

Sept. 20, 1960

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2,953,192

ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

Filed May 25, 1956

5 Sheets-Sheet 1

FIG. 1

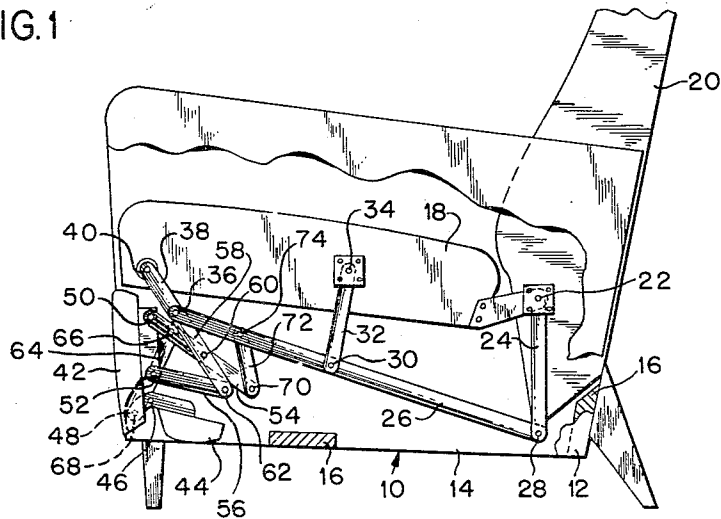
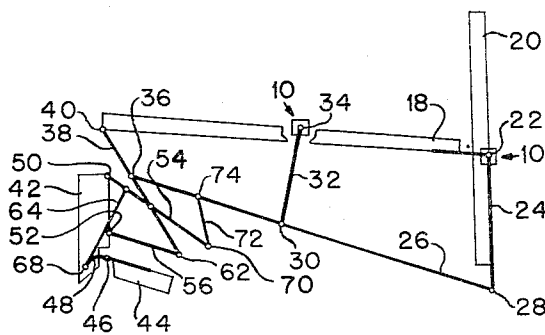


FIG. 2



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FIG. 4

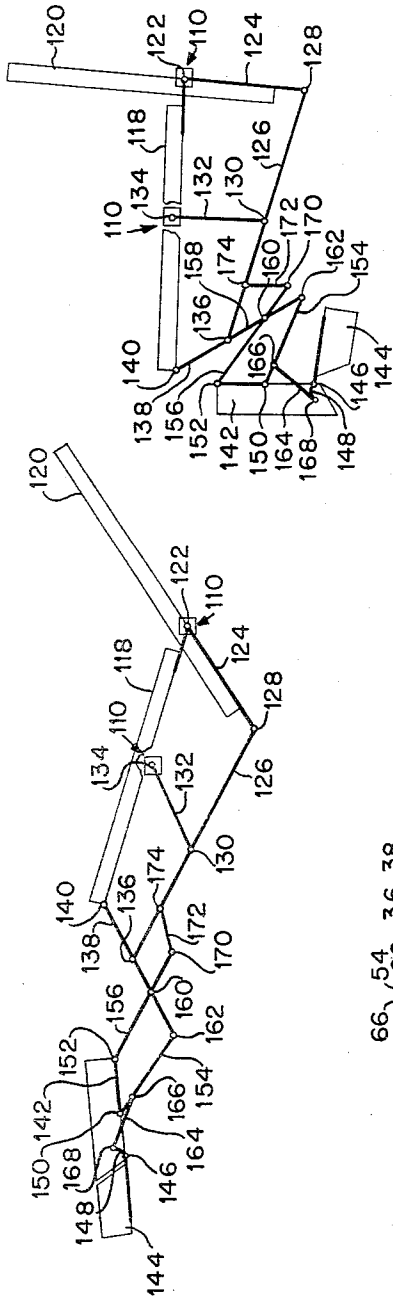


FIG. 5

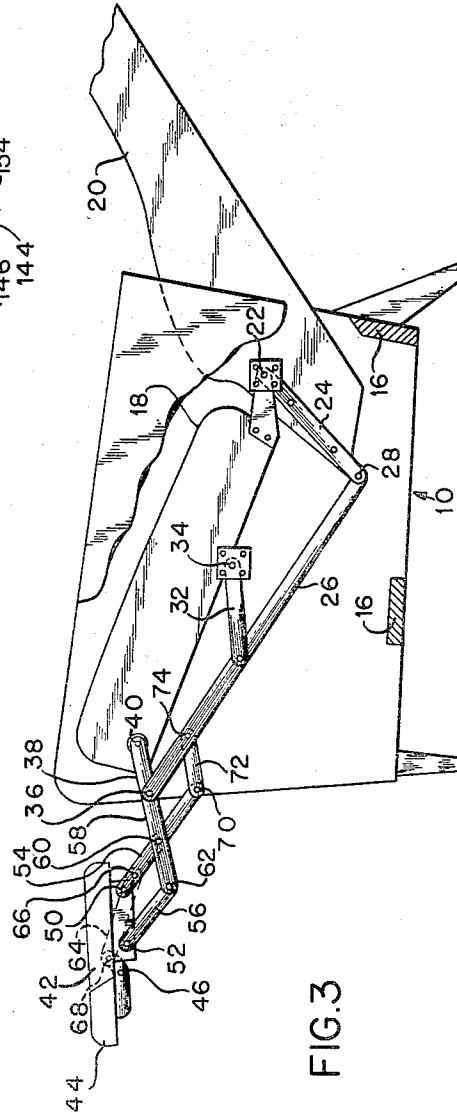


FIG. 3

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FIG. 6

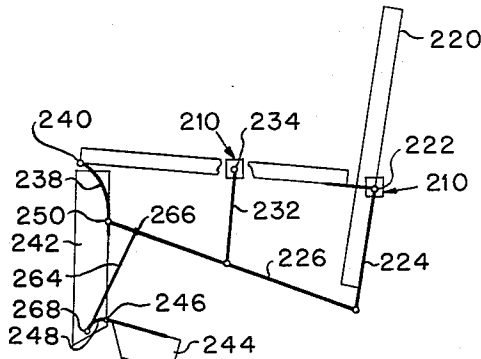


FIG. 7

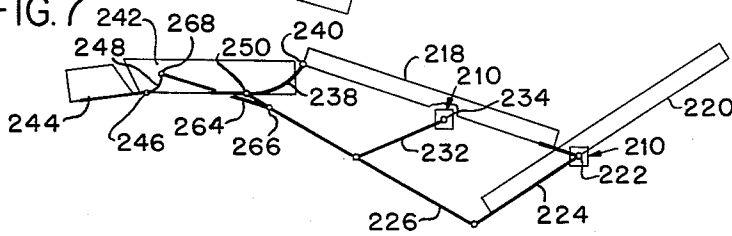


FIG. 8

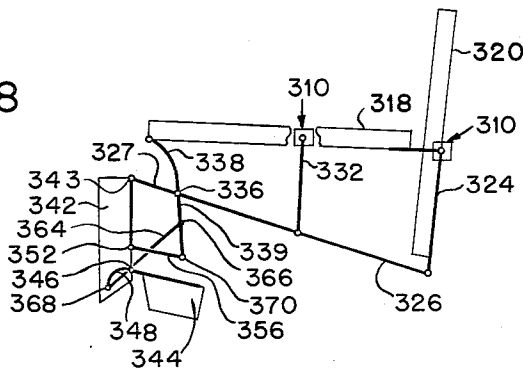
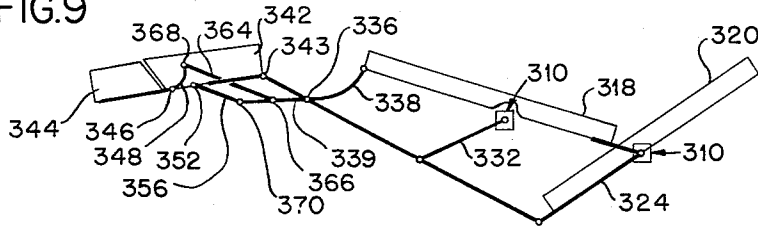


FIG. 9



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ARTICLE OF REPOSE FOR SUPPORTING THE BODY OF A PERSON

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Filed May 25, 1956, Ser. No. 587,321

7 Claims. (Cl. 155-106)

This invention relates to articles of furniture and more particularly to a leg-rest control arrangement for use in connection with an adjustable article of repose for supporting the body of a person, wherein a support, rockable body supporting means and a linkage are positively inter-engaged with each other.

An object of the present invention is to provide a leg-rest control arrangement by means of which on one hand the leg-rest is swung upwardly and on the other hand is extended when the seat of the article of repose is moved from the sitting position into a reclined position, so that the supporting portion of the leg-rest in the elevated position of the latter is extended to such a degree that a full support of the legs of a tall person resting on the article of repose is assured.

A further object of the present invention is to provide an extensible leg-rest arrangement which can be collapsed in the sitting position of the leg-rest to such a degree, that the article of repose may be made comparatively low, and which in spite of this collapsible feature permits an extension of the leg-rest during its movement from the sitting position into the elevated position to such an extent that a full support of the legs of the occupant of the article is assured.

Another object of the present invention is to improve on the art of articles of repose for supporting the body of a person as now customarily made.

The above mentioned objects and advantages, as well as other objects and advantages, will be more fully disclosed in the following specification, reference being made to the accompanying drawings forming part of this specification, wherein:

Fig. 1 is a side elevational view of a reclining arm-chair equipped with a leg-rest control arrangement, according to the invention, a portion of the side wall being broken away,

Fig. 2 is a diagrammatical illustration of the link system of a chair shown in Fig. 1,

Fig. 3 is a side elevational view of the chair shown in Fig. 1, wherein however the movable elements of the chair are shown in a reclined position,

Fig. 4 is a diagrammatical illustration of a different embodiment of a reclining chair with a leg-rest control arrangement according to the invention,

Fig. 5 is a diagrammatical illustration of the link system of the chair shown in Fig. 4, wherein however the movable elements of said link system are in the reclined position,

Figs. 6 and 7 are diagrammatical illustrations of the link system of a further embodiment of a chair according to the invention, said link system being shown in the sitting position and a reclined position respectively,

Figs. 8 and 9 are diagrammatical illustrations of a link system of still another embodiment of a chair according to the invention, said link system being shown in the sitting position and a reclined position respectively,

Figs. 10 and 11 are diagrammatical illustrations of

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a link system of a further embodiment of a chair according to the invention, said link system being shown in the sitting position and a reclined position respectively,

Figs. 12 and 13 are diagrammatical illustrations of a link system of still another embodiment of a chair according to the invention, said link system being shown in the sitting position and a reclined position respectively,

Figs. 14 and 15 are diagrammatical illustrations of a link system of a further embodiment of a chair according to the invention, said link system being shown in the sitting position and a reclined position respectively, and

Figs. 16 and 17 are diagrammatical illustrations of a link system of still another embodiment of a chair according to the invention, said link system being shown in the sitting position and a reclined position respectively.

Referring now to the chair illustrated by Figs. 1 to 3, 10 generally indicates a support, having side walls 12 and 14 connected with each other by cross bars 16. The rear end portion of a seat 18 is pivotally connected with the support 10 and with a back-rest 20 at 22.

On each side of the chair the back-rest 20 has a downward extension 24 rigid therewith. Each downward extension 24 (only one being shown) is pivotally connected with the rear end of a lower connecting link 26 at 28. Said lower connecting link 26 is pivoted at 30 intermediate its ends with a lower end of a guiding link 32, the upper end of which is swingably mounted on the support 10 at 34. The front end of the lower connecting link 26 is pivoted at 36 to a front connecting link 38, which in turn is swingably mounted on the seat 18 at 40.

The above described constrained linkage provides for coordinated movements of the seat 18 and the back-rest 20 with each other.

The portion of the support between the pivots 22 and 34 represents the stationary link of the constrained linkage. The movable links of said constrained linkage are formed by the seat 18, back-rest 20, 24, the lower connecting link 26, the front connecting link 38 and the guiding link 32.

A leg-rest 42 is pivotally connected with an extension 44 at 46. Said leg-rest extension 44 has a projection 48 beyond the pivotal connection 46 between the leg-rest 42 and the leg-rest extension 44, whereby a double armed lever is formed.

The control of the movements of the leg-rest 42 and its extension 44 relative to each other and relative to the seat 18 during a movement from the sitting position shown in Fig. 1 and the reclining position shown in Fig. 3 and vice versa is obtained by the following arrangement: The leg-rest 42 is pivoted at spaced points 50 and 52 to a first bar 54 and a first link 56 respectively. Said first bar 54 crossing an extension 58 of the front connecting link 38 is pivotally connected with said extension 58 at 60. The lower end of said extension 58 of the front connecting link 38 is pivoted to the rear end of the link 56 at 62. A second bar 64 is pivoted to the first bar 54 at 66 and the projection 48 of the leg-rest extension 44 at 68. The rear end of the first bar 54 is pivoted at 70 to the lower end of an auxiliary connecting link 72, the upper end of which is pivoted to the lower connecting link 26 at 74.

Thus, it will be readily understood that the above described leg-rest control arrangement is operatively connected with two movable members 26 and 38 of the constrained linkage 18, 20, 24, 26, 32, 38, including the seat 18 and the back-rest 20. One of said links 72 of the leg-rest control arrangement is pivotally connected with the movable member 26 of the constrained linkage while the other member 58 of said leg-rest control arrangement is rigid with the front connecting link 38 of the

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constrained linkage. Although, according to the embodiments shown in Figs. 1-3, the members 38 and 58 are integral with each other, it will be understood that said two members may be separate elements rigidly connected with each other by screws or the like.

When the movable members of the chair are in the sitting position, the extension 44 of the leg-rest 42 is turned rearwardly as shown in Figs. 1 and 2.

When the movable members of the chair are brought from the sitting position shown in Figs. 1 and 2 into the reclined position shown in Fig. 3, the relative movement of the links 26 and 38, the constrained linkage 20, 24, 26, 32, 38, to which the above described leg-rest control arrangement is connected, causes an upward movement of the leg-rest 42 and simultaneously therewith a forward movement of the extension 44 whereby the latter is brought into alignment with the leg-rest 42 when the movable members of the chair reach the extreme reclined position.

According to the embodiment shown in Figs. 4 and 5 again the seat 118 and back-rest 120 with its downward extension 124 are swingably mounted on the support 110 at 122. Furthermore, again the constrained linkage includes a lower connecting link 126, a front connecting link 138 and a guiding link 132. The rear end of the lower connecting link 126 is pivoted to the downward extension 124 of the back-rest 120 at 128. The front end of the lower connecting link 126 is pivoted to the front connecting link 138 at 136. The upper end of the front connecting link 138 is pivoted to the front end of the seat 118 at 140. The guiding link 132 being swingably mounted on the support 110 at 134 is pivoted to the lower connecting link 126 at 130.

The leg-rest control arrangement includes a leg-rest 142 and an extension 144 swingably mounted on the leg-rest 142 at 146. The extension 144 of the leg-rest 142 has a projection beyond the pivotal connection 146 between the leg-rest 142 and its extension 144. A first bar 154 is pivotally connected to the leg-rest 142 at 150. A second bar 164 is pivoted to said first bar 154 at 166 and to the projection 148 of the leg-rest control 144 at 168. Furthermore, a link 156 is pivoted to the leg-rest 142 at 152. The pivotal connection 150 of the leg-rest 142 with the bar 154 is between the pivotal connections 146 and 152 of said leg-rest 142 with the leg-rest extension 144 and the link 156. Another link 158 crossing said first mentioned link 156 and being pivotally connected with the latter at the crossing point 160 is pivoted to the bar 154 at 162. Said link 158 is rigid with the front connecting link 138 of the constrained linkage 118, 120, 124, 126, 132 and 138. Moreover, an auxiliary connecting link 172 is pivoted to the link 156 at 170 and to the lower connecting link 126 at 174.

Upon a movement of the seat 118 and back-rest 120 from the sitting position shown in Fig. 4 into the reclined position shown in Fig. 5, the leg-rest 142 is moved forwardly and upwardly and its extension 144 is brought into alignment with the main portion of the leg-rest 142 as may be readily gathered from Fig. 5. The movement of the leg-rest 142 and its extension 144 are obtained by the link system described above.

According to the embodiments shown in Figs. 6 and 7 the leg-rest 242 is swingably mounted on the front end of the seat 218 at 240, the upper portion 238 of said leg-rest 242 being included as a movable link in the constrained linkage 218, 220-224, 226 and 232. The guiding link 232 is swingably mounted on the support 210 at 234 and the seat 218 and back-rest are swingably mounted on said support 210 at 222.

The bar swingably mounted on the leg-rest 242 at 250 is identical with the lower connecting link 226. The extension 244 of the leg-rest 242 swingably mounted on the latter at 246 has a projection 248. A bar 264 is pivotally connected to said projection 248 at 268 and to the lower connecting link 226 at 266.

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A movement of the seat 218 and back-rest 220 from the sitting position shown in Fig. 6 into the reclined position shown in Fig. 7 causes positively a displacement of the leg-rest 242 and its extension 244 from the position shown in Fig. 6 into the position shown in Fig. 7.

The chair shown in Figs. 8 and 9 again comprises the constrained linkage 318, 320-324, 326, 332 and 338. The links of said linkage are pivotally connected with each other and with the support 310 respectively in the same manner as described above in connection with the link system of the chair shown in Figs. 1, 2 and 3.

The leg-rest control arrangement is designed as follows: The lower connecting link 326 has an extension 327 rigid therewith. Said extension 327 extends beyond the pivotal connection 336 between the lower connecting link 326 and the front connecting link 338. The front connecting link 338 has an extension 339 rigid therewith. The leg-rest 342 is swingably mounted at 343 on the extension 327 of the lower connecting link 326. One end of a connecting link 356 is pivoted to the leg-rest 342 at 352. The other end of said connecting link 356 is pivoted to the extension 339 of the front connecting link 338 at 370. The lower end of the leg-rest 342 is hingedly connected with an extension 344 thereof at 346. Said leg-rest extension 344 has a projection 348 to which is pivoted at 368 one end of a bar 364, the other end of which is pivoted to the extension 399 of the front connecting link 338 at 366.

Upon movement of the seat 318 and the back-rest 320 from the sitting position shown in Fig. 8 to the reclined position shown in Fig. 9, the leg-rest 342 and its extension 344 are brought into alignment with each other and into the elevated position shown in Fig. 9.

According to the embodiments shown in Figs. 10 and 11 the seat 418 and back-rest 420 are rigid with each other so as to form a unit generally indicated by 476. One arm of a double armed lever 478 swingably mounted on the support 410 at 480 is pivoted to the unit 476 at 482 while the other arm of said double armed lever 478 is pivoted to the rear end of a lower connecting link 426. An arm 484 swingably mounted on the support 410 at 486 is connected by a pin-and-slot connection 488 with the lower connecting link 426. A guiding link 432 swingably mounted on the support 410 at 434 is pivotally connected with the lower connecting link 426 at 430. Furthermore a second guiding link 490 rockably mounted on the support 410 at 492 is pivoted to the seat portion 418 of the unit 476 at 494.

A leg-rest 442 is swingably mounted at 443 on an extension 427 of the lower connecting link 426 being rigid with the latter. A bar 454 is pivoted to said leg-rest 442 at 450 and to the arm 484 at 485. An intermediate point 466 of said bar 454 is pivoted to one end of another bar 464, the other end of which is pivoted at 468 to a projection 448 of a leg-rest extension 444, swingably mounted on the leg-rest 442 at 446.

If the movable members of the chair shown in Fig. 10 are moved from the sitting position shown therein into the reclined position shown in Fig. 11, the leg-rest 442 and its extension 444 are brought from the position shown in Fig. 10 into the position shown in Fig. 11 through the controlling mechanism described above.

According to the embodiment shown in Figs. 10 and 11 the seat 518 and the back-rest 520 having an extension 524 are swingably mounted on the support 510 at 522. The constrained linkage for controlling the movement of the seat 518 in dependence of the back-rest 520 comprises said seat 518, the back-rest 520-524, a lower connecting link 526, a guiding link 532 and a connecting link 538. The lower connecting link 526 is pivoted at 528 to the downward extension 524 of the back-rest 520. The upper end of the guiding link 532 is swingably mounted on the support 510 at 534. The lower end of said guiding link 532 is pivoted to the lower connecting link 526 at 530. The connecting link 528 is pivoted to

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said guiding link 532 at 531 and to the seat 518 at 540.

The leg-rest control arrangement includes the leg-rest 542 and its extension 544 swingably mounted thereon at 546. The extension 544 has the projection 548, so as to form a double armed lever. Said projection 548 is pivoted at 568 to one end of a bar 564, the other end of which is pivoted to another bar 554. One end of said bar 554 is pivoted at 550 to the leg-rest 542 while the other end of said bar 554 is pivoted at 585 to an arm 584 swingably mounted on the support 510 at 586. The lower end of said arm 584 is pivoted at 560 to an intermediate point of a link 556, one end of which is pivoted to the leg-rest 542 at 552. The other end of said link 556 is pivoted at 596 to another arm 598 swingably mounted on the support 510 at 500. One end of a controlling link 502 is pivoted to said arm 598 at 504. The other end of said controlling link 502 is pivoted at 506 to the lower end of the guiding link 532, so that movements of the link system including the seat 518 and the back-rest 510 are transmitted to the leg-rest 542 and its extension 544. Thus it will be readily understood that upon a movement of the seat 518 and back-rest 520 from the sitting position shown in Fig. 12 into the reclined position shown in Fig. 13 the leg-rest 542 and its extension 544 are propelled upwardly and forwardly and brought into alignment with each other.

With exception of the connection of the bar 664, the chair shown in Figs. 15 and 16 is similar to the chair shown in Figs. 6 and 7. The constrained linkage includes the seat 618, the back-rest 620 with its extension 624, the lower connecting link 626, the front connecting link 628 and the guiding link 632. Said constrained linkage is swingably mounted on the support 610.

The leg-rest 642 being rigid with the front connecting link 638 is swingably connected at 646 with the leg-rest extension 644. The latter has a projection 648 pivoted at 668 to the lower end of a bar 664. According to the embodiments shown in Figs. 15 and 16 the upper end of this bar 668 is pivoted at the bar 618 at 608.

The sitting position of the movable members of the chair is shown in Fig. 14 and the reclined position of the movable members is shown in Fig. 15.

The chair shown in Figs. 16 and 17, with exception of the connection of the bar 764 is similar to the chair shown in Figs. 12 and 13. The lower end of said bar 764 is pivoted at 768 to the projection 748 of the leg-rest extension 744 swingably mounted on the leg-rest 742 at 746. The upper end of said bar 764 is swingably mounted on the support 710 at 709.

As mentioned above the connections of the remaining links 702, 718, 720, 724, 726, 732, 738, 754, 756, 784, 798 with each other and with the support 710 respectively are identical with the connections of the corresponding links shown in Figs. 12 and 13.

The sitting position is shown in Fig. 16 and the extreme reclining position is shown in Fig. 17.

If desired, the adjustable reclining chairs shown in the drawings may be equipped with stopping means for limiting the sitting position and the extreme reclined position of the movable members thereof.

Furthermore, if desired, the reclined chairs shown in the drawings may be equipped with locking means for holding the movable members of the chairs in any desired position.

I have described preferred embodiments of my invention but it is understood that this disclosure is for the purpose of illustration and that various omission or changes in shape, proportion and arrangement of parts, 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.

What I claim is:

1. In a reclining chair including a support, body-supporting means having a seat and a back-rest rockably

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mounted on said support, a leg-rest, and a linkage mechanism including said seat and back-rest as movable links and said support as a stationary link connected to said leg-rest and mounting said leg-rest for movement from beneath the forward end of said seat to an elevated position in response to reclining movement of said back-rest, the improvement comprising a leg-rest extension normally disposed below said seat in a stored position, means operatively connected to said leg-rest extension and mounting said leg-rest extension on said leg-rest for pivotal movement about a pivot out of said stored position into an extended position in alignment with said leg-rest, an arm extending forwardly of said pivot and operatively connected to said leg-rest extension, and a link pivotally connected to said arm and to said linkage and effective to exert a pull on said arm in response to reclining movement of said body-supporting means whereby said pivotal movement is imparted to said leg-rest extension.

2. In a reclining chair including a support, body-supporting means having a seat and a back-rest rockably mounted on said support, a leg-rest, and a linkage mechanism including said seat and back-rest as movable links and said support as a stationary link connected to said leg-rest and mounting said leg-rest for movement from beneath the forward end of said seat to an elevated position in response to reclining movement of said back-rest, the improvement comprising a leg-rest extension normally disposed below said seat in a stored position, means operatively connected to said leg-rest extension and mounting said leg-rest extension on said leg-rest for pivotal movement about a pivot out of said stored position into an extended position in alignment with said leg-rest, an arm extending forwardly of said pivot and operatively connected to said leg-rest extension, and a link pivotally connected to said arm and to said seat and effective to exert a pull on said arm in response to reclining movement of said body-supporting means whereby said pivotal movement is imparted to said leg-rest extension.

3. In a reclining chair including a support, body-supporting means having a seat and a back-rest rockably mounted on said support, a leg-rest, and a linkage mechanism including said seat and back-rest as movable links and said support as a stationary link connected to said body-supporting means and said leg-rest and mounting said leg-rest for movement from beneath the forward end of said seat to an elevated position in response to reclining movement of said back-rest, the improvement comprising a leg-rest extension normally disposed below said seat in a stored position, means operatively connected to said leg-rest extension and mounting said leg-rest extension on said leg-rest for pivotal movement about a pivot out of said stored position into an extended position in alignment with said leg-rest, an arm extending forwardly of said pivot and operatively connected to said leg-rest extension, and a link pivotally connected to said arm and to said support and effective to exert a pull on said arm in response to reclining movement of said body-supporting means whereby said pivotal movement is imparted to said leg-rest extension.

4. In a reclining chair including a support, body-supporting means having a seat and a back-rest rockably mounted on said support, a leg-rest, and a linkage mechanism for said body-supporting means coordinating said leg-rest for movement to an elevated position in response to reclining movement of said back-rest, the improvement comprising a leg-rest extension normally disposed below said seat in a stored position, a double-armed lever mounted on said leg-rest at a pivot and having one arm extending forwardly and the other arm extending rearwardly, means rigidly connecting said one arm of said double-armed lever to said leg-rest extension and mounting said leg-rest extension for pivotal movement about said pivot and out of said stored position into an extended position in alignment with said leg-rest, and a link pivotally

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ly connected to said other arm of said double-armed lever and said linkage mechanism and effective to exert a pull on said other arm in response to reclining movement of said back-rest whereby said pivotal movement is imparted to said leg-rest extension.

5. In a reclining chair including a support, body-supporting means having a seat and a back-rest rockably mounted on said support, a leg-rest, and a linkage mechanism including said seat and back-rest as movable links and said support as a stationary link connected to said leg-rest and mounting said leg-rest for movement from beneath the forward end of said seat to an elevated position in response to reclining movement of said back-rest, the improvement comprising a leg-rest extension normally disposed below said seat in a stored position, means operatively connected to said leg-rest extension and mounting said leg-rest extension on said leg-rest for pivotal movement about a pivot out of said stored position into an extended position in alignment with said leg-rest, and a link pivotally connected to the mounting means for said leg-rest extension and to said linkage to exert a pull on said mounting means effective to pivot said leg-rest extension from said stored position into said extended position in response to reclining movement of said body-supporting means.

6. An improved leg-rest extension control arrangement for a reclining chair of the type including a support, body-supporting means having a seat and a back-rest normally disposed in a sitting position and rockably mounted on said support, a leg-rest, a linkage mechanism including said seat and back-rest as movable links and said support as a stationary link connected to said body-supporting means and said leg-rest and mounting said leg-rest for movement from beneath the forward end of said seat to an elevated position in response to reclining movement of said back-rest, said arrangement comprising a leg-rest extension normally disposed below said seat in a stored position, means operatively connected to said leg-rest extension and mounting said leg-rest extension on said leg-rest at a pivot for pivotal movement about said pivot out of said stored position into an extended position in alignment with said leg-rest, an arm extending forwardly of said pivot in said sitting position and

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connected to said leg-rest extension, and a link having a pivotal connection to said arm and effective to exert a pull on said arm in response to reclining movement of said body-supporting means whereby said pivotal movement is imparted to said leg-rest extension, said pivotal connection being disposed forwardly of said pivot in said sitting position and moving through an upward arc in response to said reclining movement.

7. An improved leg-rest extension control arrangement for a reclining chair of the type including a support, body-supporting means having a seat and a back-rest normally disposed in a sitting position and rockably mounted on said support, a leg-rest, a linkage mechanism connected to said body-supporting means and said leg-rest and mounting said leg-rest for movement from beneath the forward end of said seat to an elevated position in response to reclining movement of said back-rest, said arrangement comprising a leg-rest extension normally disposed below said seat in a stored position, a double-armed lever mounted on said leg-rest at a pivot, means connecting one arm of said double-armed lever to said leg-rest extension and mounting said leg-rest extension for pivotal movement about said pivot out of said stored position into an extended position in alignment with said leg-rest, and a link having a pivotal connection to the other arm of said double-armed lever and effective to exert a pull on said other arm in response to reclining movement of said body-supporting means whereby said pivotal movement is imparted to said leg-rest extension, said pivotal connection being disposed forwardly of said pivot in said sitting position and moving through an upward arc in response to said reclining movement.

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