

- [54] **MANUALLY MOVABLE HEADREST FOR CHAIRS**
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- [51] Int. Cl. .... A47c 1/02, A47c 7/36
- [58] Field of Search ..... 297/396, 403, 61, 69

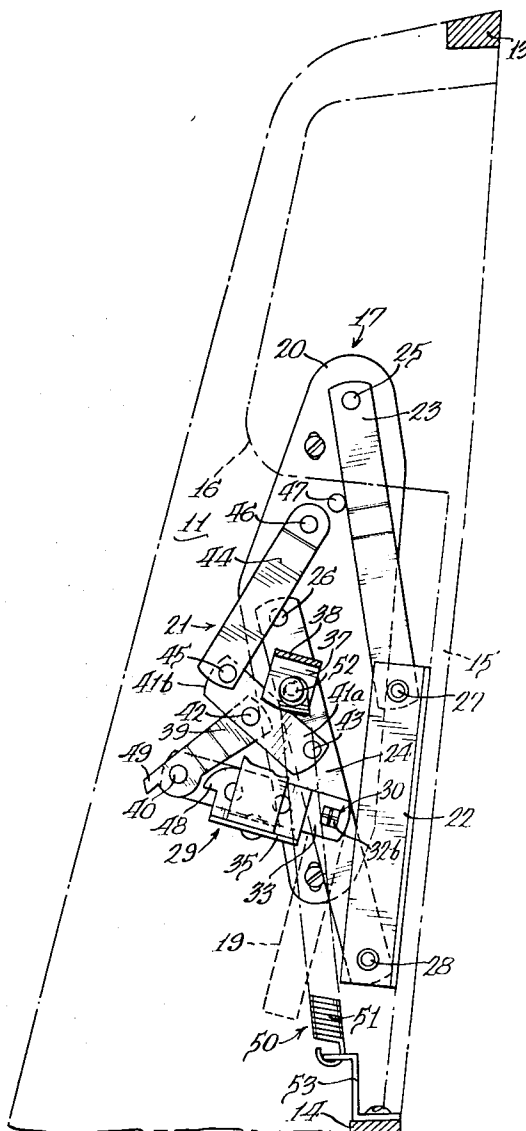
Primary Examiner—Casmir A. Nunberg  
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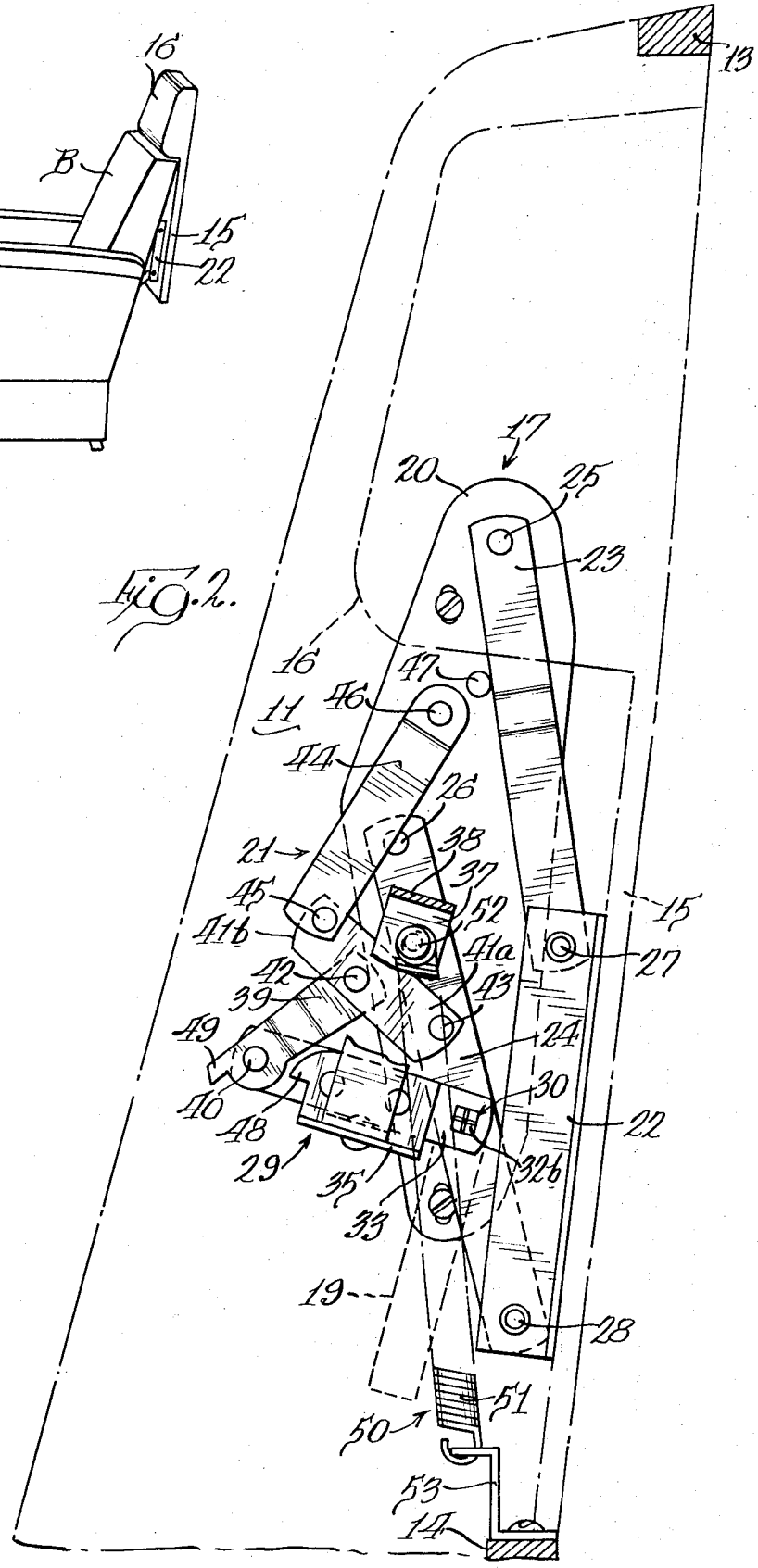
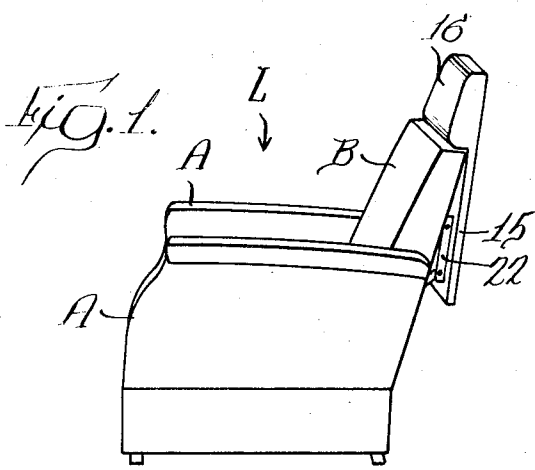
[57] **ABSTRACT**

A manually operated linkage means moves a back panel-headrest for a lounge chair between a retracted position and an extended position. Each of a pair of mounting plates on the sides of a cavity in the chair back is connected by a pair of movable links with brackets on the back panel to form four bar linkages, actuating linkage means connects each four bar linkage with a rock shaft, one of the rock shafts is provided with an operating handle, and a cross bar connects the linkages for simultaneous movement. Tension spring means connecting the linkage with the chair back is constantly under tension and moves through a point of maximum tension as the back panel-headrest moves between its retracted and extended positions, thereby urging the back panel-headrest against stops in both said positions.

- [56] **References Cited**  
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18 Claims, 5 Drawing Figures





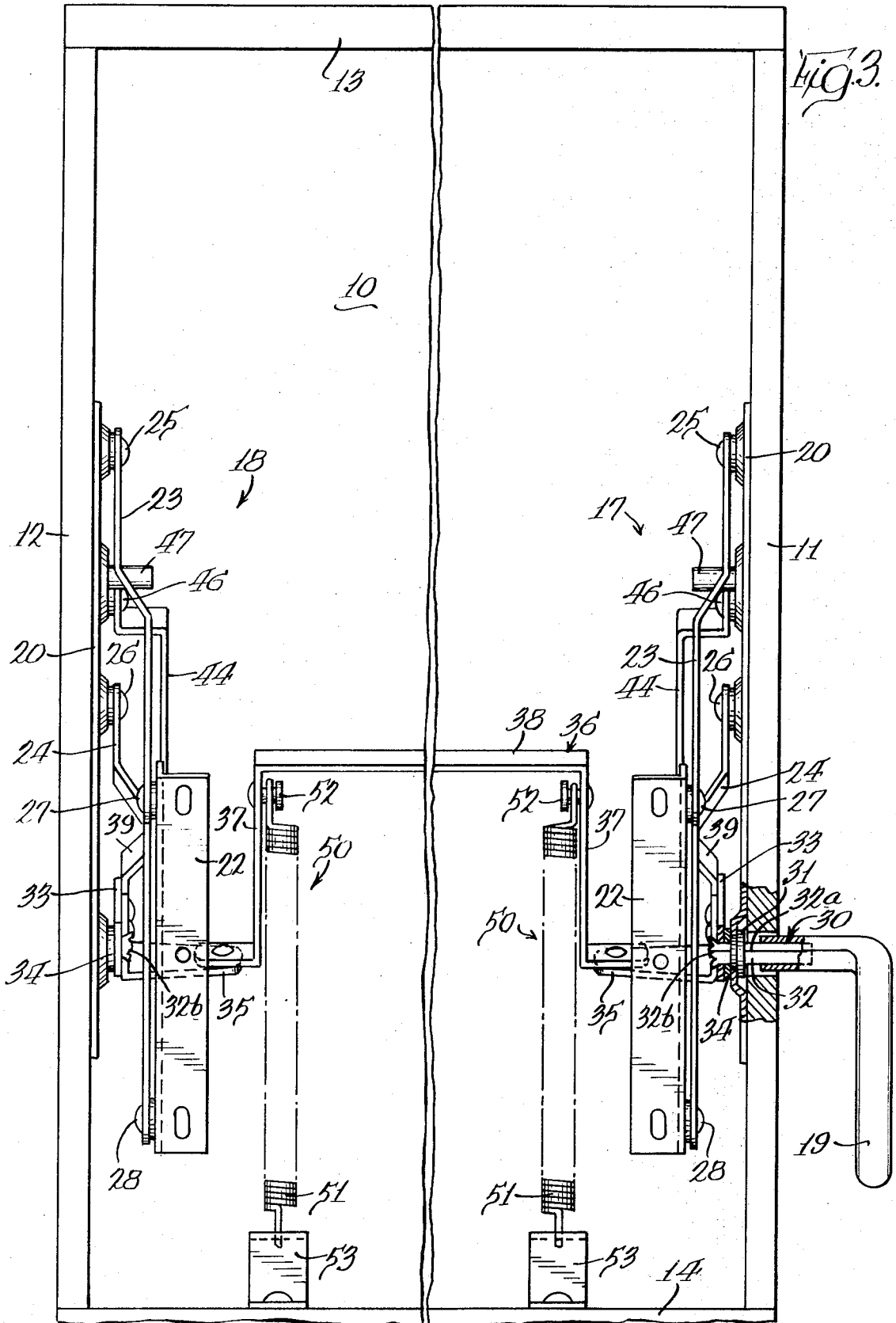
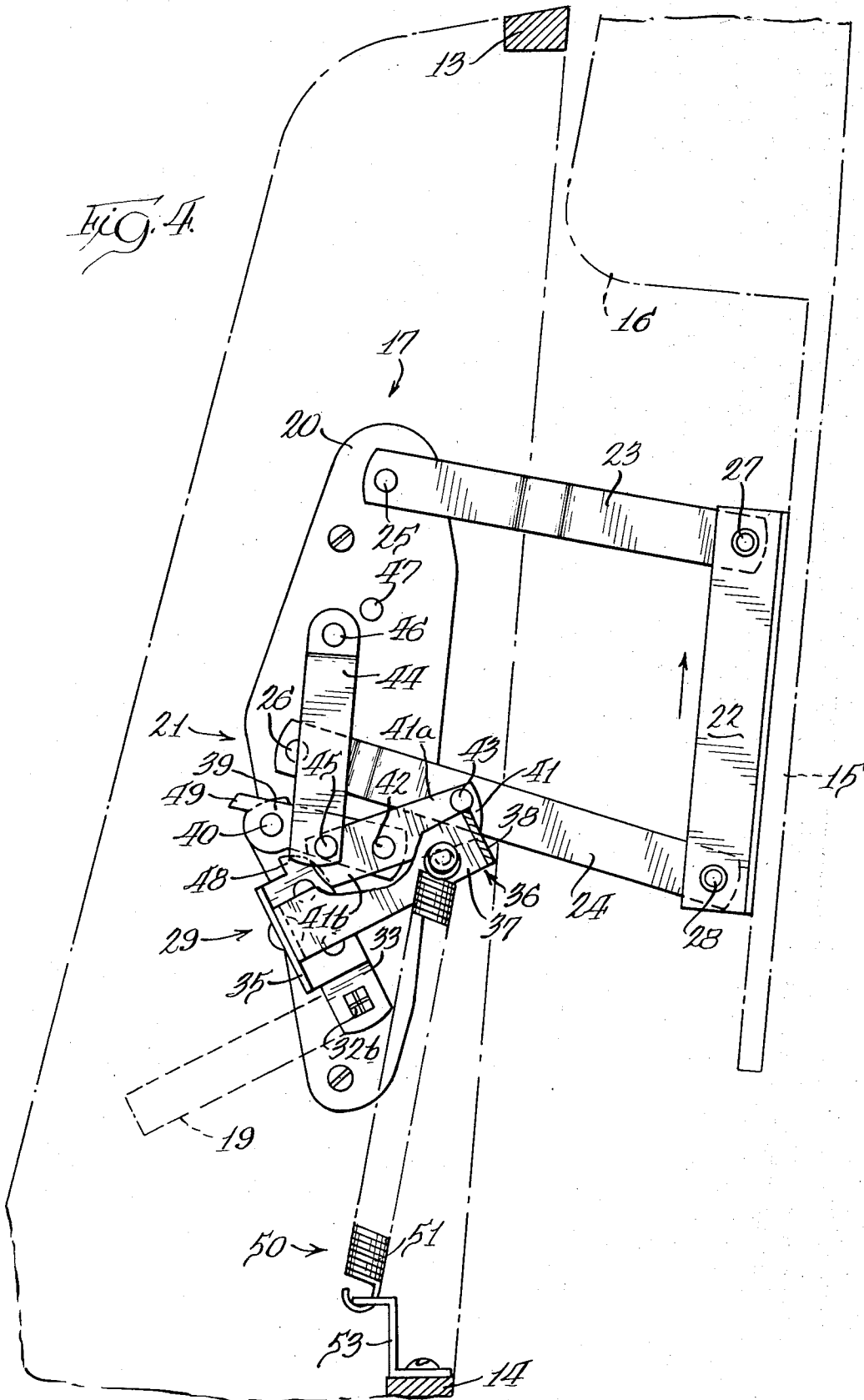
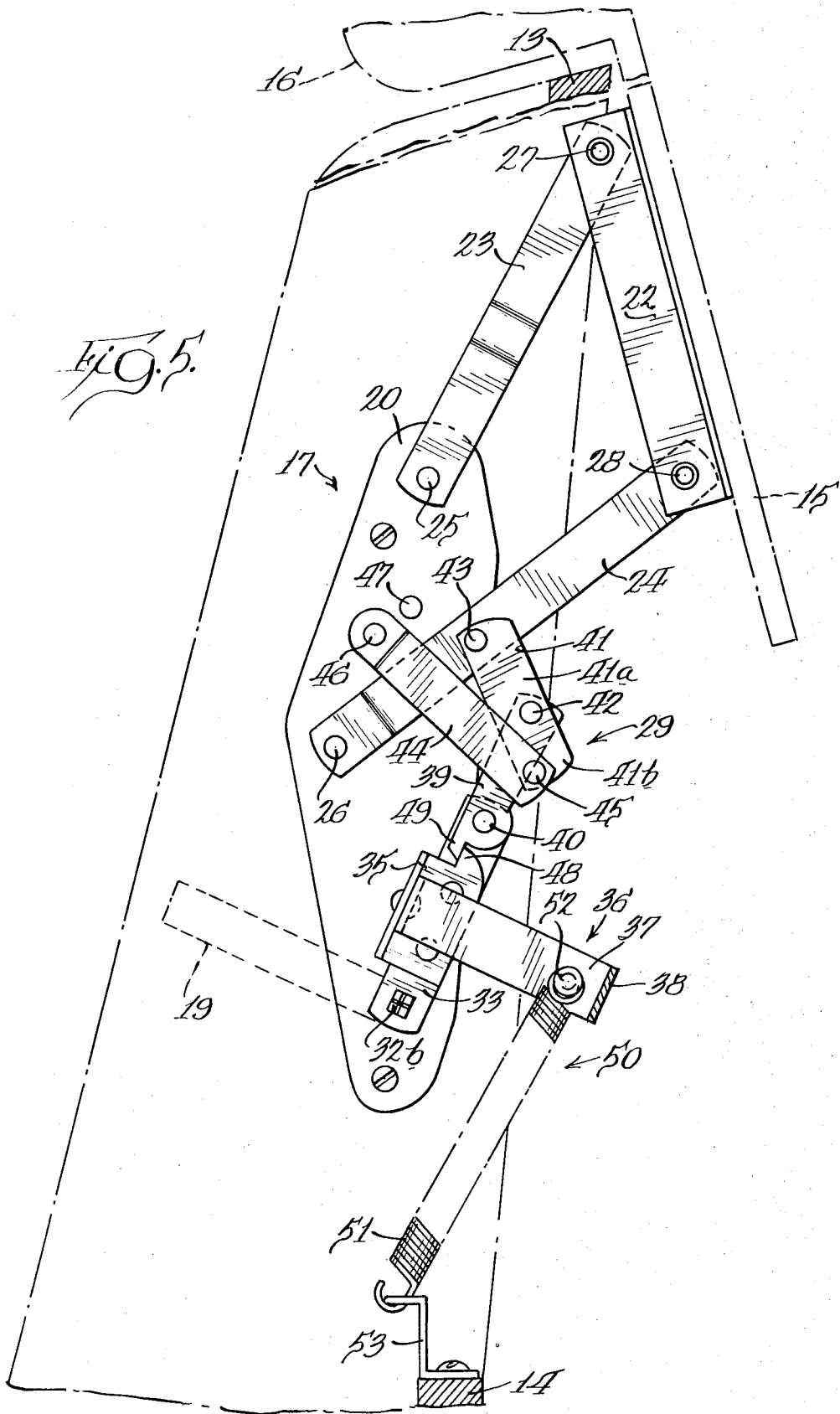


FIG. 4.





## MANUALLY MOVABLE HEADREST FOR CHAIRS

## BACKGROUND OF THE INVENTION

Upholstered lounge chairs, and particularly those which recline, look excessively high and bulky if the back is high enough to provide an adequate headrest for a person sitting in the chair. However, such lounge chairs, and reclining chairs in particular, need a headrest for maximum comfort of the occupant. Accordingly, many arrangements have been developed for providing lounge chairs with a headrest which is movable between a retracted position where it is usually concealed in a cavity in the back of the chair, and an extended position above the back of the chair.

In the case of reclining chairs, the mechanisms for extending and retracting the headrest are often directly linked to the reclining mechanism so that the headrest automatically extends when the chair is reclined and retracts when the chair is returned to upright position. However, this is not always the most desirable arrangement, because some people like to have the headrest available even in upright position of the chair; and in addition, manual headrest operating means has the advantage of being adaptable to lounge chairs which are not reclining chairs.

There have, heretofore, been few mechanisms for manually extending and retracting a headrest which are simple and inexpensive to manufacture, easily operated by a person sitting in the chair, and which are capable of positively holding the headrest in both its extended and retracted positions without manually operated latching means which must be released before the headrest can be moved.

## SUMMARY OF THE INVENTION

The principal object of the invention is to provide improved mechanisms for manually moving a headrest between a retracted position in a rearwardly open cavity in the chair back and an extended position above the chair back.

Yet another object of the invention is to provide such a mechanism which is easily operated by a person sitting in the chair by rotating an operating handle in either of two directions.

Yet another object of the invention is to provide a simple, rugged and inexpensive linkage mechanism for manually extending and retracting a headrest, with the linkage mechanism using only rotatable links without lost motion connections.

Still another object of the invention is to provide a manual headrest operating mechanism which has stops at the two limits of the travel of the headrest, and which is provided with tension spring means that urges the mechanism firmly against the stops in both of said limit positions so as to retain the headrest firmly in said positions while permitting it to be moved from either position solely by rotation of the operating handle.

## THE DRAWINGS

FIG. 1 is a perspective view of a lounge chair with a headrest of the present type in its extended position;

FIG. 2 is a vertical sectional view which shows the linkage means at one side of the chair back in the retracted position of the headrest with part of the connecting cross bar broken away for clarity of illustration, the back panel-headrest and the chair back being illus-

trated in broken lines except for certain back frame parts;

FIG. 3 is a fragmentary rear elevational view of the linkage means in the position of FIG. 2;

FIG. 4 is a view similar to FIG. 2 with the linkage means generally at the mid-point of its travel between retracted and extended positions; and

FIG. 5 is a view similar to FIG. 2 with the linkage means in the extended position of the headrest.

## DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings in greater detail, and referring first to FIG. 1, a lounge chair, indicated generally at L, includes upholstered arms A and an upholstered back B. As best seen in FIG. 3, the back B has a rearwardly open cavity 10 which is defined by side panels 11 and 12, a top cross rail 13 and a bottom cross rail 14. A back panel-headrest includes a back panel 15 surmounted by a forwardly projecting headrest 16; and as seen in FIG. 2, in the retracted position of the headrest it is received within the cavity 10 in the chair back and the back panel 15 substantially closes the cavity. As seen in FIGS. 1 and 5, in the extended position the back panel 15 is behind the top rail 13 and the headrest 16 is above the back B.

Referring now particularly to FIGS. 2 to 5, on the side panel 11 at the right hand side of the chair back is a back panel-headrest carrier means, indicated generally at 17, which has a counterpart, indicated generally at 18, on the left hand side panel 12 that is identical with the carrier 11 except for lacking any means to receive an operating handle 19 (FIG. 3) alongside the back where it is readily accessible to a person seated in the chair. Since the carrier means 17 and 18 are mechanically identical only the carrier means 17 will be described in detail herein.

A mounting plate 20 is secured on the side panel 11 by means of screws, and a collapsible and expandable linkage means, indicated generally at 21, is pivotally supported upon the mounting plate 20 and supports an angle bracket 22. The back panel 15 is secured to the angle brackets of the carrier means 17 and 18.

The collapsible and expandable linkage 21 includes an upper movable link 23 and a lower movable link 24 which are pivoted on the mounting plate 20 on vertically spaced pivots 25 and 26, respectively, and which are respectively pivotally connected to the angle bracket 22 by pivots 27 and 28. Thus, the mounting plate 20, the movable links 23 and 24 and the angle bracket 22 constitute a four bar linkage on which the back panel-headrest is moved between the retracted position of FIG. 2 and the extended position of FIG. 5.

The linkage means 21 also includes a drive linkage system, indicated generally at 29, which connects the lower movable link 24 with a rock shaft 30. As best seen in FIG. 3, the rock shaft 30 comprises a shoulder stud 31 which is journaled in a hole in the mounting plate 20 and has an integral square shaft 32 on one end portion 32a of which extends through the side panel 11 and receives the handle 19, and the other end portion 32b of which extends inwardly and carries an operating arm 33. A nylon washer 34 surrounds the shaft portion 32b between the mounting plate 20 and the arm 33; and the rock shaft is retained in place by upsetting its inner end portion 32b.

The arm 33 carries an angle bracket 35, and between said bracket 35 and its counterpart on the carrier means 18 is a cross member 36 that includes mounting arms 37 and a cross member 38. Thus, rotation of the rock shaft 30 by the handle 19 acts through the cross member 36 to cause simultaneous movement of the rock shaft in the carrier means 18.

The drive linkage system 29 also includes an intermediate link 39 which is pivoted at 40 on the free end of the arm 33 to form a toggle linkage, and a bell crank 41 which is fulcrumed at 42 on the intermediate link 39 and has a first arm 41a which is pivotally connected at 43 to the movable link 24. Finally, a control link 44 is pivotally connected at 45 to the second arm 41b of the bell crank 41, and has a pivotal connection 46 to the mounting plate 20.

Stop means is provided for limiting the travel of the collapsible and extendable linkage system 21 at the retracted position of the back panel-headrest and at the extended position thereof. An inwardly projecting stud 47 on the mounting plate 20 is positioned to be contacted by the movable link 23 when the mechanism is in the retracted position of the back panel-headrest. The stop means for limiting movement to the extended position includes a finger 48 at the outer end of the drive linkage arm 33 and a finger 49 at the adjacent end of the intermediate link 39, and as seen in FIG. 5 said fingers have straight edges which abut in the fully extended position of the linkage means.

In order that the back panel-headrest may be firmly retained in both its retracted and extended positions while permitting it to be moved from either position to the other by rotation of the handle 19, tension spring means, indicated generally at 50, is provided. The tension spring means comprises two tension springs 51, each of which has one end connected to a headed spring stud 52 on one of the mounting arms 37 of the cross member 36, and each of which has its other end connected to a spring anchoring bracket 53 which is mounted on the bottom cross rail 14 of the chair back. The springs 51 are constantly under tension, and comparison of FIGS. 2, 4 and 5 shows that during movement of the linkage means from the retracted position of FIG. 2 to the extended position of FIG. 5 the spring passes through a point of maximum extension (approximately at the position of FIG. 4). Accordingly, the spring means 50 urges the back panel-headrest both to its fully retracted position and to its fully extended position. The resilient urging of the spring, however, may be readily overcome by rotating the handle forwardly and upwardly from the retracted position of FIG. 2 to the extended position of FIG. 5, or downwardly and rearwardly from the extended position of FIG. 5 to the retracted position of FIG. 2.

The foregoing detailed description is given for clearness of understanding only and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

I claim:

1. In a lounge chair having an upholstered seat and back, said back having a rearwardly open cavity defined by side panels and a top cross rail, a back panel surmounted by a forwardly projecting headrest, and carrier means supporting said back panel-headrest for movement between a retracted position in which the back panel closes the rear of the cavity with the headrest within the cavity, and an extended position with

the back panel behind the top rail and the headrest above the upholstered back, said carrier means comprising in combination:

a pair of mounting plates secured to the side panels;

a pair of brackets mounted at the sides of the forward face of the back panel;

a collapsible and expandable linkage means associated with each of said mounting plates and connecting the associated mounting plate with an adjacent one of the brackets, said linkage means having coaxial transverse rock shafts, one of said rock shafts extending through the side panel to which the associated plate is secured;

a cross bar connecting said linkage means together for simultaneous movement;

a handle fixed to the outer end of said one of the rock shafts for rotating said one shaft, rotation of said shafts in one direction collapsing the two linkage means to place the back panel-headrest in retracted position, and rotation of said shaft in the opposite direction expanding said two linkage means to place the back panel-headrest in extended position;

stop means limiting movement of said back panel-headrest in both directions;

and tension spring means connected to the linkage means and to a portion of the chair back, said tension spring means being under tension at all times and swinging through a position of maximum tension as the back panel-headrest moves between retracted and extended positions, whereby said spring means urges the back panel-headrest against the stop means in both directions.

2. The combination of claim 1 in which the spring means comprises two tension springs each of which has one end secured to the cross bar adjacent one of the two linkage means and the other end secured to the chair back below the cavity.

3. The combination of claim 1 in which each linkage means includes a four bar linkage consisting of two movable links pivoted on vertically spaced pivots on the associated mounting plate and on vertically spaced pivots on the adjacent bracket, a drive linkage system having one end fixed on the rock shaft and the other end pivotally connected to a movable link, and control link means connecting the drive linkage system to the mounting plate.

4. The combination of claim 3 in which the drive linkage system comprises an arm on the rock shaft, an intermediate link having a first end pivoted on the free end of the arm, and a bell crank fulcrumed on the second end of the intermediate link, said bell crank having one arm pivotally connected to said movable link and the control link means being pivoted on the other arm of the bell crank.

5. The combination of claim 4 in which the cross bar is fixed to the arms.

6. The combination of claim 4 in which the stop means includes projecting fingers on the arm and on the adjacent end of the intermediate link, said fingers abutting when the back panel-headrest is in extended position.

7. The combination of claim 6 in which the stop means also includes inwardly projecting studs on the mounting plates against which one of the movable links

abuts when the back panel-headrest is in retracted position.

8. The combination of claim 3 in which the drive linkage system includes an arm on the rock shaft, and the cross bar is secured to said arms.

9. The combination of claim 3 in which the drive linkage system includes an arm on the rock shaft and a link pivoted on the arm, and in which the stop means includes projecting fingers on the arm and on the link, said fingers abutting when the back panel-headrest is in extended position.

10. The combination of claim 9 in which the stop means also includes inwardly projecting studs on the mounting plates against which one of the movable links abuts when the back panel-headrest is in retracted position.

11. In a lounge chair having an upholstered seat and back, said back having a rearwardly open cavity defined by side panels and a top cross rail, a back panel surmounted by a forwardly projecting headrest, and carrier means supporting said back panel-headrest for movement between a retracted position in which the back panel closes the rear of the cavity with the headrest within the cavity, and an extended position with the back panel behind the top rail and the headrest above the upholstered back, said carrier means comprising in combination;

a pair of mounting plates secured to the side panels;

a pair of brackets mounted at the sides of the forward face of the back panel;

coaxial transverse rock shafts journaled in said mounting plates, one of said rock shafts extending through the side panel to which the associated plate is secured;

a handle fixed to the outer end of said one of the rock shafts for rotating said one shaft;

a linkage means associated with each of the mounting plates and connecting the plates and the rock shaft with an adjacent one of the brackets, each said linkage means including a four bar linkage consisting of two movable links pivoted on vertically spaced pivots on the associated mounting plate and on vertically spaced pivots on the adjacent bracket, a drive linkage system having one end fixed on the rock shaft and the other end pivotally connected to a movable link, and control link means connecting

the drive linkage system to the mounting plate, rotation of the rock shafts moving the back panel-headrest between retracted and extended positions;

a cross bar connecting said linkage means together for simultaneous movement;

stop means limiting movement of said back panel-headrest in both directions;

and means associated with the linkage means for retaining the back panel-headrest selectively in its retracted or extended position until movement of the handle shifts it to the other position.

12. The combination of claim 11 in which the drive linkage system comprises an arm on the rock shaft, an intermediate link having a first end pivoted on the free end of the arm, and a bell crank fulcrumed on the second end of the intermediate link, said bell crank having one arm pivotally connected to said movable link and the control link means being pivoted on the other arm of the bell crank.

13. The combination of claim 12 in which the cross bar is fixed to the arms.

14. The combination of claim 12 in which the stop means includes projecting fingers on the arm and on the adjacent end of the intermediate link, said fingers abutting when the back panel-headrest is in extended position.

15. The combination of claim 14 in which the stop means also includes inwardly projecting studs on the mounting plates against which one of the movable links abuts when the back panel-headrest is in retracted position.

16. The combination of claim 11 in which the drive linkage system includes an arm on the rock shaft, and the cross bar is secured to said arms.

17. The combination of claim 11 in which the drive linkage system includes an arm on the rock shaft and a link pivoted on the arm, and in which the stop means includes projecting fingers on the arm and on the link, said fingers abutting when the back panel-headrest is in extended position.

18. The combination of claim 17 in which the stop means also includes inwardly projecting studs on the mounting plates against which one of the movable links abuts when the back panel-headrest is in retracted position.

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