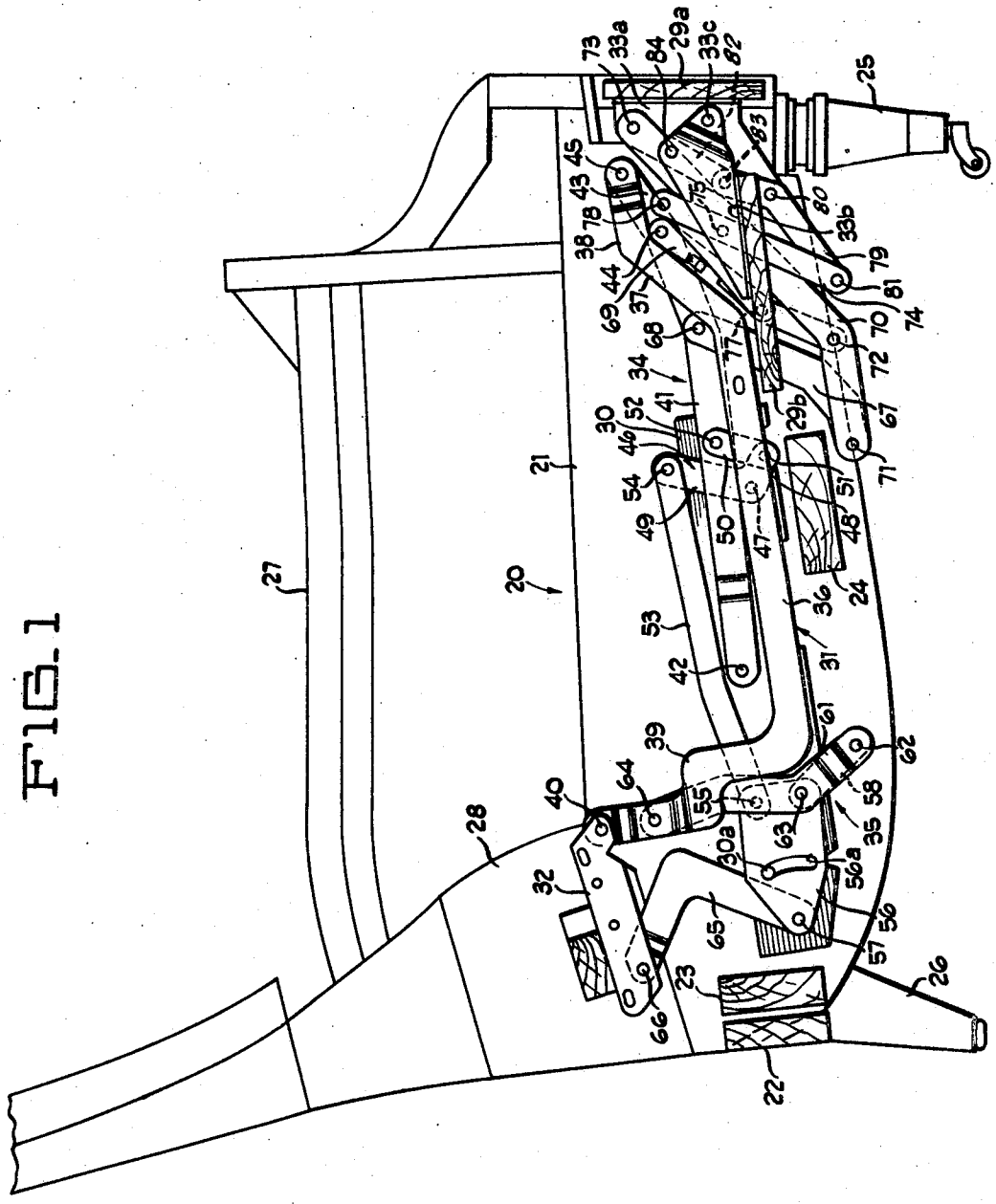
Feb. 17, 1970 N. W. MIZELLE 3,495,870

RECLINING CHAIR MECHANISM

Filed April 18, 1968 6 Sheets-Sheet 1

FIG. 1



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Attorneys

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RECLINING CHAIR MECHANISM

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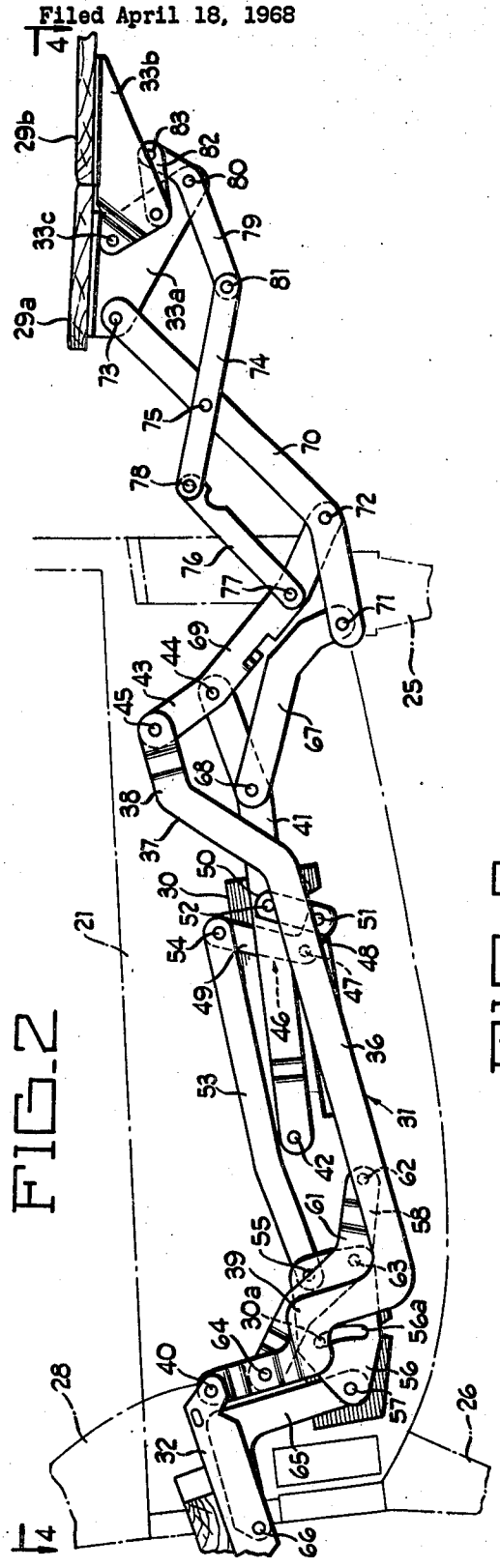


FIG. 2

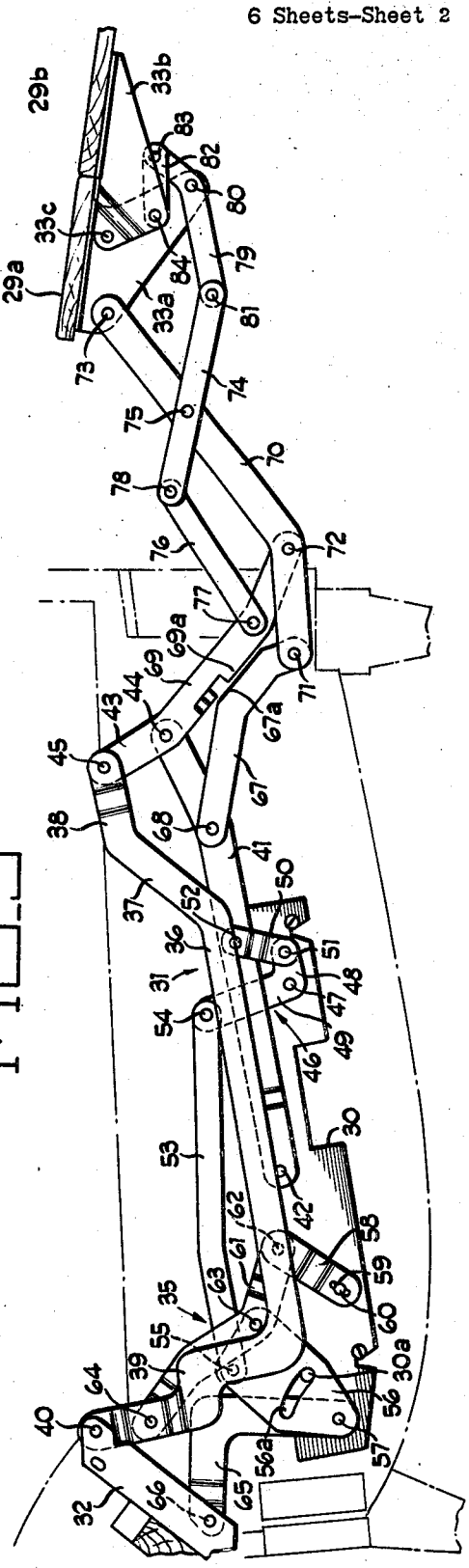


FIG. 3

RECLINING CHAIR MECHANISM

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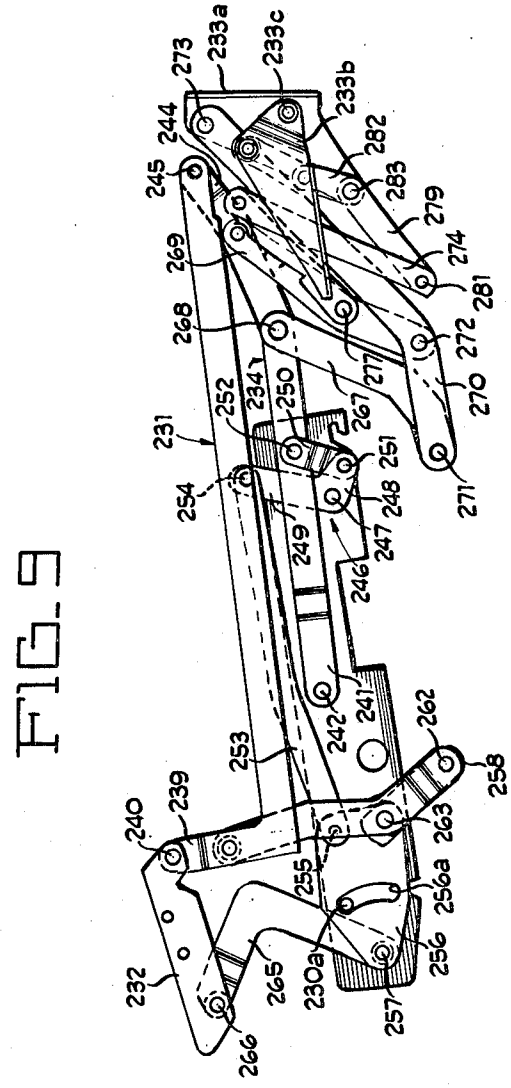


FIG. 9

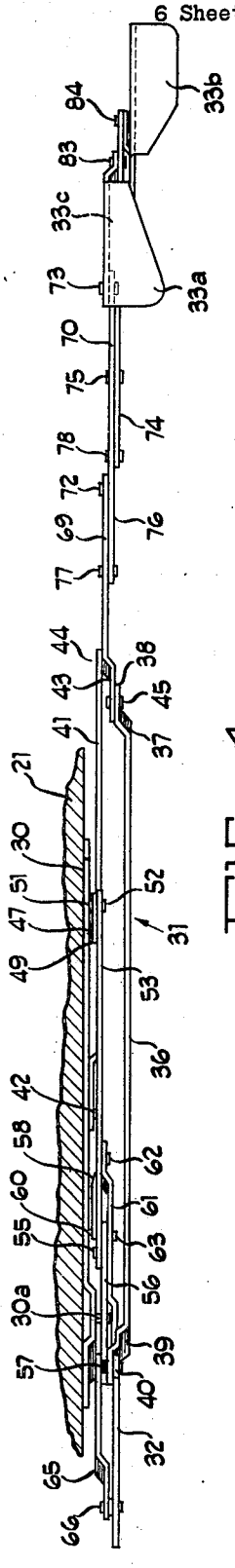


FIG. 4

RECLINING CHAIR MECHANISM

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FIG. 5

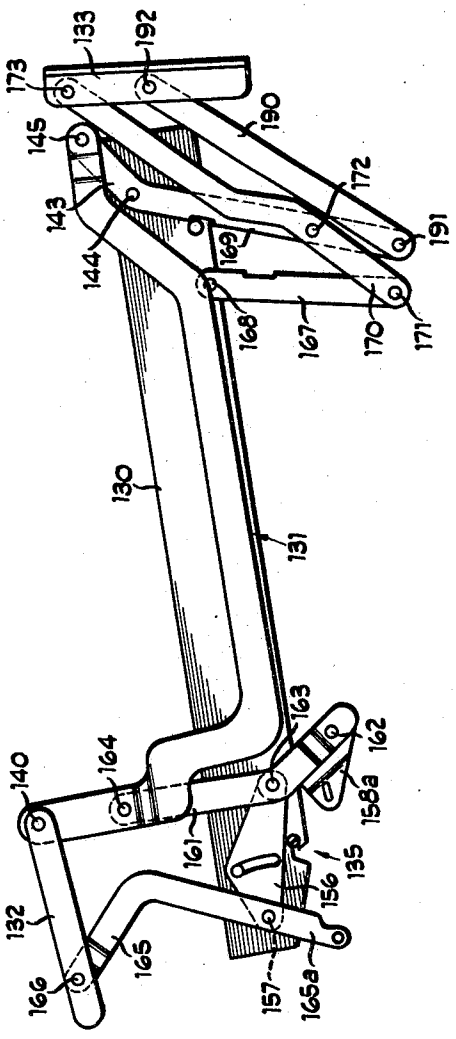
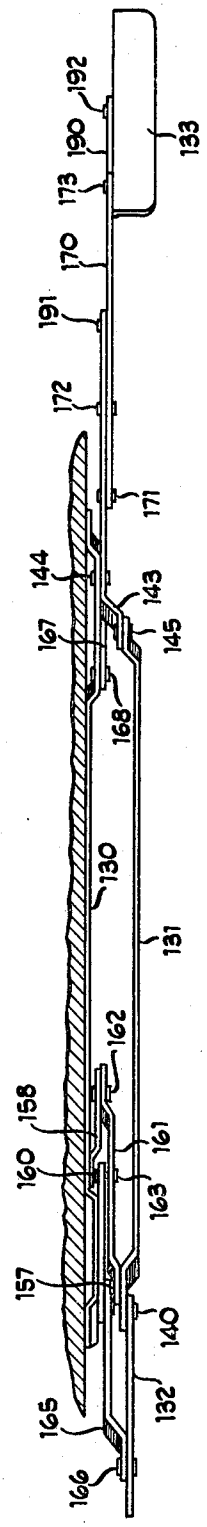


FIG. 6



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RECLINING CHAIR MECHANISM

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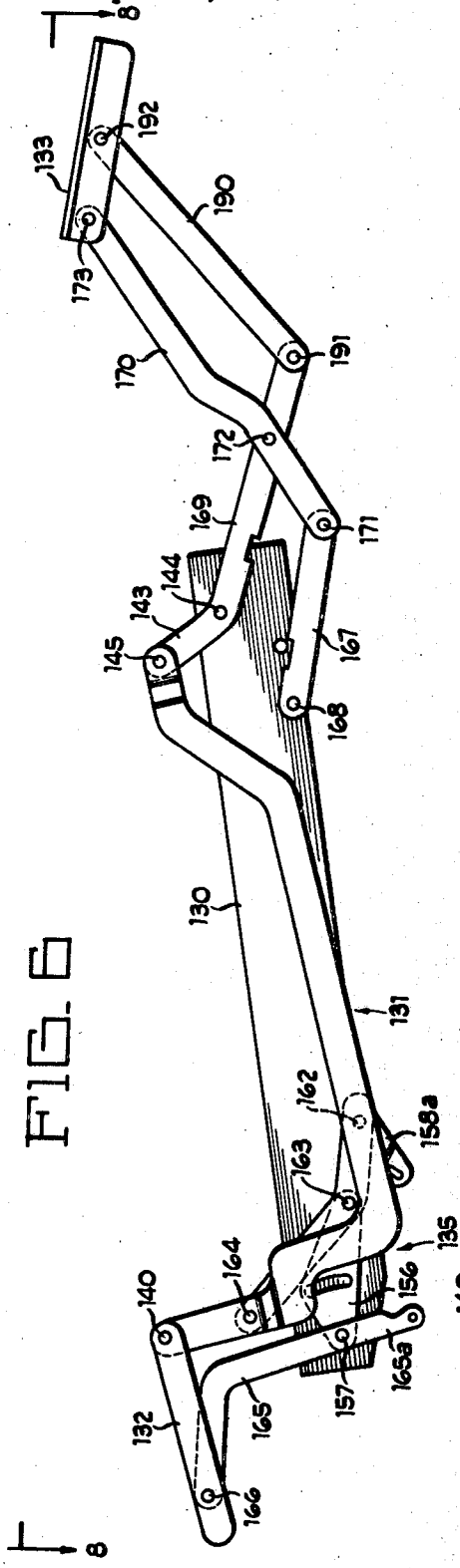


FIG. 6

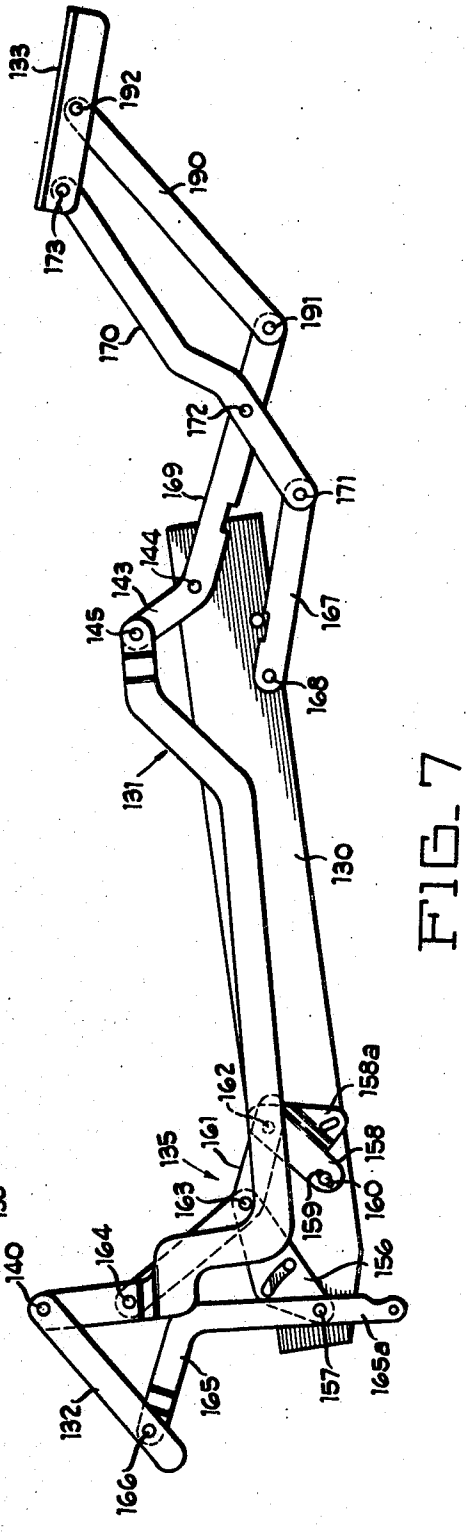


FIG. 7

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RECLINING CHAIR MECHANISM

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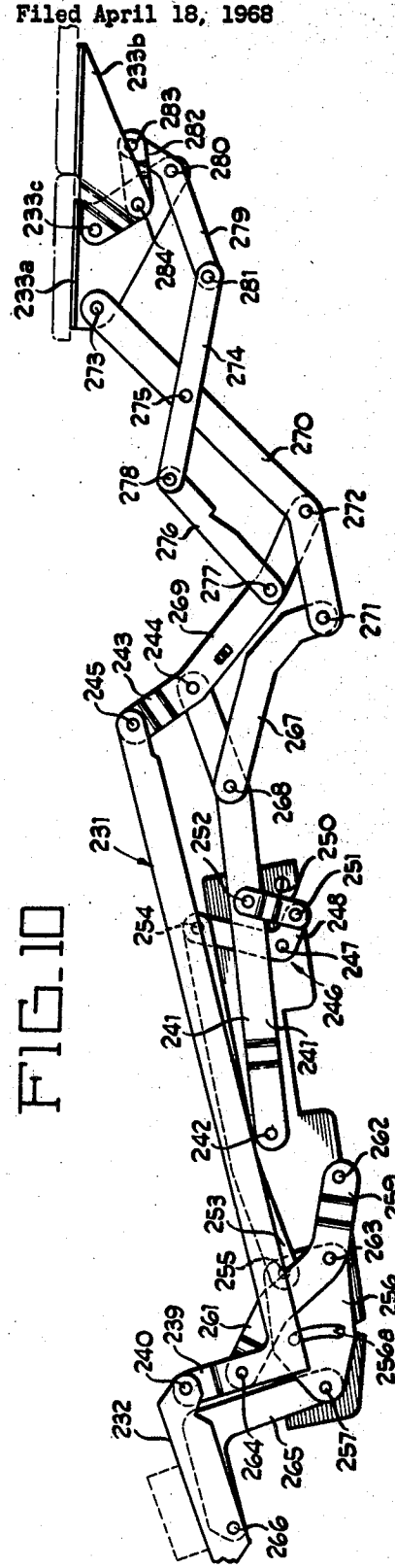


FIG_10

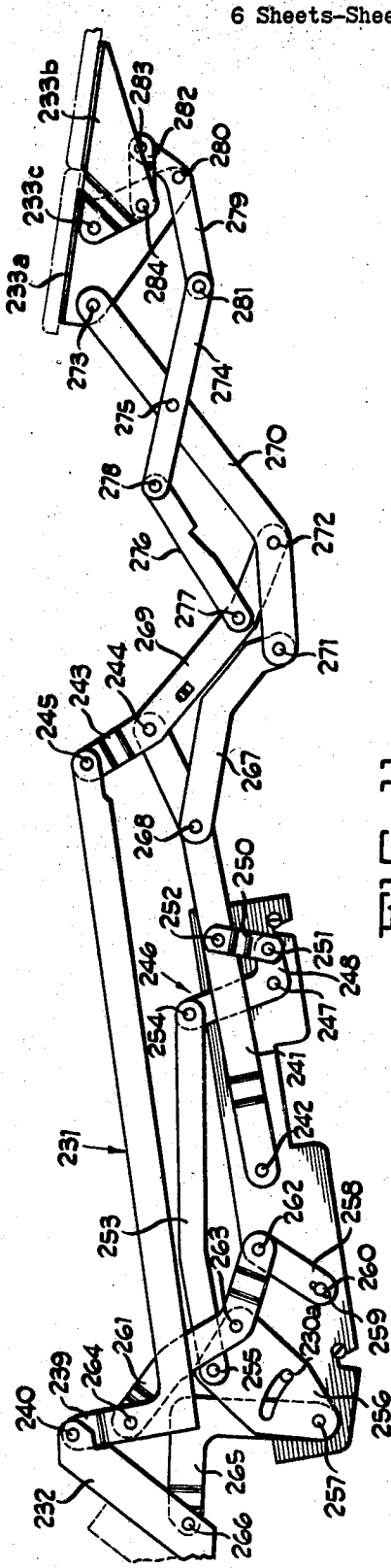


FIG_11

United States Patent Office 3,495,870 Patented Feb. 17, 1970

3,495,870

RECLINING CHAIR MECHANISM

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Filed Apr. 18, 1968, Ser. No. 722,423
Int. Cl. A47c 1/034
U.S. Cl. 297—84 14 Claims

ABSTRACT OF THE DISCLOSURE

A three position reclining chair mechanism in which the seat and back move as a unit from upright position to an intermediate position while a retracted leg rest is extended, and in which a parallel linkage system elevates the rear of the seat and reclines the back during further movement to a reclining position while the extended leg rest remains substantially fixed relative to the seat.

Background of the invention

Three position reclining chair mechanisms are those in which the seat and back are movable between an upright position, an intermediate position which is still sufficiently upright for reading or television viewing, and a reclining position in which the occupant of the chair is more or less recumbent. Desirably such chairs are provided with a retractable and extendable leg rest which is substantially completely extended during a first movement of the seat and back from upright position to intermediate position, and which remains in a substantially fixed position.

Prior art three position reclining chairs have had a number of undesirable characteristics, among which are the fact that there is a definite stopping of movement between the first movement and the further movement, with relative difficulty of initiating the further movement; that once further movement is started the chair cannot be readily balanced in a position between the intermediate and full reclining position; that the leg rest is unduly elevated between the intermediate position and full reclining position; that the front of the seat moves upwardly an excessive distance during movement from upright position to full reclining position; and that the angle between the seat and the back cannot open enough for the occupant to assume a substantially recumbent position.

The structure of the present invention eliminates all the above enumerated disadvantages of the prior art reclining chair mechanisms, and in addition is readily adaptable to use in combined rocking and reclining chair mechanisms, and affords extremely versatile styling possibilities for chair manufacturers using the mechanism.

Summary of the invention

In accordance with the present invention, a reclining chair mechanism is of the common type in which two identical sets of hardware are mounted on opposite sides of a chair base, and the chair seat and back are secured to the two sets of hardware. Leg rest brackets are adapted to receive upholstered leg rest members. Each set of hardware includes a base plate on which the entire mechanism is pivotally supported.

The present mechanism has a seat member, and a back bracket is pivoted at the rear end of the seat member and extended rearwardly therefrom. A front seat support arm pivotally mounts the seat member relative to the base, and a back support arm pivotally mounts the back bracket on the base behind the seat member. The rear of the seat is mounted upon a linkage which includes a pair of parallel links which are pivoted on the base, and a supporting link which has its lower end

pivoted to the forward of the two parallel links, which has an intermediate pivotal connection to the rearward of the two parallel links, and which has its upper end pivotally connected to the rear of the seat member. A retractable and extendable leg rest mechanism is pivotally mounted near the front of the seat, and one part of the pivotal mounting for the leg rest mechanism is an extension of the front seat support arm, so that as the seat swings rearwardly on the front support arm from upright position to intermediate position the leg rest is fully extended.

During the first movement of the chair mechanism from upright position to intermediate position the rear seat support link swings rearwardly and downwardly about its intermediate pivot on the rear parallel link, while at the same time the front seat support arm and the back support arm move in parallel with the rear seat support link so that the seat and back swing rearwardly as a unit. During this first movement the front parallel link of the rear seat support linkage idles upwardly and forwardly with the lower portion of the rear seat support link to a dead center position.

With the chair in intermediate position, all the occupant of the chair need do to move it to full reclining position is to shift his weight slightly against the back of the chair which swings the front parallel link above its dead center position and permits the two parallel links to swing upwardly and elevate the rear seat support link and the rear of the seat with respect to the base. During this movement the back bracket, because it is directly connected to the base by the back support arm, is caused to swing downwardly about its pivotal connection with the rear of the seat member so that in reclining position the back of the chair occupies a very wide angle with reference to the seat. During such further movement the upward pivoting of the seat member is about its pivotal connection with the front seat support arm. Thus, there is little relative movement between the seat and the leg rest, and no movement of the leg rest during such further movement of the chair.

In a preferred embodiment of the invention the seat member is not mounted directly upon the base at the front, but instead there is a long mounting link which is pivoted toward the rear of the base and extends forwardly with the front seat support arm pivoted at its forward end. Forward of its pivotal connection with the base the long mounting arm is linked to the base through a short forward link and one arm of a bell crank which has its other arm connected by a long coordinating link with the back parallel link of the rear seat support linkage. Accordingly, in this form of the invention the front of the seat moves up about one third as far as does the back of the seat during the further movement from intermediate position to reclining position.

The reclining chair mechanism of the present invention lends itself to incorporation into a variety of reclining chair structures, either low leg or high leg, and by merely changing the shape of the seat member the same mechanism is adapted for use either with an inner spring seat cushion or with horizontally sinusoidal seat springs.

In a simplified and somewhat less complex and costly modification of the mechanism, the long support link and associated bell crank, etc. are eliminated, and the front seat support arm is pivoted directly on the base. In this simplified form, of course, the front of the seat is not elevated with the rear of the seat during further movement from intermediate position to full reclining position.

The principal object of the present invention, therefore, is to provide a reclining chair mechanism which may be used in a wide variety of reclining chair constructions of various styles and types.

A further object of the invention is to provide a reclining chair mechanism of the three position type in which the chair may be moved from upright position to intermediate position and on to fully reclining position with ease, and with the ability to balance the occupant in any position between intermediate position and fully reclined position by slight body movement.

Yet another object of the invention is to provide a three position reclining chair mechanism in which relative movement between the seat and the leg rest during travel of the chair from intermediate position to reclining position is very slight.

Yet another object of the invention is to provide a reclining chair mechanism in which the rear of the seat is elevated as the back is reclined during movement from intermediate position to reclining position, so as to afford a maximum angle of inclination between the seat and the back when the chair is fully reclined and thereby permit the occupant to assume a nearly recumbent position.

Description of the drawings

FIG. 1 is a longitudinal sectional view of the high leg reclining chair embodying a first form of the reclining chair mechanism of the invention with the mechanism and the chair parts in upright position;

FIG. 2 is a fragmentary view similar to FIG. 1 illustrating the first embodiment of the mechanism in intermediate, or television viewing position;

FIG. 3 is a view like FIG. 2 illustrating the mechanism in reclining position;

FIG. 4 is a sectional view taken substantially as illustrated along the line 4—4 of FIG. 2;

FIG. 5 illustrates the mechanism of a second form of the invention with the mechanism in upright position;

FIG. 6 illustrates the second form of the invention in intermediate position;

FIG. 7 illustrates the second form of the invention in reclining position;

FIG. 8 is a sectional view taken substantially as illustrated along the line 8—8 of FIG. 6;

FIG. 9 is a side elevational view of the mechanism of a third form of the invention illustrated in upright position;

FIG. 10 is a view showing the third form of the mechanism in intermediate position; and

FIG. 11 is a view illustrating the mechanism of the third form of the invention in reclining position.

Detailed description of the invention

Referring to the drawings in greater detail, and referring first to FIGS. 1 to 4, a reclining chair has a rectangular wooden base, indicated generally at **20**, which includes side rails **21**, back bars **22** and **23**, and a forward cross member **24**, together with front legs **25** and rear legs **26**. Arm frames **27** surmount the side rails **21** and are adapted to be upholstered in any desired manner.

The reclining chair mechanism of the first form of the present invention includes a base plate **30** which is screwed to one of the side rails **21** of the chair frame, and the entire mechanism is mounted upon the base plate **30** so that a furniture manufacturer need only mount a pair of such base plates on the opposite side rails **21** of a chair frame, mount an upholstered seat (not shown) on seat members **31** of the two mechanisms, mount a back frame suitable for upholstering on back brackets **32** of the two mechanisms, and mount leg rests boards **29***a* and **29***b*, suitable for upholstering, upon leg rest brackets **33***a* and **33***b*, respectively of the two mechanisms. The leg rest brackets are pivotally connected at **33***c*.

In the first form of the invention the seat member **31** is supported upon a front support linkage, indicated generally at **34**, and upon a rear support linkage, indicated generally at **35**. The seat member **31** has a central portion **36** which is adapted to receive a drop-in coil spring base, and at the front of the central portion **36** the seat

member has an upwardly and forwardly extending portion **37** which terminates in a mounting arm portion **38**, while at the rear of the central portion **36** there is an upwardly extending arm portion **39** which forms the back of the seat member. The back bracket **32** is pivoted at **40** on the upper end of the seat arm **39**.

The front seat support linkage **34** includes a long support arm **41** which is pivotally mounted at **42** toward the rear of the base plate **30**, and a front seat support arm **43** is pivoted at **44** on the front of the long support arm **41** and at **45** has a pivotal connection with the mounting arm portion **38** of the seat member **31**. The front seat support linkage **34** also includes a bell crank **46** which is pivoted at **47** on the base and has a first arm **48** and a second arm **49**. A short link **50** is pivotally mounted at **51** on the first arm **48** of the bell crank and is pivotally connected at **52** to the long support arm **41**. A long coordinating link **53** is pivoted at **54** to the second arm **49** of the bell crank, and at **55** to a rear parallel link **56** of the rear seat support linkage means **35**.

As best seen in FIG. 3, the rear seat support linkage means **35** includes the rear parallel link **56** which is pivotally mounted on the base **30** at **57**, a front parallel link **58** which has a longitudinal slot **59** by means of which it makes a lost motion connection with a rivet **60** on which it is pivotally supported on the base **30**, and a rear support link **61** which has a lower pivotal connection **62** with the front parallel link **58**, an intermediate pivotal connection **63** with the rear parallel links **56**, and an upper pivotal connection **64** with the rear arm portion **39** of the seat member **31**. Thus, the rear support link **61** supports the rear of the seat member **31** and is operatively mounted upon the rear parallel link **56** and the front parallel link **58**. Movement of the rear parallel link **56** is limited by a slot **56***a* which is impaled by a stud. The back bracket **32** is supported by a back bracket support arm **65** to which it is pivotally connected at **66**, and the support arm **65** is pivotally mounted upon the base **30** on the same pivot **57** which carries the rear parallel link **56**.

The leg rest brackets **33***a* and **33***b* are mounted on a retractable and extensible leg rest linkage which is best seen in FIGS. 2 and 3. It includes a hanger link **67** which is pivoted at **68** on the forward portion of the long support arm, and an arm **69** which is an extension of the front seat support arm **43** below the pivot **44**. A link **70** is pivoted on the link **67** at **71**, on the arm **69** at **72**, and on the bracket **33***a* at **73**. A link **74** is pivoted intermediate its ends at **75** on the link **70**, and a link **76** connects the arm **69** to the link **74** through a pivot **77** on the arm and a pivot **78** on the link **74**. A bell crank **79** is pivoted at **80** on the bracket **33***a* and has one arm pivotally connected at **81** to the link **74**. A link **82** connects the other arm of the bell crank to the bracket **33***b* by a pivot **83** on the bell crank and a pivot **84** on the bracket.

Thus, the links **67**, **70**, **74**, **76** and **79**, together with the arm extension **69**, act as a lazy tongs linkage to extend the leg rest as the front seat support arm **43** moves from the upright position of FIG. 1 to the intermediate position of FIG. 2. The bell crank **79** and the link **82** cooperate with the pivotally connected leg rest brackets **33***a* and **33***b* to unfold the bracket **33***b* with respect to the bracket **33***a* during said movement of the leg rest linkage.

The link **67** has a flat surface **67***a* which cooperates with a surface **69***a* on the support arm extension **69** to stop the unfolding movement of the leg rest.

A comparison of FIGS. 1, 2 and 3 shows that as the reclining chair mechanism moves from the upright position of FIG. 1 to the intermediate position of FIG. 2 the front seat support arm **43**, the rear support link **61** and the back bracket support arm **65** swing rearwardly in parallel about their respective pivots **44**, **63** and **57** so that the front of the seat member **31** swings upwardly on a short arc and then slightly downwardly, while the

rear of the seat member and the back bracket swing rearwardly and downwardly as a unit without relative motion between them. At the same time, the leg rest operating arm **69**, the extension of the front seat support arm **43**, extends the leg rest linkage and pivots the leg rest bracket **33***b* into alignment with the leg rest bracket **33***a*.

During the further movement from the intermediate position of FIG. 2 to the reclining position of FIG. 3, the front seat support linkage and the rear seat support linkage cooperate to elevate the entire seat member **31** a short distance at the front and a considerably greater distance at the rear while the back bracket **32** pivots downwardly with respect to the seat member about the pivot **40**. The elevating of the seat member **31** is produced by rotation of the bell crank **46** and of the two parallel links **56** and **58** of the rear seat support linkage, coordinated through the coordinating link **53**. Rotation of the bell crank **46** about its pivot **47** acts through the short link **50** to pivot the long support arm **41** about its pivotal connection **42** to the base **30**, and thus elevate the front of the seat. At the same time, the rear parallel link **56** and the front parallel link **58** pivot about their respective pivotal connections **57** and **60** with the frame to elevate the supporting link **61** and thus elevate the rear of the seat member. Since the back bracket **32** is linked to the base **30** by the back support arm **65**, it is forced to pivot downwardly about the pivot **40** as the rear of the seat is elevated.

It will be observed that in the upright position of FIG. 1 and the intermediate position of FIG. 2 the pivotal connection **63** between the rear support link **61** and the rear parallel link **56** is coaxial with the pivotal connection **60** between the front parallel link **58** and the base **30**, so that during the first movement of the chair, from upright position to intermediate position, the front parallel link idles upwardly and forwardly about the pivot **60** with the lower portion of the rear support link **61**, and that in the intermediate position of FIG. 2 the front parallel link has reached a dead center position in which the pivot **62** which connects it with the rear support link **61** is aligned with the pivot **57** of the rear parallel link and the pivotal connection **63** of the support link **61** and the rear parallel link. Accordingly, the front parallel link **58** serves, during the first movement of the seat and back, to lock the parallel linkage against rotation, whereas when the link **58** reaches the dead center position the parallel links are free to move in unison. The slotted connection **59–60** for the front parallel link **58** provides a lost motion connection between that link and the base **30** without which the link could not idle upwardly and forwardly about the pivot **60** from the position of FIG. 1 to the position of FIG. 2.

Referring now to the second form of the invention illustrated in FIGS. 5 to 8, the mechanism is similar to that of the first form of the invention except that the front support linkage means is eliminated, and the leg rest is of the one piece type which has an operating linkage that extends a substantial distance below the chair seat and thus is not adaptable to a high leg chair style as is the first form of the invention. However, it is apparent to those skilled in the art that either type of leg rest may be used with the first form of the invention or with the second form of the invention.

The second mechanism includes a base plate **130**, a seat member **131** which is identical with the seat member **31**, and a back bracket **132** which is pivoted to the rear of the seat member **131** at **140**. A front seat support arm **143** is pivoted on the base **130** at **144**, and is pivotally connected to the front of the seat member **131** at **145**.

A rear seat support linkage **135** is identical to the rear support linkage **35** of the first form of the invention, and includes a rear parallel link **156** pivoted on the base **130** and **157**, and a front parallel link **158** having a longitudinal slot **159** by means of which it makes a lost motion connection with a pin **160** on the base **130**. A rear support link **161** is pivotally connected at its lower end to a pivot **162** on the front parallel link **158**, has an intermediate pivotal connection **163** with the rear parallel link **156**, and has an upper pivotal connection **164** with the rear of the seat member **131**. A back bracket support arm **165** is pivoted at **166** to the back bracket **132** and is connected to the base **130** at the pivot **157** of the rear parallel link **156**. A downward extension **165***a* of the back bracket support arm **165** is provided with an aperture, and an integral bracket portion **158***a* on the front parallel link **158** is provided with a slot so that a tension spring may be interposed between the extension **165***a* and the bracket portion **158***a* to urge the mechanism toward the upright position of FIG. 5.

The extensible and retractable leg rest mechanism includes a leg rest bracket **133** which is moved by a linkage that includes a link **167** pivoted at **168** on the base **130**, an extension arm **169** of the front seat support arm **143**, a long link **170** which is pivoted at **171** to the link **167**, at **172** to the arm **169**, and at **173** to the leg rest bracket **133**. A link **190** is pivoted at **191** to the arm **169** and at **192** to the leg rest bracket **133**. Thus, the links **167**, **170**, **190** and the arm **169** function as a lazy tongs linkage so that, when the chair mechanism is moved from the upright position of FIG. 5 to the intermediate position of FIG. 6 the rearward swinging movement of the front seat support arm **143** and the corresponding forward swinging movemnt of the leg rest arm **169** extend the leg rest as seen in FIG. 6.

In operation the second form of the mechanism functions much as does the first form, except that since there is no front support linkage the front of the seat member **131** is not elevated during movement from the intermediate position of FIG. 6 to the reclining position of FIG. 7. Otherwise the operation is the same, with the seat member swinging rearwardly and downwardly during the first movement about the front seat support arm **143**, the back bracket support arm **165** and the rear support link **161**, said arms and said link moving in parallel so that there is no relative motion beteen the back bracket **132** and the seat member **131**. During the second movement from the position of FIG. 6 to the position of FIG. 7 the parallel links **156** and **158** of the rear seat support linkage swing in parallel about their respective pivots **157** and **160** so as to elevate the rear support link **161** and thus swing the seat member **131** upwardly about its pivotal connection **145** with the front seat support arm **143**. During this movement the link **165** causes the back support bracket **132** to swing downwardly about the pivot **140** on the back of the seat member **131**.

As in the first form of the invention, the front parallel link **158** idles upwardly and forwardly about the pivot **160** during the first movement, and unitl it reaches the dead center position the parallel links **156** and **158** are locked against parallel movement. The lost motion connection between the link **158** and the base **130** permits the idling movement of the link **158** during the travel of the mechanism between the upright position of FIG. 5 and the intermediated position of FIG. 6.

Referring now to FIGS. 9, 10 and 11, which illustrate the third form of the invention, the mechanism is seen to be exactly like that of the first form except that the unit has a seat member, indicated generally at **231**, the structure of which is different from that of the seat member **31**. As indicated in the detailed description of the first form, the drop center portion **36** of the seat member **31** adapts it to support a drop-in coil spring base. In contrast, the seat member **231** extends straight from front to rear, and thus is particularly adapted to receive a seat structure consisting of horizontally oriented serpentine spring members of the type commonly used in upholstered furniture.

The dimensions of the seat member **231** from its front pivot **245** to its rear upright arm **239** are identical with those of the seat member **31**, so that a manufacturer of

reclining chair mechanisms may supply a customer either with a mechanism to receive a drop-in coil spring base or with a mehanism to receive a serpentine spring seat cushion merely by using either the seat member **31** or the seat member **231**. All other parts in the two units are identical, and thus no further detailed description of the third form of the invention is given herein although the drawings are numbered with reference numerals corresponding to those of the first form of the invention but 200 numbers higher in each case.

As is well known in the art, and as previously suggested herein, various substitutions of parts may be made as, for example, using a leg rest and leg rest linkage like that of the second form of the invention on the structure of the first or third form of the invention, or by using the leg rest and leg rest operating mechanism of the first and third forms of the invention, with the second form of the invention. Similarly, the seat member **231** of the first form of the invention may be substituted for the seat member **131** in the second form of the invention if a customer desires the combination of the lower priced linkage with the seat member designed to receive the lower cost type of upholstered seat.

In view of the fact that each of the last above mentioned modifications would be obvious to one skilled in the art in view of the structure illustrated and described for the first three forms, no more detail of such modifications is given herein.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations are to be understood therefrom, as modifications will be obvious to those skilled in the art.

I claim:

1. In a three position reclining chair mechanism, in combination: a base; a seat member; a back bracket member pivoted on the rear of the seat member and extending rearwardly therefrom; a front seat support arm pivotally mounting the front of the seat member relative to the base; a back support arm pivotally mounting the back bracket on the base behind the seat member, said support arms swinging rearwardly substantially in parallel as the seat member and back bracket perform a first movement from an upright position to an intermediate position so that said member and said bracket move between said positions substantially without relaitve movement; and linkage means supporting the rear of the seat member on the base, said linkage means including front and rear parallel links pivoted on the base and a support link pivoted on said links and pivotally connected at its upper end to the rear of the seat member, the upper end of said support link swinging rearwardly and downwardly about its connection to the rear parallel link during first movement of the seat member and back bracket, and said parallel links cooperating to elevate said support link and the rear of the seat member during a further movement from intermediate position to reclining position, said support link and said back support arm cooperating to pivot the back bracket downwardly about its pivotal connection to the seat member during said further movement.

2. The mechanism of claim **1** in which the front parallel link has a lost motion connection, the support link is mounted on the front parallel link at its lower end and has an intermediate pivotal connection with the rear parallel link, and in which the front parallel link pivots idly forwardly and upwardly with the lower part of the support link to a dead center position during the first movement.

3. The mechanism of claim **1** which includes an extensible and retractable leg rest pivotally mounted adjacent the front of the base, and in which the front seat support arm has an extension which provides part of the pivotal mounting for the leg rest so that the first movement of the seat member extends the leg rest.

4. The mechanism of claim **1** in which the seat member pivots about the front seat support arm during said further movement.

5. The mechanism of claim **1** where includes a long support arm pivotally mounted toward the rear of the base and having the front seat support arm pivotally mounted at its front end, a bell crank pivotally mounted on the base below said long suport arm, a short link connecting a first arm of the bell crank to the long support arm, and a long coordinating link connecting the second arm of the bell crank to the rear parallel link.

6. The mechanism of claim **5** which includes an extensible and retractable leg rest which is pivotally mounted on the front portion of the long support arm, and in which the front seat support arm has an extension which provides part of the pivotal mounting for the leg rest so that the first movement of the seat member extends the leg rest.

7. The mechanism of claim **1** in which the seat member is substantially straight from front to rear, and has an upwardly extending portion at the rear in which the pivots for the back bracket and the support link are mounted.

8. The mechanism of claim **1** in which the seat member has a central portion adapted to receive a drop-in spring base, the front portion of the seat member extends forwardly and upwardly from said central portion, and there is an upwardly extending portion at the rear of said central portion in which the pivots for the back bracket and the support link are mounted.

9. In a three position reclining chair mechanism, in combination:

a base;

a seat member;

a back bracket pivoted on the rear of the seat member and extending rearwardly therefrom;

front linkage means mounting the front of the seat member on the base, said front linkage means including a long support arm pivoted on the base, a plurality of links adapted to raise and lower the front of said support arm, and a front seat support arm pivotally mounting the front of the seat member on the long support arm;

rear linkage means mounting the rear of the seat member on the base, said rear linkage means including a plurality of links pivoted on the base and a support link connecting the rear of the seat member with said plurality of links;

a back support arm pivotally mounting the back bracket on the base behind the seat member;

a coordinating link connecting the front linkage means and the rear linkage means;

said front and rear linkage means and said back support arm cooperating to support the seat and back bracket for a first unitary rearward swinging movement from an upright position to an intermediate position, and said front and rear linkage means cooperating during further movement to elevate the front and rear of the seat member while said back support arm causes the back bracket to tilt downwardly relative to the rear of the seat member;

and extensible and retractable leg rest means swingingly suspended from the front of the front linkage means and operatively connected with the front seat support arm so that the leg rest is substantially fully extended during first movement.

10. The mechanism of claim **9** in which the plurality of links in the front linkage means comprises a bell crank pivoted on the base and a short link pivoted on one arm of the bell crank and on the long support arm, and in which the coordinating link is pivotally connected to the other arm of the bell crank.

11. The mechanism of claim **9** in which the plurality of links in the rear linkage means comprises front and rear parallel links pivoted on the base, and in which the rear support link is pivoted at its lower end on the front parallel link, is pivoted intermediate its ends on the rear

parallel link, and is pivoted at its upper end on the seat member.

12. The mechanism of claim **11** in which the coordinating link is pivotally connected to the rear parallel link.

13. The mechanism of claim **12** in which the plurality of links in the front linkage means comprises a bell crank pivoted on the base and a short link pivoted on one arm of the bell crank and on the long support arm, and in which the coordinating link is pivotally connected to the other arm of the bell crank.

14. The mechanism of claim **9** in which the relationship between the front linkage means, the rear linkage means and the coordinating link is such that during said further movement the rear of the seat member elevates more than twice as far as does the front of the seat member.

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