

Aug. 9, 1960

A. LORENZ

2,948,330

ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

Filed Aug. 5, 1955

4 Sheets-Sheet 1

Fig. 1.

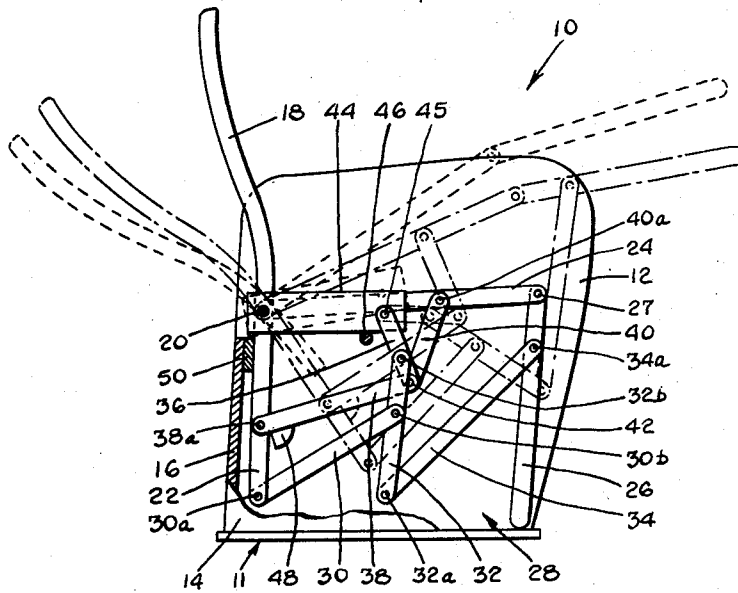
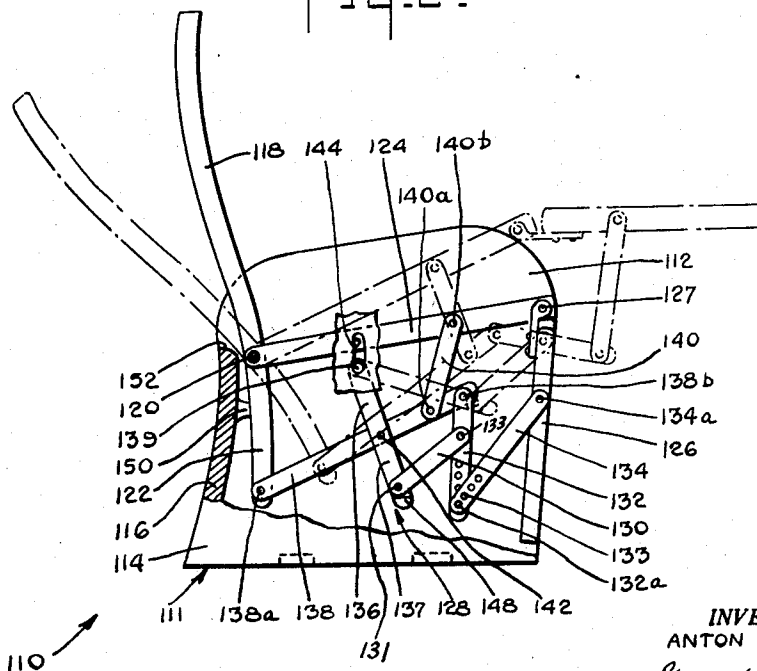


Fig. 2.



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Fig. 3.

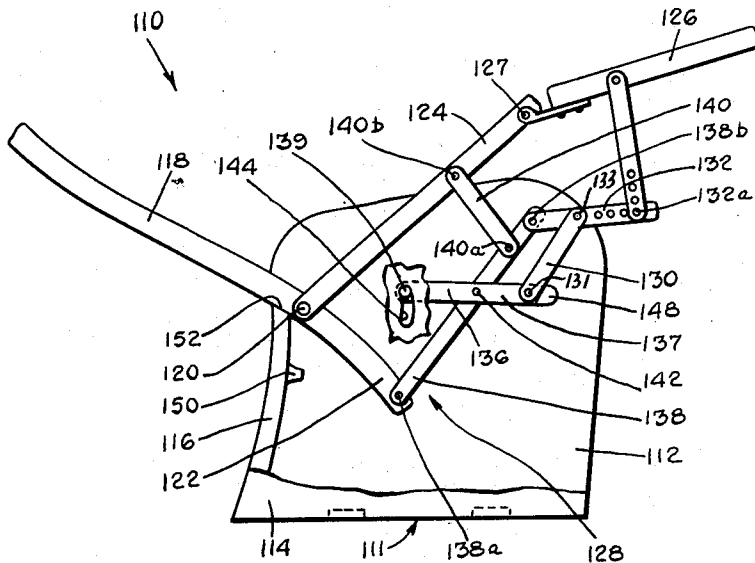
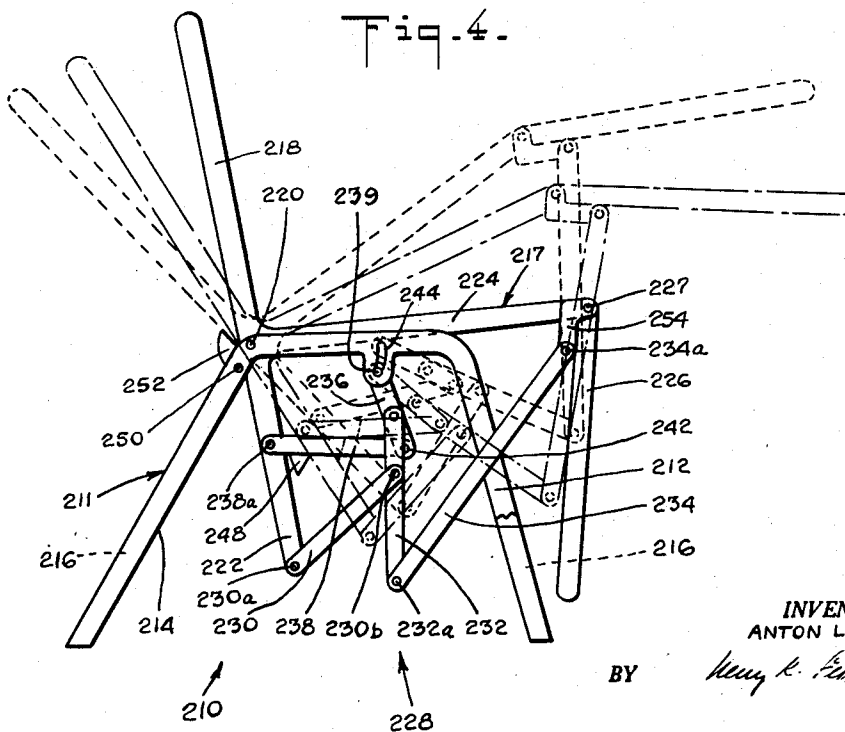


Fig. 4.



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Fig. 5

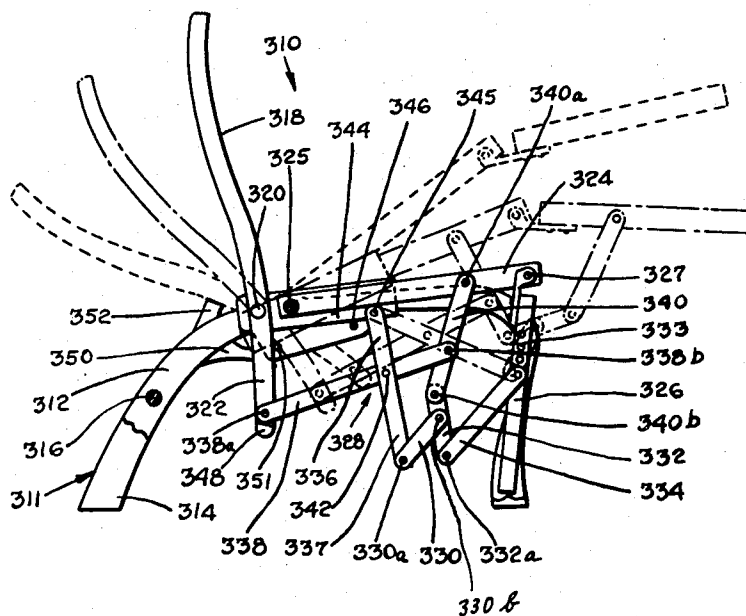
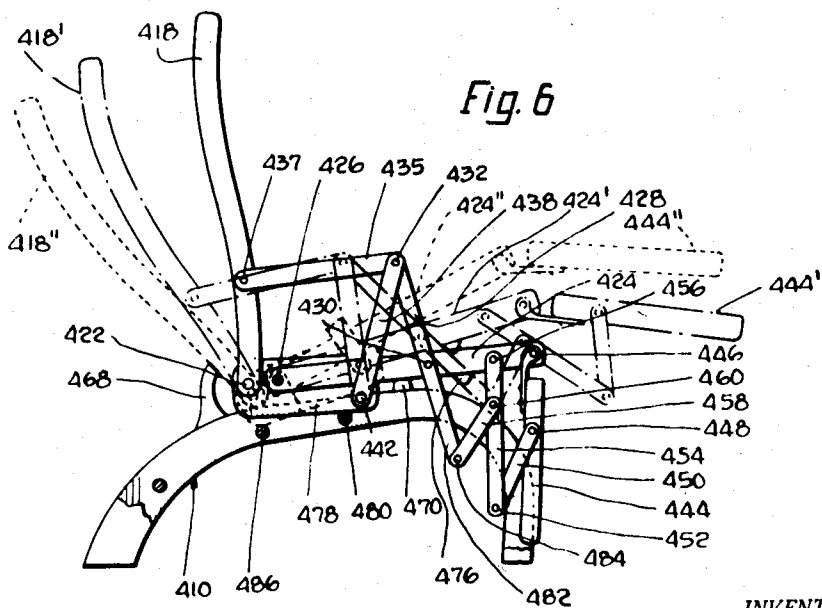


Fig. 6



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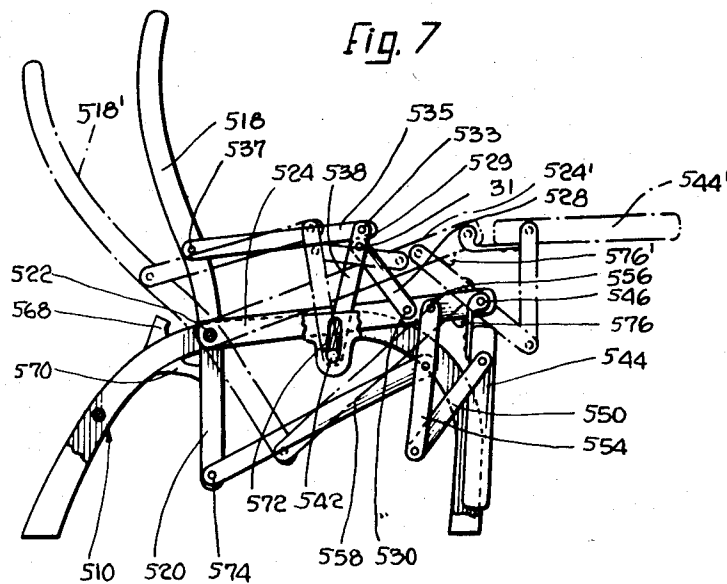
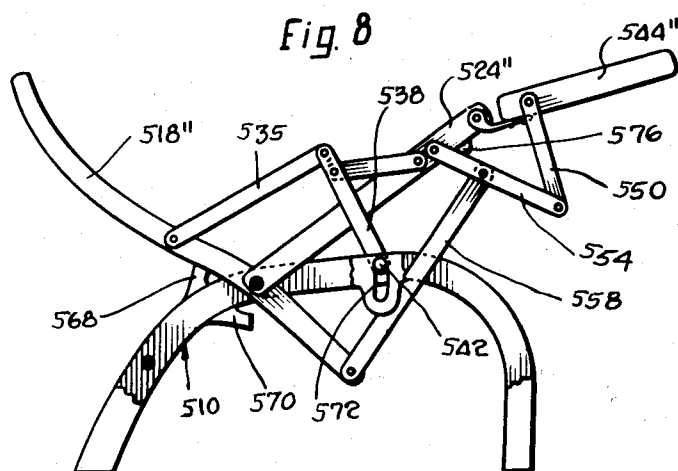
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2,948,330

ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

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15 Claims. (Cl. 155—106)

The present invention relates to reclining chairs, and in particular to a reclining chair of the type including body-supporting means having a movable seat and a back-rest mounted on a chair frame for reclining and inclining movement respectively into various reclined positions. This application is a continuation-in-part of my copending application Serial No. 309,271 filed September 12, 1952 (now U.S. Patent No. 2,746,522 of May 22, 1956), application Serial No. 309,272 filed September 12, 1952 (now U.S. Patent No. 2,746,521 of May 22, 1956), application Serial No. 316,197 filed October 22, 1952 (now U.S. Patent No. 2,760,555 of August 28, 1956), and application Serial No. 316,276 filed October 22, 1952 (now U.S. Patent No. 2,743,764 of May 1, 1956).

The well-known reclining chair comprises a support and body-supporting means including a seat and back-rest movable relative to each other and to the support for inclining and reclining movement respectively through a series of reclining positions. Such chair usually incorporates a leg-rest which moves to an elevated leg-supporting position as the body-supporting means moves into the fully reclined position.

Broadly, it is an object of the present invention to provide an improved reclining chair of this type wherein the leg-rest is moved into a predetermined elevated leg-supporting position relative to the seat and back-rest as the body-supporting means moves into an intermediate semi-reclining position, with the leg-rest remaining substantially in the predetermined elevated leg-supporting position as the chair movement is continued until the body-supporting means is in the fully reclined position.

In accordance with an illustrative embodiment demonstrating objects and features of the present invention, there is provided a reclining chair comprising a support, body-supporting means including a seat and back-rest movable relative to each other for inclining and reclining movement respectively and mounted on the support for movement successively from a sitting position to an intermediate resting position and from the resting position to a reclining position, and seat control means operatively connected to the seat for displacing the seat relative to the back-rest in response to movement of the body-supporting unit from the sitting position to the resting position. The seat control means includes a linkage having at least two pivots on the support providing a stationary link and movable links pivotally connected to the stationary link, with means mounting one of the pivots on the support for displacement relative to the other of the pivots in an arc about the other of the pivots. The one pivot remains substantially stationary when the movable links of the linkage are moved relative to each other, and the one pivot is displaced in the arc when the movable links of the linkage are blocked against movement relative to each other. A leg-rest is mounted for movement into an elevated leg-supporting position and includes a leg-rest control linkage arranged to move the leg-rest to an elevated leg-supporting po-

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sition incident to the movement of the movable links of the linkage, with the one pivot remaining substantially stationary. Provision is made for blocking the movable links of the linkage against movement relative to each other as the body-supporting means moves into a resting position, with the leg-rest remaining substantially in the leg-supporting position.

The above brief description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of a number of presently preferred illustrative embodiments of the invention, when taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a side elevational view of an improved reclining chair demonstrating features of the invention, with parts broken away in the interests of clarity, with the full lines showing the sitting position for the chair, the dot-dash lines showing the intermediate resting position for the chair, and the dotted lines showing the fully reclined position for the chair;

Fig. 2 is a side elevational view of a further embodiment of reclining chair demonstrating features of the present invention, with parts broken away in the interests of clarity, with the full lines showing the sitting position for the chair and the dot-dash lines showing the intermediate resting position for the chair;

Fig. 3 is a side elevational view of the embodiment of reclining chair shown in Fig. 2, shown in the fully reclined position;

Fig. 4 is a side elevational view of a still further embodiment of reclining chair demonstrating features of the present invention, with parts broken away in the interests of clarity, with the full lines showing the sitting position for the chair, the dot-dash lines showing the intermediate resting position for the chair, and the dotted lines showing the fully reclined position for the chair;

Fig. 5 is a side elevational view of a still further embodiment of reclining chair demonstrating features of the present invention, with parts broken away in the interests of clarity, with the full lines showing the sitting position for the chair, the dot-dash lines showing the intermediate resting position for the chair, and the dotted lines showing the fully reclined position for the chair;

Fig. 6 is a side elevational view of a still further embodiment of reclining chair demonstrating features of the present invention, with parts broken away in the interests of clarity, with the full lines showing the sitting position for the chair, the dot-dash lines showing the intermediate resting position for the chair, and the dotted lines showing the fully reclined position for the chair;

Fig. 7 is a side elevational view of a still further embodiment of reclining chair demonstrating features of the present invention, with parts broken away in the interests of clarity, with the full lines showing the sitting position for the chair and the dot-dash lines showing the intermediate resting position for the chair; and

Fig. 8 is a side elevational view of the embodiment of reclining chair shown in Fig. 7, shown in the fully reclined position.

Referring now to Fig. 1, the numeral 10 generally identifies a reclining article of furniture or a chair including a support or base generally identified by the numeral 11 and comprising a pair of spaced support members 12 and 14. The support member 14 is cut away in Fig. 1 to provide a clearer view of the inner mechanism of the chair structure. The spaced support members 12 and 14 are interconnected with each other by a rear wall 16 and additional transverse members 70 (not shown).

A back-rest 18, swingably mounted on each of the support members 12 and 14 at pivot means 20, has an ex-

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tension 22 extending downwardly therefrom. The extension 22 of the back-rest 18 is fixedly connected or made integral with the latter, and extends below the plane of a seat 24. The seat 24 has its rear end portion swingably mounted on the support 11 at the pivot means 20.

A leg-rest 26 is swingably mounted at 27 to the front end of the seat 24. The leg-rest 26 is adapted to be raised to support the legs of the person reclining in the chair 10 in response to the swinging or rocking movement of the back-rest 18 and in coordination therewith. The leg-rest 26 is caused to move in response to the movements of the back-rest 18 by a controlling mechanism generally indicated by 28, positioned therebetween and interconnecting the leg-rest with the back-rest extension 22.

The controlling mechanism 28 comprises a lower connecting link 30 connected at 30a at its one end to the extreme end of the extension 22, and at its other end 30b, to an intermediate portion of a controlling arm 32. The lower end of the controlling arm 32 is attached at 32a, to an end of a controlling link 34 which has its other end connected at 34a to the leg-rest 26 intermediate the ends thereof. The controlling arm 32 has its other end connected at 32b with a guiding link 36 intermediate the ends thereof. An upper connecting link 38 is connected at 38a with the extension 22 intermediate the ends thereof, and connects the extension with the guiding link 36 and with a front connecting link 40 at 42. The upper connecting link 38, the front connecting link 40, and the guiding link 36, are each interconnected to pivot together at the pivot 42. It will be noted that the front connecting link 40 is connected at its other end 40a to an intermediate portion of the seat 24, to control the reclining movement thereof in response to the movement of the back-rest 18, while the top portion of the guiding link 36 is connected to an end of one of a pair of supporting plates 44 at 45. The supporting plates 44 are swingably mounted on the support members 12 and 14 relative to the base 11 at the pivot means 20, in coaxial alignment with the pivotal connection between the back-rest 18 and the seat 24. The normally substantial horizontal position of the supporting plates 44, shown in full lines, is limited by a stop 46.

The upright or sitting position of the movable members of the chair 10 shown in Fig. 1 is indicated by the full lines. The dash-dot lines in Fig. 1 identify the chair when it is in its intermediate reclining position, while the dash lines indicate the extreme reclining position of the chair 10.

When the back-rest 18 is first swung rearwardly about the pivot 20 into the intermediate reclining position, the supporting plates 44 remain in their full line position under the action of the load of the person resting on the chair. However, due to the relative movements of the parts of the controlling mechanism 28 in response to the movement of the extension 22 when the back-rest 18 is moved toward its reclining position, the seat 24 and the leg-rest 26 moves to the intermediate reclined position shown by the dash-dot lines. When the back-rest, seat and leg-rest are moved to the intermediate position, the extension 22 of the back-rest 18 comes into blocking engagement with a blocking element 48 on the upper connecting link 38. As a result of this engagement, when the movement of the back-rest 18 is continued in order to bring the same into the extreme reclined position shown by the dash lines in Fig. 1, the members of the controlling mechanism 28 are then locked relative to each other, and the back-rest 18, the seat 24, and the leg-rest 26 remain unchanged relative to each other and in their same positions as they occupied in the intermediate reclined position shown by the dash-dot lines in Fig. 1.

However, because the entire controlling mechanism 28 is locked, the supporting plates 44 are caused to swing about the pivot means 20 relative to the base 11 and its supports 12 and 14 until they reach their extreme reclined

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position shown by the dash lines in Fig. 1 to permit the back-rest 18, the seat 24 and the leg-rest 26 to swing as a unit to their extreme reclined positions, also indicated by the dash lines in Fig. 1. A stop plate 50, positioned on the cross member or rear wall 16, limits the swinging movement of the supporting plates 44 when the chair is moved into its reclining position. When the chair is moved toward its upright position however, the extension 22 of the back-rest 18 comes into abutting engagement with the stop 50 to limit the further movement of the chair past its upright position.

From the foregoing it will be noted that the chair 10 may be moved into an intermediate reclining position and the leg-rest 26 lifted to support the legs of a person reclining in the chair. But it will be recognized that the leg-rest moves relative to the seat, and the seat relative to the back-rest only until the chair is moved to its intermediate reclining position shown by the dash-dot lines in Fig. 1. When, however, the chair is moved from the intermediate reclining position into its extreme reclining position, shown by the dash lines in Fig. 1, the leg-rest and seat and back-rest each remain fixed relative to each other and move as a unit into the extreme reclining position.

According to the embodiment shown in Figs. 2 and 3, the chair 110, including a back-rest 118 and seat 124, are swingably mounted on a common pivot means or axis 120 on side supports 112 and 114 of the base 111. A leg-rest 126 is pivotally mounted to the end of the seat 124 at 127. As in the prior embodiment, the leg-rest 126 moves to its leg-supporting position in response to the reclining movement of the back-rest 118 by way of a controlling mechanism generally indicated by 128 connecting the leg-rest with a downward extension 122 of the back-rest 118.

The controlling mechanism 128 includes a controlling link 134 connected at its one end 134a to the leg-rest 126 intermediate the ends thereof. An upper connecting link 138 is connected at its one end to the lower portion of the back-rest extension 122 at 138a, and at its other end 138b to an end of a controlling arm 132. The lower end 132a of the controlling arm 132 is pivotally and adjustably connected to the lower end of the controlling link 134 by means of a pin passing through aligned holes of a series of holes 133 on the arm 132 and link 134.

Pivotally mounted at 142, intermediate the ends of the upper connecting link 138, and intermediate its own ends, is a guiding link 136. The guiding link 136 has an extension portion 137 extending below the upper connecting link 138, and is pivotally connected at 131 with an end portion of a lower connecting link 130. The other end of the lower connecting link 130 is pivoted to the connecting arm 132 at 133 intermediate the ends thereof. The upper link portion of the guiding link 136 has an extension or pivot 139 which rides in a slot 144 provided in one of the side support members 112 and 114 of the base or support 111 to define a lost-motion connection. A front connecting link 140, is pivoted at 140a to the upper connecting link 138 intermediate the guiding link 136 and the controlling arm 132. The front connecting link 140 interconnects the remaining parts of the controlling mechanism 128 with the seat 124 at 140b to move the latter in response to the rocking movements of the back-rest 118.

Normally, under the action of the weight of the movable members of the chair and/or the weight of a person resting on the chair, the pivot extension 139 remains in engagement with the lower end of the lost-motion connection slot 144, as shown in Fig. 2.

When the unit 110 is in its upright (full line position) shown in Fig. 2, the extension 122 of the back-rest 118 is in abutment with the stop 150, and the leg-rest 126 is withdrawn from its leg-supporting position to the full line position shown in Fig. 2. When the person sitting

in the chair leans backward against the back-rest 118 to move the same toward its intermediate reclining position as shown by the dash-dot lines in Fig. 2, the leg-rest 126 is moved in response to the swinging or pivoting movement of the back-rest to its leg-supporting position, also shown in dash-dot lines in Fig. 2, while the seat 124 pivots relative to the back-rest 118 about the common pivot means 120. The various members of the controlling mechanism 128 thus control the relative movements of the back-rest, the seat and the leg-rest in response to the rocking movement of the back-rest.

When the unit 110 is moved to this intermediate reclined position shown by the dash-dot lines in Fig. 2, the leg-rest 126 is already in its highest leg-supporting position relative to the seat. The movement of the chair 110 into its intermediate reclined position is limited by the abutting engagement of the lower connecting link against a stop 148 arranged on the extension 137 of the guiding link 136. Hence, when the movement of the back-rest into a further reclining position is continued, the stop 148 acts as a blocking element holding the movable members of the controlling mechanism 128 fixed in their relative positions. The pivot extension 139 of the guiding link 136 then slides upwardly in the lost-motion connection slot 144 to permit the back-rest, seat and leg-rest to swing as a unit into the extreme reclined position shown in Fig. 3. The chair is limited in its movement into its extreme reclining position by the abutment of the back-rest 118 with the top portion 152 of the connecting rear wall 116.

Hence, as a result of the blocking action of the blocking element 148 with the lower connecting link 130, the leg-rest 126 remains in its same fixed position relative to the seat 124 as it was in the intermediate reclined position shown by the dash-dot lines in Fig. 2. Similarly, the seat 124 remains in its same fixed position relative to the back-rest 118 as it was in the intermediate reclined position shown in Fig. 2. Thus when the chair 110 rocks or reclines from the intermediate reclined position shown in Fig. 2, toward the extreme reclined position shown in Fig. 3, none of the members 118, 124 and 126 move relative to each other, but rather, they all move as a unit to rock into the extreme reclined position.

Referring now to Fig. 4, the reclining article of furniture generally identified by the numeral 210 comprises a base 211 having side supports 212 and 214, interconnected by connecting rods 216, and an integral seat and back-rest unit generally identified by the numeral 217. The unit 217 comprises a back-rest 218 and a seat 224 pivotally mounted on the support 214 and 212 at the pivot means 220. Extending downwardly from the back-rest 218 is an extension 222, which abuts against a stop 250 when the unit 217 is in its upright sitting position as shown by the full lines in Fig. 4.

A leg-rest 226 is pivotally mounted at 227 on the end of the seat 224 for movement relative thereto, into a leg-supporting position. The movement of the leg-rest 226 is coordinated with the movement of the back-rest and seat unit 217, so that the same may be moved to its leg-supporting position in dependence on the reclining movement of the unit 217. The leg-supporting movement of the leg-rest 226 is controlled by a controlling mechanism generally indicated by 228 which is arranged between the leg-rest 226 and the extension 222 of the back-rest 218.

The controlling mechanism 228 includes an upper connecting link 238 pivoted at its one end 238a to the back-rest extension 222 and at its other end 242 to the lower end of a guiding link 236. The guiding link 236 has at its upper end, a pivot extension 239 which rides in a slot 244 provided in at least one of the side supports 212 or 214 of the base 211. Pivoted at 230a to the lower end of the downward extension 222 is a lower connecting link 230. The opposite end of the lower connecting

link 230 is pivoted to the controlling arm 232 at 230b, intermediate the ends thereof. The controlling arm 232 is pivoted at its upper end to an intermediate portion of the guiding link 236, and at its lower end 232a, to an end portion of a controlling link 234. The upper end of the controlling link 234 is pivoted to a leg-rest controlling arm 254, which is in turn pivoted at 227 to the end portion of the seat 224 and is in disengageable abutting engagement with the leg-rest 226.

In Fig. 4 the full lines indicate the upright or sitting position of the chair unit 210. The dash-dot lines show the chair 210 in its intermediate reclining position, while the dash lines indicate the fully reclined position of the chair.

When it is desired to pivot or swing the unit 217 comprising the back-rest 218 and seat 224 about the pivot means 220, into a reclining position, the person sitting in the chair leans against the back-rest. By so doing, the back-rest and seat are caused to pivot as a unit relative to the axis of the pivot 220, and the controlling mechanism 228, interconnecting the downward extension 222 with the leg-rest controlling arm 254, moves the leg-rest 226 in accordance with the reclining movement of the unit 217, until the chair moves to its intermediate position as shown by the dash-dot lines in Fig. 4. In the intermediate position, the leg-rest 226 has then been moved to its leg-supporting position by the leg-rest controlling arm 254 being in abutment with the back or rear portion of the leg-rest.

When the chair 210 has moved to its intermediate reclining position shown by the dash-dot lines in Fig. 4, the downward extension 222 comes into abutting engagement with the abutment 248, thus limiting any further relative movement between the parts of the controlling mechanism 228. At such time the leg-rest 226 is thus fixed against movement relative to the seat 224, and any further reclining movement of the chair 210 will merely move the back-rest 218 with the seat 224, and the leg-rest 226, as a unit, about the axis of pivot 220, without moving the members relative to each other. This is accomplished by permitting the extension 239 on the guiding link 236, to move upwardly in the lost-motion connection slot 224 until the back portion of the back-rest 218 comes into abutting engagement with the stop 252.

Therefore, as in the prior embodiments, once the chair 210 has been moved to its intermediate reclining position, the back and seat-rest unit 217 and the leg-rest 226 are locked in their relative positions and no longer move relative to each other, but rather, pivot or swing as a unit about the axis of pivot 220.

The reclining chair 310 shown in Fig. 5, is supported on a base generally identified by the numeral 311 and includes support members 312 and 314 which are interconnected by the connecting member 316. On each side of the chair is a supporting plate 344 (only one being shown) swingably mounted on the support members 312, 314 at pivot means 325. A back-rest 318 is pivoted for swinging movement relative to the base or support 311 by being pivotally mounted on the supporting plates 344 at the pivot means 320 thereon. A seat 324 is pivoted between the support members 312 and 314 at 325 in coaxial alignment with the pivotal connection between the supporting plates 344 and the support 312, 314, it being noted that the pivot 325 of the seat is spaced from the pivot means 320 by which the back-rest 318 is swingably mounted on the support 311.

A leg-rest 326 is swingably mounted at 327 to the end portion of the seat 324 for movement to and from its leg-supporting position by a controlling mechanism generally indicated by 328 which moves the leg-rest in response to the reclining movement of the back-rest 318. This is accomplished by connecting the extension 322 of the back-rest 318 with the leg-rest 326, by way of the controlling mechanism 328.

The controlling mechanism 328 comprises on each side

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of the chair 310, an upper connecting link 338, which is pivoted at its one end 338a to the lower portion of the downward extension 322 of the back-rest, and at its other end 338b to intermediate portions of a front connecting link 340. The front connecting link 340 is connecting at its upper end 340a with intermediate portions of the seat 324, and at its lower end 340b with a controlling arm 332. The lower end 332a of the controlling arm 332 is connected with a lower end of a controlling link 334, while the upper end of the controlling link 334 is adjustably connected with the leg-rest 326 by way of a series of holes 333 positioned along the extent of the sides of the leg-rest 326.

A guiding link 336 is pivoted intermediate its ends, and to the upper connecting link 338 between the ends of the latter at 342. The lower end 337 of the guiding link 336 is pivotally connected with a lower connecting link 330 at 330a, which interconnects the guiding link 336 with the controlling arm 332 by the pivotal connection 330b of its other end with said controlling arm 332. The upper end of the guiding link 336 is pivoted at 345 to the above mentioned supporting plate 344 swingably mounted on the base 311 at 325. The normally substantial horizontal position of the supporting plates 344 shown in full lines, is limited by a stop 346.

The full lines shown in Fig. 5 indicate the upright or sitting position of the chair 310. The dash-dot lines indicate the intermediate reclining position of the chair, while the dash lines indicate the extreme reclining position of the chair.

As the chair 310 is moved from its upright sitting position shown in Fig. 5, in full lines, toward its intermediate reclining position, shown in dash-dot lines, the back-rest 318 is caused to pivot about the axis of the pivot means 320, relative to the supporting plates 344 which remain in their substantially horizontal position under the weight of the person resting on the chair. The controlling mechanism 328, interconnecting the leg-rest 326 with the downward extension 322 of the back-rest 318, moves in response to the movement of the downward extension to extend the leg-rest 326 toward its leg-supporting position. At the same time, the seat 324 is pivoted about the axis 325 relative to the support members 312 and 314 of the base 311. When the back-rest, seat and leg-rest have moved into the intermediate reclining position (dash-dot lines), the upper connecting link 338 will then come into abutting engagement with the abutment 348 at the lower end of the downward extension 322.

When this abutting relationship occurs, the parts of the controlling mechanism 328 will then be caused to lock up and further relative movement between the parts of the mechanism 328 will be limited or restricted. Thereafter, any further reclining movement of the back-rest 318 and the seat 324 will be done as a unit, so that the back-rest, seat, supporting plates 344 and leg-rest will pivot as a unit about the axis of pivot means 325, into the extreme reclined position (dash lines) limited by an abutting engagement of the supporting plates 344 with the stop 351 on the support members 312 and 314 of the base 311. Substantially simultaneously therewith, the back-rest 318 will come into limiting abutment with the stop 352. On the other hand, when the back-rest 318 is in its upright position, as shown by the full lines in Fig. 5, the downward extension 322 will abut the stop 350 to limit the chair in its movement into its upright position.

According to the embodiment shown in Fig. 6, on each side of the chair a supporting plate 478 is swingably mounted on the support or base 410 at 426. The normal, substantially horizontal position of each plate 478 is limited by a stop 480 arranged on the support 410. The back-rest 418 is swingably mounted on the supporting plates 478 at 422. The seat 424 is swing-

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able relative to the plates 478 about the pivotal axis 426 in coaxial alignment with the pivotal axis between the plate 478 and the support 410. The lower end of the guiding link 438 is pivoted to the plate 478 at 442. The upper end of the guiding link 438 is pivotally joined to the link chain 428, 435 at 432. The front connecting link 428 of said link chain is pivoted to the seat 424 at 430. Said front connecting link 428 has an extension 482 projecting downwardly beyond its pivotal connection 430 with the seat 424. The rear end of the top connecting link 435 of the link chain 428, 435 is pivoted to the back-rest 418 at 437.

The front end of a controlling link 450 is pivotally connected at 448 with a leg-rest 444 swingably mounted on the seat 424 at 446. The other end of said controlling link 450 is pivoted at 452 to a controlling arm 454, the upper end of which is pivoted to the seat 424 at 456. One end of a controlling bar 458 is pivoted to the controlling arm 454 at 460. The other end of said controlling bar 458 is pivoted to the extension 482 of the front connecting link 428 at 484.

The sitting position of the movable members of the chair is limited by a stop 470 arranged on the support 410 for cooperation with the seat 424. The plate 478 is normally held in its substantially horizontal position shown in full lines by the weight of the members of the chair and by the weight of a person resting on the chair when the latter is occupied. When the person resting on the chair exerts a pressure on the back-rest 418, at first the back-rest is swung into the intermediate position 418' shown in dash and dot lines, whereby at the same time the seat and leg-rest are brought into the positions 424' and 444' respectively, wherein the leg-rest is in a predetermined position relative to the seat. When the back-rest, seat, and leg-rest reach said intermediate reclined position 418', 424', 444', a blocking element 476 arranged on the lower surface of the seat 424 comes into abutting engagement with the downward extension 482 of the front connecting link 428, whereby the links of the system are held in a fixed position relative to each other when the swinging movement of the back-rest 418 is continued so as to bring same into the extreme reclined position 418'' shown in dash lines. Therefore, when the back-rest is brought from the intermediate reclined position 418' into the extreme reclined position 418'', owing to the blocking of the links of the system, the plate 478 is caused to swing about the pivot 426 until it abuts against a stop 486 arranged on the support 410. During the movement of the back-rest, seat and leg-rest from the intermediate reclined position 418', 424', 444' into the extreme reclined position 418'', 424'', 444'', the relative position between said elements remains unchanged. The extreme reclined position is limited by a stop 468 arranged on the support 410 for abutting engagement with the back-rest.

According to the embodiment shown in Figs. 7 and 8, the back-rest 518 and the seat 524 are jointly pivoted to the support or base 510 at 522. The lower end of the guiding link 538 carries a pivot 542 rotatably engaged with the lower end of a slot 572 arranged in the support 510. The upper end of the guiding link 538 is integral with an intermediate link 529 of the link chain 528, 529, 535. The intermediate link 529 of said link chain is pivoted at 531 to one end of the front connecting link 528, the other end of which is pivoted to the seat 524 at 530. Furthermore, said intermediate connecting link 529 is pivoted at 533 to one end of the top connecting link 535 pivoted at the other end to the back-rest 518 at 537.

Again the controlling arm 554 of the controlling mechanism 550, 554, 558 of the leg-rest 544 swingably mounted on the seat at 546 is pivoted to the seat 524 at 556. The rear end of the controlling bar 558, however,

is pivoted to a downward extension 520 of the back-rest 518 at 574.

The sitting position of the movable members of the chair shown in full lines in Fig. 7 is limited by a stop 570 arranged on the support 510 for cooperation with the downward extension 520 of the back-rest 518. The pin 542 of the guiding link 538 is normally held in engagement with the lower end of the slot 572 by the weight of the movable members of the chair and, if the chair is occupied, by the weight of the person resting therein. When a person resting in the chair exerts a pressure on the back-rest 518, the back-rest, the seat and the leg-rest will be brought, at first, into the intermediate reclined position 518', 524', 544' shown in dash and dot lines in Fig. 7, wherein the leg-rest is in a predetermined position relative to the seat. During this movement from the sitting position shown in full lines in Fig. 7 into the intermediate reclined position shown in dash and dot lines in Fig. 7 the pin 542 of the guiding link 538 rotates in the lower end of the slot 572.

When the movable members of the chair reach said intermediate position, a blocking element 576 arranged on the lower surface of the front end of the seat 524 comes into abutting engagement with the controlling arm 554, whereby the links of the link system of the chair, being blocked, are held in a fixed position relative to each other when the swinging movement of the back-rest 518 is continued beyond the intermediate reclined position 518'. Thus, when the movable structure of the chair is brought from the intermediate reclined position 518', 524', 544' shown in Fig. 7 into the extreme reclined position 518'', 524'', 544'' shown in Fig. 8 the angular positions between the back-rest and the seat and the leg-rest remain unchanged, while the pivot 542 of the guiding link 538 slides upwardly in the slot 572 of the support 510. Therefore, although, owing to the particular controlling mechanism according to the invention the leg-rest reaches its elevated position already while the seat and back-rest are only somewhat inclined, it is possible to obtain a greater inclination of the back-rest and the seat without changing the relative position between the leg-rest and the seat. The extreme reclined position of the movable members of the chair is limited by the stop 568 arranged on the support for cooperation with the back-rest.

It will be recognized that the forward pivot means 45, 139, 239, 345, 442, 542 in each of the respective above described embodiments of the rear pivot means made between the back-rest and seat and their respective supports, at 20 in Fig. 1, 120 in Figs. 2 and 3, 220 in Fig. 4, at 320, 422 between the back-rest and the supporting plates 344, 478 in Figs. 5 and 6, and at 522 in Fig. 7 remain in their original position during the reclining of the respective chairs as each moves from its sitting position to its intermediate reclining position. Whereas, during the movement of the respective chairs from their intermediate reclining position to their extreme reclined position, at least one of the pivot means is displaced from its original position. In the embodiment in Fig. 1 the forwardly arranged pivot means 45, linked by plates 44 to rear pivot 20, is displaced. In Figs. 2, 4 and 7 respectively, the forward pivots 139, 239 and 542 are each linked to their respective rear pivots 120, 220 and 522 by the support members 112-114, 212-214 and 510 respectively, for displacement. In the embodiment shown in Figs. 5 and 6 both the forward and rear pivot means 345, 442 and 320, 422, linked by plates 344, 478, are displaced. If desired, however, displacement of only a rear pivot means (instead of the forward pivot means (Figs. 1, 2, 4) or the forward and rear pivot means (Figs. 5, 6)) may be obtained in a similar manner and by simple rearrangement of certain of the parts.

From the foregoing it will be seen that applicant has provided reclining articles of furniture having a back-rest, seat and leg-rest capable of moving to an inter-

mediate reclining position, after which the back-rest, seat and leg-rest are secured as a unit from further movement relative to each other, and are movable as a unit to a more extreme reclining position. It will be recognized that the blocking and stop means of the various embodiments may be repositioned since their relative positions as disclosed have been intended for ease of description. If they are repositioned, they may be placed anywhere along the structure, so long as they will accomplish their intended disclosed results.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to several preferred embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated and in their operations may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

I claim:

1. An article of repose for supporting the body of a person, comprising in combination: a support having pivot means thereon, a back-rest and seat swingably mounted on said pivot means on said support, a controlling mechanism including relatively movable means operatively interconnecting said seat and back-rest to control the swinging movements of the former relative to the latter in response to the swinging movements of the latter for a first portion of the swinging movements of the latter, and means included in said controlling mechanism to limit the relative movement of said seat relative to said back-rest for a second portion of the swinging movement of said back-rest following said first portion of the swinging movement whereby said seat and said back-rest move together in a fixed relationship to each other.

2. An article of repose for supporting the body of a person comprising a support having rear pivot means, a back-rest and seat swingably mounted on said pivot means, a leg-rest, linkage means connecting said leg-rest to said back-rest for swinging movement of the leg-rest relative to the back-rest and said seat in response to rearward pivoting of said back-rest between a substantially upright position and an intermediate position, forward pivot means connecting said linkage means to said support, blocking means positioned to engage and block said linkage means when said back-rest swings into said intermediate position thereby restraining said leg-rest against further swinging movement, at least one of said pivot means being displaceable when said linkage is blocked to permit further rearward pivoting of said back-rest from said intermediate position to a fully inclined position, said movable pivot being stationary during said rearward pivoting of said back-rest between said upright position and said intermediate position, said leg-rest being maintained by the blocked linkage means in a blocked relationship to said back-rest between said intermediate position and said fully-inclined position.

3. An article of repose for supporting the body of a person, comprising in combination, a support having pivot means, a back-rest and seat swingably mounted on said pivot means, a leg-rest carried by the seat at the front end thereof, a linkage arrangement connecting said leg-rest to said back-rest for swinging movement of the leg-rest relative to the seat upon rearward movement of said back-rest between a substantially upright position and an intermediate rearwardly-inclined position, a stop means carried by a portion of said linkage arrangement and positioned to engage with another linkage portion to block the linkage arrangement at said intermediate position, and lost motion means coupling said linkage arrangement to said support and operable in response to further rearward pivoting of said back-rest from said intermediate position to a fully inclined position, the stop means being effective to block the leg-rest relative to the seat at said intermedi-

ate position and said lost motion means being thereafter operative such that the leg-rest is moved in fixed relationship to the seat between the intermediate position and the fully-inclined position of the latter.

4. A reclining chair comprising a support, a body-supporting unit including a seat and back-rest movable relative to each other for inclining and reclining movement respectively, means mounting said body-supporting unit for movement successively from a sitting position into an intermediate resting position with relative displacement between said seat and back-rest and from said resting position into a reclining position with substantially no relative displacement between said seat and said back-rest, and seat control means operatively connected to said seat for displacing said seat relative to said back-rest in response to movement of said body-supporting unit from said sitting position into said resting position, said seat control means including a linkage having at least two pivots on said support providing a stationary link and movable links pivotally connected to said stationary link and means mounting one of said pivots on said support for displacement relative thereto, said one pivot remaining substantially stationary when said movable links of said linkage are movable relative to each other and said one pivot being displaced when said movable links of said linkage are blocked against movement relative to each other, and means for blocking said movable links of said linkage against movement relative to each other in response to movement of said body-supporting unit into said resting position such that the blocked linkage maintains said back-rest and seat in a prescribed relative position, said one pivot being displaced relative to said support in response to movement of said body-supporting unit from said resting position into said reclining position whereby said body-supporting unit may continue to move with said linkage blocked and said back-rest and seat in said prescribed relative position.

5. A reclining chair comprising a support, a body-supporting unit including a seat and back-rest movable relative to each other for inclining and reclining movement respectively, means mounting said body-supporting unit for movement successively from a sitting position into an intermediate resting position with relative displacement between said seat and back-rest and from said resting position into a reclining position with substantially no relative displacement between said seat and said back-rest, and seat control means operatively connected to said seat for displacing said seat relative to said back-rest in response to movement of said body-supporting unit from said sitting position into said resting position, said seat control means including a four bar linkage having at least two pivots on said support providing a stationary link and three movable links pivotally connected to said stationary link and means mounting one of said pivots on said support for displacement relative thereto, said one pivot remaining substantially stationary when said movable links of said four bar linkage are movable relative to each other and said one pivot being displaced when said movable links of said four bar linkage are blocked against movement relative to each other, and means for blocking said movable links of said four bar linkage against movement relative to each other in response to movement of said body-supporting unit into said resting position such that the blocked four bar linkage maintains said back-rest and seat in a prescribed relative position, said one pivot being displaced relative to said support in response to movement of said body-supporting unit from said resting position into said reclining position whereby said body-supporting unit may continue to move with said four bar linkage blocked and said back-rest and seat in said prescribed relative position.

6. A reclining chair comprising a support, a body-supporting unit including a seat and back-rest movable relative to each other for inclining and reclining movement respectively, means mounting said body-supporting

unit for movement successively from a sitting position into an intermediate resting position with relative displacement between said seat and back-rest and from said resting position into a reclining position with substantially no relative displacement between said seat and said back-rest, seat control means operatively connected to said seat for displacing said seat relative to said back-rest in response to movement of said body-supporting unit from said sitting position into said resting position, said seat control means including a seat control linkage having at least two pivots on said support providing a stationary link and movable links pivotally connected to said stationary link and means mounting one of said pivots on said support for displacement relative thereto, a leg-rest control linkage operatively connected to said seat control linkage, and a leg-rest operatively connected to said leg-rest control linkage and elevated into a leg-supporting position in response to movement of said movable links of said seat control linkage relative to each other as said body-supporting unit moves into said resting position, said one pivot remaining substantially stationary when said movable links of said seat control linkage are movable relative to each other, said one pivot being displaced when said movable links of said seat control linkage are blocked against movement relative to each other, and means for blocking said movable links of said seat control linkage against movement relative to each other in response to movement of said body-supporting unit into said resting position such that the blocked seat control linkage maintains said leg-rest in said leg-supporting position and said back-rest and seat in a prescribed relative position, said one pivot being displaced relative to said support in response to movement of said body-supporting unit from said resting position into said reclining position whereby said body-supporting unit may continue to move with said seat control linkage blocked.

7. A reclining chair comprising a support, a body-supporting unit including a seat and back-rest movable relative to each other for inclining and reclining movement respectively, means mounting said body-supporting unit for movement successively from a sitting position into an intermediate resting position with relative displacement between said seat and back-rest and from said resting position into a reclining position with substantially no relative displacement between said seat and said back-rest, seat control means operatively connected to said seat for displacing said seat relative to said back-rest in response to movement of said body-supporting unit from said sitting position into said resting position, said seat control means including a four bar linkage having at least two pivots on said support providing a stationary link and three movable links pivotally connected to said stationary link, and means mounting one of said pivots on said support for displacement relative thereto, a leg-rest control linkage operatively connected to said four-bar linkage of said seat control means, and a leg-rest operatively connected to said leg-rest control linkage and elevated into a leg-supporting position in response to movement of said movable links of said four bar linkage relative to each other as said body-supporting unit moves into said resting position, said one pivot remaining substantially stationary when said movable links of said four bar linkage relative to each other as said body-supporting unit moves into said resting position, said one pivot remaining substantially stationary when said movable links of said four bar linkage are movable relative to each other, said one pivot being displaced when said movable links of said four bar linkage are blocked against movement relative to each other, and means for blocking said movable links of said four bar linkage against movement relative to each other in response to movement of said body-supporting unit into said resting position such that the blocked four bar linkage maintains said leg-rest in said leg-supporting position and said back-rest and seat in a prescribed relative position, said one pivot being displaced

relative to said support in response to movement of said body-supporting unit from said resting position into said reclining position whereby said body-supporting unit may continue to move with said four bar linkage blocked.

8. A reclining chair comprising a support, a body-supporting unit including a seat and back-rest, means mounting said body-supporting unit for movement successively from a sitting position into an intermediate resting position and into a reclining position, a leg-rest, a leg-rest control linkage including links movable relative to each other in response to movement of said body-supporting unit, said leg-rest control linkage including an auxiliary pivot for one of said links, and means mounting said auxiliary pivot for displacement relative to said support, said leg-rest control linkage elevating said leg-rest into a leg-supporting position in response to movement of said links relative to each other as said body-supporting unit moves into said resting position, said leg-rest control linkage being arranged such that said auxiliary pivot remains substantially stationary when said links move relative to each other and such that said auxiliary pivot is displaced when said links are blocked against movement relative to each other, and means for blocking said links of said leg-rest control linkage against movement relative to each other in response to movement of said body-supporting unit into said resting position such that the blocked leg-rest control linkage maintains said leg-rest in said leg-supporting position, said auxiliary pivot being displaced relative to said support in response to movement of said body-supporting unit from said resting position into said reclining position whereby said body-supporting unit may continue to move with said leg-rest control linkage blocked and said leg-rest maintained in said leg-supporting position.

9. A reclining chair comprising a support, a body-supporting unit including a seat and back-rest, link means operatively connected to said support and to said body-supporting unit and arranged to provide a constrained linkage mounting said body-supporting unit for movement successively from a sitting position into an intermediate resting position and into a reclining position, said constrained linkage including links movable relative to each other in response to movement of said body-supporting unit and a relatively stationary auxiliary pivot for one of said links, a leg-rest, control means operatively connected to said leg-rest and actuated by said constrained linkage for elevating said leg-rest into a leg-supporting position in response to movement of said links relative to each other as said body-supporting unit moves into said resting position, means mounting said auxiliary pivot for displacement relative to said support, said constrained linkage and body-supporting unit being arranged such that said auxiliary pivot remains substantially stationary when said links of said constrained linkage are movable relative to each other and such that said auxiliary pivot is displaced when said links of said constrained linkage are blocked against movement relative to each other, and means for blocking said links of said constrained linkage against movement relative to each other in response to movement of said body-supporting unit into said resting position such that said constrained linkage maintains said leg-rest in said leg-supporting position, said auxiliary pivot being displaced relative to said support in response to movement of said body-supporting unit from said resting position into said reclining position whereby said body-supporting unit may continue to move with said constrained linkage blocked and maintaining said leg-rest in said leg-supporting position.

10. A reclining chair comprising a support, a body-supporting unit including a seat and back-rest movable relative to each other, means mounting said body-supporting unit for movement successively from a sitting position into an intermediate resting position with relative displacement between said seat and back-rest and into a reclining position with no relative displacement between said seat and

said back-rest, a leg-rest control linkage including links movable relative to each other in response to movement of said body-supporting unit, said leg-rest control linkage including an auxiliary pivot for one of said links and means mounting said auxiliary pivot for displacement relative to said support, a leg-rest operatively connected to said leg-rest control linkage and elevated into a leg-supporting position in response to movement of said links relative to each other as said body-supporting unit moves into said resting position, said leg-rest control linkage and body-supporting unit being arranged such that said auxiliary pivot remains substantially stationary when said links are movable relative to each other and such that said auxiliary pivot is displaced when said links are blocked against movement relative to each other, means for blocking said links against movement relative to each other in response to movement of said body-supporting unit into said resting position such that the blocked leg-rest control linkage maintains said leg-rest in said leg-supporting position, said auxiliary pivot being displaced relative to said support in response to movement of said body-supporting unit from said resting position into said reclining position whereby said body-supporting unit may continue to move with said leg-rest control linkage blocked, and a seat control linkage operatively connected to said seat and to said leg-rest control linkage for displacing said seat relative to said back-rest in response to movement of said body-supporting unit from said sitting position into said resting position.

11. A reclining chair comprising a support, a body-supporting unit including a seat and back-rest movable relative to each other for inclining and reclining movement respectively and mounted on said support for movement successively from a sitting position into an intermediate resting position and from said resting position into a reclining position, and seat control means operatively connected to said seat for displacing said seat relative to said back-rest in response to movement of said body-supporting unit from said sitting position into said resting position, said seat control means including a linkage having at least two pivots on said support providing a stationary link and movable links pivotally connected to said stationary link and means mounting one of said pivots on said support for displacement relative to the other of said pivots in an arc about the other of said pivots, said one pivot remaining substantially stationary when said movable links of said linkage are movable relative to each other and said one pivot being displaced in said arc when said movable links of said linkage are blocked against movement relative to each other, and means for blocking said movable links of said linkage against movement relative to each other in response to movement of said body-supporting unit into said resting position.

12. A reclining chair comprising a support, a carrier member, means pivotally mounting said carrier member on said support at a pivotal mount intermediate its ends, a back-rest, means including a back-rest pivot on said carrier member at a point spaced rearwardly of said pivotal mount movably mounting said back-rest for movement relative to said carrier member and to said support, a seat, a linkage including guiding means having a pivotal connection to said seat at a point spaced forwardly of said pivotal mount and a further pivotal connection to said carrier member mounting said seat for movement relative to said carrier member and said support in response to movement of said back-rest, stop means operative to establish a stationary position for said carrier member during a first portion of chair movement wherein said back-rest and seat move relative to said carrier member and said support, and means operative after said first portion of said chair movement to establish a relatively fixed relationship between said back-rest and seat, said back-rest, seat and carrier member turning as a unit about said pivotal mount during a second portion of said chair movement into tilted back reclining positions.

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13. A reclining chair comprising a support, a carrier member, means pivotally mounting said carrier member on said support at a pivotal mount intermediate its ends, a back-rest, means including a back-rest pivot on said carrier member at a point spaced rearwardly of said pivotal mount movably mounting said back-rest for movement relative to said carrier member and to said support, a seat, a linkage including guiding means having a pivotal connection to said seat at a point spaced forwardly of said pivotal mount and a further pivotal connection to said carrier member mounting said seat for movement relative to said carrier member and said support in response to movement of said back-rest, stop means operative to establish a stationary position for said carrier member during a first portion of chair movement wherein said back-rest and seat move relative to said carrier member and said support, means operative after said first portion of said chair movement to establish a relatively fixed relationship between said back-rest and seat, said back-rest, seat and carrier member turning as a unit about said pivotal mount during a second portion of said chair movement into tilted back reclining positions, a leg-rest and means operatively connected to said leg-rest and said linkage for elevating said leg-rest during said first portion of said chair movement.

14. 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 successively from a sitting position into various reclining positions, a control linkage including links movable relative to each other in response to movement of said body-supporting means, said control linkage including a lost motion connection coupling a link of said control linkage to said support, a leg-rest operatively connected to said control linkage and elevated into a leg-supporting position forwardly of said seat in response to movement of said links relative to each other as said body-supporting means moves into a first reclining position, said lost motion means remaining substantially inoperative when said links are movable relative to each other, and said lost motion means providing for a lost motion travel of said control linkage relative to said support when said links are blocked against movement relative to each other, and means for blocking said

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links against movement relative to each other in response to movement of said body-supporting means into said first reclining position such that said control linkage moves through said lost motion travel relative to said support in response to movement of said body-supporting means from said first reclining position into a further reclining position with said leg-rest being maintained in an elevated leg-supporting position forwardly of said seat of said body-supporting means.

15. A reclining chair comprising a support, a body-supporting structure including a seat and back-rest, means mounting said body-supporting structure on said support for movement successively from an upright sitting position to an intermediate inclined position and then to a fully reclined position, a leg-rest, a leg-rest linkage carrying the leg-rest and operative to move the leg-rest from a retracted position beneath the seat to an extended position forwardly of and substantially at the level of the forward portion of the seat, means connecting the leg-rest linkage to the seat and the support for actuation thereof in response to movement of the body-supporting structure from the upright sitting position to the intermediate inclined position whereby the leg-rest is brought to its extended position, the connection between the leg-rest linkage and the support including lost motion means operable when the body-supporting structure is moved from the intermediate inclined position to the fully-reclined position to substantially prevent further actuation of the leg-rest linkage and to cause the seat to raise the leg-rest in its extended position whereby the leg-rest is retained substantially at the level of the forward end of the seat in the fully reclined position of the latter.

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