Aug. 2, 1949. L. LARSEN ET AL 2,478,112

ADJUSTABLE ROCKING CHAIR

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FIG. 1.

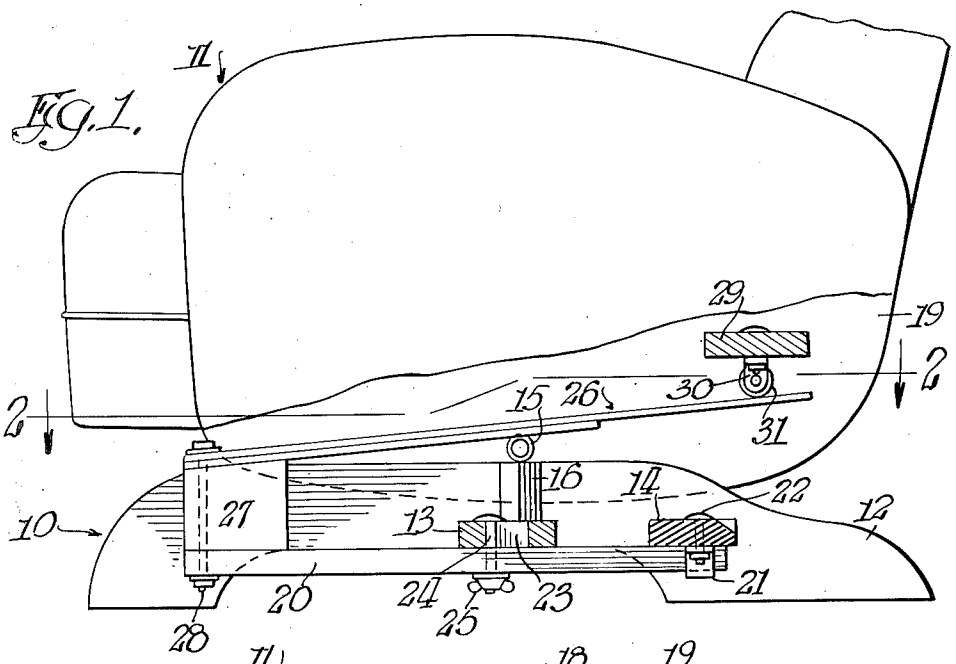
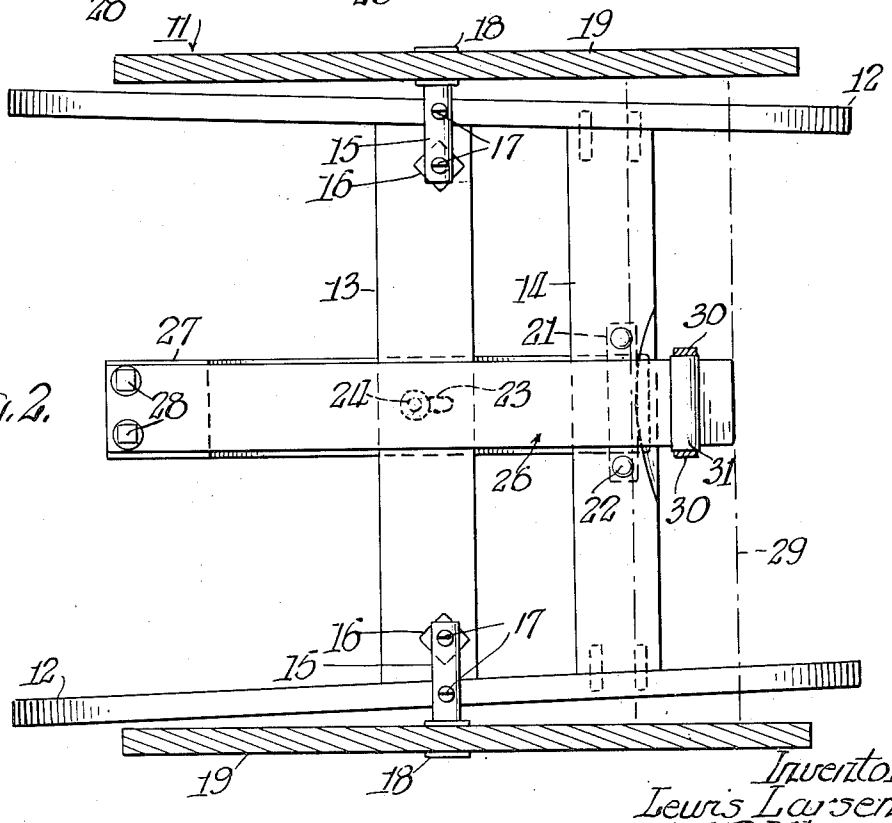


FIG. 2.



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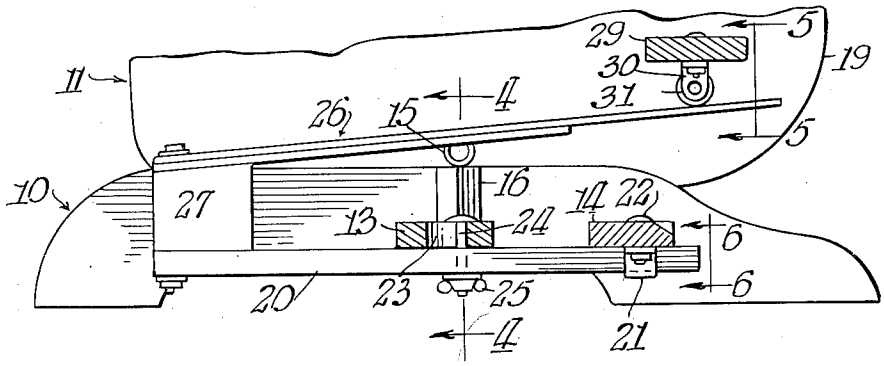
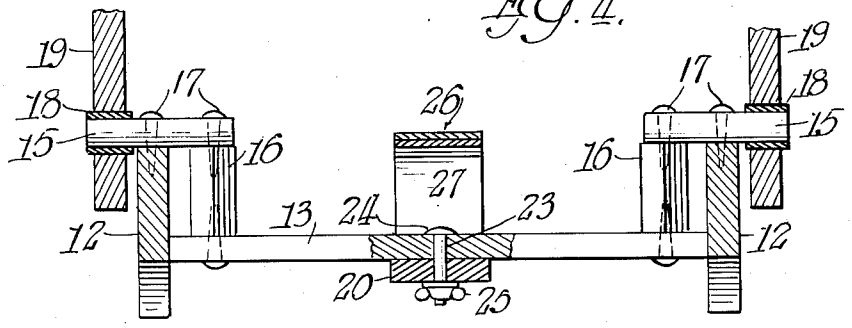


FIG. 3.

FIG. 4.



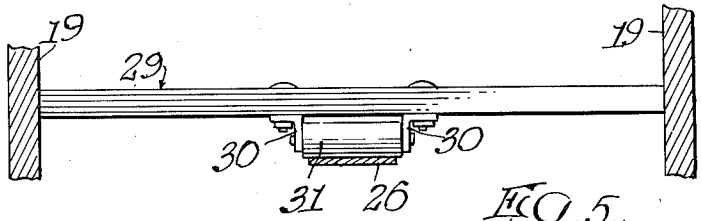


FIG. 5.

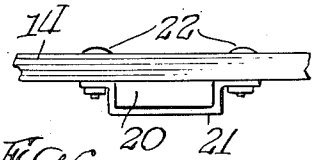


FIG. 6.

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Patented Aug. 2, 1949 2,478,112

UNITED STATES PATENT OFFICE

2,478,112

ADJUSTABLE ROCKING CHAIR

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Application July 20, 1944, Serial No. 545,800

5 Claims. (Cl. 155—77)

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This invention relates to improvements in chairs and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The present invention is especially concerned with so called "easy" chairs used in the home and of the kind wherein the seat is mounted on a base for a rearward and forward rocking movement and is cushioned by one or more springs carried by a cantilever bar on the base and suitably engaged by parts on the seat to afford the cushioning action desired.

The cushioning action of the spring, in chairs of this kind, is influenced by certain factors and they are the stiffness of the spring used in the chair and the weight of the person who is to occupy the chair, it being obvious that the heavier the occupant the "easier" the cushioning action and the lighter the occupant the "harder" the cushioning action in the same chair.

In such chairs as heretofore made no provisions were embodied therein for adjusting the spring and associated parts with respect to the base to provide that cushioning action most comfortable for the ultimate user regardless of his or her weight.

One of the objects of the present invention is to provide a chair of this kind wherein the spring cushioning structure may be quickly and easily adjusted to compensate for the weight of the occupant in affording that cushioning action most comfortable for said occupant.

Another object of the invention is to provide in a chair of this kind, simple and inexpensive means for adjusting the cushion spring and which means is positive in action and will not readily loosen up in use.

The above mentioned objects of the invention, as well as others, together with the advantages thereof will appear as the specification proceeds.

Fig. 1 is a front to rear vertical sectional view through the lower portion of a chair embodying the preferred form of the invention, with the spring mechanism in the position affording an "easy" cushioning action of the seat.

Fig. 2 is a horizontal section view through the chair as taken on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 showing the spring mechanism in the position affording a "harder" cushioning action of the seat.

Fig. 4 is a transverse vertical sectional view through a part of the chair as taken on the line 4—4 of Fig. 3.

Figs. 5 and 6 are detail transverse vertical sectional views through parts of the chair as taken

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on the line 5—5 and 6—6 respectively of Fig. 3.

Referring now in detail to that embodiment of the invention illustrated in the drawings: 10 indicates as a whole the floor engaging base of the chair and 11 indicates the seat supporting means thereof.

The base includes laterally spaced, vertically edgewise disposed, wooden side rails 12—12 which converge rearwardly and are operatively connected and are held in the desired relation by means of front and rear cross bars 13 and 14 respectively. The cross bars 13 and 14 are made as horizontally edgewise arranged pieces of wooden stock that are suitably secured at their ends to the side rails with their bottom surfaces disposed substantially in the same horizontal plane, as shown in Fig. 1.

15—15 indicates aligned stub shafts that extend transversely of the base and each of which is fixed to the top edge of a rail 12 thereof and to an upright block 16 rising from the cross bar 13 adjacent said rail. Said stub shafts are preferably formed of metal tubes and are secured in place to said rails and blocks by screws 17. The outer end of each shaft extends a suitable distance outwardly from each side rail to form a trunnion, each of which engages in a suitable bearing sleeve 18 in an associated side 19 of the seat suporting means 11. By means of the structure described, the seat supporting means is capable of a rearward and forward rocking movement on the base, about the axes of said stub shafts 15—15.

To cushion the rearward rocking movement and to assist in the forward rocking movement of the seat supporting means, a novel arrangement is provided that will now be described. Extending from the front to the rear of the base on its medial line is a cantilever member 20 which is preferably made of a length of wood of substantially the same cross section as that used for the cross bars 13 and 14. Said cantilever member, which is disposed to engage the underside of said cross bars, has its rear end portion slidably engaged in a U-shaped clip or yoke 21 fixed to the underside of the mid portion of the rear cross bar 14 as by bolts 22 and associated nuts. The cross bar 13 is provided at its middle with a transverse slot 23 which is located over a mid portion of the cantilever member 20 and a bolt 24 carried by said member passes through said slot and is provided at its bottom end with a wing nut. When the wing nut 25 is tightened upon the bolt 24, it clamps the mid portion of the cantilever member 20 to the cross bar 13. Thus said cantilever

member is supported at its rear end and at an intermediate portion, leaving the front end portion thereof unsupported so that it is capable of such upward and downward flexing as permitted by the thickness of the wooden stock of which said member is made.

Associated with and arranged above said cantilever member **20** is a leaf spring assembly **26** made up of a relatively long top leaf and a shorter bottom leaf, both preferably made of normally straight, flat resillient metal strips. The front ends of said leaves are disposed to engage upon a wedge block **27**, carried on the front end of the centilever bar **20**, and the top surface of said block is directed upwardly and rearwardly. Said ends of said leaves, along with the wedge block, are fixed to the front end of the cantilever member **20** by bolts **28** which also act to prevent lateral relative shifting of said leaves. The rear free ends of said leaves of the spring assembly **26** are disposed rearwardly of the axis of the tubes **15—15**.

The seat supporting member **11** is provided toward its rear bottom corner with a transverse reach bar **29**. A pair of laterally spaced L shaped clips **30—30** is suitably secured to the under side of the mid portion of said reach bar and disposed between and journalled in said clips is a roller **31** that normally engages with the rear end portion of the relatively long leaf of the spring assembly **26**.

When a downward pressure is imposed upon the rear end portion of the spring assembly **26**, the leaves thereof are flexed downwardly with the resistance to flexing increasing toward the front end thereof at which point, i. e. above the block **27**, they are substantially rigid. At this point, however, such flexing as is transmitted toward the front end of the spring leaves is passed on to the front end portion of the cantilever member **20** which will then flex somewhat downwardly. Thus, there is a compound flexing action imposed upon the spring as a whole and a part thereof is afforded by the spring leaves and another part is afforded by the front portion of the cantilever member **20**. The action mentioned not only cushions the rocking movement of the means **11** in one direction but it tensions the spring assembly so that as soon as the rocking movement of said means **11** is reversed, said assembly expands to assist in the rocking action of said means in the other direction in the return to its normal position.

Assume that it is desired to adjust the rocking action for a person of relatively light weight. The wing nut **25** is loosened on the bolt **24** and this releases the clamping action of the cantilever member **20** against the underside of the cross bar **13**. Said cantilever member is then moved forwardly until the bolt **24**, which moves with said member, engages the front end of the slot **23** after which the wing nut **25** is again tightened upon the bolt **24**. This position of the parts, which appears in Fig. 1, increases the effective length of the spring leaves a distance approximating the length of the slot **23** so that said leaves are more flexible.

For a heavier person, the effective length of the spring leaves should be reduced and this is brought about by loosening the wing nut **25** and moving the cantilever member **20** rearwardly until the bolt **24** engages the rear end of the slot **23** as shown in Fig. 3, after which the wing nut is again tightened on the bolt **24**. Thus as the effective length of the spring is decreased the spring leaves stiffen in their flexing action.

It is pointed out that in adjusting the cantilever member **20** either forwardly or rearwardly it cannot shift laterally because of its engagement in the clip **21** on the rear cross bar **14** and because of the bolt and slot connection between said member and the front cross bar **13**.

While in describing the invention we have referred in detail to the form, arrangement and construction of the parts involved the same is to be considered in the illustrative sense only and, therefore, we do not wish to be limited thereby except as may be specifically set forth in the appended claims.

We claim as our invention:

1. A chair embodying therein a base having laterally spaced floor engaging side rails, a cross bar connecting said rails together at a point between their ends, a second cross bar connecting said rails together rearwardly of the first mentioned cross bar, a seat member, means providing a pivotal supporting connection for said seat member on said side rails above the first mentioned cross bar, a relatively rigid cantilever bar arranged between and substantially parallel with said side rails, means supporting said cantilever bar from both of said cross bars in a manner permitting adjustment of said cantilever bar longitudinally of the base, flat leaf spring means fixed to the forward end of the cantilever bar and extending upwardly and rearwardly therefrom to a point wherein its free end is disposed rearwardly of said pivotal connection, and means carried by said seat member and operatively engaged with said free end of said spring means for cushioning the rocking movement of said seat member on said base.

2. A chair embodying therein a base having laterally spaced floor engaging side rails, a cross bar connecting said rails together at a point between the ends, a second cross bar connecting said rails together rearwardly of the first mentioned cross bar, a seat member, means providing a pivotal supporting connection for said seat member on said side rails above the first mentioned cross bar, a relatively rigid cantilever bar arranged between and substantially parallel with said side rails, means providing a sliding guided engagement for a part of said cantilever bar with one of the cross bars, means providing an adjustable clamping pin and slot connection for another part of said cantilever bar with the other cross bar and by which said cantilever bar may be adjusted into different longitudinal positions relative to the base, flat leaf spring means fixed to the forward end of the cantilever bar and extending upwardly and rearwardly therefrom to a point wherein its free end is disposed rearwardly of said pivotal connection, and means carried by said seat member and operatively engaged with said free end of said spring means for cushioning the rocking movement of the seat member on said base.

3. A chair embodying therein a base having lateraly spaced floor engaging side rails, a cross bar connecting said rails together at a point between the ends, a second cross bar connecting said rails together rearwardly of the first mentioned cross bar, a seat member, means providing a pivotal supporting connection for said seat member on said side rails at a point above the first mentioned cross bar, a relatively rigid cantilever bar arranged between and substantially parallel with said side rails, means carried by

said second cross bar for providing a sliding guiding support for a part of said cantilever bar, means providing an adjustable clamping pin and slot connection with a second part of the cantilever bar with the first mentioned cross bar for holding said second part of said cantilever bar in engagement with the one side of the first mentioned cross bar, flat leaf spring means fixed to the forward end of the cantilever bar and extending upwardly and rearwardly therefrom to a point wherein its free end is spaced rearwardly of said pivotal connection, and means carried by said seat member and operatively engaged with said free end of said spring means for cushioning the rocking movement of the seat member on said base.

4. A chair embodying therein a base having laterally spaced floor engaging side rails, a cross bar connecting said rails together at a point between their ends, a second cross bar connecting said rails together rearwardly of the first mentioned cross bar, a seat member, means providing a pivotal supporting connection for said seat member on said side rails above the first mentioned cross bar, a relatively rigid cantilever bar arranged between and substantially parallel with said side rails, means supporting said cantilever bar from both of said cross bars in a manner permitting adjustment of said cantilever bar longitudinally of the base, flat leaf spring means fixed to the forward end of the cantilever bar and extending upwardly and rearwardly therefrom to a point wherein its free end is disposed rearwardly of said pivotal connection, said flat leaf spring being adjustable in unison with the cantilever bar to which it is affixed, and means carried by said seat member and operatively engaged with said free end of said spring means for cushioning the rocking movement of said seat member on said base.

5. A chair embodying therein a base having laterally spaced floor engaging side rails, a cross bar connecting said rails together at a point between their ends, a second cross bar connecting said rails together rearwardly of the first mentioned cross bar, a seat member, means providing a pivotal supporting connection for said seat member on said side rails above the first mentioned cross bar, a relatively rigid cantilever bar arranged between and substantially parallel with said side rails, means supporting said cantilever bar from both of said cross bars in a manner permitting adjustment of said cantilever bar longitudinally of the base, said means including a slot and pin connection between one of said cross bars and the cantilever bar, a flat leaf spring means fixed to the forward end of the cantilever bar and extending upwardly and rearwardly therefrom to a point wherein its free end is disposed rearwardly of said pivotal connection, said flat leaf spring being adjustable in unison with the cantilever bar to which it is attached, said adjustability being effected by virtue of said slot and pin connection and means carried by said seat member and operatively engaged with said free end of said spring means for cushioning the rocking movement of said seat member on said base.

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