Dec. 12, 1961 A. LORENZ ET AL 3,012,816

RECLINING CHAIRS

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Fig. 1.

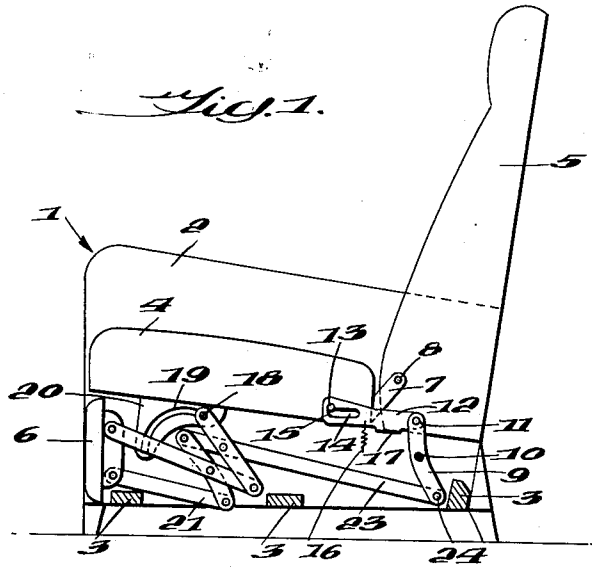


Fig. 2.

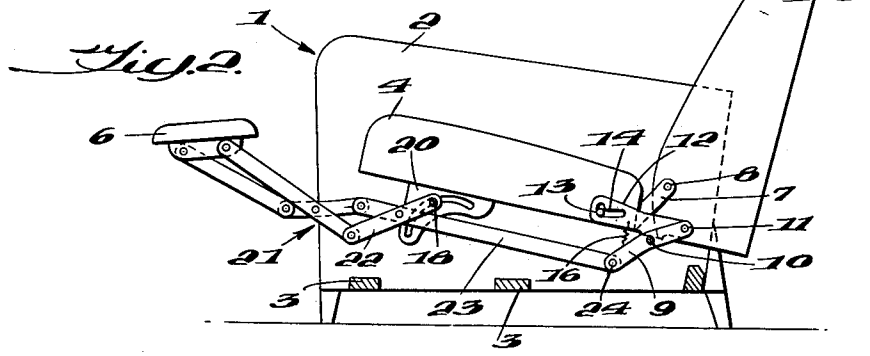
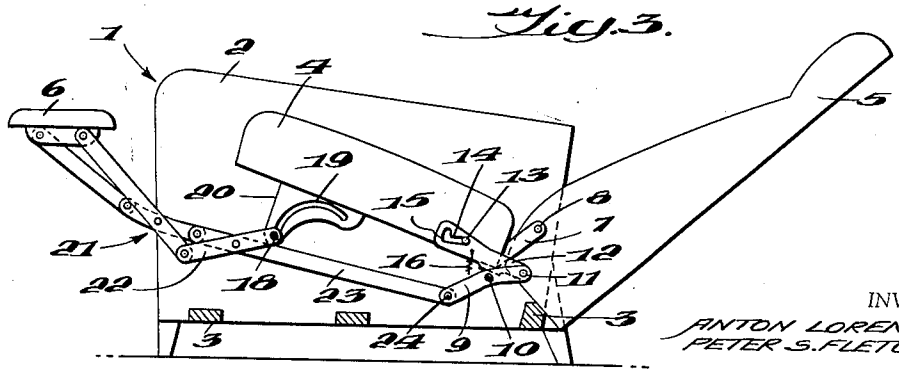


Fig. 3.



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RECLINING CHAIRS

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Fig. 4.

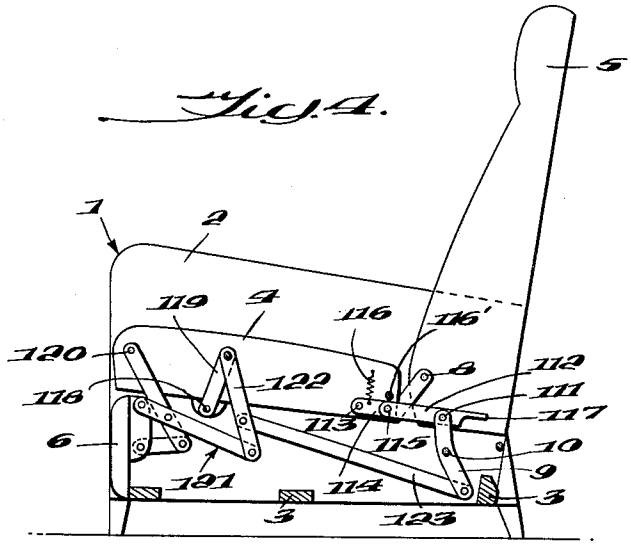


Fig. 5.

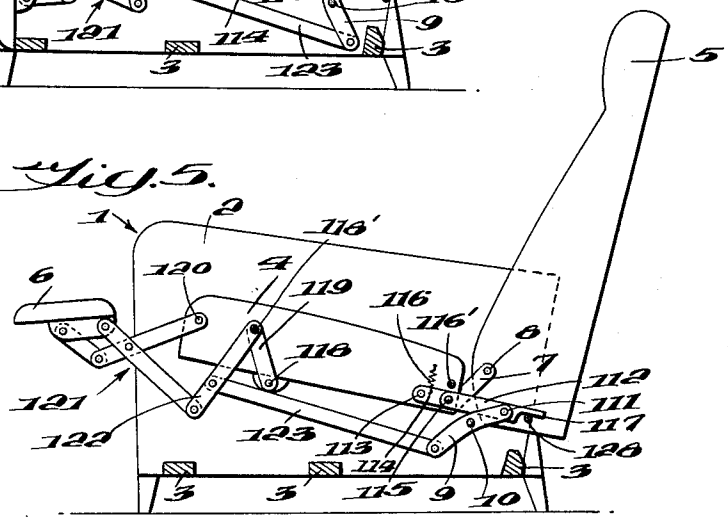
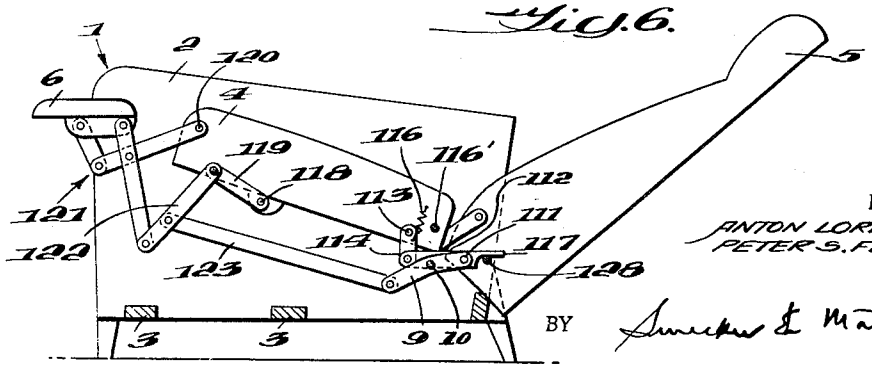


Fig. 6.



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Fig. 7.

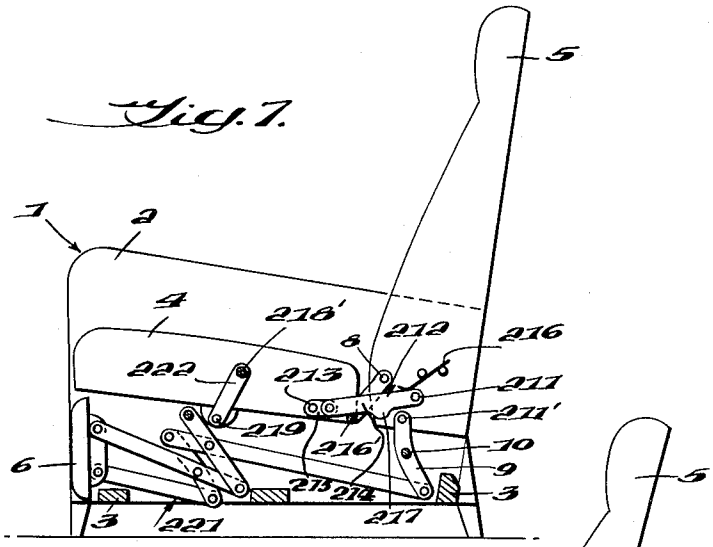


Fig. 8.

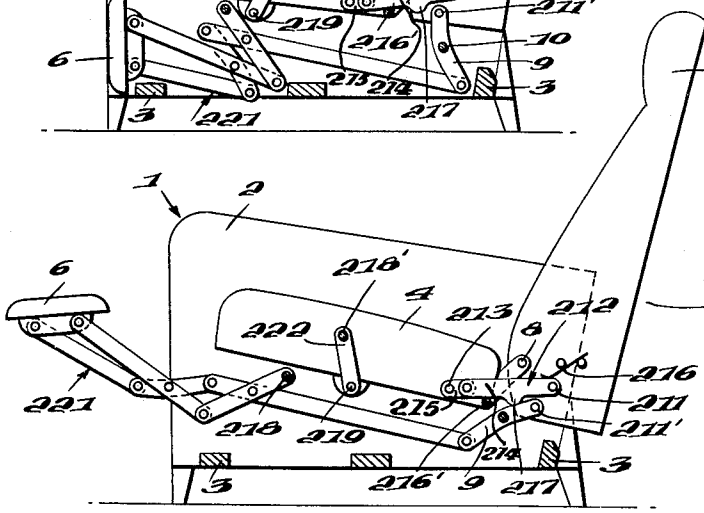
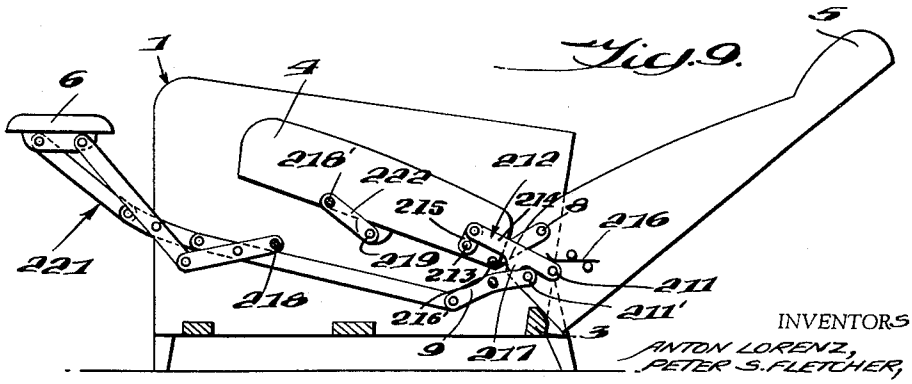


Fig. 9.



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United States Patent Office

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3,012,816

RECLINING CHAIRS

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Filed Mar. 21, 1957, Ser. No. 647,542
16 Claims. (Cl. 297—85)

This invention relates to improvements in reclining chairs and similar articles of furniture, and in particular to a sequencing arrangement for a reclining chair of the type capable of movement to a plurality of positions.

Reclining chairs, as proposed and manufactured heretofore, generally have been built of two types. One of these has the seat and backrest rigidly connected to each other in an angular relation, which is not changed when the seat unit is tilted backward in a semi-reclining position, nor even when tilted to a fully reclining position. The other type of reclining chairs has a separately movable seat and back rest, usually pivotally connected either to each other or to the supporting frame structure for movement relative to each other and to the frame structure. During the reclining movements, the angular relation between the seat and back rest is increased for the proper comfortable resting and relaxation in the full reclining position.

Each of the two kinds of reclining chairs has limitations in use. For instance, the first mentioned, in which the seat and back rest are rigidly connected together, offers a comfortable resting position only in a semi-reclining position or somewhat tilted sitting position, but the leg-rest had to be actuated in such way to move out the leg rest quickly, and propelling it nearly to a horizontal position, due to the relatively small movement backward of the seat and back rest. In this tilted or semi-reclined position, it is not possible to obtain a complete relaxation attitude, although such position is comfortable during some activity, such as reading, television viewing and the like.

Where full relaxation and resting is desired, the full reclining position attained with a reclining chair of the type including the separate seat and back rest, offers greater comfort, even though activity by the occupant cannot be continued in such position.

Both positions, namely the tilted sitting and the fully reclining, are desirable at different times, according to the needs of the occupant and the desire for some activity or to be completely inactive or relaxed.

One object of this invention is to provide, in a single chair or similar article of furniture, for the two kinds of reclining movements, one, a movement to a tilting position where some activity can be conducted; and, second, a movement to a full reclining position where the occupant may be completely relaxed.

Another object of the invention is to improve the construction of reclining chairs and the like, so as to provide for relative movement between the seat and back rest, to obtain different positions thereof with respect to each other.

Still another object of the invention is to provide for the movement of the leg rest into and out of an elevated position and to a fully retracted position automatically upon shifting of the seat and back rest either to a tilting or a full reclining position.

These objects may be accomplished, according to certain embodiments of the invention wherein the seat and back rest are mounted on a supporting frame structure for relative movement with respect to each other and are connected together through a sequencing arrangement which is rigid in the upright and tilted sitting positions of the parts, but has articulated connections whereby the back rest can swing to a full reclining position relative to the seat, and the latter is adjusted to accommodate thereto. The leg rest is connected by a linkage with the sequencing arrangement in such manner as to be extended and retracted automatically by the shifting of the seat and back rest.

In accordance with an illustrative embodiment demonstrating objects and features of the present invention, there is provided a reclining chair which comprises a support, a seat, a back-rest, and means mounting the seat and back-rest on the support for movement to a plurality of positions in a predetermined sequence. The mounting means includes seat guiding means operatively connected to the seat and support, and back-rest controlling and guiding means independent of the seat guiding means which operatively connect the back rest to the seat and support. The back-rest controlling and guiding means includes means which pivotally connect the seat to the back-rest at a back-rest pivot. A control link is pivotally connected to one of the seat and back-rest at a first point spaced from the back-rest pivot, and means connect the control link to the other of the seat and back-rest at a point spaced from the back-rest pivot. The portion of the seat between the back-rest pivot and the first point provides a first link rigid with the seat, and the portion of the back-rest between the back-rest pivot and the second point provides a second link rigid with the back-rest. The three links and the connecting means coact to hold temporarily the seat and back-rest in rigid relation, and means are operable at the end of the movement of the seat and the back-rest in the temporary rigid relationship for moving the three links and the connecting means relative to each other to recline the back-rest relative to the seat to a fully reclined position.

Certain embodiments of the invention are illustrated in the accompanying drawings, in which:

FIG. 1 is a diagrammatic side elevation of a reclining chair or the like in which the back rest is upright in sitting position;

FIG. 2 is a similar view, showing the parts in tilting position and with the leg rest extended;

FIG. 3 is a similar view, with the parts in full reclining position;

FIG. 4 is a view similar to FIG. 1, showing a modification of the linkage;

FIG. 5 is a view similar to FIG. 2 of the modified form;

FIG. 6 is a view similar to FIG. 3 of the modified form;

FIG. 7 is a view similar to FIG. 1, showing a further modification thereof;

FIG. 8 is a view similar to FIG. 2 of said further modification; and

FIG. 9 is a view similar to FIG. 3 of said further modification.

Referring to the form of chair shown in FIGS. 1, 2 and 3, the parts are illustrated, respectively, in the up-

right sitting position, the tilted sitting position and the fully reclining position, the latter two positions representing end positions of the first and second movement phases of the seat and back rest.

The chair may comprise any suitable or desired supporting structure, as generally indicated by the numeral 1, preferably having opposite sides 2, which may be formed as arm rests or the like and which are connected together by suitable connecting bars, indicated at 3, which firmly join the opposite sides 2 in a rigid frame. These parts of the structure may be varied according to the manufacturing requirements and the ornamental design to be achieved.

A chair seat is shown at 4. A back rest is indicated at 5. A leg rest is shown at 6. These are the movable parts of the chair and serve to support the occupant thereon. The seat 4 has arms 7 projecting therefrom, that are pivoted at 8 to the back rest 5, forming pivotal connection therebetween. These arms 7 are rigidly secured to the seat 4.

A lever 9, which may be a bellcrank lever or a straight lever as desired, is pivotally supported at 10 on the frame structure, as, for example, by an inward projection of the pivot pin 10 from the adjacent side support 2. The back rest 5 is pivotally supported upon the lever 9 at 11. The pivot 11 is spaced from the pivot 8 so as to form one link of a triangle and these pivots 8 and 11 support the back-rest 5 and hold it in its several positions.

A control link 12 extends forwardly from the pivot 11, being joined thereby to the back rest 5, to a pivot pin 13 connected with the seat 4. The pivot pin 13 extends in an elongated slot 14 in the control link 12 to permit relative longitudinal movement of the control link 12 relative to the seat 4. The control link may be locked in a fixed position with respect to the seat by an angular or offset end portion 15 of the slot 14, as shown in FIG. 1. A spring 16, or other suitable means, preferably is connected with the control link 12, normally tending to urge the latter downward into the locked position shown, when the pin 13 is in the angular end of the slot 14.

When the pivot pin 13 is in the position shown in FIG. 1 relative to the control link 12, the control link and pin cooperate with the pivots 8 and 11 to form a rigid triangular unit between the seat and back rest, which permits of no relative movements between the seat and back rest, although they can move together. The joint movement of the seat and back rest may occur around the pivot 11, substantially as illustrated in FIG. 2. As the lever 9 swings on the pivot 10 during this movement, a projection 17 on the control link 12 will engage the pivot pin 10 and thereby lift the front end of the control link 12 relative to the seat 4, thereby shifting the pin 13 out of the angular portion 15 of the slot 14. This frees the rigid connection between the control link 12 and the seat and permits of endwise shifting of the control link 12 relative to the seat, as hereinafter described.

The front end portion of the seat 4 is supported on an independent seat guiding means including a pin 18 at each opposite side of the seat, projecting inwardly from the side portion 2 of the frame structure. Each pin 18 is shown as extending in a slot 19 within a bracket 20 secured to the underside of the seat 4 at the adjacent lateral edge thereof. The slot 19 is somewhat arcuate or curved, to permit of the desired movements of the front end portion of the seat relative to the pin 18.

The leg rest 6 is supported by a lazy tong linkage assembly, generally indicated at 21. One of the links of the assembly 21 is indicated at 22 and extends to the pivot pin 18 with which it is fixedly connected to the support and forms a control for the extension of the assembly.

The lazy tong link assembly 21 is also connected with an actuating link 23 extending therefrom to the lower end of the lever 9, being pivoted thereto at 24.

The linkage shown and described should be provided at each opposite side of the chair and of the seat and back rest thereof, with room for freedom of action to accommodate the several movements referred to. The actuating and supporting linkage for the leg rest 6 may be changed, as desired, so long as coordinating movements of the leg rest are accomplished with the movements of the seat and back rest, as preferred.

If the user of the chair desires to change the sitting position from that shown in FIG. 1, it is necessary merely to apply a sufficient pressure against the back rest 5, such that the seat 4 and back rest 5 will swing bodily backward around the pivot 11 and on the frame support of the chair by the action of the lever 9. This swinging movement may continue to the position shown in FIG. 2, which is designated as a "tilting" position and is accomplished as the first movement of the chair. This swinging movement of the lever 9, acting through the link 23, causes the leg rest 6 to be propelled outwardly substantially as shown in FIG. 2. The leg rest linkage 21 permits of the leg rest 6 being a greater distance away from the seat 4 than generally provided heretofore, and the legs will have a long supporting surface for the comfortable resting in this position, as desirable, if the occupant wishes to remain in the position shown.

During this first phase of movement into the position shown in FIG. 2, the control link 12 is released from its rigid locking position, as shown in FIG. 1, by the projection 17 on the lower edge of the control link 12. This projection 17 abuts against the pivot pin 10 when the seat and back rest are moved approximately to the tilting position, raising the control link 12 relative to the pin 13 and freeing the latter from the angular portion 15 of the slot 14. This releases the back rest 5 for freedom of movement relative to the seat 4 by additional pressure against the back rest, permitting the latter to swing to the position shown in FIG. 3. During this second phase of movement, the control link 12 is moved bodily forward relative to the seat 4 until the pin 13 comes to rest at the rear end of the slot 14. The further movement will also serve to tilt the seat 4, substantially as indicated in FIG. 3, and such continued movement of the back rest 5, by reason of the swinging movement of the lever 9 will serve to elevate the leg rest 6 to a comfortable relation with respect to the seat.

The user of the chair can restore the parts to the position shown in FIG. 2, or that shown in FIG. 1, by pressure of his legs on the leg rest 6 and/or by elevating his upper body relative to the back rest 5. These parts will swing first to the position shown in FIG. 2, and, if desired, the forward movement of the seat and back rest can be continued to the position shown in FIG. 1. As soon as the seat 4 and back rest 5 have moved forwardly toward the upright sitting position, the control link 12 will lose contact of its projection 17 with the pivot pin 10. This will cause the control link 12 to drop down by the action of the spring 16 or other suitable means connected therewith, and thereby prevent relative movement between the seat and back rest, due to the triangular assembly referred to above.

Each of the first and second positions mentioned can be accomplished and maintained so long as desired, or the parts moved into the next position in a simple and easy manner. Thus, the seat and back rest can be shifted into the tilted position shown in FIG. 2 and there maintained in that relation, so long as desired, or moved to the full reclining position, whenever desired. Each of these movements is fully independent and does not require any other changes of positions.

In the modification shown in FIGS. 4 to 6, the corresponding parts are designated by the same numerals as used in FIGS. 1 to 3 and repetition of the description thereof is not required.

In this embodiment, in place of the control link 12, we have provided an articulated or knee action comprising a pair of links 112 and 114, pivoted together at 115, nor-

mally in straight alignment with each other. The link 112 is pivoted to the back rest 5 at 111, coaxial with the pivot of the lever 9 to the back rest. The link 114 is pivoted to the seat 4 at 113.

In the normal upright sitting position, as shown in FIG. 4, the links 112 and 114 normally are held in a locked relation, a straight line alignment, by a spring 116 and a stop 116' on the seat 4 in vertical alignment with the pivot 115. In this rigid alignment, the articulated or knee action links 112 and 114 coact with the pivots 111 and 113 to form the triangular unit which holds the back rest in rigid relation to the seat. This triangular unit includes the pivots 111, 8 and 113, maintaining the seat and back rest against relative movement, so long as the articulated or knee action links remain in the aligned relation shown in FIG. 4.

In this form of the invention, the leg rest 6 is carried by a linkage assembly 121, which has a pivoted connection 120 with the seat 4 and also includes a link 122 pivoted to the adjacent support 2 at 118'. The link 119 may be pivoted to the support 2 at the same pivot 118'. The link 119 is pivoted at 118 to a bracket on the seat 4. An actuating link 123 extends from the linkage assembly 121 to the free lower end of the lever 9.

When the seat and back rest are moved rearwardly, as shown in FIG. 5, guided by the lever 9 and the link 119, this will be the first phase of movement to the tilted sitting position, as described. During this first phase of movement, a projection 117 on the link 112 abuts against a pin 128, which is secured to the frame structure 1, preferably by projecting inward from the adjacent side 2 thereof. This first position, which is the tilted sitting position of the chair, can be maintained so long as desired. If the user wishes to return to the upright sitting position shown in FIG. 4, this may be accomplished by a pressure of the legs against the leg rest 6.

If the occupant of the chair wishes to assume a more comfortable position of full reclining, as shown in FIG. 6, further backward pressure on the back rest 5 will cause the link 112 to swing around its pivot 111, thereby buckling the pivotal connection 115 downward. As soon as the articulated linkage 112—114 has moved past dead center into an unlocked relation, the back rest 5 can move rearward relative to the seat 4, thus increasing the angularity therebetween for the most comfortable use.

Again, the user of the chair can move back, either to the tilting position of FIG. 5 or the upright sitting position of FIG. 4, by raising the back rest 5 or applying pressure to the leg rest 6 when the parts will be restored and held in the desired relation.

A further modification is illustrated in FIGS. 7, 8 and 9 which correspond, respectively, to the positions shown in FIGS. 1, 2 and 3. Corresponding parts of the chair or the like are designated by the same numerals, but the differences in construction are principally the linkage connection between the seat and back rest and between the leg rest and the seat.

An articulated linkage 212 including pivotally interconnected links 214, 215 is pivotally connected at 211 with the back rest and at 213 with the seat. The pivotal connection 211 is spaced from the pivot 8 between the seat and back rest, as described above, and also from the pivotal connection 211' between the lever 9 and the back rest 5. The articulated linkage 212 is provided with a projection 217 on the lower side thereof, in position to abut against the lever 9 upon movement of the parts to tilting and full reclining positions, as shown in FIGS. 8 and 9. After the first movement, this linkage 212 will fold in an upward direction from a stop 216' on the seat 4, to allow relative movement of the back rest 5 with respect to the seat 4. A leaf spring is shown at 216 bearing upon the articulated linkage 212 and carried by the back rest 5, normally tending to hold the articulated linkage in a rigid extended position, bearing downward upon the pin 216'.

The leg rest linkage 221 is substantially the same as shown in FIGS. 1, 2 and 3, being connected at 218 with the side portion 2 of the frame structure. In addition thereto, the front portion of the seat is supported on the side portion 2 of the frame structure by a link 222 pivoted at 218' to the frame structure and at 219 to the seat.

The operation of this form of the invention will be the same as described above, except for the modifications described and shown, and repetition is unnecessary.

It will be apparent that the lever 9 of the back rest linkage, which acts as a support for the back rest and the rear portion of the seat, is moved in both the first and second phases of movement described. However, the link 12 or the linkage 112 or 212 forms a rigid connection between the seat and back rest in the first movement described to the tilting position shown in FIGS. 2, 5 and 8, but is shortened by sliding movement or knee action in the second movement described, to allow relative movement of the back rest with respect to the seat. This construction provides for a rigid triangular unit between the seat and back rest to hold these parts in rigid relation to each other in the normal upright sitting position, and yet makes it possible for shifting movement either to a tilting position or to a full reclining position. Such shifting movement is accompanied by an extension of the leg rest, which is accommodated to a comfortable supporting position relative to the seat in either of the last-mentioned positions of adjustment.

The linkage described and shown in the drawings will be provided at each opposite side of the seat and back rest. It is supported on the adjacent sides of the chair or other article of furniture, and only one side has been described for simplicity of disclosure.

While the invention has been illustrated and described in certain embodiments, it is recognized that other variations and changes may be made therein, without departing from the invention, as set forth in the claims.

We claim:

1. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, and means mounting the seat and back rest on the frame structure for movement to a plurality of positions relative thereto, said mounting means including a plurality of connections between the seat and back rest with a plurality of pivotal connections with at least one of them and at least one pivotal connection with the other normally tending to hold said seat and back rest in rigid relation to each other and for bodily tilting movement in said rigid relation, and means connected with one of said seat and back rest for breaking said rigid relation and providing for reclining movement of the back rest relative to the seat.

2. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, means mounting the seat and back rest on the frame structure for movement to a plurality of positions relative thereto, said mounting means including a link connected with the seat and having a pivotal connection with the back rest, a separate link pivoted to the seat and having a pivotal connection with the back rest at a point spaced from the first-mentioned pivotal connection therewith, said links and pivotal connections normally forming a rigid connection between the seat and back rest, and means for shortening one of said link connections between the seat and back rest for swinging movement of the back rest relative to the seat.

3. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, means forming a connection between the seat and back rest and pivoted to the back rest, separate means forming a second connection between the seat and back rest and pivoted to the back rest at a point spaced from the first-mentioned pivot, said separate means being movable relative to the seat and back rest and forming a rigid connection therebetween in one position of the separate means and permitting relative movement therebetween in another posi-

tion of the separate means for swinging movement of the back rest relative to the seat, and means supporting the seat and back rest on the frame structure.

4. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, means connecting the seat and back rest together and having a pivotal connection with the back rest, a linkage connecting the seat and back rest together and having a pivotal connection with the back rest spaced from the first-mentioned pivotal connection therewith, said linkage including a plurality of links connected together and movable relative to the back rest and seat and forming a rigid connection therebetween in one position of the linkage, means connected with at least one of the links forming a lost-motion connection in the linkage in another position of the linkage for movement of the back rest to a reclining position relative to the seat, and means supporting the seat and back rest on the frame structure.

5. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, means connecting the seat and back rest together and having a pivotal connection with the back rest, a linkage connect- the seat and back rest together and having a pivotal connection with the back rest spaced from the first-mentioned pivotal connection therewith, said linkage including a plurality of links connected together and movable relative to the back rest and seat and forming a rigid connection therebetween in one position of the linkage, means connected with one of the links forming a lost-motion connection in the linkage in another position of the linkage for movement of the back rest to a reclining position relative to the seat, and said linkage including a lever pivotally supported on the frame structure and having a pivotal connection with the back rest for supporting the back rest in the different adjusted positions thereof.

6. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, means connecting the seat and back rest together and having a pivotal connection with the back rest, a linkage connecting the seat and back rest together and having a pivotal connection with the back rest spaced from the first-mentioned pivotal connection therewith, said linkage including a plurality of links connected together and movable relative to the back rest and seat and forming a rigid connection therebetween in one position of the linkage, means connected with one of the links forming a lost-motion connection in the linkage in another position of the linkage for movement of the back rest to a reclining position relative to the seat, and said linkage including a lever pivotally supported on the frame structure and having a pivotal connection with the back rest for supporting the back rest in the different adjusted positions thereof, and means connected with the linkage and operatively connected with the lever for causing said lost-motion of the linkage and thereby providing for movement of the back rest relative to the seat.

7. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, means connecting the seat and back rest together and having a pivotal connection with the back rest, a linkage connecting the seat and back rest together and having a pivotal connection with the back rest spaced from the first-mentioned pivotal connection therewith, said linkage including a plurality of links connected together and movable relative to the back rest and seat and forming a rigid connection therebetween in one position of the linkage, means connected with one of the links forming a lost-motion connection in the linkage in another position of the linkage for movement of the back rest to a reclining position relative to the seat, means supporting the seat and back rest on the frame structure, a leg rest, and means operatively connected with the linkage for projecting the leg rest relative to the seat and holding the leg rest in elevated position.

8. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, means connecting the seat and back rest together and having a pivotal connection with the back rest, a linkage connecting the seat and back rest together and having a pivotal connection with the back rest spaced from the first-mentioned pivotal connection therewith said linkage including a plurality of links connected together and movable relative to the back rest and seat and forming a rigid connection therebetween in one position of the linkage, means connected with one of the links forming a lost-motion connection in the linkage in another position of the linkage for movement of the back rest to a reclining position relative to the seat, a lever pivotally supported on the frame structure and having a pivotal connection with the back rest for supporting the back rest in the different adjusted positions thereof, means connected with the linkage and operatively connected with the lever for causing said lost-motion of the linkage and thereby providing for movement of the back rest relative to the seat, a leg rest, linkage means connected with the leg rest for bodily movement thereof to retracted and elevated positions relative to the frame structure, and means operatively connecting the lever with the last-mentioned linkage for projecting the leg rest to said elevated position upon movement of the back rest to an intermediate adjusted position thereof.

9. A reclining chair or the like comprising a supporting frame structure, a seat, an upright back rest, a leg rest, leg rest linkage supporting the leg rest for movement from a retracted position to an extended elevated position, arms connected with the seat and having pivotal connections with the back rest, linkage pivotally connected with the back rest at points spaced from the first-mentioned pivotal connections, said linkage extending to the seat and pivoted thereto and having lost-motion connections with the seat, means supporting the seat and back rest on the frame structure including a lever pivotally mounted on the frame structure, means connected with the seat linkage and operatively connected with the lever for causing said lost-motion connection between the seat and back rest upon bodily movement of the seat and back rest relative to the lever, and actuating means operatively connecting the lever with the leg rest linkage.

10. A reclining chair or the like comprising a supporting frame structure, a seat, a back rest, a link connection between the seat and the back rest pivotally connected with the back rest, a second link connection between the seat and back rest having a pivotal connection with the back rest, means mounting the seat and back rest on the frame structure for tilting movement relative thereto, and for reclining movement of the back rest relative to the seat, and means in the second link connection holding the seat and back rest in rigid relation during one movement, and for swinging movement of the seat and reclining movement of the back rest relative to each other and relative to the frame structure after said one movement of the seat and back rest.

11. A reclining chair comprising a support, a seat, a back-rest, and means mounting said seat and back-rest on the support for movement to a plurality of positions in a predetermined sequence, the mounting means including seat guiding means operatively connected to said seat and said support and back-rest controlling and guiding means independent of said seat guiding means and operatively connecting said back-rest to said seat and said support, said back-rest controlling and guiding means including means pivotally connecting said seat to said back-rest at a back-rest pivot, a control link pivotally connected to one of said seat and said back-rest at a first point spaced from said back-rest pivot, means connecting said control link to the other of said seat and said back-rest at a second point spaced from said back-rest pivot, the portion of said seat between said back-rest pivot and the point on said seat providing a first link rigid with said seat, the

portion of said back-rest between said back-rest pivot and the point on said back-rest providing a second link rigid with said back-rest, said three links and the connecting means coacting to hold temporarily said seat and said back-rest in rigid relation, and means operable at the end of the movement of said seat and said back-rest in said temporary rigid relation for moving said three links and said connecting means relative to each other to recline said back-rest relative to said seat to a fully reclining position.

12. In a reclining chair including a support, a seat, a back-rest, and means mounting the seat and back-rest on the support for movement to a plurality of positions in a predetermined sequence including seat guiding means operatively connected to said seat and said support, the improvement comprising back-rest controlling and guiding means independent of said seat guiding means and operatively connecting said back-rest to said seat and said support, said back-rest controlling and guiding means including means pivotally connecting said seat to said back-rest at a back-rest pivot, a control link pivotally connected to one of said seat and back-rest at a first point spaced from said back-rest pivot, means connecting said control link to the other of said seat and back-rest at a second point spaced from said back-rest pivot, the portion of said seat between said back-rest pivot and the point on said seat providing a first link rigid with said seat, the portion of said back-rest between said back-rest pivot and the point on said back-rest providing a second link rigid with said back-rest, said three links and the connecting means coacting to hold temporarily the seat and back-rest in rigid relation, and means operable at the end of the movement of the seat and back-rest in said temporary rigid relation for moving said three links and said connecting means relative to each other to recline the back-rest relative to the seat to a fully reclining position.

13. A reclining chair comprising a support, a seat, a back-rest, and means mounting said seat and back-rest on the support for movement to a plurality of positions in a predetermined sequence including tilting movement of said seat and back-rest and reclining movement of said back-rest relative to said seat, the mounting means including seat guiding means operatively connected to said seat and said support and back-rest controlling and guiding means independent of said seat guiding means and operatively connecting said back-rest to said seat and said support, said back-rest controlling and guiding means including means pivotally connecting said seat to said back-rest at a back-rest pivot, a link connection between said seat and back-rest and pivotally connected to one of said seat and back-rest at a first point spaced from said back-rest pivot, connecting means in said link connection operatively connected to the other of said seat and back-rest at a second point spaced from said back-rest pivot for holding said seat and back-rest in a rigid relation during one movement phase and in a movable relation to each other after said one movement phase for reclining said back-rest relative to said seat, and means operable at the end of said one movement phase for reclining said back-rest relative to said seat to a fully reclining position.

14. A reclining chair comprising a support, a seat, a back-rest, and means mounting said seat and back-rest on the support for movement to a plurality of positions in a predetermined sequence, the mounting means including seat guiding means operatively connected to said seat and said support and back-rest controlling and guiding means independent of said seat guiding means and operatively connecting said back-rest to said seat and said support, said back-rest controlling and guiding means including means pivotally connecting said seat to said back-rest at a back-rest pivot, a control link pivotally connected to one of said seat and said back-rest at a first point spaced from said back-rest pivot, means connecting said control link to the other of said seat and said back-rest at a second point spaced from said back-rest pivot, the connecting means including a pin and slot interconnection between said control link and said other of said seat and said back-rest and providing for a lost motion travel between said control link and said other of said seat and said back-rest when released, the portion of said seat between said back-rest pivot and the point on said seat providing a first link rigid with said seat, the portion of said back-rest between said back-rest pivot and the point on said back-rest providing a second link rigid with said back-rest, said three links and the connecting means coacting to hold temporarily said seat and said back-rest in rigid relation, and means operable at the end of the movement of said seat and said back-rest in said temporary rigid relation for releasing said pin and slot interconnection and for moving said three links and said connecting means relative to each other to recline said back-rest relative to said seat to a fully reclining position.

15. A reclining chair comprising a support, a seat, a back-rest, and means mounting said seat and back-rest on the support for movement to a plurality of positions in a predetermined sequence, the mounting means including seat guiding means operatively connected to said seat and said support and back-rest controlling and guiding means independent of said seat guiding means and operatively connecting said back-rest to said seat and said support, said back-rest controlling and guiding means including means pivotally connecting said seat to said back-rest at a back-rest pivot, a control link pivotally connected to one of said seat and said back-rest at a first point spaced from said back-rest pivot, means connecting said control link to the other of said seat and said back-rest at a second point spaced from said back-rest pivot, the connecting means including a further link pivotally connected between said control link and said other of said seat and said back-rest, said further link and said control link being substantially in alignment with each other, the portion of said seat between said back-rest pivot and the point on said seat providing a first link rigid with said seat, the portion of said back-rest between said back-rest pivot and the point on said back-rest providing a second link rigid with said back-rest, said three links and the connecting means coacting to hold temporarily said seat and said back-rest in rigid relation, and means operable at the end of the movement of said seat and said back-rest in said temporary rigid relation for urging said further link and said control link out of alignment with each other and for moving said links relative to each other to recline said back-rest relative to said seat to a fully reclining position.

16. A reclining chair comprising a support, body-supporting means including a seat and back-rest, means mounting said body-supporting means on said support for movement from a sitting position through a first movement phase into an intermediate tilted sitting position and from said intermediate tilted sitting position through a second movement phase to a fully reclined position, the mounting means including a back-rest pivot pivotally mounting said back-rest on said seat, seat guiding means operatively connected between said seat and said support, and back-rest controlling and guiding means independent of said seat guiding means and operatively connecting said back-rest to said seat and said support and operable to hold said back-rest substantially in a fixed angular relationship with said seat during said first movement phase and to recline said back-rest relative to said seat and said support during said second movement phase, said back-rest controlling and guiding means including first and second control links pivotally interconnected and having a first control pivot to said back-rest at a point spaced from said back-rest pivot and a second control pivot to said seat at a point spaced from said back-rest pivot, said back-rest, said seat and said first and

second control links remaining stationary relative to each other during said first movement phase to maintain said fixed angular relationship, and means operatively engaged between said support and one of said control links and operable during said second movement phase to cause relative movement between said first and second control links to recline said back-rest relative to said seat and said support.

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