Feb. 1, 1966 A. C. FERRO 3,232,574

ADJUSTABLE COUNTERBALANCING STRUCTURE

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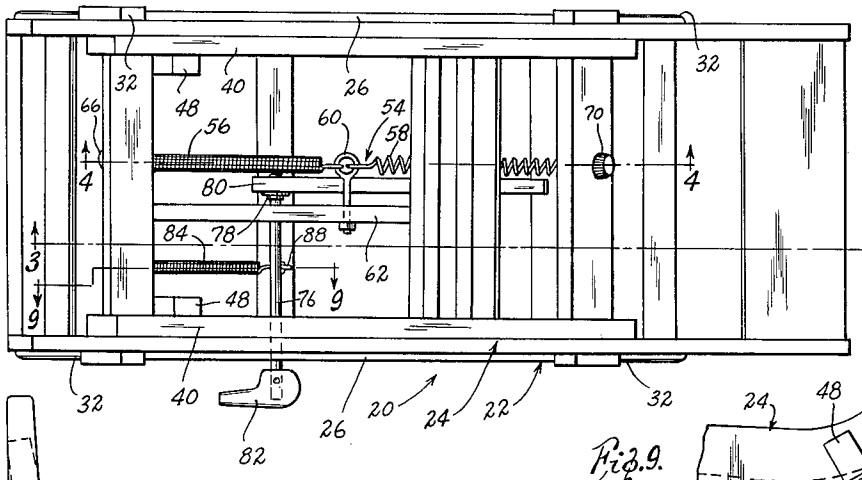


Fig. 1.

Fig. 2.

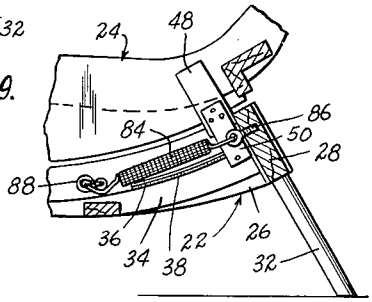
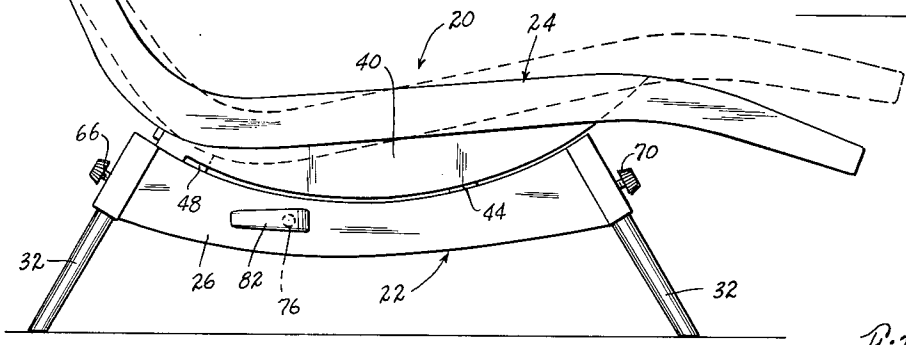


Fig. 9.



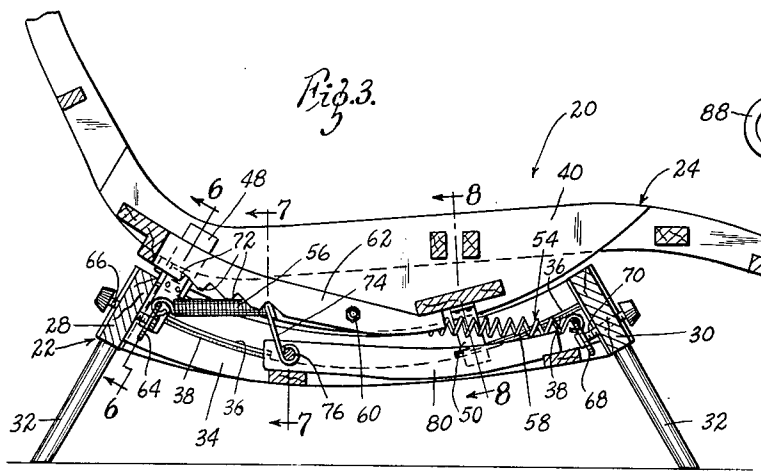


Fig. 3.

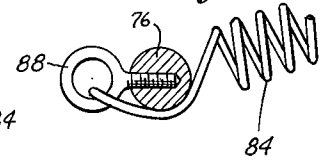


Fig. 10.

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Fig. 4.

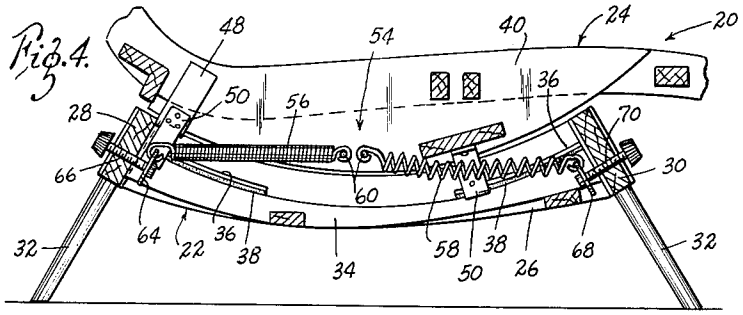


Fig. 8.

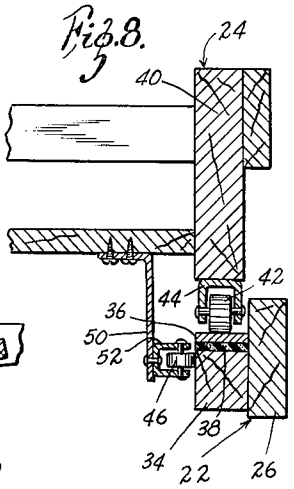


Fig. 5.

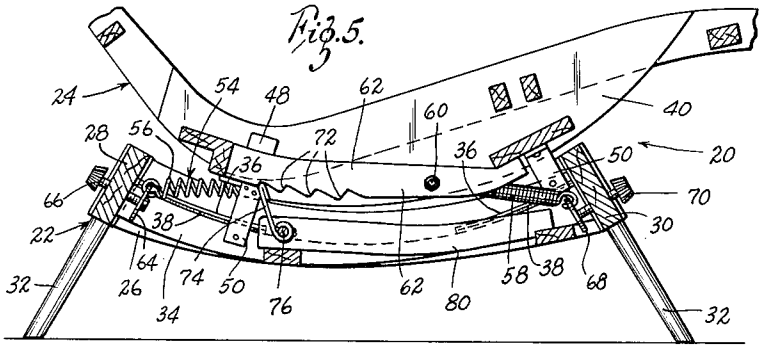


Fig. 6.

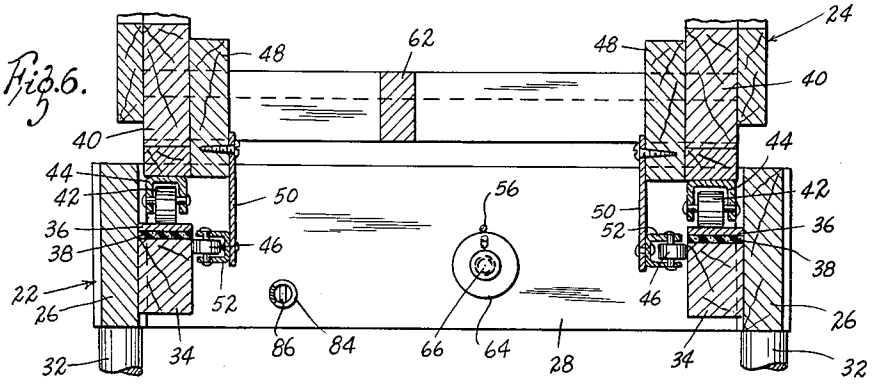
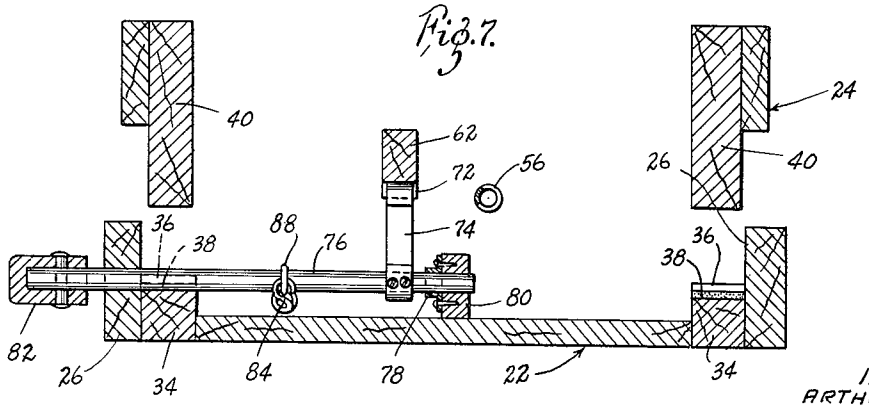


Fig. 7.



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ADJUSTABLE COUNTERBALANCING STRUCTURE

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2 Claims. (Cl. 248—379)

The present invention relates generally to manually adjustable lounge chairs in which the top portion receiving the resting person is movable bodily in relation to a stationary base portion, and more particularly to a novel adjustable lounge chair including adjustable tensioning means biasing the top portion to a preselected position in respect to the base portion and to novel adjustable tensioning means.

It is desirable that a manually adjustable lounge chair of the reciprocating arc type be yieldably biased to a predetermined rest position. Such chairs made heretofore have fallen short of this combination. The need and desirability have been recognized, but no simple solution has been provided.

Hence, an object of the present invention is to provide a novel adjustable lounge chair which includes adjustable tensioning means.

In brief, the present novel adjustable lounge chair includes a stationary base incorporating arcuate track segments. A movable top portion includes rollers which move back and forth on the arcuate track segments. Manually releasable latch means is provided to hold the top part against movement in one direction relative to the base portion. Tension springs are anchored at adjacent ends to the movable top portion and at remote ends to the stationary base portion so that when occupied, the top portion assumes a normal predetermined position under the influence of the springs, movement in either direction being against one or the other spring. Adjusting means permits varying of the said position.

Therefore, another object of the present invention is to provide a novel, manually adjustable lounge chair of the reciprocating arc type which assumes a predetermined position when not occupied.

Another object is to provide a novel manually adjustable lounge chair of the reciprocating arc type incorporating opposed tension springs which automatically return the top portion to a predetermined position upon becoming unoccupied when in a different position.

Another object is to provide a novel manually adjustable lounge chair of the reciprocating arc type incorporating opposed tension springs which are alternatively effective to return the top portion to a neutral position.

The foregoing and other objects and advantages are apparent from the following description taken with the accompanying drawings, in which:

FIGURE 1 is a top plan view of the chassis of a manually adjustable lounge chair constructed in accordance with the teachings of the present invention;

FIGURE 2 is a side elevational view thereof;

FIGURE 3 is a vertical, longitudinal, cross-sectional view taken on substantially the line 3—3 of FIGURE 1, the top portion being in one extreme position of movement;

FIGURE 4 is a vertical, longitudinal, cross-sectional view taken on substantially the line 4—4 of FIGURE 1;

FIGURE 5 is a vertical, longitudinal, cross-sectional view similar to FIGURE 3, but with the top portion in the opposite extreme position of movement;

FIGURES 6, 7 and 8 are enlarged vertical, transverse cross-sectional views taken on substantially the lines 6—6, 7—7 and 8—8 of FIGURE 3, the last one being fragmentary;

FIGURE 9 is a vertical, longitudinal, cross-sectional view taken on substantially the line 9—9 of FIGURE 1; and

FIGURE 10 is an enlarged fragment from FIGURE 9 illustrating the spring anchoring details.

Referring to the drawings more particularly by reference numerals, 20 indicates generally a chassis of a manually adjustable lounge chair incorporating the principles of the present invention. The chair chassis 20 includes a stationary base 22 and a movable top portion 24, which may be constructed as shown, the latter being manually reciprocable upon the former in a concave arc.

The base 22 includes arcuate side members 26, end members 28 and 30, and legs 32. Against the inner face of each side member 26 is an arcuate supporting member 34 which extends between the end members 28 and 30. An arcuate metal track segment 36 is secured to and adjacent each end of each supporting member 34, there being a cushion segment 38 of rubber or other resilient material beneath each track segment 36.

The top portion 24 includes side members 40 arcuate along a predetermined reach of the bottom. Two spaced rollers 42 are secured by inverted U-brackets 44 to the bottom of each side member 40 in position to roll back and forth upon the track segments 36 in an arcuate path. Adjacent each roller 42 and engaging the inner face of the respective supporting member 34 is a side roller 46 which is secured to the inner face of the respective side member 40 by a block 48, strap plate 50 and U-bracket 52. The rollers 46 prevent lateral movement of the top portion 24.

An adjustable tension spring unit 54 is provided which includes two tension springs 56 and 58, adjacent ends of which are hooked into the eye of a bolt 60 mounted in a longitudinal rack bar 62 secured to and beneath the top portion 24 (FIGS. 1 and 3). The other end of the spring 56 is hooked into a large washer 64 mounted on a bolt member 66 threadedly mounted in the end member 28 for adjustment of spring 56, as is clear. Similarly, the other end of spring 58 is hooked into a large washer 68 mounted on a bolt member 70 threadedly mounted in the end member 30 for adjustment of spring 58. Manifestly, adjustment of the position of either bolt member 66 or 70 will affect the rest position of the top portion 24 in respect to the base 22. This adjustment provides distribution.

The rack bar 62 includes several equi-spaced shoulders 72 engageable by a flat arm 74 secured to a shaft 76 pivotally mounted in one side member 26 and a bearing sleeve 78 secured to a longitudinal structural member 80 of the base 22 (FIGS. 1, 2, 3 and 7). An operating handle 82 is mounted on the free end of the shaft 76. A tension spring 84 is connected at one end to an eye bolt 86 mounted in the end member 30 and at the other end to an eye bolt 88 threaded into the shaft 76. The spring 84 biases the arm 74 clockwise, considering FIGURE 3. It will be noted that the rack bar 62 and arm 74 permit free movement of the top portion 24 to the left, again considering FIGURE 3, but the arm 74 has to be pivoted manually counterclockwise by the handle 82 to permit movement of the top portion 24 to the right.

In order to obtain full advantage of the present novel chair 20, the neutral position of the top portion 24, when the chair is initially occupied, should be as shown in FIGURE 3. This allows an occupant to utilize all stop positions determined by the shoulders 72 and arm 74. This, of course, may mean that the neutral position unoccupied of the top portion 24 is at some point between the one extreme position thereof illustrated in FIGURE 3 and the other extreme position thereof of FIGURE 5.

It is manifest that there has been provided a novel ad-

justable chair which fulfills the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawing have been given by way of illustration and example. It is also to be understood that changes in form of the elements, rearrangement of parts, and substitution of equivalent elements, which will be obvious to those skilled in the art, are contemplated as within the scope of the present invention which is limited only by the claims which follow.

What is claimed is:

1. A manually adjustable lounge chair comprising, in combination, a stationary base, a top portion mounted on said base for manual reciprocation in respect thereto between two extreme positions of movement, movable means for maintaining said top portion in intermediate positions of adjustment, means for effecting movement of said movable means, means biasing said top portion toward a predetermined intermediate position of rest in respect to said base, and means for adjusting said biasing means to vary the position of rest, said biasing means comprising a pair of tension springs, each spring being connected to said top portion and each spring being connected to said base, said connections to said top portion being interiorly of the chair with respect to said connections to said base, said adjusting means for said biasing means including a separate independently operable screw device for each spring including an actuating knob disposed exteriorly of the base for ready access.

2. A manually adjustable lounge chair comprising in combination, a stationary base including laterally spaced

concave top members, a top portion mounted on said base for manual reciprocation in respect thereto between two extreme positions of movement including laterally spaced convex bottom members in opposed relation to said concave top members of said base, rollers mounted on said convex bottom members and engaging said concave top members providing easy reciprocative movement of said top portion on said base, movable means for maintaining said top portion in intermediate positions of adjustment, means for effecting movement of said movable means, and means biasing said top portion towards a predetermined intermediate position of rest in respect to said base, said biasing means comprising a pair of tension springs, each spring being connected to said top portion and each spring being connected to said base, said connections to said top portion being interiorly of the chair with respect to said connections to said base, said rollers cooperating with said springs for effective predetermined positioning of said top portion on said base.

References Cited by the Examiner

UNITED STATES PATENTS

585,213	6/1897	Jones	248—395 X
2,271,925	2/1942	Niles	297—317
2,313,023	3/1943	Rugger	297—329
2,319,700	5/1943	Miller	297—328

FOREIGN PATENTS

491,796	3/1954	Italy.

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