

Dec. 30, 1947.

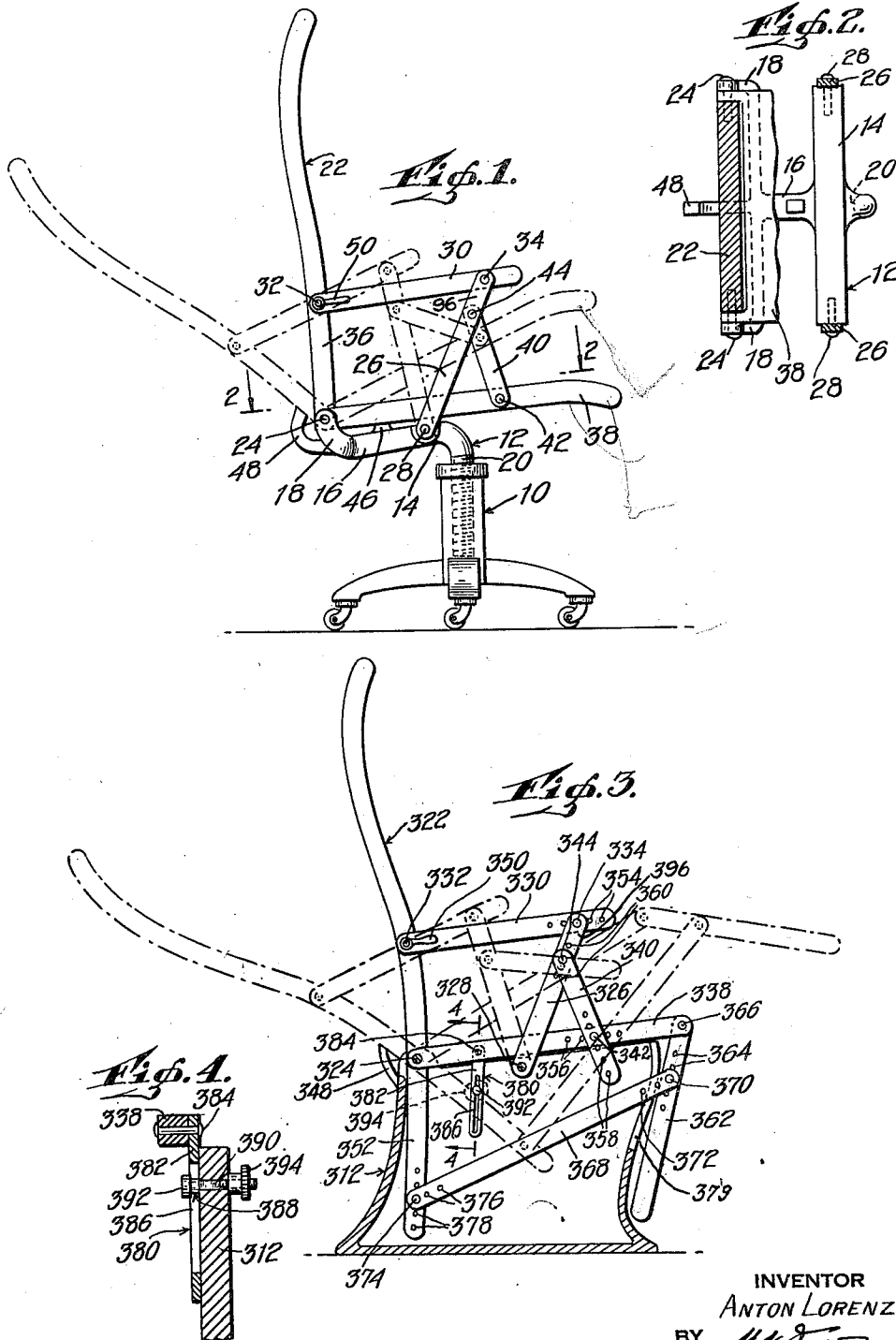
A. LORENZ

2,433,520

RECLINING ARTICLE OF FURNITURE

Filed March 1, 1945

2 Sheets-Sheet 1



INVENTOR
ANTON LORENZ
BY *Anton Lorenz*
ATTORNEY

Dec. 30, 1947.

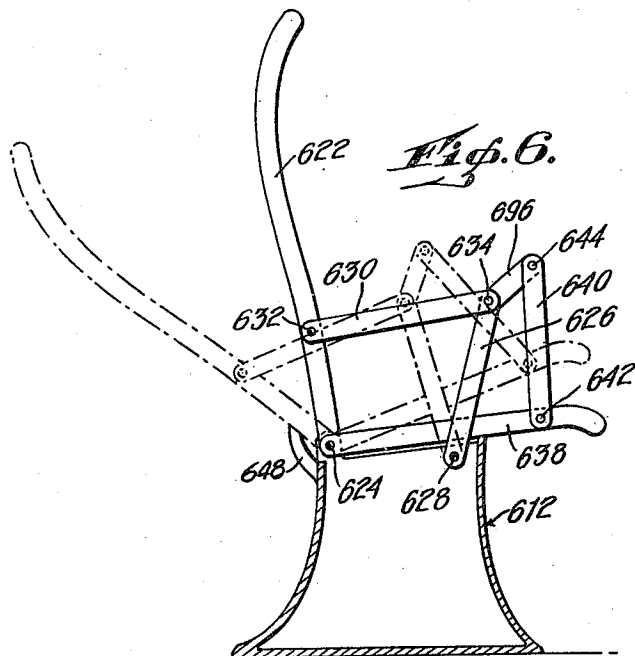
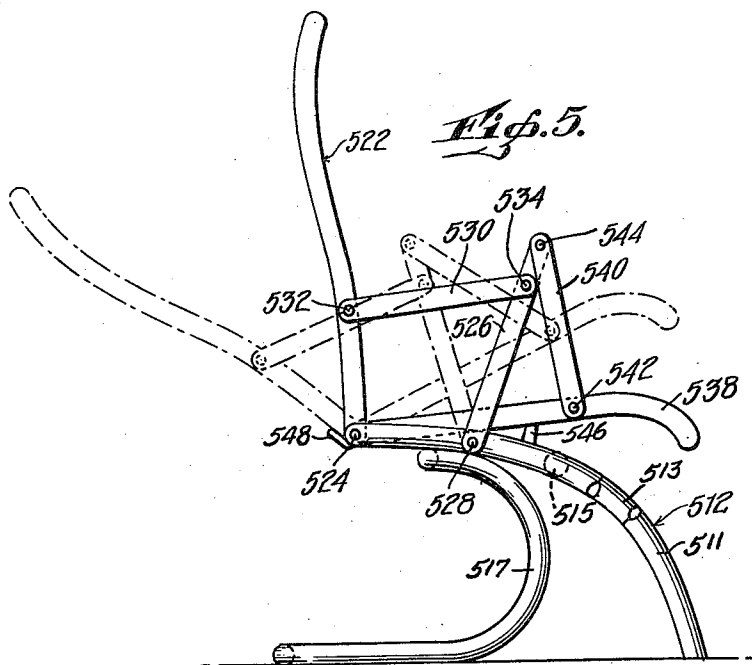
A. LORENZ

2,433,520

RECLINING ARTICLE OF FURNITURE

Filed March 1, 1945

2 Sheets-Sheet 2



INVENTOR
ANTON LORENZ
BY *John F. Fair*
ATTORNEY

UNITED STATES PATENT OFFICE

2,433,520

RECLINING ARTICLE OF FURNITURE

Anton Lorenz, Buffalo, N. Y.

Application March 1, 1945, Serial No. 580,377

11 Claims. (Cl. 155-106)

1

My invention relates to articles of furniture, and more particularly to a reclining article of furniture wherein the seat and the back-rest form movable links of a polygonal compound linkage swingably mounted on a support, a portion of the latter forming the stationary link of said linkage.

An object of the present invention is to provide a reclining article of furniture wherein the change in the angle between the back-rest and the seat during a movement of said members may be readily adapted to the requirements of users of the article of furniture.

Another object of the present invention is to provide a reclining article of furniture of above described type with means, by which the user of the article of furniture may alter the inclination of the back-rest while the seat is held in a predetermined position.

A further object of the present invention is to provide a reclining article of furniture of above described type with means, by which the user of the article of furniture may alter the inclination of the seat while the back-rest is held in a predetermined position.

Still another object of the present invention is to provide a reclining article of furniture of above described type with means, by which the user of the article of furniture may alter the degree of the change in the inclination of the back-rest from the sitting position into the extreme reclining position while the degree of the change in the inclination of the seat from the sitting position into the extreme reclining position remains substantially unchanged.

A further object of the present invention is to provide a reclining article of furniture of above described type with means, by which the user of the article of furniture may alter the degree of change in the inclination of the seat from the sitting position into the extreme reclining position while the degree of the change in the inclination of the back-rest from the sitting position into the extreme reclining position remains substantially unchanged.

Still another object of the present invention is to improve a reclining article 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 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 an adjustable desk chair according to the invention,

Fig. 2 is a sectional view of the desk chair shown in Fig. 1, taken on line 2-2, a portion of the seat being broken away,

2

Fig. 3 is a vertical sectional view of an adjustable reclining chair with a leg-rest according to the invention,

Fig. 4 is a sectional view of a locking device arranged on the chair shown in Fig. 3 taken on line 4-4 of Fig. 3, in an enlarged scale,

Fig. 5 is a side elevational view of another embodiment of an adjustable reclining chair according to the invention, and

Fig. 6 is a vertical sectional view of still another embodiment of an adjustable reclining chair according to the invention.

Referring now to Figs. 1 and 2, 10 generally indicates a pedestal of a desk chair, which may be of any conventional type. A supporting member 12 comprising a cross bar 14 and an extension 16 having an arm 18 on each side of the chair is carried by a spindle 20 screwed into a threaded bore of the pedestal 10.

As best shown in Fig. 1, the rear end portion of a seat 38 is pivoted to the support 12 at 24. On each side of the chair, the lower end portion of a controlling link 40 is pivoted to said seat at 42. The upper end portion of said controlling link is pivotally connected at 44 with a guiding link 26. The lower end portion of said guiding link 26 is pivoted to the cross bar 14 of the support 12 at 28 at a point spaced from the pivotal connection 24 between the seat 38 and the support 12. Said seat 38, said controlling link 40, said guiding link 26 and the stationary portion of the support 12 between the pivotal connection 28 of the guiding link 26 with the support and the pivotal connection 24 of the seat 38 with the support 12 form the links of a four-bar link-mechanism.

The lower end 36 of a back-rest 22 is pivoted to the seat 38 at 24 in coaxial alignment with the pivotal connection between the seat 38 and the support 12. On each side of the chair, the rear end of a connecting link 30 constituting an arm-rest is pivoted to an intermediate point 32 of said back-rest 22 above the pivotal connection 24 between the back-rest 22 and the seat 38. The front end of each connecting link 30 is pivotally connected at 34 with an extension 96 of the guiding link 26. According to the drawings, said extension 96 of the guiding link 26 projecting beyond the pivotal connection 44 of the guiding link 26 with the controlling link 40 is integral with said guiding link.

As will be apparent from above, the seat 38 and the back-rest 22 form movable links of a polygonal compound linkage comprising the movable links 38, 40, 26-96, 30, 36 and the stationary portion 28-24 of the support.

When the user of the chair leans the weight of his body against the back-rest 22 so as to bring same into the reclined position shown in dash and dot lines, the seat 38 is lifted by means of the

[The page contains a large, dense block of text that has been completely redacted with black ink. The redaction covers the entire body of the document, leaving only the header and footer areas visible.]

movable members of the chair connected therewith are firmly held in their position.

If the members of the chair are connected with each other as shown in Fig. 3, the members may be held in any desired position by tightening either one of said two locking devices 350 or 380.

If the user of the chair wishes to have the back-rest at a different angle relative to the seat when the latter is in a certain position, he may hold the seat in said certain position by a tightening of the locking device 380. The other locking device 350 remains in loose condition. Now the user of the chair may change the position of the pivotal connection 344 between the connecting link 330 and the guiding link 326 by inserting the pin 334 into another hole of the series of holes 354, whereby the angle between the back-rest 322 and the seat 338 may be changed.

When the user of the chair wishes to have the seat in a different position relative to the back-rest when the latter is in a certain reclined position, the back-rest is held in said position by a tightening of the locking device 350 while the locking device 380 remains in loose condition. Now the user of the chair may bring the seat into a different position relative to the back-rest by altering the position of the pivotal connection 342 and/or 344 by inserting the respective pins into another hole of the series of holes 356, 358 and/or 360.

Above described change in the position of the back-rest 322 and/or the seat 338 causes a change in the degree of change of angularity between the back-rest and the seat during a movement from the sitting position into the reclined position. If the back-rest alone is adjusted in a different position, the degree of change of the inclination of the seat will remain substantially unchanged. If the seat alone is adjusted in a different position, the degree of change of the inclination of the back-rest will remain substantially unchanged.

In a similar manner, a change of the position of the pivotal connections 370 and/or 374 by inserting the pins in different holes results in a change in the movement of the leg-rest 362 relative to the seat 338.

According to the embodiment of a chair, shown in Fig. 5, the support 512 comprises two side bars 511, 513 of tubular material, one on each side of the chair, which are connected with each other by a bracing member 515 and are mounted on a base member 517 of an integral piece of tubular material by welding, for example. The rear end of the seat 538 is swingably mounted on the support 512 at 524. On each side of the chair, the lower end portion of a controlling link 540 is pivoted to the seat 538 at 542. The upper end portion of said controlling link 540 is pivoted at 544 to the upper end of a guiding link 526, the lower end of which is pivoted to the support 512 at 528 at a point spaced from the pivotal connection 524 between the support 512 and the seat 538. The seat 538, the controlling link 540, the guiding link 526 and the stationary portion of the support 512 between the pivots 528 and 525 form a four-bar link mechanism.

The back-rest 522 is swingably mounted at 524 on the seat 538 in coaxial alignment with the pivotal connection of the latter with the support 512. On each side of the chair, the rear end portion of a connecting link 530 is pivoted to an intermediate point 532 of the back-rest 522 in a plane above the plane of the seat 538. The front end of the connecting link 530 is pivoted at

534 to an intermediate point of the guiding link 526 between the pivotal connection 544 of the guiding link 526 with the controlling link 540 and the pivotal connection 528 of the guiding link 526 with the support 512.

The sitting position of the movable members of the chair is limited by a stop 546 mounted on the support 512 for cooperation with the seat 538. When the back-rest 522 is swung about its pivot 524 into the extreme reclined position limited by an abutment of the back-rest 522 against the stop 546 mounted on the support 512, the movable members of the chair are likewise brought into a reclined position as shown in dash and dot lines in Fig. 5.

The mechanism of the chair shown in Fig. 6 substantially corresponds to the mechanism of the chair shown in Fig. 5. In Fig. 6, 622 indicates the back-rest, pivotally connected with the seat 638 and the support 612 at 624. 626 indicates the guiding link pivoted to the support at 628. One end of the connecting link 630 is pivoted to the back-rest at 632, the other end of said connecting link is pivoted to an intermediate point of said guiding link 626 at 634. 640 indicates the controlling link, one end of which is pivoted to the seat 638 at 642, the other end of which is pivoted to the upper end 696 of the guiding link 626 at 644. In contrast to the showing of Fig. 5 the guiding link 626 of the chair shown in Fig. 6 is in the shape of a bent link. During a movement of the back-rest 622 from its sitting position into the reclined position shown in dash and dot lines, the seat 638 is brought into the reclined position shown in dash and dot lines.

Above described Fig. 6 illustrates a further modification of the mechanism according to the invention by the use of a bent link for the guiding link 626, whereby a further variation in the degree of the change of the angle between the back-rest and the seat during a movement therefrom the sitting position into the reclined position is rendered possible.

The sitting position of the movable members of the chair shown in Fig. 6 is limited by the upper edge of the support 612 against which the seat 638 comes to a rest. The extreme reclined position of the movable members of the chair is limited by a stop 648 mounted on the support 612 for cooperation with the back-rest 622.

I have described preferred embodiments of my invention, but it is understood that this disclosure is for the purpose of illustration, that the invention may also be applied to various other types of reclining articles of furniture, such as garden chairs, chairs for use in railroad cars, chairs for use in airplanes, sofas, lounges, etc., 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.

What I claim is:

1. A reclining article of furniture, comprising: a support, a seat pivoted to said support at its rear end portion, a guiding link, the lower portion of said guiding link being pivoted to said support at a point spaced from the pivotal connection between the seat and the support, a controlling link, the lower portion of said controlling link being pivoted to the front portion of said seat, the upper end portion of said controlling link being pivoted to the upper portion of said guid-

ing link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link-mechanism, a back-rest, said back-rest being pivoted to the rear portion of said seat, and a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, and the front portion of said connecting link being pivoted to a point of the guiding link spaced from its pivotal connection with the controlling link.

2. A reclining article of furniture, comprising: a support, a seat pivoted to said support at its rear end portion, a guiding link, the lower portion of said guiding link being pivoted to said support at a point spaced from the pivotal connection between the seat and the support, a controlling link, the lower portion of said controlling link being pivoted to the front portion of said sheet, the upper end portion of said controlling link being pivoted to the upper portion of said guiding link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link-mechanism, said guiding link having an extension projecting beyond its pivotal connection with the controlling link, a back-rest, said back-rest being pivoted to the rear portion of said sheet, and a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, and the front portion of said connecting link being pivoted to said extension of the guiding link.

3. A reclining article of furniture, comprising: a support, a seat pivoted to said support at its rear end portion, a guiding link, the lower portion of said guiding link being pivoted to said support at a point spaced from the pivotal connection between the seat and the support, a controlling link, the lower portion of said controlling link being pivoted to the front portion of said seat, the upper end portion of said controlling link being pivoted to the upper portion of said guiding link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link-mechanism, a back-rest, said back-rest being pivoted to the rear portion of said seat, and a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, and the front portion of said connecting link being pivoted to an intermediate point of the guiding link between its pivotal connections with the controlling link and the support.

4. A reclining article of furniture, comprising: a support, a seat pivoted to said support at its rear end portion, a guiding link, the lower portion of said guiding link being pivoted to said support at a point spaced from the pivotal connection between the seat and the support, a controlling link, the lower portion of said controlling link being pivoted to the front portion of said seat, the upper end portion of said controlling link being pivoted to the upper portion

of said guiding link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link-mechanism, a back-rest, said back-rest being pivoted to the rear portion of said seat in coaxial alignment with the pivotal connection between the seat and the support, and a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, and the front portion of said connecting link being pivoted to a point of the guiding link spaced from its pivotal connection with the controlling link.

5. A reclining article of furniture, comprising:
a support, a seat pivoted to said support at its
rear end portion, a guiding link, said guiding
20 link being in the shape of a bent link, the lower
portion of said guiding link being pivoted to said
support at a point spaced from the pivotal con-
nection between the seat and the support, a con-
trolling link, the lower portion of said controlling
25 link being pivoted to the front portion of said
seat, the upper end portion of said controlling
link being pivoted to the upper portion of said
guiding link, said seat, said controlling link, said
guiding link and the stationary portion of the
30 support between the pivotal connections of the
guiding link with the support and of the seat
with the support forming the links of a four-bar
link-mechanism, a back-rest, said back-rest be-
ing pivoted to the rear portion of said seat, and
35 a connecting link, the rear end of said connect-
ing link being pivoted to an intermediate point of
said back-rest above the pivotal connection be-
tween the back-rest and the seat, and the front
portion of said connecting link being pivoted to
40 a point of the guiding link spaced from its piv-
otal connection with the controlling link.

6. A reclining article of furniture, comprising:
a support, a seat pivoted to said support at its
rear end portion, a guiding link, the lower portion
45 of said guiding link being pivoted to said
support at a point spaced from the pivotal con-
nection between the seat and the support, a con-
trolling link, the lower portion of said controlling
link being pivoted to the front portion of
50 said seat, the upper end portion of said controlling
link being pivoted to the upper portion of
said guiding link, said seat, said controlling link,
said guiding link and the stationary portion of
the support between the pivotal connections of
55 the guiding link with the support and of the seat
with the support forming the links of a four-
bar link-mechanism, a back-rest, said back-rest
being pivoted to the rear portion of said seat, a
connecting link, the rear end of said connecting
60 link being pivoted to an intermediate point of
said back-rest above the pivotal connection be-
tween the back-rest and the seat, the front por-
tion of said connecting link being pivoted to a
point of the guiding link spaced from its pivotal
65 connection with the controlling link, and means
whereby the effective length of said guiding link
may be varied and adjusted.

7. A reclining article of furniture, comprising:
a support, a seat pivoted to said support at its rear
70 end portion, a guiding link, the lower portion of
said guiding link being pivoted to said support
at a point spaced from the pivotal connection be-
tween the seat and the support, a controlling link,
the lower portion of said controlling link being
75 pivoted to the front portion of said seat, the up-

per end portion of said controlling link being pivoted to the upper portion of said guiding link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link-mechanism, a back-rest, said back-rest being pivoted to the rear portion of said seat, a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, the front portion of said connecting link being pivoted to a point of the guiding link spaced from its pivotal connection with the controlling link, and means whereby the effective length of said controlling link may be varied and adjusted.

8. A reclining article of furniture, comprising: a support, a seat pivoted to said support at its rear end portion, a guiding link, the lower portion of said guiding link being pivoted to said support at a point spaced from the pivotal connection between the seat and the support, a controlling link, the lower portion of said controlling link being pivoted to the front portion of said seat, the upper end portion of said controlling link being pivoted to the upper portion of said guiding link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link-mechanism, a back-rest, said back-rest being pivoted to the rear portion of said seat, a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, the front portion of said connecting link being pivoted to a point of the guiding link spaced from its pivotal connection with the controlling link, and means whereby the effective length of said connecting link may be varied and adjusted.

9. A reclining article of furniture, comprising: a support, a seat pivoted to said support at its rear end portion, a guiding link, the lower portion of said guiding link being pivoted to said support at a point spaced from the pivotal connection between the seat and the support, a controlling link, the lower portion of said controlling link being pivoted to the front portion of said seat, the upper end portion of said controlling link being pivoted to the upper portion of said guiding link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link mechanism, a back-rest, said back-rest being pivoted to the rear portion of said seat, in coaxial alignment with the pivotal connection between the seat and the support, a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, the front portion of said connecting link being pivoted to a point of the guiding link spaced from its pivotal connection with the controlling link, and locking means associated with at least two members of the article, at least one of said members being a member of the linkage comprising said guiding link, said connecting link and the back-rest for locking said

linkage with the back-rest in a predetermined position.

10. A reclining article of furniture, comprising: a support, a seat pivoted to said support at its rear end portion, a guiding link, the lower portion of said guiding link being pivoted to said support at a point spaced from the pivotal connection between the seat and the support, a controlling link, the lower portion of said controlling link being pivoted to the front portion of said seat, the upper end portion of said controlling link being pivoted to the upper portion of said guiding link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link-mechanism, a back-rest, said back-rest being pivoted to the rear portion of said seat, a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, the front portion of said connecting link being pivoted to a point of the guiding link spaced from its pivotal connection with the controlling link, a leg-rest swingably mounted on the front portion of the seat, and means for controlling the movements of said leg-rest in dependence on the movements of a movable member of the article.

11. A reclining article of furniture, comprising: a support, a seat pivoted to said support at its rear end portion, a guiding link, the lower portion of said guiding link being pivoted to said support at a point spaced from the pivotal connection between the seat and the support, a controlling link, the lower portion of said controlling link being pivoted to the front portion of said seat, the upper end portion of said controlling link being pivoted to the upper portion of said guiding link, said seat, said controlling link, said guiding link and the stationary portion of the support between the pivotal connections of the guiding link with the support and of the seat with the support forming the links of a four-bar link-mechanism, a back-rest, said back-rest being pivoted to the rear portion of said seat, a connecting link, the rear end of said connecting link being pivoted to an intermediate point of said back-rest above the pivotal connection between the back-rest and the seat, the front portion of said connecting link being pivoted to a point of the guiding link spaced from its pivotal connection with the controlling link, a downward extension rigidly connected with said back-rest, a leg-rest swingably mounted on the front portion of the seat, a controlling member, said controlling member being pivoted at one of its ends to said downward extension of the back-rest and at its other end to said leg-rest, and means whereby the effective length of said controlling member may be varied and adjusted.

ANTON LORENZ.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
652,801	Moore	July 3, 1900
2,353,838	Lorenz	July 18, 1944