May 22, 1956 A. LORENZ 2,746,521

ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

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FIG. 1.

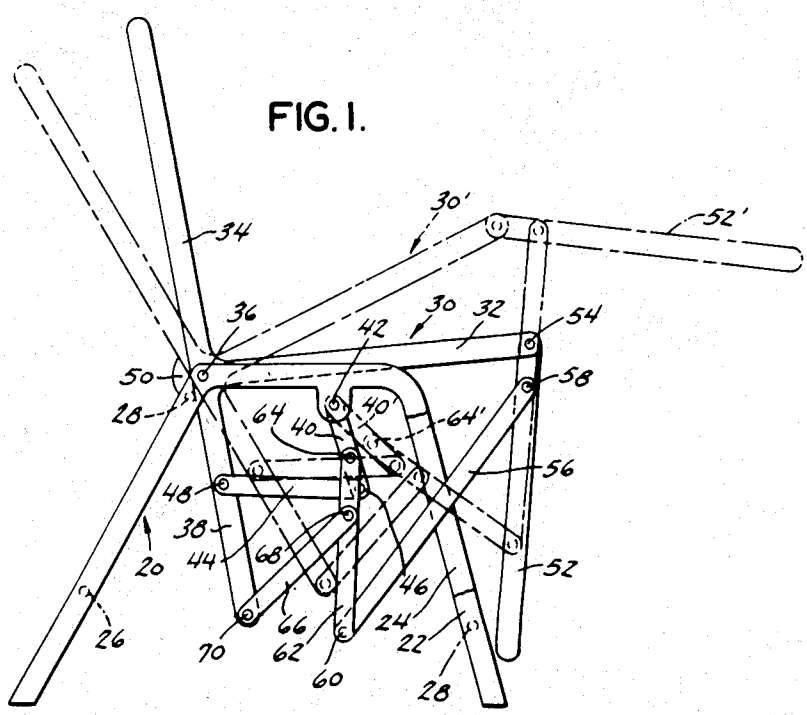
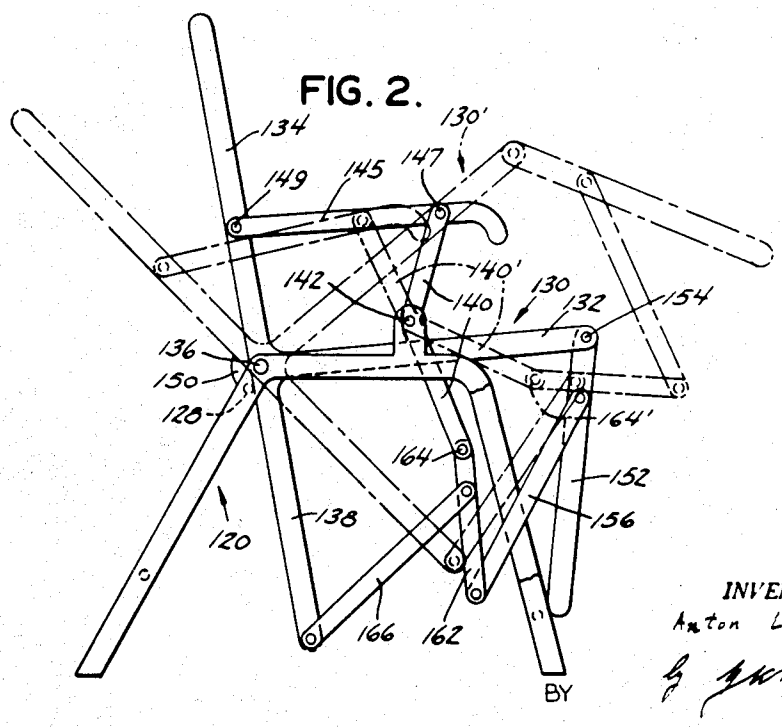


FIG. 2.



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FIG. 3.

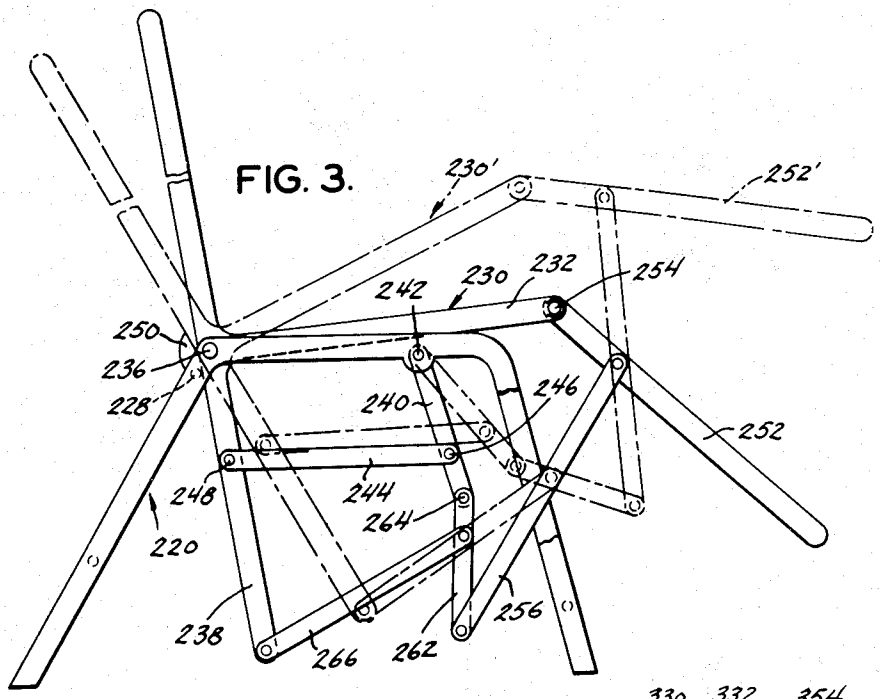


FIG. 5.

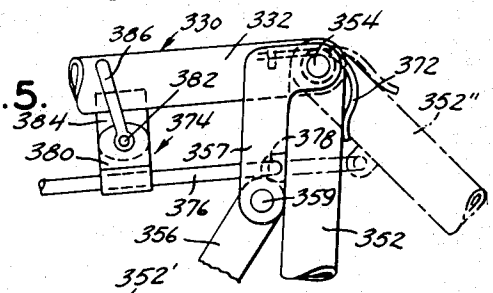
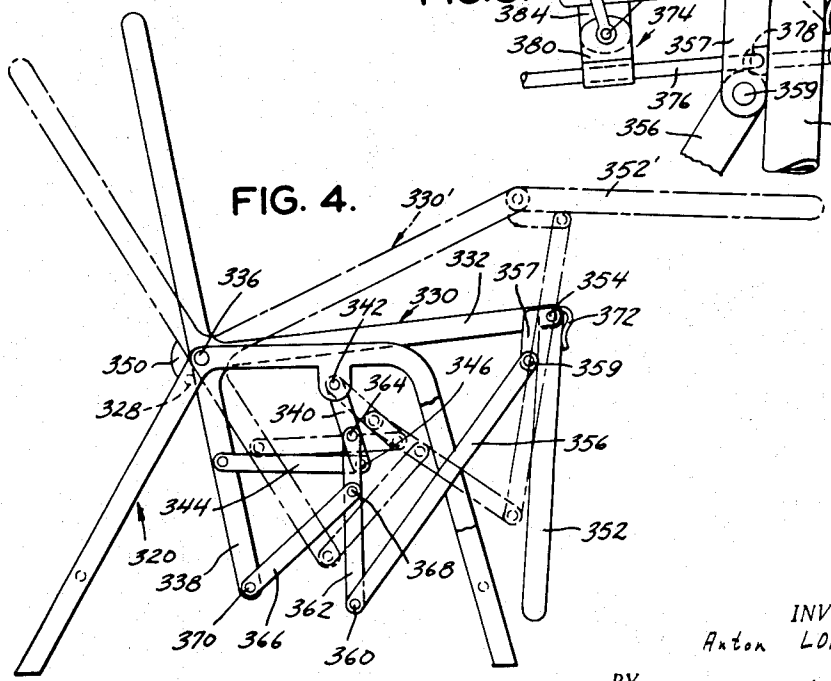


FIG. 4.



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FIG. 6.

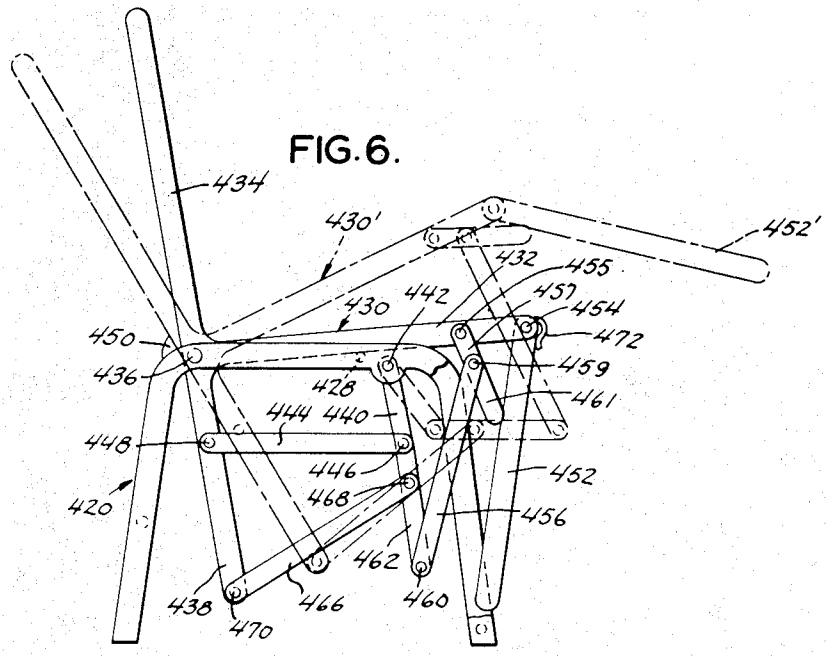
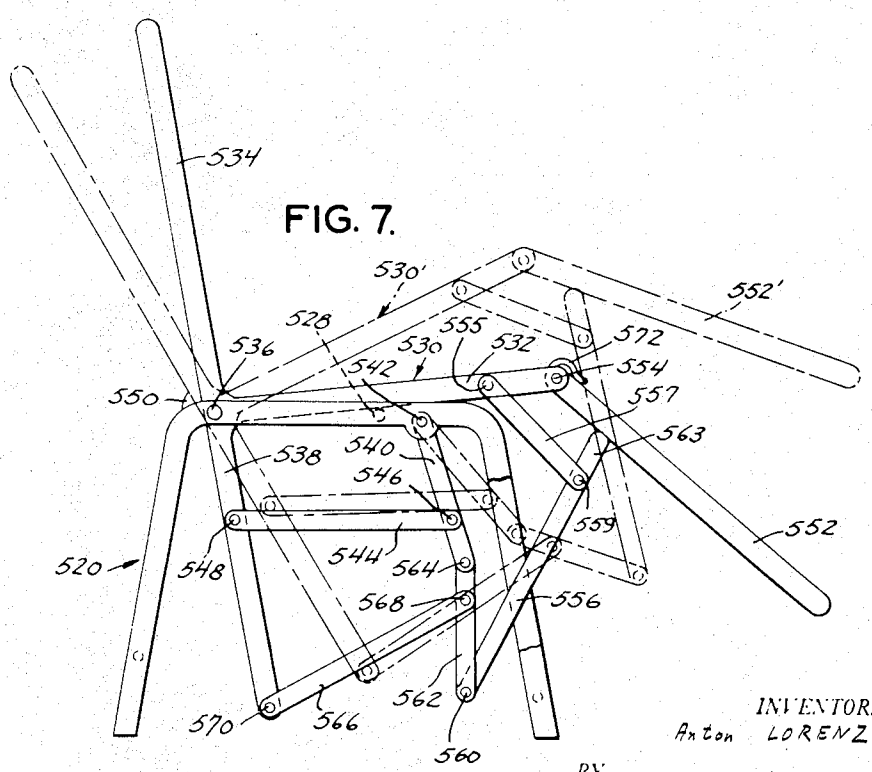


FIG. 7.



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ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

Anton Lorenz, Buffalo, N. Y.

Application September 12, 1952, Serial No. 309,272

6 Claims. (Cl. 155—106)

This is a continuation-in-part application of my copending patent application Ser. No. 54,254, filed October 13, 1948, now abandoned, for "A Reclining Article of Furniture."

This invention relates to articles of furniture, and more particularly to a reclining article of furniture wherein a seat and a back-rest rigidly connected with each other are swingably mounted as a unitary structure on a support.

An object of the present invention is to provide a convenient controlling mechanism for a leg-rest swingably mounted on the seat of a reclining article of furniture of above described type, by means of which the leg-rest may be propelled forwardly and upwardly at a great initial speed, when the movable members of the article of furniture are swung from their sitting position into a reclined position.

Another object of the present invention is to equip a reclining article of furniture of above described type with a controlling mechanism for the leg-rest, which may cause a fast movement of the leg-rest relative to the seat at the beginning of a movement of the seat-back-rest structure from the sitting position into a reclined position, which, however, does not form a positive connection between the leg-rest and the controlling mechanism and permits an independent movement of the leg-rest relative to the seat, if so desired.

With the above and other objects of the invention in view, the invention consists in the novel construction, arrangement and combination of various devices, elements and parts, as set forth in the claims hereof, certain embodiments of the same being described in the specification and being illustrated in the accompanying drawings forming part of this specification, wherein:

Fig. 1 is a side elevational view of a reclining chair according to the invention, a portion of a side frame being broken away,

Fig. 2 is a side elevational view of a different embodiment of a reclining chair according to the invention,

Fig. 3 is a side elevational view of a reclining chaise-longue according to the invention,

Fig. 4 is a side elevational view of another embodiment of a reclining chair according to the invention,

Fig. 5 is a fragmentary side elevational view of a chair according to Fig. 4, which is equipped with a holding device for holding the leg-rest in a predetermined position relative to the seat,

Fig. 6 is a side elevational view of a further embodiment of a reclining chair according to the invention, and

Fig. 7 is a side elevational view of another embodiment of a reclining chaise-longue according to the invention.

Referring now to Fig. 1, 20 generally indicates a support comprising two side frames 22, 24 connected with each other by cross bars 26 and 28.

A seat-back-rest unit 30 comprising a seat 32 and back-rest 34 rigidly connected with each other is swingably mounted on said support 20 at 36.

An extension 38 of the seat-back-rest unit 30 fixedly connected with the latter extends downwardly below the plane of the seat 32.

On each side of the chair the upper end of a guiding element or guiding link 40 is pivoted to a lug of the support 20 at 42. One end of a connecting link 44 is pivoted to the lower end of said guiding element 40 at 46, the other end of said connecting link is pivoted to the back-rest-unit extension 38 at 48. Therefore, when the seat-back-rest-unit or structure 30 is swung from the sitting position shown in full lines into the reclined position 30' shown in dash and dot lines, the guiding element 40 is swung by means of the connecting link 44 about its pivot 42 from its full line position into the position 40' shown in dash and dot lines.

The sitting position of the structure 30 is limited by the rear cross bar 28 cooperating with the extension 38; the extreme reclined position 30' of said structure is limited by a stop 50 arranged on the support 20 for cooperation with the back-rest 34.

A leg-rest 52 is swingably mounted on the front portion of the seat 32 at 54. On each side of the chair one end of a controlling link 56 is pivoted to said leg-rest 52 at 58, the other end of said controlling link 56 is pivoted at 60 to the lower end of a controlling arm 62, the upper end of which is pivoted to the guiding element 40 at 64 at a point between the pivotal connections 42 and 46 respectively of said guiding element 40 with the support 20 and the connecting link 44 respectively. One end of a controlling bar 66 is pivoted to the controlling arm 62 at 68, the other end of said controlling bar 66 is pivoted to the back-rest extension 38 at 70.

When the seat-back-rest unit 30 is swung about the pivot 36 from the full line sitting position into the dash and dot line reclined position, the leg-rest 52 is swung about its pivot 54 by means of the controlling mechanism 38, 66, 62, 56 into the position 52'. It will be noted that for the reasons explained above the pivot 64 of the controlling arm 62 of said controlling mechanism 38, 66, 62, 56 is swung along a circular path about the point 42 into the position 64' during such a movement of the structure 30 into the position 30'. Said displacement of the pivot 64 into the position 64' contributes to a fast propelling of the leg-rest 52 forwardly and upwardly about its pivot 54.

According to the embodiment shown in Fig. 2, the seat-back-rest structure 130 is again swingably mounted at 136 on the support 120. Its sitting position is limited by the cross bar 128 of the support 120 and its extreme reclined position is limited by the stop 150 mounted on said support 120.

The guiding element 140, however, is in the shape of a bell-crank lever pivoted to the support 120 at 142. The upper arm of said bell-crank lever or guiding element 140 is pivoted at 147 to the front end portion of a connecting link 145 constituting an arm rest. The rear end of said connecting link or arm-rest 145 is pivoted to the back-rest 134 of the unit 130 at 149 at a point above the plane of the seat 132. When the seat-back-rest unit 130 is swung about its pivot 136 from the full line sitting position into the reclined position 130', the guiding element 140 is swung about its pivot 142 into the dash and dot line position 140'.

The leg-rest 152 swingably mounted on the seat 132 at 154 is again controlled by the controlling mechanism including the seat-back-rest unit extension 138, the controlling bar 166, the controlling arm 162 and the controlling link 156 joined with each other in the same manner as described above in connection with Fig. 1. It will be noted that the controlling arm 162 is pivoted at 164 to the end of the lower arm of the guiding element or bell-crank lever 140 and that said pivot 164 is brought into the posi-

tion 164' when the unit 130 is brought into the position 130'.

According to the embodiment shown in Fig. 3 the seat-back-rest structure 230 is again swingably mounted on the support 220 at 236, its end positions being limited by the cross bar 228 and the stop 250 of the support 220.

Furthermore, the guiding element 240 is again in the shape of a link swingably mounted at its upper end on the support at 242.

Also, the controlling mechanism 238, 266, 262, 256, for the leg-rest 252 swingably mounted on the seat 232 at 254 corresponds to the controlling mechanism of the chair shown in Fig. 1, the controlling arm 262 of said controlling mechanism being pivoted to the guiding element 240 at 264. However, the connecting link 244 pivoted to the seat-back-rest unit extension 238 at 248 is pivoted to the guiding element 240 at 246 at a point between the pivotal connections 242 at 264 respectively of said guiding element 240 with the support 220 and the controlling arm 262 respectively.

A movement of the seat-back-rest unit 230 from the sitting position shown in full lines into the reclined position 230' shown in dash and dot lines causes a movement of the leg-rest 252 into the position 252' by means of the link mechanisms described above.

The arrangement of the sea-back-rest structure 330 of the chair shown in Fig. 4 on the support 320 as well as the arrangement of the seat-back-rest structure extension 338, the connecting link 344 and the guiding element 340 correspond to the arrangement of similar parts of the chair shown in Fig. 1.

One end of a controlling bar 366 is again pivoted to the extension 338 at 370, the other end of said controlling bar 366 is pivoted at 368 to a controlling arm 362, the upper end of which is pivoted at 364 to the guiding element 340 between the pivotal connections 342 and 346 respectively of the latter with the support 320 and connecting link 344 respectively. The lower end of the controlling arm 362 is pivoted at 360 to one end of a first controlling link 356, the other end of which is pivoted at 359 to one end of a second controlling link 357, the other end of which is pivoted at 354 to the seat 332 in coaxial alignment with the pivotal connection between the leg-rest 352 and said seat 332. An abutting surface of said leg-rest 352 is in loose engagement with a cooperating abutting surface of the second controlling link 357. The cooperating abutting surfaces of the leg-rest 352 and the second controlling link 357 are normally held in engagement with each other by a spring 372 engaged with the seat 332 and the leg-rest 352. When the seat-back-rest unit 330 is swung about its pivot 336 from its sitting position limited by the cross bar 328 of the support 320 into its extreme reclined position 330' limited by the stop 350 on the support 320, the leg-rest 352 is brought through the medium of the controlling mechanism 338, 366, 362, 356, 357 into the position 352' shown in dash and dot line.

As mentioned above the leg-rest 352 is loosely engaged with the second controlling link 357. If desired, the leg-rest 352 may be moved by hand relative to the seat 332 against the action of the spring 372. Such a movement of the leg-rest 352 relative to the seat 332 by hand may be desirable, if the user of the chair wishes to have the leg-rest 352 at a certain angle relative to the seat 332 in a certain position of the latter.

Fig. 5 illustrates a holding device generally indicated by 374 for holding the leg-rest 352 at a predetermined angle relative to the seat 332, for example, in the position 352''. Said holding device 374 comprises a rod 376 pivotally connected with the leg-rest at 378 and slidably engaged with a clamping sleeve 380 swingably mounted at 382 on a lug 384 rigidly connected with the seat 332. A handle 386 serves either to tighten the clamping sleeve 380 on the rod 376 or to loosen same. If the clamping sleeve 380 is loosened, the rod 376 may freely slide therein and, consequently, the leg-rest 352 held by the spring 372 against the second controlling link 357 may follow the movements of the latter during a swinging of the seat-back-rest unit 330 about its pivot on the support.

Now assume the seat-back-rest structure is in the sitting position shown in full lines in Fig. 5 and the occupant of the chair wishes to have the leg-rest 352 in the position 352''. When the leg-rest has been brought into said position 352'' relative to the seat 332, the clamping sleeve 380 is tightened by the handle 386 on the rod 376, so that the leg-rest is held in said position 352''. Now the occupant of the chair may carry out a limited reclining movement of the seat-back-rest structure 330 into a somewhat reclined position, i. e., until the second controling link 357 comes again into engagement with the leg-rest locked relative to the seat and moving together with the latter. During said limited reclining movement of the seat-back-rest structure, the leg-rest remains at all times in the same position 352'' at the predetermined angle relative to the seat 332. Of course, if desired, any other suitable holding device arranged between the seat and the leg-rest may be used for this purpose.

According to the embodiment of a reclining chair shown in Fig. 6 the seat-back-rest structure 430 is again swingably mounted on the support 420 at 436. The sitting position of said structure 430 is limited by a cross bar 428 of the support 420 and the extreme reclined position thereof is limited by a stop 450 arranged on the support 420.

One end of a connecting link 444 is pivoted to a downward extension 438 of the seat-back-rest structure 430 at 448. The other end of said connecting link 444 is pivoted to the lower end of the guiding element or guiding link 440 at 446. The upper end of said guiding element 440 is pivoted to the support 420 at 442.

One end of a controlling bar 466 is pivoted to the extension 438 at 470, the other end of said controlling bar 466 is pivoted to the controlling arm 462 at 468. The upper end of the controlling arm 462 is pivoted at 446 to the guiding element 440 in coaxial alignment with the pivotal connection of the latter with the connecting link 444. One end of a first controlling link 456 is pivoted to the lower end of the controlling arm 462 at 460, the other end of said first controling link 456 is pivoted to a second controlling link 457 at 459. Said second controlling link 457 is pivoted to the seat 432 at 455 at a point spaced from the pivotal connection 454 between the leg-rest 452 and the seat 432. The leg-rest 452 is in loose engagement with an abutting surface on an extension 461 of the second controlling link 457, said extension 461 projecting downwardly beyond the pivot 459. A spring 472 tends to urge the leg-rest 452 into engagement with said extension 461.

A movement of the seat-back-rest structure 430 from the full line sitting position into the reclined position 430' causes a movement of the leg-rest into the dash and dot line position 452' through the medium of a mechanism shown in Fig. 6 when the leg-rest 452 is in engagement with the extension 461 of the second controlling link 457.

If desired, the leg-rest 452 may be moved away from said extension 461 by hand against the action of the spring 472, and, furthermore, if desired, the chair shown in Fig. 6 may be equipped with a holding device of the type shown in Fig. 5 or of any other suitable type for holding the leg-rest at a predetermined angle relative to the seat.

According to Fig. 7, the seat-back-rest structure 530 is again swingably mounted on the support 520 at 536. The sitting position of said structure is limited by the cross-bar 528 of the support 520 and the extreme reclined position is limited by the stop 530 arranged on the support 520.

The upper end of a guiding element 540 is pivoted to the support at 542. One end of a connecting link 544 is pivoted at 546 to an intermediate point of said guiding element 540. The other end of said connecting link 544

is pivoted to the downward extension 538 of the back-rest 534 at 548.

One end of a controlling bar 566 is pivoted to the seat-back-rest unit extension 538 at 570, the other end of said controlling bar 566 is pivoted to a controlling arm 562 at 568. The upper end of said controlling arm 562 is pivoted to the lower end of the guiding element 540 at 564. The lower end of said controlling arm 562 is pivoted at 560 to a first controlling link 556. Said first controlling link 556 is pivoted at 559 to the lower end of a second controlling link 557, the upper end of which is pivoted to the seat 532 at 555 at a point spaced from the pivotal connection 554 between the leg-rest 552 and the seat 532. A spring 572 tends to urge the leg-rest 552 against an extension 563 of the first controlling link 556.

Upon a movement of the seat-back-rest structure 530 from the sitting position shown in full lines into the extreme reclined position 530' shown in dash and dot lines the leg-rest 552 being held in engagement with the first controlling link 556 by the spring 572 will be brought into the position 552' shown in dash and dot lines.

If desired, the leg-rest 552 may be disengaged from the first controlling link 556 by a manual operation against the action of the spring 572, and, if so desired, a holding device of the type shown in Fig. 5 or of any suitable type may be arranged for holding the leg-rest at a predetermined angle relative to the seat.

I have described preferred embodiments of my invention, but it is understood that this disclosure is for the purpose of illustration, and that various changes in shape and proportion as well as the substitution of equivalent elements for those herein shown and described may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

If desired, a locking device of any suitable type may be arranged on each type of the reclining articles of furniture shown in the drawings so as to enable the user of the article to lock the movable members of the article in any desired position.

Furthermore, the guiding elements of the articles of furniture shown in Figs. 4, 6, and 7 could also be moved in dependence on the movements of the back-rest by a connecting link arranged on the article in the manner shown in Fig. 2.

Moreover, for example, the guiding element of the article shown in Fig. 2 could also be controlled by a connecting link arranged on the article in the manner shown in Fig. 6.

What I claim is:

1. An article of repose for supporting the body of a person, comprising in combination: a support, a unit including a seat and a back-rest rigid with each other, said unit being swingably mounted on said support, a downward extension included in the structure of said unit, a leg-rest swingably mounted on the front portion of said seat, a guiding element swingably mounted on said support, means interposed between said guiding element and the structure of said unit for effecting movement of said guiding element about its pivot in dependence on movements of said unit, a controlling arm pivoted to said guiding element at a point spaced from the pivotal connection of the latter with the support and above the lower end of said extension, a control bar pivoted to the lower end of said extension of the unit at one of its end portions and pivoted above the middle of said controlling arm at its other end portion, a first controlling link pivoted at one of its end portions to said controlling arm, and a second controlling link pivoted at one of its end portions to the other end portion of said first controlling link, the other end portion of said second controlling link being pivoted to the front portion of said seat, and cooperating abutting surfaces arranged on the structure of one of said controlling links and on the structure of said leg-rest for effecting the movements of the latter in coordination with said controlling arm, said cooperating abutting surfaces loosely abutting against each other whereby said abutting surfaces may be disengaged from each other for the performance of independent movements of the leg-rest relative to the seat.

2. An article of repose for supporting the body of a person, comprising in combination: a support, a unit including a seat and a back-rest rigid with each other, said unit being swingably mounted on said support, a downward extension included in the structure of said unit, a leg-rest swingably mounted on the front portion of said seat, a guiding element swingably mounted on said support, means interposed between said guiding element and the structure of said unit for effecting movement of said guiding element about its pivot in dependence on movements of said unit, a controlling arm pivoted to said guiding element at a point spaced from the pivotal connection of the latter with the support and above the lower end of said extension, a control bar pivoted to the lower end of said extension of the unit at one of its end portions and pivoted above the middle of said controlling arm at its other end portion, a first controlling link pivoted at one of its end portions to said controlling arm, and a second controlling link pivoted at one of its end portions to the other end portion of said first controlling link, the other end portion of said second controlling link being pivoted to the front portion of said seat, and cooperating abutting surfaces arranged on the structure of said second controlling link and on the structure of said leg-rest for effecting the movements of the latter in coordination with said controlling arm, said cooperating abutting surfaces loosely abutting against each other whereby said abutting surfaces may be disengaged from each other for the performance of independent movements of the leg-rest relative to the seat.

3. An article of repose for supporting the body of a person, comprising in combination: a support, a unit including a seat and a back-rest rigid with each other, said unit being swingably mounted on said support, a downward extension included in the structure of said unit, a leg-rest swingably mounted on the front portion of said seat, a guiding element swingably mounted on said support, means interposed between said guiding element and the structure of said unit for effecting movement of said guiding element about its pivot in dependence on movements of said unit, a controlling arm pivoted to said guiding element at a point spaced from the pivotal connection of the latter with the support and above the lower end of said extension, a control bar pivoted to the lower end of said extension of the unit at one of its end portions and pivoted above the middle of said controlling arm at its other end portion, a first controlling link pivoted at one of its end portions to said controlling arm, and a second controlling link pivoted at one of its end portions to the other end portion of said first controlling link, the other end portion of said second controlling link being pivoted to the front portion of said seat, the structure of said second controlling link including an extension projecting beyond the pivotal connection between said two controlling links, and cooperating abutting surfaces arranged on said extension of the second controlling link and on the structure of said leg-rest for effecting the movements of the latter in coordination with said controlling arm, said cooperating abutting surfaces loosely abutting against each other whereby said abutting surfaces may be disengaged from each other for the performance of independent movements of the leg-rest relative to the seat.

4. An article of repose for supporting the body of a person, comprising: a support, a structure including a seat and a back-rest rigidly connected with each other, said structure being swingably mounted on said support, a downward extension of the structure fixedly connected

with the latter, a leg-rest swingably mounted on the front portion of said seat, a guiding element swingably mounted on said support, a connecting link pivoted at one of its end portions to said back-rest above the plane of the seat and pivoted at its other end portion to said guiding element, a controlling arm pivoted to said guiding element at a point spaced from the pivotal connection of the latter with the support and above the lower end of said extension, a controlling bar pivoted at one of its end portions to the lower end of said extension and pivoted at its other end portion above the middle of said controlling arm, and a controlling link pivoted at one of its end portions to the lower end of said controlling arm and pivoted at its other end portion to the upper end of said leg-rest for effecting movement of the latter in coordination with said controlling arm whereby the leg-rest is swung initially rapidly from a vertical position to an almost horizontal position with a slight initial rearward tilt of the back-rest.

5. An article of repose for supporting the body of a person, comprising in combination: a support, a unit including a seat and a back-rest rigid with each other, said unit being swingably mounted on said support, a downward extension included in the structure of said unit, a leg-rest swingably mounted on the front portion of said seat, a guiding element swingably mounted on said support, means interposed between said guiding element and the structure of said unit for effecting movement of said guiding element about its pivot in dependence on movements of said unit, a controlling arm pivoted to said guiding element at a point spaced from the pivotal connection of the latter with the support and above the lower end of said extension, a control bar pivoted to the lower end of said extension of the unit at one of its end portions and pivoted above the middle of said controlling arm at its other end portion, a first controlling link pivoted at one of its end portions to said controlling arm, and a second controlling link pivoted at one of its end portions to the other end portion of said first controlling link, the other end portion of said second controlling link being pivoted to the front portion of said seat, the structure of said first controlling link including an extension projecting beyond the pivotal connection between said two controlling links, and cooperating abutting surfaces arranged on said extension of the first controlling link and on the structure of said leg-rest for effecting the movements of the latter in coordination with said controlling arm, said cooperating abutting surfaces loosely abutting against each other whereby said abutting surfaces may be disengaged from each other for the performance of independent movements of the leg-rest relative to the seat.

6. An article of repose for supporting the body of a person, comprising in combination: a support, a unit including a seat and a back-rest rigid with each other, said unit being swingably mounted on said support, a downward extension included in the structure of said unit, a leg-rest swingably mounted on the front portion of said seat, a guiding element swingably mounted on said support, said guiding element including an upward extension projecting upwardly beyond its pivotal connection with the support, a connecting link pivoted at one of its ends to said upward extension of the guiding element and at its other end to said back-rest at a point above the plane of the seat, a controlling arm pivoted to said guiding element at a point spaced from the pivotal connection of the latter with the support and above the lower end of said extension, a control bar pivoted to the lower end of said extension of the unit at one of its end portions and pivoted above the middle of said controlling arm at its other end portion, and means interposed between the lower end of said controlling arm and the upper end of said leg-rest for effecting movement of the latter in coordination with said controlling arm whereby the leg-rest is swung initially rapidly from a vertical position to an almost horizontal position with a slight initial rearward tilt of the back-rest.

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