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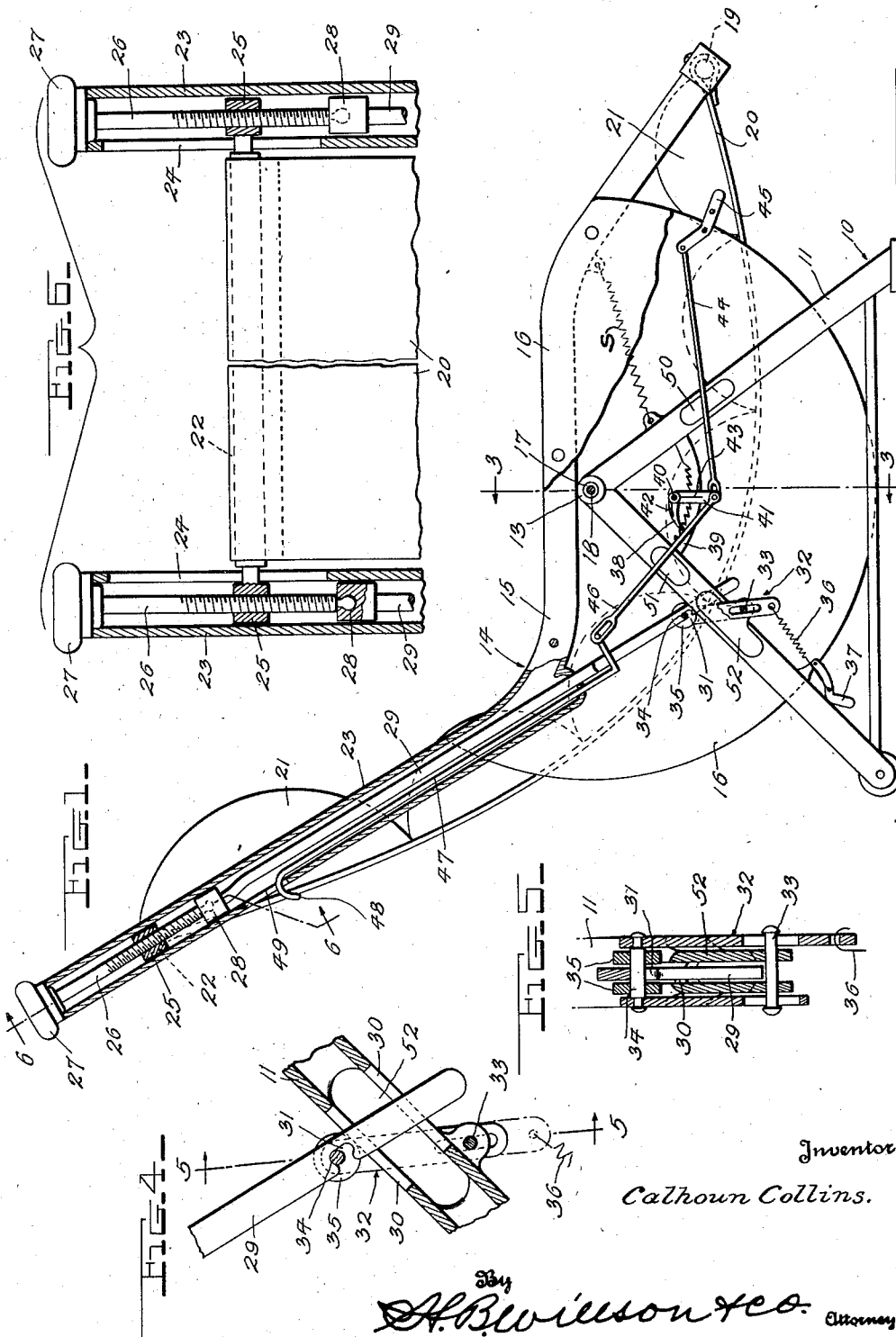
C. COLLINS

2,448,860

ADJUSTABLE RECLINING CHAIR

Filed Nov. 25, 1944

3 Sheets-Sheet 1



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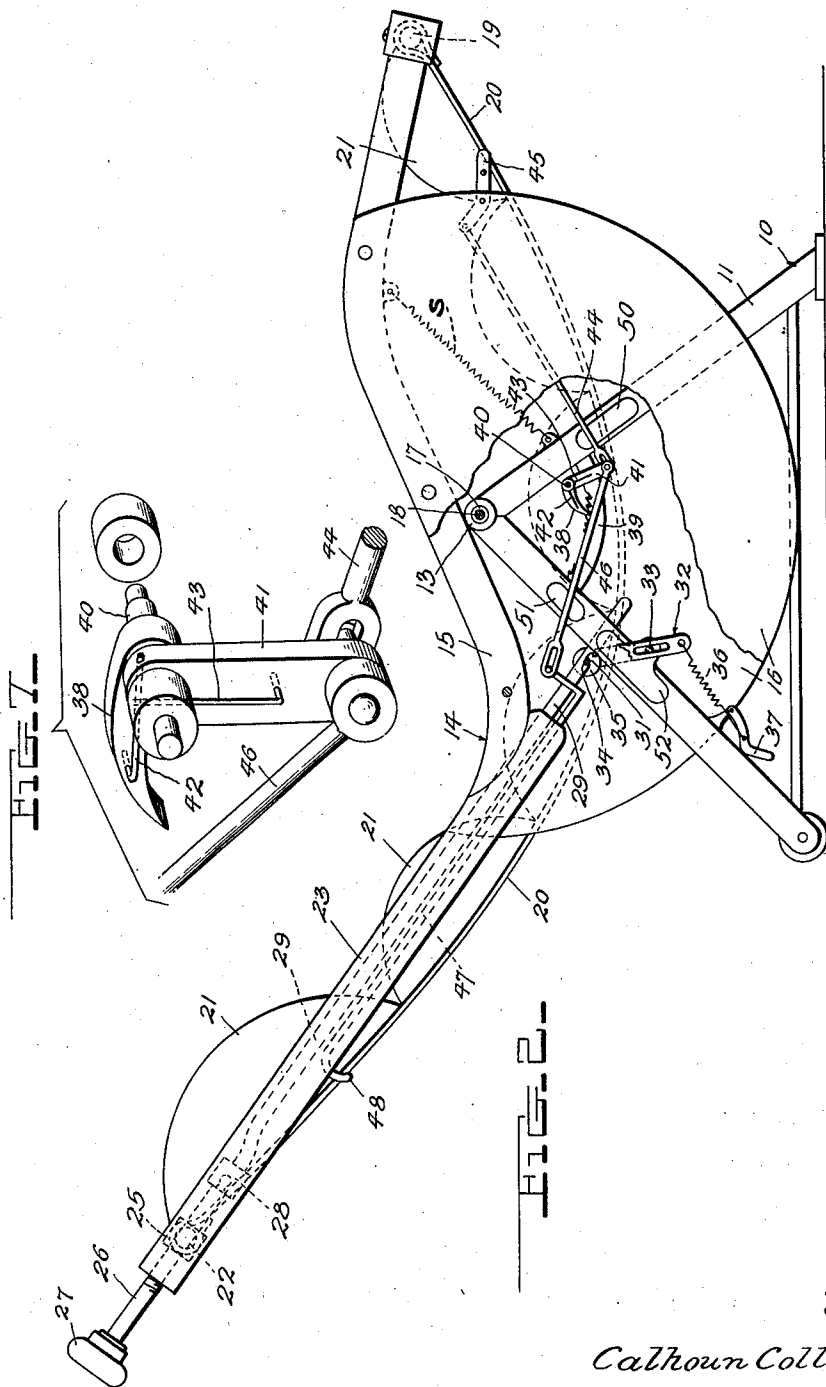
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Sept. 7, 1948.

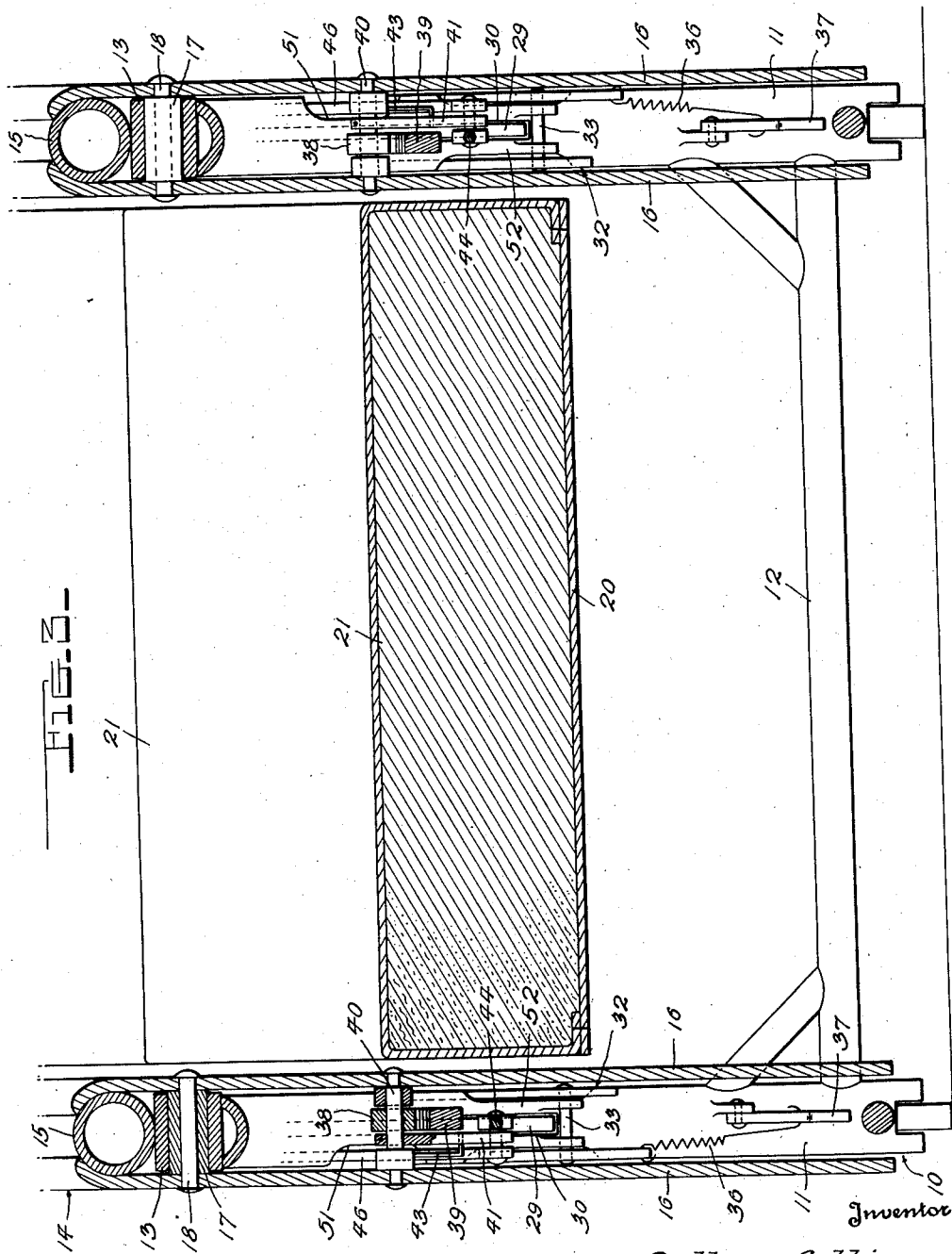
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,448,860

ADJUSTABLE RECLINING CHAIR

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Application November 25, 1944, Serial No. 565,106

12 Claims. (Cl. 155—116)

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This invention aims to provide a new and improved chair which will permit the occupant to sit quietly, rock, recline, or lie down, as desired, the chair being thus not only well adapted for affording maximum comfort and relaxation for the average person, but being particularly well adapted for persons temporarily or permanently handicapped physically.

The chair includes a preferably upholstered web having its ends connected with front and rear transverse bars of a tiltably mounted chair frame, said web having a seat portion merging into a back portion, similar to known lawn, beach and deck chairs; and a further object of the invention is to provide means for automatically removing some of the slack from said web as the chair is tilted to reclining and lying-down positions, providing for greater comfort. In this connection, a still further aim is to provide for throwing the slack-diminishing means out of operation if it be desired to merely rock to and fro.

Yet another aim is to include in the aforesaid slack-diminishing means, a novel adjusting means for compensating for stretching of the web.

The tiltable chair is preferably biased forwardly to sitting position, and still another object is to provide a novel ratchet mechanism which may be thrown into and out of operation at will, for either holding the chair against forward return when tilted rearwardly to one position or another, or for permitting return, as well as unhampered rocking, when desired.

Figure 1 is a side elevation partly broken away and in section showing the chair in sitting position.

Fig. 2 is a view similar to Fig. 1 but showing the chair tilted rearwardly to a reclining or lying-down position.

Fig. 3 is an enlarged transverse sectional view on line 3—3 of Fig. 1.

Fig. 4 is an enlarged detail vertical section showing the means for releasably connecting one of the thrust members with one of the vertical side frames of the supporting frame.

Fig. 5 is a vertical transverse sectional view on line 5—5 of Fig. 4.

Fig. 6 is an enlarged transverse sectional view on line 6—6 of Fig. 1.

Fig. 7 is a perspective view showing the dog and associated elements.

The structure disclosed in the drawings will be rather specifically described, with the understanding, however, that within the scope of

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the invention as claimed, variations may be made.

A supporting frame 10 is provided comprising substantially A-shaped vertical tubular side frames 11 rigidly connected at their lower portions by transverse frame members such as that shown at 12 in Fig. 3. The upper ends of the side frames 11 are provided with aligned bearings 13.

A chair frame 14 is tiltably mounted on the supporting frame 10, said chair frame including side members 15, the intermediate portions of which extend over the side frames 11, said intermediate portions of the side members 15 being each provided with two downwardly projecting plates 16 which straddle said side frames 11. Sleeves 17 are shown extending through the bearings 13 and abutting the plates 16, and bolts or rivets 18 are illustrated extending through said plates and sleeves and securing them together, the chair frame 14 being thus tiltably mounted upon the supporting frame 10.

The front ends of the side members 15 are connected by a suitable transverse bar 19 appropriately attached thereto and said bar 19 serves to anchor the front end of a flexible web 20, said web being preferably suitably upholstered by means of cushions 21. The web 20 forms both the seat and the back of the chair and the seat portion gradually merges into the back portion as shown. The upper end of this back portion is suitably connected to a second transverse bar 22 which extends between the upper ends of the back portions 23 of the side members 15. As seen in Fig. 6, the ends of the bar 22 are reduced and extend through longitudinal slots 24 in the aforesaid back portions 23 of the side members 15, said bar ends being provided with nuts 25 within said portions 23. Threaded through these nuts, are two adjusting screws 26 having knobs 27 which normally abut the upper ends of the side members 15. The lower ends of the screws 26 are rotatably connected at 28 with the upper ends of rods 29 which are received throughout the greater portions of their lengths in the back portions 23 of the side members 15. The lower end portions of these rods 29, however, project beyond the aforesaid portions 23 and are preferably flattened, said lower ends of the rods 29 being connected as hereinafter described with the rear legs of the side frames 11 of the supporting frame 10, at points spaced downwardly and rearwardly from the pivots 18 of the chair frame 14. Thus, the rods 29 and screws 26 cooperate in forming

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thrust members which will push the transverse web-anchoring bar 22 upwardly and rearwardly, as the chair frame 14 is tilted toward a reclining or lying-down position (see Fig. 2). Also, as the chair is returned to sitting-down position, these thrust members will return the bar 22. When bar 22 is pushed rearwardly as in Fig. 2, it diminishes the slack in the web 20 for more comfortable support of the occupant in reclining or lying-down position, but this slack is restored when the chair is again forwardly tilted, for maximum comfort when the occupant is merely sitting down or rocking.

In the present disclosure, the projecting lower ends of the rods 29 pass through slots 30 in the rear legs of the side frames 11 and have notches 31 formed in their rear edges. Yokes 32 straddle said rear legs of the frames 11 and are pivotally and slidably connected therewith as shown at 33, the upper ends of said yokes being each provided with a transverse pin 34, the two pins being normally seated in the notches 31 of the two rods 29. Each pin 34 preferably carries two rollers 35 contacting with the rear edge of the rear leg of the side frame 11. Tension springs 36 are connected at their upper ends with the yokes 32 and at their lower ends with levers 37, which levers normally occupy the position shown in Figs. 1 and 2 and thus hold the pins 34 in the notches 31 of the rods 29. When the levers 37 are swung forwardly, however, to relieve the springs 36 of tension, and the chair frame is tilted a trifle, the yokes 32 may swing by gravity to move the pins 34 out of said notches 31. The thrust members 29, 26 are thus disconnected from the side frames 11 of the supporting frame 10 and the chair 14 may thus be rocked to and fro without causing the upper transverse bar 22 to affect the amount of slack in the web 20. When the pins 34 are to be again engaged with the notches 31, the levers 37 are first swung to the past-dead-center position shown in Figs. 1 and 2, thus causing tensioning of the springs 36 to so swing the yokes 32 that said pins 34 will contact with the rear edges of the rods 29, say at points above or below said notches 31. Then by tilting the chair 14 in one direction or another until the pins are opposite the notches, said pins will be snapped into the notches and the thrust members will again be connected with the side frames. These thrust members and side frames remain connected with each other unless the chair occupant wishes to rock.

By proper structural characteristics, the entire chair 14 is preferably biased forwardly to a normal sitting position and must, therefore, be held against forward return when it is tilted rearwardly to reclining or lying down positions. To attain the forward biasing of the chair to the normal sitting position, the chair seat could well be sufficiently heavy in advance of the bearings 13, but I have shown a spring S for performing the biasing function. To hold the chair against undesired forward return when tilted rearwardly, I provide two dogs 38 cooperable with ratchet-like segments 39, said segments being disposed between the front and rear legs of the side frames 11 and welded or otherwise secured to said legs. Except when rocking, the dogs 38 are left in operative position and it will be seen that as the chair is tilted rearwardly, said dogs will click over the teeth of the segments 39 and will thus hold the chair against forward return until said dogs are released. The releasing means for

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the dogs may be more readily explained after describing the mounting of said dogs.

Each dog 38 (see more particularly Fig. 7) is pivotally supported on a non-rotatable pin 40 suitably secured to the side plates 16. Pivotally hung from this pin is an arm 41, the upper end of which is connected with the dog 38 by a spring arm 42, and another spring arm 43 may well be provided to swing said arm 41 forwardly and therefore bias said dog 38 toward the segment 39. The spring arm 42 is secured at its front end to the arm 41 and is suitably connected at its rear end with the dog 38, and the spring arm 43 is secured at its upper end to the fixed pin 40 and is suitably connected at its lower end with the arm 41. Extending forwardly from the lower end of each arm 41, is a rod 44, and the front ends of the two rods are connected to two operating levers 45 fulcrumed between the front edges of the plates 16. When the levers 44 are pulled upwardly to past-dead-center positions, they swing the arms 41 to tension the springs 42 and cause these springs to exert an upward force on the dogs 38 so that as soon as the frictional contact of the dogs with teeth of the segments 29 is relieved, by slight tilting of the chair frame 14 from its dog-held position, said dogs will be swung upwardly to idle positions, so that they will not interfere with to and fro rocking of the chair, nor with forward return of said chair after it has been held in one rearwardly swung position or another. The levers 45 may of course be operated by the occupant of the chair but it is preferable to also provide controls for the dogs 38, operable from the chair back by means of a nurse or other attendant. To accomplish this, a link 46 extends rearwardly from each arm 41 and is connected with a pull rod 47. The two pull rods 47 extend through the back portions 23 of the side members 15 and have finger portions 48 extending outwardly through slots 49.

Where the rods 44 and 46 cross the legs of the side frames 11, said legs preferably have flat portions 50 and 51 respectively, and where the yokes 32 cross the rear legs, the latter are preferably somewhat flattened as shown at 52. This permits the plates 16 to be more closely spaced than would otherwise be possible.

From the foregoing, taken in connection with the accompanying drawings, it will be seen that a novel and advantageous chair has been provided in which the occupant may merely sit quietly, in which he may rock to and fro if desired, and in which he may comfortably recline or lie down. As the chair is tilted toward reclining or lying-down positions, the thrust members 29, 26 thrust rearwardly on the bar 22 and thus remove surplus slack from the web 20 which will then support the occupant more comfortably. Also, the screws 26 of the thrust members may be manually rotated to adjust the bar 22, either for the purpose of compensating for stretching of the web 20, or to merely place more or less slack in said web, as desired.

While excellent results may be obtained from the general construction shown and described, attention is again invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. In a chair, a supporting frame; a chair frame including longitudinal side members and front and rear end bars, one of said end bars being fixedly mounted on said side members, the other of said end bars being movably mounted on

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said side members for movement toward and from said one of said end bars; pivots connecting said chair frame to said supporting frame for rearward tilting from a normal sitting position to a lying position; an occupant-supporting web anchored at its ends to said end bars and having slack between them; and end-bar-shifting means active on said movable end bar and reactive on said supporting frame, said end-bar-shifting means being constructed and arranged to move said movable end bar away from said fixed end bar as said chair frame is rearwardly tilted toward said lying position, whereby the slack in said web will be decreased as said chair frame is so tilted.

2. In a chair, a supporting frame; a chair frame including longitudinal side members and front and rear end bars, one of said end bars being fixedly mounted on said side members, the other of said end bars being movably mounted on said side members for movement toward and from said one of said end bars; pivots connecting said chair frame to said supporting frame for rearward tilting from a normal sitting position to a lying position; an occupant-supporting web anchored at its ends to said end bars and having slack between them; longitudinal vertically swingable thrust members connected with the ends of said movable end bar and extending therefrom to said supporting frame, said supporting frame having means for pivotally supporting the lower ends of said thrust members at points spaced from said chair frame pivots, the action of said supporting means being such that said thrust members will move said movable end bar a gradually increasing distance from said chair frame pivots as said chair frame is tilted rearwardly toward said lying position, whereby the slack in said web will be decreased as said chair frame is rearwardly tilted toward said lying position.

3. A structure as specified in claim 2; together with means for adjusting said movable end bar longitudinally of said thrust members to compensate for stretching of said web.

4. A structure as specified in claim 2; said movable end bar having nuts at its ends; said thrust members including manually rotatable screws threaded through said nuts for adjusting said movable end bar longitudinally of said thrust members to compensate for stretching of said web.

5. A structure as specified in claim 2; said side members having tubular portions formed with slots through which the ends of said movable end bar extend into said tubular portions, said thrust members having the major portions of their lengths received in said tubular portions of said side members.

6. A structure as specified in claim 2; said side members having tubular portions formed with slots through which the ends of said movable end bar extend into said tubular portions, said ends of said movable end bar having nuts within said tubular portions of said side members; said thrust members having the major portions of their lengths received in said tubular portions of said side members and including manually rotatable screws threaded through said nuts to adjust said movably mounted end bar longitudinally of said thrust members to compensate for stretching of said web.

7. A structure as specified in claim 2; said means for pivotally supporting said lower ends of said thrust members including means where-

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by the lower ends of said thrust members may be freed from said supporting frame to permit unhampered rocking of said chair frame.

8. A structure as specified in claim 2; said supporting frame including side frames having inclined legs, said means for pivotally supporting said lower ends of said thrust members comprising levers pivotally and slidably connected with said legs having pins normally received in notches in said thrust members, said pins having thrust rollers abutting said legs, and movable means for holding said levers in normal position and for permitting movement of said levers to free said pins from said notches when unhampered rocking of said chair frame is desired.

9. In a chair, a supporting frame having two side frames, a chair frame between said side frames, aligned pivots connecting said chair frame with said side frames for movement from a sitting position to reclining positions, means normally biasing said chair frame forwardly to said sitting position, a segment secured to one of said side frames in concentric relation with one of said pivots, said segment having ratchet teeth, a dog pivotally mounted on said chair frame and successively cooperable with said ratchet teeth to hold said chair frame against forward return when tilted rearwardly to reclining positions, a manually operable member mounted on said chair frame for movement from an idle position to a dog-releasing position, and dog-releasing means extending from said manually operable member to said dog and including a spring which is tensioned by movement of said manually operable member to dog-releasing position, said spring being so connected with said dog as to exert a releasing force on said dog when said spring is tensioned, whereby said force will be effective to release said dog from any contacting tooth of said segment when the friction between said dog and tooth is relieved.

10. In a chair, a frame having side members provided with tubular portions at the back of the chair, the inner sides of said tubular portions having longitudinal slots at their upper ends, a web-anchoring bar having its ends extending through said slots and provided with nuts within said tubular portions, and said web-anchoring bar being movable upwardly to tighten said web, and screws within said tubular portions and threaded through said nuts for upwardly moving said web-anchoring bar to tighten said web, said screws having operating knobs abutting the upper extremities of said tubular portions.

11. In a chair, a supporting frame having two side frames, a chair between said side frames, aligned pivots connecting said chair with said side frames for movement from a sitting position to reclining positions, means normally biasing said chair frame forwardly to said sitting position, a segment secured to one of said side frames in concentric relation with one of said pivots and disposed below the latter, said segment having forwardly facing ratchet teeth on its upper edge, a dog above said segment and having a rear end successively cooperable with said ratchet teeth to hold said chair frame against forward return when tilted rearwardly to reclining positions, a transverse pin upon which the front end of said dog is pivotally mounted, said pin being non-rotatably secured to said chair frame, an arm pivotally suspended from said pin for forward and rearward movement, one substantially horizontal spring arm secured at its front end to the upper end of said pivotally suspended arm

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and connected at its rear end with said dog, a second substantially vertical spring arm secured at its upper end to said pin and connected at its lower end with said pivotally suspended arm, said springs being normally active to hold said dog engaged with any contacting tooth of said segment, and manually operable means connected with said pivotally suspended arm and mounted on said chair frame for swinging said arm rearwardly to so tension said one spring arm as to cause it to exert an upward force on said dog, whereby said force will be effective to release said dog when the friction between said dog and the contacting tooth is relieved.

12. In a chair, a rigid supporting frame including vertical side frames; a chair frame between said side frames and including longitudinal side members having upwardly directed rear ends, and front and rear end bars, said front end bar being fixedly mounted on said side members, said rear end bar being movably mounted on said upwardly directed rear ends of said side members for movement toward and from said front end bar; aligned pivots mounting said chair frame upon said side frames for rearward tilting from a normal sitting position to a lying position; an occupant-supporting web anchored at its ends to said end bars and having slack between them, two thrust rods inclined rearwardly from said side frames respectively, means connecting the rear ends of said thrust rods with said movable rear end bar of said chair frame, and means whereby the lower ends of said thrust rods are pivotally supported upon said side frames at points spaced

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downwardly and rearwardly from the aforesaid pivots, whereby during rearward tilting of said chair frame to said lying position, said chair frame and said thrust rods will swing on different arcs and consequently said rear end bar will be rearwardly moved with respect to said front end bar, thereby decreasing the slack in said web.

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