Oct. 28, 1952 J. LUCKHARDT 2,615,497

RECLINING ARTICLE OF FURNITURE

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FIG. 1.

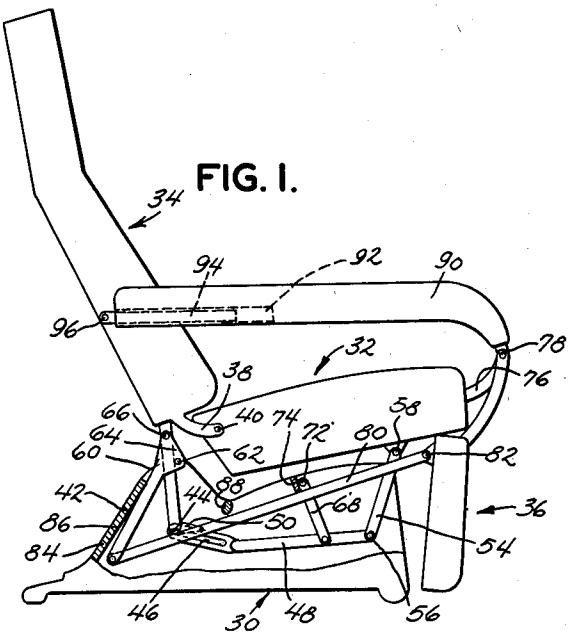


FIG. 2.

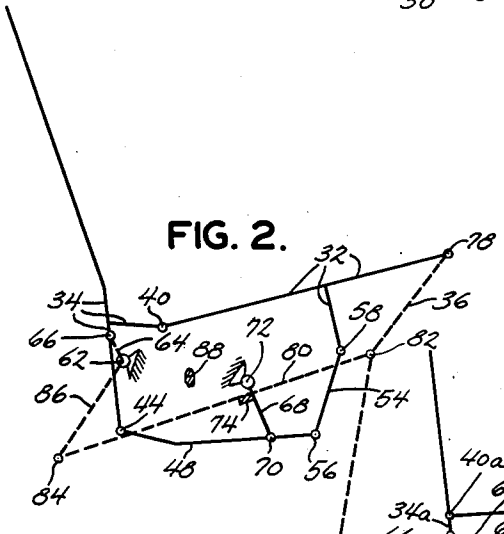
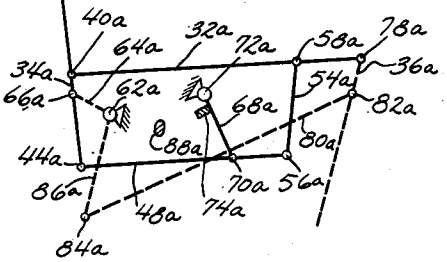


FIG. 3.



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FIG. 4.

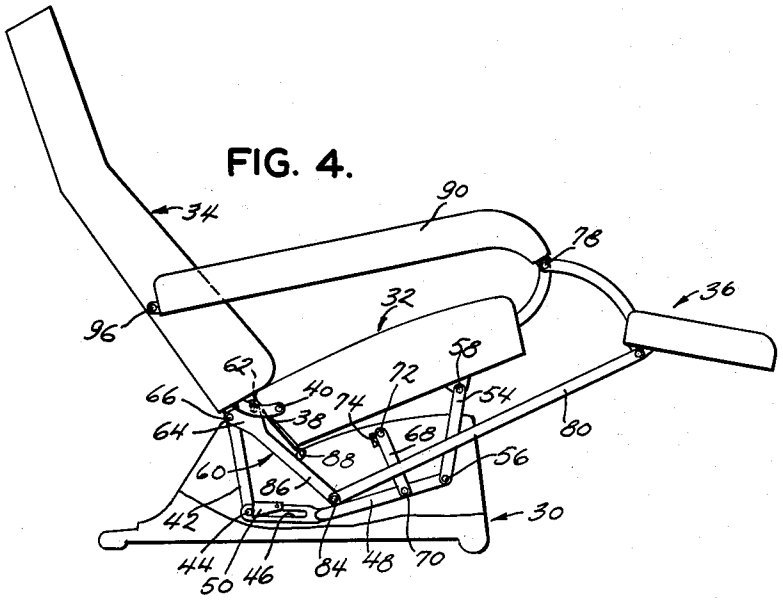


FIG. 5.

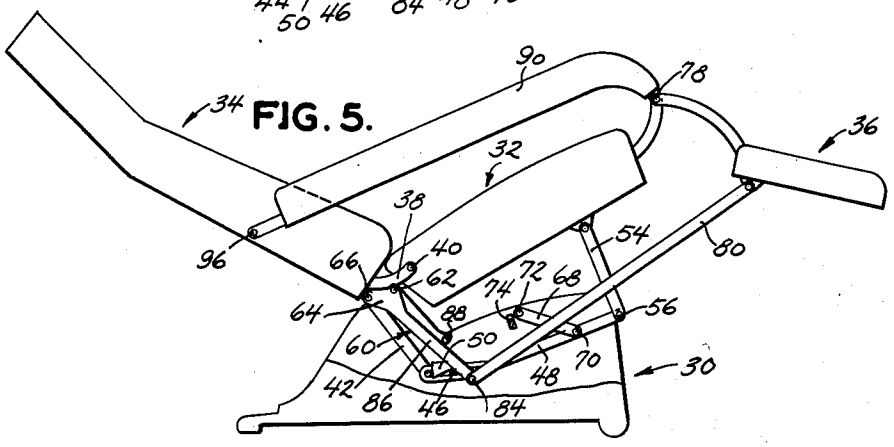
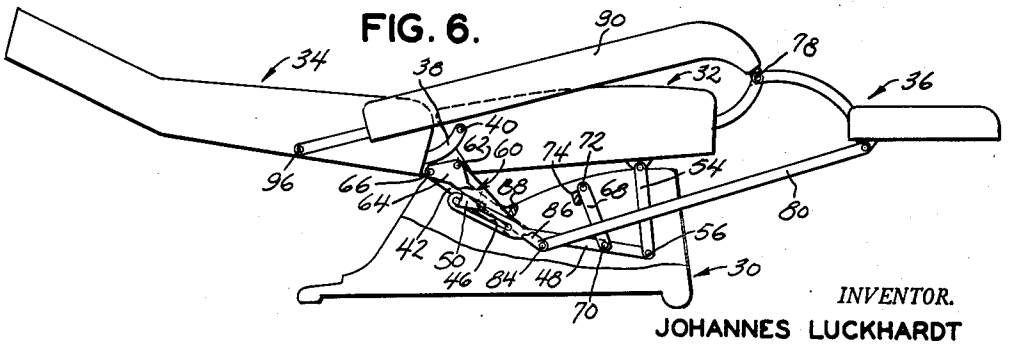


FIG. 6.



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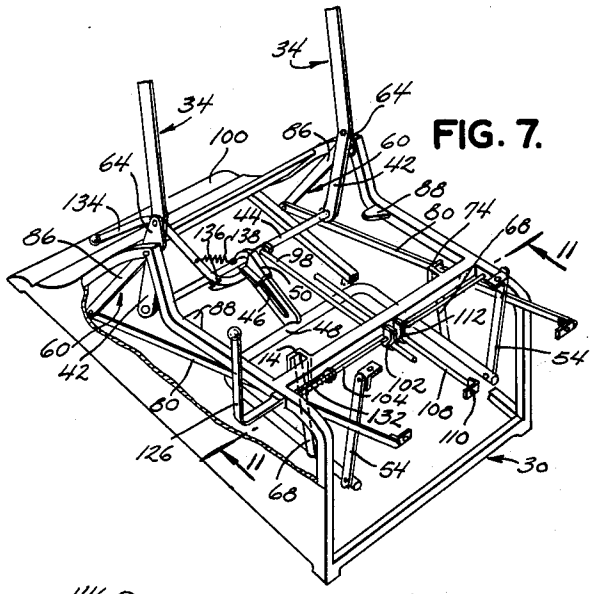


FIG. 7.

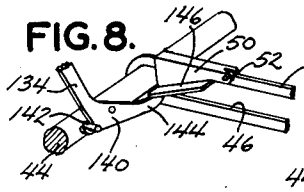


FIG. 8.

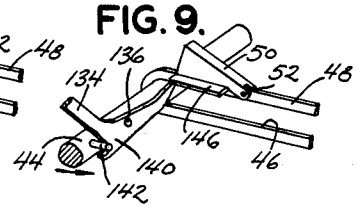


FIG. 9.

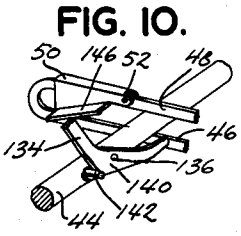


FIG. 10.

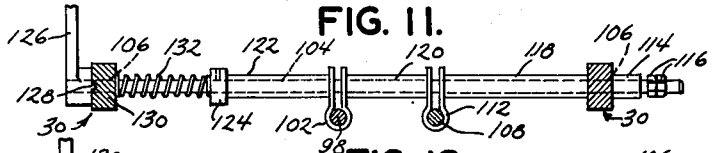


FIG. 11.

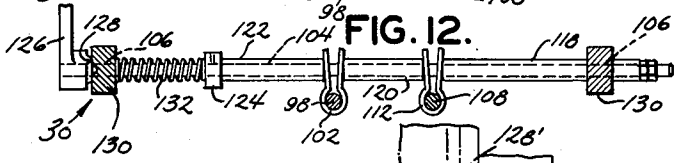


FIG. 12.

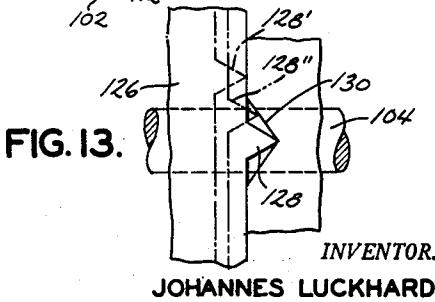


FIG. 13.

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FIG. 14.

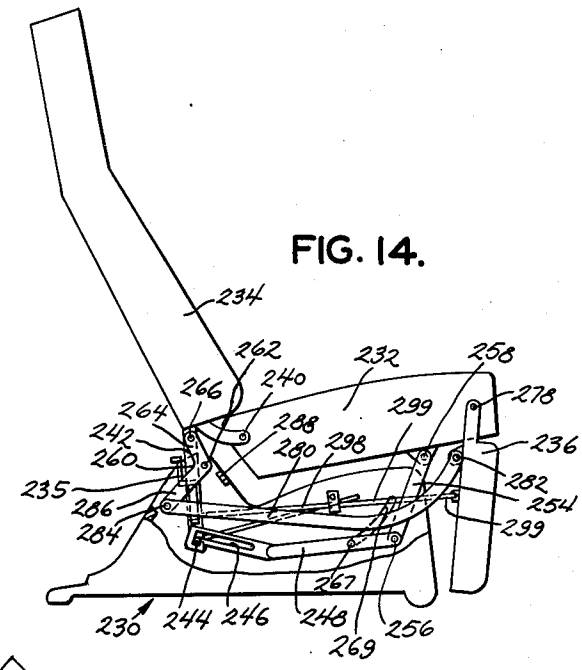


FIG. 15.

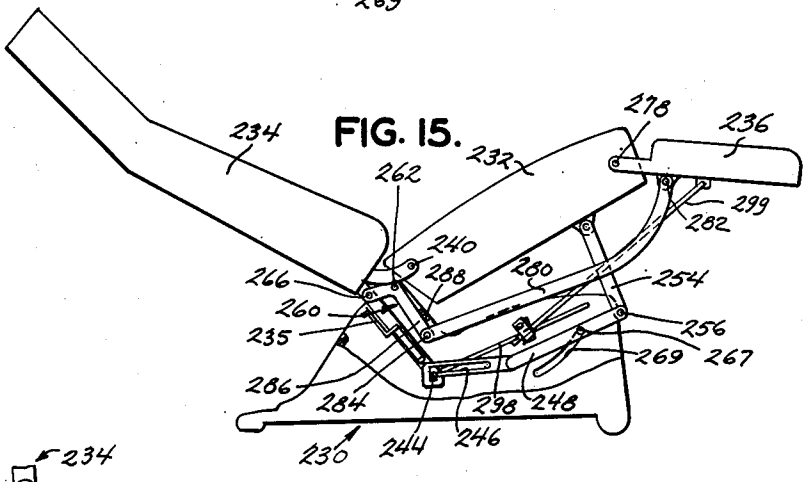
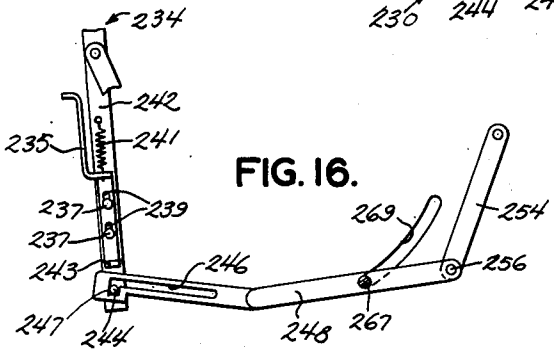


FIG. 16.



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UNITED STATES PATENT OFFICE

2,615,497

RECLINING ARTICLE OF FURNITURE

Johannes Luckhardt, Berlin, Germany, assignor to Anton Lorenz, Buffalo, N. Y.

Application May 26, 1949, Serial No. 95,413

17 Claims. (Cl. 155—106)

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This invention relates to articles of furniture and more particularly to a reclining article of furniture, wherein a seat and a back-rest constitute movable members of a link-system and wherein the movements of a leg-rest swingably mounted on the seat may be controlled by a controlling mechanism responsive to movements of the back-rest.

An object of the present invention is to provide a reclining article of furniture wherein the seat and back-rest may be brought from a sitting position through a somewhat reclined or tilted position into an extreme reclined position and wherein, during the movement of the seat and back-rest into said tilted position, the leg-rest may be propelled from its sitting position into a position at a great angle relative to the seat in which relative position the leg-rest substantially remains during a movement of the seat and back-rest from the tilted position into the extreme reclined position.

A further object of this invention is to provide a reclining chair with controlled relative movements of its seat, back-rest and leg-rest, which may be readily converted into a bed-like furniture.

Another object of the present invention is to improve on the art of reclining articles of furniture as now ordinarily made.

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 described hereinafter and 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 wall of the support being broken away,

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

Fig. 3 is a simplified diagrammatical illustration of the type of linkages of the chair according to the invention.

Fig. 4 is a side elevational view of the chair shown in Fig. 1, wherein, however, the movable members thereof are in a tilted position,

Fig. 5 is a side elevational view of the chair shown in Fig. 1, wherein, however, the movable members thereof are in a reclined position,

Fig. 6 is a side elevational view of the chair shown in Fig. 1, wherein, however, the back-rest, seat and leg-rest are brought into a substantially horizontal position,

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Fig. 7 is a fragmentary perspective view of the support and mechanisms of the chair shown in Fig. 1, some parts being broken away or being omitted,

Fig. 8 is a perspective view of a detail of the mechanism of the chair shown in Fig. 1,

Figs. 9 and 10 are perspective views of the same detail as shown in Fig. 8, wherein, however, the elements of said detail are in different positions,

Fig. 11 is a sectional view taken on line 11—11 of Fig. 7, illustrating the locking mechanism of the chair,

Fig. 12 is a sectional view similar to that shown in Fig. 11, wherein, however, the elements of the locking mechanism are in releasing position,

Fig. 13 is an elevational view of a portion of the locking mechanism shown in Fig. 12,

Fig. 14 is a side elevational view of another embodiment of a reclining chair according to the invention, a portion of a side wall of the support being broken away,

Fig. 15 is a side elevational view of the chair shown in Fig. 14, wherein the movable members of the chair are in a reclined position, and

Fig. 16 is a fragmentary elevational view of a detail of the chair shown in Fig. 14.

Referring now to Figs. 1 and 4–7, 30 generally indicates a support made of a suitable framework covered by a suitable covering material. 32 generally indicates a seat carried by a suitable seat frame, 34 generally indicates a back-rest carried by a suitable backrest-frame and 36 generally indicates a leg-rest carried by a suitable legrest-frame.

On each side of the chair the back-rest 34 is provided with a lug 38 rigidly connected with said back-rest. The rear end portion of the seat 32 is pivoted to said lugs 38 of the back-rest 34 at 40.

The downwardly extending portions 42 of the frame of the back-rest 34 are connected with each other by a cross-rod 44 slidably and rotatably engaged with a slot 46 of a lower connecting link 48, the portion end of which is in the shape of a U (see Figs. 1 and 7). As best shown in Figs. 1, 7 and 8, the cross-rod 44 of the backrest-frame 34 is normally held in rotatable engagement with the left-hand end of the slot 46 of the lower connecting link 48 by means of a cap-like member 50 swingably mounted on the lower connecting link 48 at 52. Said member 50 drops by its own weight into the locking position shown in Fig. 8 for holding the back-rest 34 in pivotal connection with the lower connecting-link 48.

On each side of the chair the lower end of a front connecting link 54 is pivoted to an arm of

the lower connecting link 48 at 56. The upper end of each of said front connecting links 54 is pivoted to the seat 32 at 58.

On each side of the chair a bell-crank lever generally indicated by 60 is swingably mounted on the support 30 at 62. The upper arm 64 of said bell-crank lever 60 pivoted to the back-rest 34 at 66 acts as a first guiding link.

Moreover, on each side of the chair the lower end of a second guiding link 68 is pivoted to the lower connecting link 48 at 70. The upper end of each second guiding link 68 is swingably mounted on the support 30 at 72.

When the movable members of the chair are in the sitting position shown in Fig. 1, said guiding link 68 is in loose engaging abutment with a stop 74 mounted on the support 30.

On each side of the chair the frame of the leg-rest 36 is swingably mounted on a forward extension 76 of the seat-frame 32 at 78. On each side of the chair, the front end portion of a controlling link 80 is pivoted to the leg-rest 36 at 82. The rear end portion of each controlling link 80 is pivoted at 84 to the lower arm 86 of the bell-crank lever 60 acting as a controlling arm.

For a purpose to be described hereinafter, a stop 88 is arranged on the support 30 on each side of the chair. Said stop 88 is arranged for co-operation with the downward extension 42 of the back-rest 34 and for cooperation with the controlling arm 86 of the bell-crank lever 60.

Fig. 2 diagrammatically illustrates the linkages of the chair shown in Fig. 1, the links shown in Fig. 2 being of the same lengths and proportions as in said Fig. 1. For a better understanding of the link-systems of the chair according to the invention, Fig. 3 illustrates the same type of linkages as Fig. 2, the links and proportions of the links, however, being chosen differently. In Fig. 3 the various links corresponding to links shown in Fig. 2 have been indicated by the same reference numerals as in Fig. 2 with the only difference that the letter *a* has been added.

As may be gathered from Figs. 2 and 3, the chair comprises a series of connected links including the seat 32, the back-rest 34, the lower connecting link 48 and the front connecting link 54, said links being in pivotal connection. A first guiding link 64 swingably mounted on a stationary point of the support at 62 is pivoted at 66 to the back-rest 34 constituting a link of said series of connected links. A second guiding link 68 swingable on the stationary point 72 of the support is pivoted to the lower connecting link 48 at 70.

According to Fig. 1, on each side of the chair, the front end of an arm-rest 90 is pivoted to the extension 76 of the seat 32 at 78. Said arm-rest 90 has a bore 92 in slidable engagement with a rod 94 pivoted to the back-rest 34 at 96. Said arm-rest does not form a part of above-described link-systems including the back-rest 34, the seat 32 and the leg-rest 36.

When an occupant rests in the chair, the weight of the seat 32 and the weight of the person resting on the seat act through the front connecting link 54 and lower connecting link 48 on the pivot 70 between the lower connecting link 48 and guiding link 68 in the direction of the arrow A (Fig. 1) whereby the guiding link 68 is urged against the stop 74.

Now when the occupant of the chair exerts pressure on the back-rest 34, the force transmitted at this time through the lower extension 42 of the back-rest 34 and the lower connecting link 48 on the pivot 70, which force acts in a direction opposite to the direction of the arrow A, will be smaller than the force acting in the direction of the arrow A on said pivot 70, so that the guiding link 68 will be held in engagement with the stop 74 and, consequently, the pivot 70 remains in its position acting as a stationary pivot around which the lower connecting link 48 of the series of connected links 32, 34, 48, 54 may swing. During this time the series of connected links 32, 34, 48, 54 is guided by the guiding link 64 swinging around the stationary pivot 62. Consequently, the seat 32 and back-rest 34 constituting links of said series of connecting links will reach the partly reclined or tilted position shown in Fig. 4 wherein the angle between the seat 32 and back-rest 34 is not changed at all or is only slightly changed if compared with the angle between said seat and back-rest in the sitting position of Fig. 1. Said tilted position of the seat 32 and back-rest 34 is limited by an abutment of the controlling arm 86 against the stop 88. It may be noted that in this position the guiding link 68 is still in engagement with the stop 74.

Owing to the rigid connection between the controlling arm 86 and the guiding link 64, both members forming a part of the bell-crank lever 60, the leg-rest 36 connected to the controlling arm 86 through the medium of the controlling link 80 is propelled into the position shown in Fig. 4 during above-described movement of the seat 32 and back-rest 34 from the sitting position shown in Fig. 1 into the tilted position shown in Fig. 4. It may be noted that the angle between the leg-rest 36 and seat 32 has been considerably increased during said movement from the sitting position into the tilted position, so that the leg-rest 36 is almost in a horizontal position, although the back-rest 34 has been reclined only to a small degree. Said tilted position of the seat 32, back-rest 34 and leg-rest 36 is very convenient for watching television programs, for example.

As soon as the controlling arm 86 abuts against the stop 88, as described above, the pivot 66 on the guiding link 64 rigidly connected with said controlling arm 86 becomes stationary during a further movement of the back-rest 34 in counter-clockwise direction (as viewed in Fig. 4). Consequently, the pressure exerted by the occupant of the chair on the back-rest 34 overcomes the force acting on the pivot 70 in the direction of the arrow A (see Fig. 1), so that, now, the guiding link 68 is disengaged from the stop 74. During a movement of the back-rest 34 from the tilted position shown in Fig. 4 into an extreme reclined position shown in Fig. 5, the back-rest 34 constituting a link of the series of connected links 32, 34, 48, 54 swings about the now stationary pivot 66 and the guiding link 68 pivoted to the lower connecting link 48 swings about the pivot 72. The seat 32 is now more reclined than in the tilted position shown in Fig. 4 and the angle between the seat 32 and the back-rest 34 in the reclined position is larger than the angle between said two members in the tilted position.

During the movement of the seat 32 and back-rest 34 from the tilted position shown in Fig. 4 into the reclined position shown in Fig. 5, the controlling arm 86 remains in abutting engagement with the stop 88. Consequently, the leg-rest 36 is held in an elevated position through the medium of the controlling link 80. The angle between leg-rest 36 and seat 32, although being somewhat smaller than the angle between said members in the tilted position shown in Fig.

4, is still large. When the movable members of the chair are brought into the reclined position shown in Fig. 5, they offer a comfortable resting position for the occupant of the chair. The extreme reclined position of the movable members of the chair is limited by a self-locking characteristic of the link-system according to the embodiment shown in the drawing. However, if desired, said extreme reclined position of the movable members of the chair could be limited by a stop arranged on the support and acting, for example, on the guiding link 68 limiting the swinging movement of the latter.

The movable members of the chair may be readily returned from the extreme reclined position into the tilted position and into the sitting position when the occupant of the chair shifts the weight of his body forwardly. A slight pressure on the leg-rest 36 may assist in returning the movable members of the chair from the tilted position shown in Fig. 4 into the sitting position shown in Fig. 1.

In order to enable the occupant of the chair to lock the movable members of the chair in any suitable position, the chair is equipped with a locking mechanism which, for clearness' sake is shown only in Figs. 7 and 11–13.

As there is a double-link-system, the series of connected links 32, 34, 48 and 54 and a link-chain 36, 88, 60, the locking mechanism is designed in such a way that it may act simultaneously on a link of said series of connected links and on a link of said link-chain.

As best shown in Fig. 7, the rear end portion of a first locking rod 98 is pivoted to the cross-rod 44 of the frame of the back-rest 34 at 100. The front end portion of said locking rod 98 is slidably engaged with a clamping sleeve 102, the upwardly extending arms of which are provided with bores engaged with a transverse rod 104 slidably engaged with bores 106 of the side frames of the support 30 (see Figs. 7, 11 and 12).

Furthermore, the front end portion of a second locking rod 108 is pivotally connected at 110 with the leg-rest (not shown in Fig. 7). The rear end portion of said second locking rod 108 is slidably engaged with a clamping sleeve 112, the upwardly extending arms of which are provided with bores slidably engaged with above-mentioned transverse rod 104.

As best shown in Figs. 11 and 12, an abutting collar 114 is loosely arranged on the projecting end of the transverse rod 104 between the support 30 and stop nuts 116 screwed on the threaded end of the transverse rod 104. A first spacing tube 118 is loosely arranged on the transverse rod 104 between the frame of the support 30 and the clamping sleeve 112. A second spacing tube 120 is loosely arranged on the transverse rod 104 between the two clamping sleeves 102 and 112. A third spacing tube 122 is loosely arranged between the clamping sleeve 102 and a set collar 124 rigidly connected with the transverse rod 104. A handle 126 provided with a nose 128 capable of engagement with a recess 130 arranged on the frame of the support 30 (see Figs. 7, 11 and 13) is rigidly connected with the projecting end of the transverse rod 104. A spring 132 wound around the transverse rod 104 and arranged between the set collar 124 and the frame of the support 30 tends to urge the transverse rod 104 and the handle 126 connected therewith in right-hand direction, as viewed in Fig. 11.

When the elements of the locking mechanism are in the position shown in Fig. 11, and shown in full lines in Fig. 13, the nose 128 of the handle 126 is in engagement with the recess 130 and the spring 132 causes a clamping effect of the clamping sleeve 102 and 112 on the locking rods 102 and 108 through the medium of the spacing tubes 122, 120 and 118, so that the movable members of the chair are held in a predetermined position.

When the occupant of the chair desires to bring the movable members of the chair in a different position, the handle 126 is turned from the position shown in Fig. 11 into the position shown in Fig. 12, so that the nose 128 is disengaged from the recess 130 and reaches the position 128' shown in dash and dot lines in Fig. 13, wherein said nose rests on the outer surface of the frame of the support 30. As best shown in Fig. 12, said rotation of the handle 126 results in a compression of the spring 132 by means of the set collar 124 and in a release of the resilient arms of the clamping sleeves 102 and 112, as the spacing tubes 122 and 120 may follow the sidewise movement of the set collar 124. Said release of the arms of the clamping sleeves 102 and 112 results, in turn, in a release of the locking rods 98 and 108, so that the occupant of the chair may readily move the movable members of the chair from one position into another one. The movable members of the chair remain in said released condition as long as the nose of the handle 126 is in the position 128'. If the movable members of the chair shall be locked in said position, the handle 126 is returned into its starting position shown in Fig. 11 whereby the nose 128 is brought into engagement with the recess 130, permitting the spring 132 to urge the collar 124 towards the clamping sleeves 102 and 112 causing a tightening thereof on the locking rods 98 and 108, by means of the spacing tubes 122, 120 and 118.

If desired, the occupant of the chair may rotate the handle 126 only to a certain degree, so that the nose of the handle reaches only an intermediate position 128'' as shown in Fig. 13, wherein the nose is still in engagement with the inclined surface of the recess 130. Said intermediate position 128'' is sufficient for a release of the locking rods 98 and 108 so as to permit the occupant of the chair to bring the movable members of the chair from one position into another one. Said intermediate position 128'' of the nose of the handle 126, however, has the advantage that after release of the handle 126, the latter is automatically returned by the action of the spring 132 into the position shown in Fig. 11, wherein the locking rods 98 and 108 are locked and the movable members of the chair are held in a certain position.

The reclining chair shown in Figs. 1–7 is also provided with means to convert same into a bed-like furniture.

As long as the cap-like member 50 pivoted to the lower connecting link 48 is in the position shown in Figs. 1, 2–7 and 8, the cross-rod 44 of the frame of the back-rest 34 is held in engagement with the left-hand end of the slot 46 of the lower connecting link 48, so as to provide for a pivotal connection between the back-rest 34 and the lower connecting link 48. As best shown in Figs. 7–10, a handle 134 is swingably mounted on the cross-rod 44 at 136. A spring 138 stretched between the cross-rod 44 and the handle 134 tends to urge same into the position shown in Figs. 7 and 8, wherein a lug 140 of the latter abuts against a stop 142 arranged on the

cross-rod 44 and wherein the lower end 144 of said handle 134 is in loose engagement with the lower surface of a lug 146 arranged on the cap-like member 50.

When it is desired to convert the reclining chair into a bed-like furniture, said handle 134 is swung about its pivot 136 against the action of the spring 138 whereby the cap-like member 50 is lifted into the position shown in Fig. 9. Now, the cross-rod 44 is released and the back-rest 34 may be swung into a substantially horizontal position as shown in Fig. 6. Said substantially horizontal position of the back-rest 34 is limited by an abutment of its lower extension 42 against the stop 88. During said movement of the back-rest 34 into said substantially horizontal position, the cap-like member 50 drops automatically by its own weight into the position shown in Fig. 10 and the handle 134 is automatically returned into its starting position by the spring 138. Furthermore, during said movement of the back-rest into said substantially horizontal position, the leg-rest 36 may be propelled through the medium of the bell-crank lever 60 and the controlling link 80 into the substantially horizontal position shown in Fig. 6. The seat 32 is, likewise, in its substantially horizontal sitting position limited by the abutment of the right-hand end of the slot 46 of the lower connecting link 48 against the cross-rod 44 held in turn, in its position by the abutment of the lower extension 42 of the back-rest 34 against the stop 88.

When it is desired to re-convert the article of furniture into a chair, the back-rest 34 is swung upwardly until the cross-rod 44 reaches the left-hand end of the slot 46. During said movement of the back-rest 34, the cap-like member 50 is lifted by the cross-rod 44 and drops automatically into its locking position shown in Fig. 8 by the action of its own weight.

If desired, the gap between the leg-rest 36 and the seat 32 in the positions shown in Figs. 4, 5 and 6 may be covered by a member (not shown) attached to the seat and resting on the leg-rest.

According to the embodiment shown in Figs. 14–16, the reclining chair again comprises a double-link-system including a series of connected links and a link-chain. The series of connected links includes the seat 232, the back-rest 234, the lower connecting link 248 and the front connecting link 254, said links being in pivotal connection at 240, 244, 256 and 258 respectively. The link-chain comprises the leg-rest 236, the controlling link 280 and the bell-crank lever 260 swingable on the support 230 at 262; the leg-rest 236 is pivoted to the seat 232 at 278, one end of the controlling link 280 is pivoted to the leg-rest 236 at 282, the other end of said controlling link 280 is pivoted at 284 to the controlling arm 286 of the bell-crank lever 260 and the upper arm or guiding link 264 of said bell-crank lever 260 is pivoted to the downward extension 242 of the back-rest 234 at 266.

According to the embodiment of the chair shown in Figs. 14–16, however, there is a pin and slot connection 267, 269 between the lower connecting link 248 and the support 230. The pin 267 carried by the lower connecting link 248 is slidably engaged with the slot 269 of the support 230.

When the movable members of the chair are in the sitting position shown in Fig. 14, the pin 267 arranged on the lower connecting link 248 is in loose abutting engagement with the lower end of the slot 269, said end acting as a stop.

During the movement of the movable members of the chair from said sitting position shown in Fig. 14 into a tilted position corresponding to the position of the movable members of the chair shown in Fig. 4, the pin 267 of the lower connecting link 248 of the chair shown in Fig. 14 remains in abutting engagement with the lower end of said slot 269, so that the lower connecting link 248 may swing about the point 267.

During a movement of the movable members of the chair shown in Fig. 14 from a tilted position corresponding to the position shown in Fig. 4 into a reclined position shown in Fig. 15, the bell-crank lever 260 is held in its position by a stop 288 against which it rests and the lower connecting link 248 is guided by the slot 269 wherein the pin 267 slides.

The movable members of the chair may be held in any desired position by a locking mechanism comprising a first locking rod 298 connected to the downward extension 242 of the back-rest and a second locking rod 299 connected to the leg-rest 236. Said locking mechanism, being of the same construction as the locking mechanism described above in connection with Figs. 7 and 11–13 is only partly shown in Figs. 14 and 15 for clearness sake.

The operation of the chair shown in Figs. 14 and 15 with respect to the displacement of its movable members corresponds entirely to the operation of the chair described above in connection with Figs. 1–13. There is only the difference that the lower connecting link 248 is guided by cooperating sliding means 267, 269 instead of by a guiding link.

In order to convert the chair shown in Figs. 14 and 15 into a bed-like furniture, the chair is provided with the following mechanism:

The lower connecting link 248 has a slot 246 at its rear end portion. As best shown in Fig. 16, the left-hand end 247 of said slot 246 is at a right angle to the main portion of the slot 246. As long as the chair is used as a chair and, consequently, the back-rest 234 should be in a pivotal connection with the lower connecting link 248, a pin or rod 244 carried by the lower extension 242 of the back-rest 234 is in rotatable engagement with said branched-off portion 247 of the slot 246 so as to provide for a pivotal connection between the back-rest 234 and the lower connecting link 248.

When it is desired to convert the chair into a bed-like furniture, said pivotal connection between the back-rest 234 and the lower connecting link 248 must be disengaged. For this purpose, a pushing element 235 slidably mounted on the downward extension 242 of the back-rest 234 by means of pins and slots 237, 239 is pushed downwardly by hand or foot against the action of a spring 241 stretched between said pushing element 235 and said downward extension 242 of the back-rest 234. During such a downward pushing of the pushing element 235 a lug 243 or the like projecting from the main body of the pushing element is brought into engagement with the lower connecting link 248, so that the latter is swung somewhat about the point 267 with the result that the pin or rod 244 becomes disengaged from the branched-off end 247 of the slot 246 and enters the slot proper wherein it may be shifted longitudinally for swinging the back-rest into a substantially horizontal position.

After release of the pushing element 235, the

latter is automatically returned into its original position by means of the spring 241.

If it is desired to re-convert the article of furniture into a chair, the back-rest is merely swung upwardly until the pin or rod 244 reaches the left-hand end of the slot 246, whereupon the lower connecting link 248 swings automatically in clockwise direction about the point 267 by the action of the weight of the seat acting through the front connecting link 254 on the front end portion of the lower connecting link 248. Owing to said clockwise movement of the lower connecting link 248, the pin or rod 244 of the back-rest 234 enters again the branched-off end 247 of the slot 246, whereby the pivotal connection between the back-rest 234 and the lower connecting link 248 is reinstated.

I have described preferred embodiments of my invention, but it is understood that this disclosure is for the purpose of illustration and that various omissions 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.

For example, the upper arm of the bell-crank lever 60 or 260 acting as a guiding link could also be pivoted to the seat 32 or 232 instead of to the back-rest 234 or 34.

Furthermore, instead of a pin-and-slot connection 267, 269 between the lower connecting link 248 and the support 230 any other suitable cooperating sliding cam means could be used.

What I claim is:

1. A reclining article of furniture comprising: a support, connected links including a seat, a back-rest, a lower connecting link and a front connecting link, said lower connecting link and said front connecting link being arranged below the plane of said seat and being pivotally connected with each other at one of their ends, the other end of said lower connecting link being in pivotal connection with said back-rest, the other end of said front connecting link being pivotally connected with the front end portion of said seat, the rear end portion of said seat being pivoted to said back-rest at a point spaced from the connection of the latter with the lower connecting link, a guiding link swingable on said support and pivoted to one of said connected links other than said connecting links, cooperating guiding means slidably engaged with each other and arranged on said support and on said lower connecting link, a leg-rest swingably mounted on the front end portion of said seat, a controlling link pivoted at one of its ends to said leg-rest, and a controlling arm in rigid connection with said guiding link, said controlling arm being in pivotal connection with the other end of said controlling link.

2. A reclining article of furniture comprising: a support, connected links including a seat, a back-rest, a lower connecting link and a front connecting link, said lower connecting link and said front connecting link being arranged below the plane of said seat and being pivotally connected with each other at one of their ends, the other end of said lower connecting link being in pivotal connection with said back-rest, the other end of said front connecting link being pivotally connected with the front end portion of said seat, the rear end portion of said seat being pivoted to said back-rest at a point spaced from the connection of the latter with the lower connecting link, a guiding link swingable on said support and pivoted to said back-rest, cooperating guiding means slidably engaged with each other and arranged on said support and on said lower connecting link, a leg-rest swingably mounted on the front end portion of said seat, a controlling link pivoted at one of its ends to said leg-rest, and a controlling arm in rigid connection with said guiding link, said controlling arm being in pivotal connection with the other end of said controlling link.

3. A reclining article of furniture comprising: a support, connected links including a seat, a back-rest, a lower connecting link and a front connecting link, said lower connecting link and said front connecting link being arranged below the plane of said seat and being pivotally connected with each other at one of their ends, the other end of said lower connecting link being in pivotal connection with said back-rest, the other end of said front connecting link being pivotally connected with the front end portion of said seat, the rear end portion of said seat being pivoted to said back-rest at a point spaced from the connection of the latter with the lower connecting link, a guiding link swingable on said support and pivoted to one of said connected links other than said connecting links, cooperating guiding means slidably engaged with each other and arranged on said support and on said lower connecting link, a leg-rest swingably mounted on the front end portion of said seat, a controlling link pivoted at one of its ends to said leg-rest, a controlling arm in rigid connection with said guiding link, said controlling arm being in pivotal connection with the other end of said controlling link, a first stop arranged on said support for loose abutting engagement with the guiding means arranged on the lower connecting link so as to limit an extreme position thereof wherein the movable members of the article are in a sitting position, and a second stop arranged on said support, said second stop acting on said guiding link so as to limit an extreme position thereof after a movement of the movable members of the article from the sitting position into an intermediate reclined position whereby the pivotal connection between the link of the connected links and said guiding link is held stationary during a continuation of the movement of the back-rest into an extreme reclined position while the guiding means arranged on the lower connecting link is disengaged from said first stop.

4. In a reclining article of furniture as claimed in claim 3, a pin- and slot-connection between said support and said lower connecting link, an end of said slot acting as said first stop.

5. In a reclining article of furniture as claimed in claim 3, the pivotal connection between the back-rest and the lower connecting link being disengageable, and holding means arranged on the article for acting on said back-rest so as to hold same in a substantially horizontal position after disengagement of said pivotal connection between the back-rest and the lower connecting link.

6. In a reclining article of furniture as claimed in claim 3, a pin- and slot-connection between the back-rest and the lower connecting link, locking means associated with said pin- and slot-connection for holding the elements thereof in a predetermined relative position rendering said connection a pivotal connection, actuating means associated with said locking means for releasing the elements of said pin- and slot-con-

nection so as to permit a relative sliding movement between the pin and the slot, and holding means arranged on the article for acting on said back-rest so as to hold same in a substantially horizontal position after a release of the elements of said pin- and slot-connection.

7. In a reclining article of furniture as claimed in claim 3, the pivotal connection between the back-rest and the lower connecting link being disengageable, and said second stop being arranged for abutting engagement with said back-rest so as to hold same in a substantially horizontal position after disengagement of said pivotal connection between the back-rest and the lower connecting link.

8. In a reclining article of furniture as claimed in claim 3, said guiding link being pivoted to said back-rest.

9. A reclining article of furniture comprising: a support, connected links including a seat, a back-rest, a lower connecting link and a front connecting link, said lower connecting link and said front connecting link being arranged below the plane of said seat and being pivotally connected with each other at one of their ends, the other end of said lower connecting link being in pivotal connection with said back-rest, the other end of said front connecting link being pivotally connected with the front end portion of said seat, the rear end portion of said seat being pivoted to said back-rest at a point spaced from the connection of the latter with the lower connecting link, a guiding link swingable on said support and pivoted to said back-rest, cooperating guiding means slidably engaged with each other and arranged on said support and on said lower connecting link, a leg-rest swingably mounted on the front end portion of said seat, a controlling link pivoted at one of its ends to said leg-rest, a controlling arm in rigid connection with said guiding link, said controlling arm being in pivotal connection with the other end of said controlling link, a first stop arranged on said support for loose abutting engagement with the guiding means arranged on the lower connecting link so as to limit an extreme position thereof wherein the movable members of the article are in a sitting position, and a second stop arranged on said support for abutting engagement with said controlling arm rigidly connected with said guiding link so as to limit an extreme position of said guiding link after a movement of the movable members of the article from the sitting position into an intermediate reclined position whereby the pivotal connection between the back-rest and said guiding link is held stationary during a continuation of the movement of the back-rest into an extreme reclined position while the guiding means arranged on the lower connecting link is disengaged from said first stop, the pivotal connection between the back-rest and the lower connecting link being disengageable, and said second stop being arranged for abutting engagement with said back-rest so as to hold same in a substantially horizontal position after disengagement of said pivotal connection between the back-rest and the lower connecting link.

10. In a reclining article of furniture as claimed in claim 9, a second pin- and slot-connection between said support and said lower connecting link, an end of said slot of said second pin- and slot-connection acting as said first stop.

11. An article of repose for supporting the body of a person, comprising in combination: a support, a linkage comprising a seat structure, a back-rest structure and a chain of connecting links including a first connecting link at one end of the chain and a second connecting link at the other end of the chain, said first connecting link being pivoted to said back-rest structure, said second connecting link being pivoted to the front portion of said seat, the rear end portion of said seat structure being pivoted to said back-rest structure at a point spaced from the pivotal connection between the latter and the first connecting link, a double-armed guiding member swingably mounted on said support, one arm of said double-armed guiding member being pivoted to at least one structure of said seat- and back-rest structures, additional guiding means connected to said support and operatively engaged with at least one connecting link of said chain of connecting links, a leg-rest swingably mounted on the front portion of said seat structure, a controlling link pivoted at one of its ends to said leg-rest, the other end of said controlling link being pivoted to the other arm of said double-armed guiding member, and a stop arranged on said support for abutting engagement with said double-armed guiding member upon a movement of the movable members of the article from the sitting position into an intermediate reclined position whereby said pivotal connection between one arm of the double-armed guiding member and at least one of said structures is held in a fixed position so as to act as a fulcrum during a continuation of the movement of the movable members of the article into an extreme reclined position.

12. An article of repose for supporting the body of a person, comprising in combination: a support, a linkage comprising a seat structure, a back-rest structure and a chain of connecting links including a first connecting link at one end of the chain and a second connecting link at the other end of the chain, said first connecting link being pivoted to said back-rest structure, said second connecting link being pivoted to the front portion of said seat, the rear end portion of said seat structure being pivoted to said back-rest structure at a point spaced from the pivotal connection between the latter and the first connecting link, a double-armed guiding member swingably mounted on said support, one arm of said double-armed guiding member being pivoted to at least one structure of said seat- and back-rest structures, additional guiding means connected to said support and operatively engaged with at least one connecting link of said chain of connecting links, said additional guiding means being capable of guiding said connecting link along a predetermined path and of causing a swinging movement of said connecting link about a predetermined axis, a leg-rest swingably mounted on the front portion of said seat structure, a controlling link pivoted at one of its ends to said leg-rest, the other end of said controlling link being pivoted to the other arm of said double-armed guiding member, limiting means associated with said guiding means for rendering same partially ineffective and limiting its effectiveness to act as a fulcrum for a swinging movement of the connecting link during a movement of the movable members of the article from the sitting position into an intermediate reclined position, and a stop arranged on said support for abutting engagement with said double-armed guiding member upon said movement of the movable members of the article from the sitting position into an interme-

diate reclined position whereby said pivotal connection between one arm of the double-armed guiding member and at least one of said structures is held in a fixed position so as to act as a fulcrum during a continuation of the movement of the movable members of the article into an extreme reclined position.

13. An article of repose for supporting the body of a person, comprising in combination: a support, a linkage comprising a seat structure, a back-rest structure and a chain of connecting links including a first connecting link at one end of the chain and a second connecting link at the other end of the chain, said first connecting link being pivoted to said back-rest structure, said second connecting link being pivoted to the front portion of said seat, the rear end portion of said seat structure being pivoted to said back-rest structure at a point spaced from the pivotal connection between the latter and the first connecting link, a double-armed guiding member swingably mounted on said support, one arm of said double-armed guiding member being pivoted to at least one structure of said seat- and back-rest structures, an additional guiding link swingably mounted on said support and pivotally connected with at least one connecting link of said chain of connecting links, a leg-rest swingably mounted on the front portion of said seat structure, a controlling link pivoted at one of its ends to said leg-rest, the other end of said controlling link being pivoted to the other arm of said double-armed guiding member, a first stop arranged on said support for abutting engagement with said additional guiding link so as to prevent same from rotation in one direction and to hold the pivotal connection between said guiding link and said connecting link in a fixed position so as to act as a fulcrum for said connecting link during a movement of the movable members of the article from the sitting position into an intermediate reclined position, and a second stop arranged on said support for abutting engagement with said double-armed guiding member upon said movement of the movable members of the article from the sitting position into an intermediate reclined position whereby said pivotal connection between one arm of the double-armed guiding member and at least one of said structures is held in a fixed position so as to act as a fulcrum during a continuation of the movement of the movable members of the article into an extreme reclined position.

14. An article of repose for supporting the body of a person, comprising in combination: a support, a linkage comprising a seat structure, a back-rest structure and a chain of connecting links including a first connecting link at one end of the chain and a second connecting link at the other end of the chain, said first connecting link being pivoted to said back-rest structure, said second connecting link being pivoted to the front portion of said seat, the rear end portion of said seat structure being pivoted to said back-rest structure at a point spaced from the pivotal connection between the latter and the first connecting link, a double-armed guiding member swingably mounted on said support, one arm of said double-armed guiding member being pivoted to at least one structure of said seat- and back-rest structure, additional guiding means connected to said support and operatively engaged with at least one connecting link of said chain of connecting links, a leg-rest swingably mounted on the front portion of said seat structure, a controlling link pivoted at one of its ends to said leg-rest, the other end of said controlling link being pivoted to the other arm of said double-armed guiding member, and a stop arranged on said support for abutting engagement with said double-armed guiding member upon a movement of the movable members of the article from the sitting position into an intermediate reclined position whereby said pivotal connection between one arm of the double-armed guiding member and the back-rest structure is held in a fixed position so as to act as a fulcrum during a continuation of the movement of the movable members of the article into an extreme reclined position.

15. An article of respose for supporting the body of a person, comprising in combination: a support, a linkage comprising a seat structure, a back-rest structure and a chain of connecting links including a first connecting link at one end of the chain and a second connecting link at the other end of the chain, said first connecting link being pivoted to said back-rest structure, said second connecting link being pivoted to the front portion of said seat, the rear end portion of said seat structure being pivoted to said back-rest structure at a point spaced from the pivotal connection between the latter and the first connecting link, a double-armed guiding member swingably mounted on said support, one arm of said double-armed guiding member being pivoted to at least one structure of said seat- and back-rest structure, an additional guiding link swingably mounted on said support and pivotally connected with at least one connecting link of said chain of connecting links, a leg-rest swingably mounted on the front portion of said seat structure, a controlling link pivoted at one of its ends to said leg-rest, the other end of said controlling link being pivoted to the other arm of said double-armed guiding member, a first stop arranged on said support for abutting engagement with said additional guiding link so as to prevent same from rotation in one direction and to hold the pivotal connection between said guiding link and said connecting link in a fixed position so as to act as a fulcrum for said connecting link during a movement of the movable members of the article from the sitting position into an intermediate reclined position, and a second stop arranged on said support for abutting engagement with said double-armed guiding member upon said movement of the movable members of the article from the sitting position into an intermediate reclined position whereby said pivotal connection between one arm of the double-armed guiding member and said back-rest structure is held in a fixed position so as to act as a fulcrum during a continuation of the movement of the movable members of the article into an extreme reclined position.

16. In an article of repose as claimed in claim 13, the pivotal connection between the back-rest structure and the first connecting link being disengageable whereby said back-rest structure together with the leg-rest connected with the former may be moved into a substantially horizontal position while said seat structure remains in its sitting position, and said second stop being arranged for abutting engagement with said back-rest structure when the latter is in its substantially horizontal position.

17. In an article of repose as claimed in claim

13, the pivotal connection between the back-rest structure and the first connecting link forming a part of a pin- and slot-connection between said members, locking means associated with said pin- and slot-connection for normally holding the elements thereof in a predetermined relative position making same a pivotal connection, and actuating means associated with said locking means for releasing the element of said pin- and slot-connection so as to permit a relative sliding movement between the pin and the slot of said connection whereby said back-rest structure together with the leg-rest connected with the former may be moved into a substantially horizontal position while said seat structure remains in its sitting position, and said second stop being arranged for abutting engagement

with said back-rest structure when the latter is in its substantially horizontal position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,353,838	Lorenz	July 18, 1944
2,433,520	Lorenz	Dec. 30, 1947
2,478,770	Lorenz	Aug. 9, 1949

FOREIGN PATENTS

Number	Country	Date
53,406	Netherlands	Nov. 16, 1942