing interpivoted levers, means to pivot one end of one of the crossing levers with the downwardly extending arm of the second lever, a footrest, means to pivot the other end of the first crossing lever to the upper end of the footrest, means to pivot one end of the second crossing lever to the frame, a link connecting the other end of the second crossing lever to the footrest below the upper end thereof, a seat, means to support the rear end of the seat on said frame, and means to tilt the front end of the seat upwardly when the backrest is swung backwardly to reclining position.

5. The combination of claim 4, said last-mentioned means comprising a bell crank pivoted to the frame and having a forwardly extending arm and a downwardly extending arm, link means to connect the downwardly extending arm of the bell crank to the downwardly extending arm of the first lever, said means to support the rear end of the seat comprising a bracket on the rear end of the seat, a link connecting said bracket with an intermediate portion of the first link, a second bracket attached to the seat forwardly of a first bracket, said second bracket being formed with a slot extending up from its lower end, and a pin on the forwardly extending arm of said bell crank removably engaged within said slot of said second bracket.

6. In a reclining chair, a frame, a backrest pivoted to the frame, a seat, means to tilt the front end of the seat upwardly upon reclining the chair, said seat and backrest being movable relative to one another, a footrest, a pair of crossing interpivoted levers, means to pivot one end of one of said interpivoted levers to the frame, a link interconnecting the other end of the first interpivoted lever with the footrest, means to pivot one end of the second of the interpivoted levers to the footrest, another lever pivoted to the frame and having a downwardly extending arm pivoted to the other end of the second interpivoted lever, said other lever having an upwardly extending arm and means to connect the upwardly extending arm to the backrest.

7. In combination, a frame, a supporting bar fixed to the frame, said supporting bar extending from front to rear and being formed with a slot extending down from its upper edge, a backrest, a pivot pin on the backrest received in said slot and resting at the bottom of said slot, an arm fixed to the backrest and extending downwardly below said pivot pin, a lever pivoted to the supporting bar and having a downwardly extending arm and an upwardly extending arm, a first link interconnecting the lower end of the downwardly extending arm of said lever with the downwardly extending arm of the backrest, a bell crank pivoted to said supporting bar and having a forwardly extending arm and a downwardly extending arm, a seat, a bracket fixed to the seat and having a slot extending upwardly from its lower end, a pivot pin at the forward end of the forwardly extending arm of the bell crank disengageably received within said slot, a second link interconnecting the lower end of said downwardly extending arm of the bell crank with the downwardly extending arm of said first lever, a second bracket fixed to the seat, a third link interconnecting the second bracket on the seat with an intermediate portion of the first link.

8. The combination of claim 7, a footrest, a second lever pivoted to the supporting bar and having an upwardly extending arm and a downwardly extending arm, a fourth link interconnecting the upwardly extending arm of the second lever with the upwardly extending arm of the first lever, a paid of crossing interpivoted levers, means to pivot one end of one of the crossing levers to the frame, a link interconnecting the other end of the first crossing lever with the footrest, means to pivotally connect one end of the second crossing lever with the downwardly extending arm of the second lever, and means to pivotally connect the other end of the second crossing lever with the footrest.

9. A reclining chair comprising a frame, a backrest, a member fixed to the backrest and carrying a pivot pin, a member fixed to the frame and being formed with a downwardly extending slot receiving said pivot pin with said pivot pin resting in the bottom of the slot, said member on said backrest having an arm extending downwardly below said pivot pin, a seat, means to support the rear end of the seat on said frame, means connected to said arm to tilt the front end of the seat upwardly upon reclining the backrest, a footrest and means to project the footrest forwardly of the frame and swing the footrest upwardly upon reclining said backrest, and a member formed with an opening receiving the pivot pin, said member projecting downwardly from said pivot pin and being fastened to the frame to prevent the pivot pin from moving up out of the slot.

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