March 9, 1943. L. LARSEN ET AL 2,313,559

CHAIR

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Fig. 1.

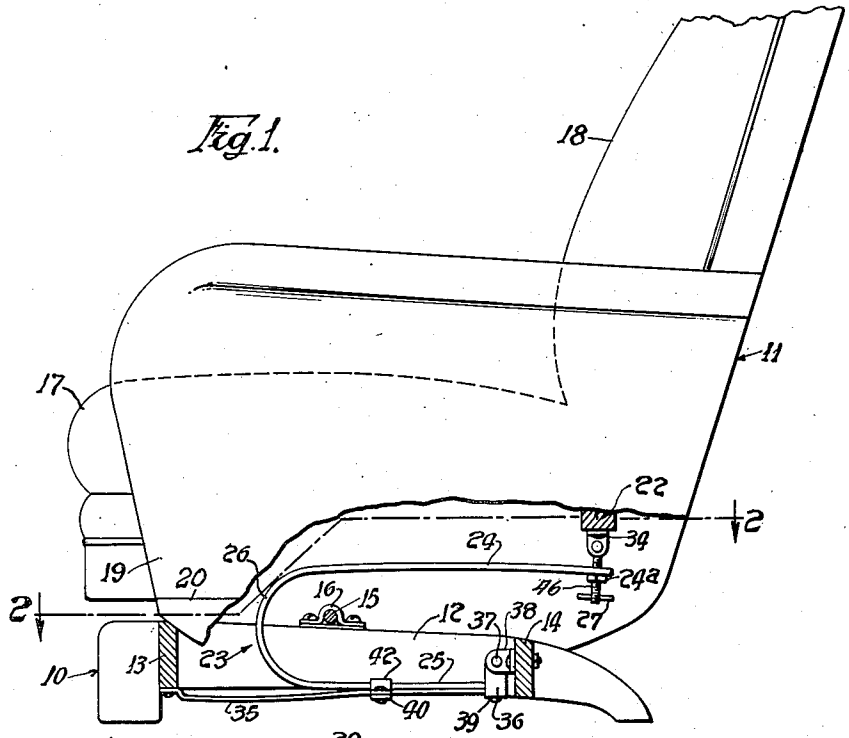


Fig. 2.

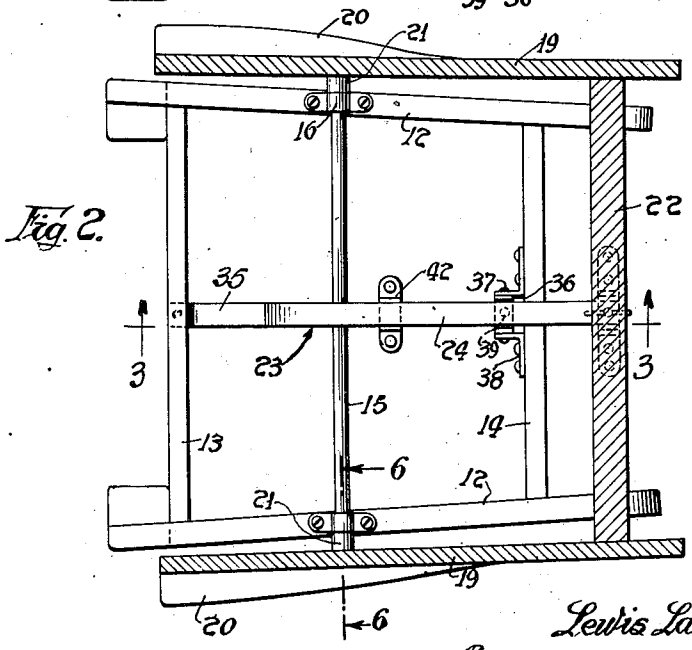
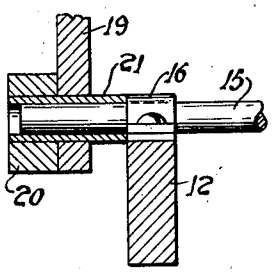


Fig. 6.



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Fig. 3.

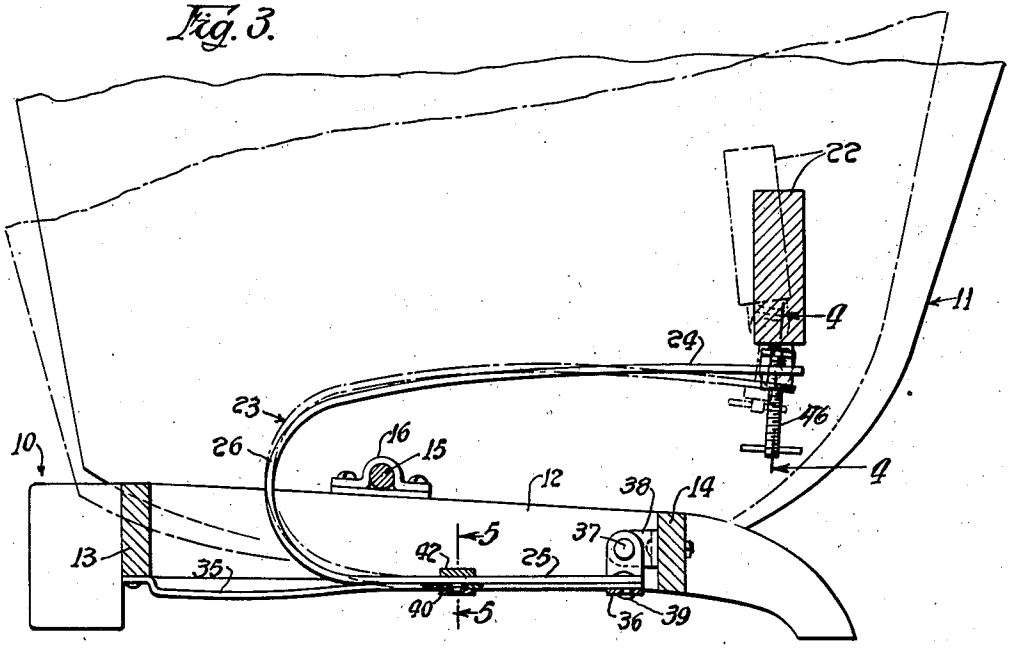


Fig. 4.

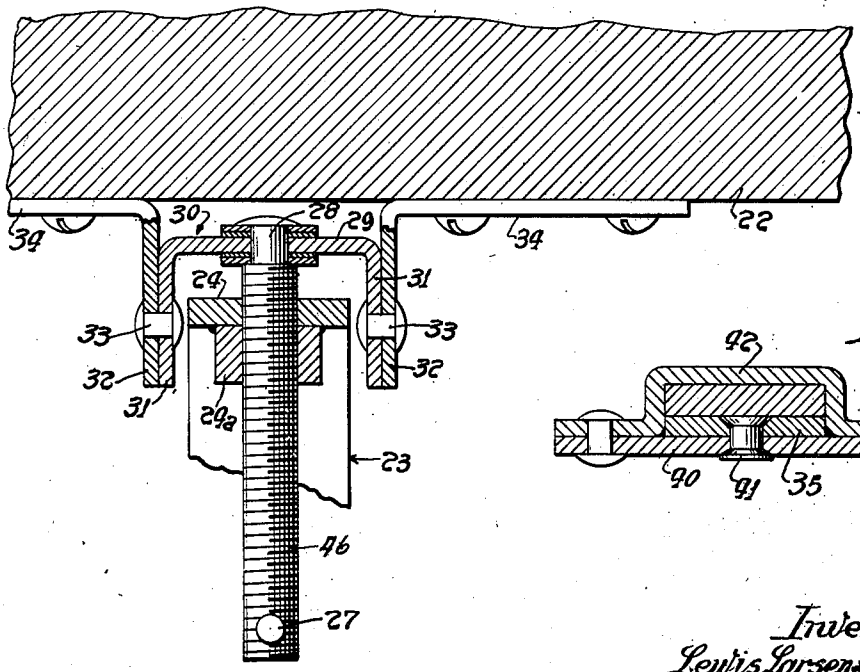


Fig. 5.

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UNITED STATES PATENT OFFICE

2,313,559

CHAIR

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Application June 28, 1940, Serial No. 342,926

9 Claims. (Cl. 155—54)

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 more especially concerned with that type of chair wherein the seat-supporting means is mounted on a base for a forward and a backward cushioned, rocking movement and wherein it is possible readily to shift the position of the seat-supporting means relative to the cushioning means. With such an arrangement, the effect of the weight of the occupant on the cushioning means may be altered so that the rocking action may be easily changed from a relative "soft" or easy one to a stiffer one.

One of the objects of the present invention is to provide a chair of the type mentioned, which is more simple in construction than has heretofore been possible so as to embody fewer parts and which parts are correlated to operate efficiently for the intended purpose.

Another object of the invention is to provide a chair of this kind which may be more readily and accurately adjusted when it is desired to change the rocking action from a "soft" or easy one to a stiffer one and vice versa.

Also, it is an object of the invention to provide a chair of this kind wherein the parts are so arranged that while they are easily accessible for adjustment, they are substantially concealed from view from the front of the chair and therefore the chair gives no indication of its character.

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

In the drawings:

Fig. 1 is a view in side elevation of a chair embodying the preferred form of the invention, parts of which are illustrated as broken away and in section for a better illustration of the structure involved.

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

Fig. 3 is a vertical sectional view, on a somewhat enlarged scale, through a part of the chair as taken on the line 3—3 of Fig. 2 with the seat-supporting means shown in diagrammatic outline and in two different positions of adjustment.

Fig. 4 is a detail vertical sectional view, on an enlarged scale, through a part of the chair as taken on the line 4—4 of Fig. 3.

Fig. 5 is a transverse vertical detail sectional view through another part of the chair, on the scale of Fig. 4, as taken on the line 5—5 of Fig. 3.

Fig. 6 is a detail vertical sectional view through a part of the chair as taken on the line 6—6 of Fig. 2 and on a scale greater than that of said Fig. 2.

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 as a whole, the seat-supporting means of the chair.

The base 10 includes laterally spaced side bars or rails 12—12 that converge rearwardly toward each other and are operatively connected together by front and rear cross bars 13 and 14 respectively. 15 indicates a shaft that extends transversely of the base in a plane between the cross bars 13 and 14. Said shaft is non-rotatively fixed at points toward its ends, upon the top edges of the side bars 12 of the base by clips 16 and the end portions of said shaft extend laterally beyond said side bars.

The seat-supporting means 11 includes a seat 17 and a back rest 18, both suitably upholstered, and side portions 19 which may be made of wood and suitably covered. Said side portions 19, which are substantially parallel, are so spaced apart that they are disposed in vertical planes laterally outward from the planes of the side rails 12 of the base. Along the bottom portion of the outer face of each side portion 19 is a longitudinal cleat 20.

In the bottom of each side portion 19 is provided a transversely extending sleeve 21 (see Fig. 6) which extends into and substantially through the associated cleat. The sleeves 21 receive the associated end parts of the shaft 15 outwardly beyond the clips 16 and whereby the seat-supporting means has a bearing on said shaft and is capable of a forward and a backward rocking movement relative to the base. The side members 18—19 of the seat-supporting means 11 are operatively connected together at a point above and rearwardly of the cross bar 14 of the base by a transverse bar 22 as best appears in Fig. 1.

On the longitudinal median line of the chair as a whole and considered from front to the rear of the chair, is located a resilient means 23 for cushioning the rocking action of the seat supporting means 11. Said means includes a single U-shaped spring, preferably of a flat cross-sectional stock, that has upper and lower legs 24—25 which are connected together at their front ends by a crotch or rounded portion 26. When this spring is in operative position, as

will soon appear, the shaft 15 extends through said spring, between the front end portion of the legs as best appears in Fig. 1. Sufficient clearance is provided between said shaft and spring so as not to interfere with the action of the spring in the rocking movement of the seat-supporting means 11.

The upper leg 24 of said spring is the longer one and its rear end extends into a position beneath the cross bar 22 that connects the two side members 19 of the seat-supporting means together. The said rear end of the spring leg 24 has a boss 24a welded to its bottom side and said end part of said leg and said boss are drilled and threaded to receive a screw 46. The bottom end of this screw carries a cross pin 27 whereby said screw may be turned manually. The upper end of said screw is made as a reduced extension 28 that is journalled for a turning movement in the cross member 29 of an inverted U shaped clip 30.

The clip 30 also includes ears 31 that depend from the ends of the cross member 29 and said ears are disposed to engage against the opposed faces of depending flanges 32 and to which they are pivotally connected as by rivets 33. Each flange 32 is made as a part of an L-shaped bracket 34 that is fixed to the underside of the cross bar 22 that connects the side members 19—19 of the seat-supporting means 11 together. From the above, it is apparent that the clip 30 is capable of a limited rocking movement with respect to the cross bar 22 and that the screw 46 may be turned relatively to said clip and to the leg 24 of the spring and its boss 24a.

The lower leg 25 of the U-shaped spring, which is shorter than the upper leg, engages flatwise upon a supporting member 35. This supporting member, which is disposed in the vertical plane of the U-shaped spring, is operatively secured at its front end to the bottom edge of the front cross bar of the base 10. Its rear end is fixed in the bottom end of a U-shaped clip 36, the top end of which is pivotally connected as at 37 to a pair of ears 38 fixed to the front side of the cross bar 14 of the base. The rear end extremity of the leg 25 is disposed within and is suitably secured to the clip 36 by the same pin or rivet 39 (see Fig. 3) that secures the rear end of the member 35 in said clip.

To prevent the lateral displacement of the leg 25 from its supporting member 35, we secure a transverse plate 40 to the underside of the member 35 by a rivet 41, the member 40 being located a suitable distance forwardly of the cross bar 14 of the base. A guide clip 42 straddles the leg 25 and associated part of the member 35 and the ends of this clip are secured to the ends of the plate 40.

When the occupant of the seat causes a backward and a forward rocking action on the seat-supporting means 11 as a whole from its normal position of rest, said means rocks about the shaft 15. In the rearward part of the rocking movement of the means 11, from said position of rest, toward the limit of the direction mentioned, the leg 24 of the U-shaped spring flexes from the crotch to move toward the leg 25. In the forward rocking movement of the means 11, the leg 24 of the said U-shaped spring flexes upwardly so that the crotch "opens up" and the forward part of the lower leg bears upon that part of the bar 35 in advance of the clip 42 thereon. In this movement of the leg 25, the bar 35 flexes but slightly, if at all, according to the arc through which the means 11 swings about the shaft. If this movement of the means 11 is sufficient to flex the bar 35, the said bar which has a lengthwise, shallow reverse curvature formation, tends to elongate. When said bar so elongates, as its rear end is fixed to the clip 36, then said clip swings rearwardly about its axis to accommodate that elongation. This elongation is not of any considerable degree so that but a slight swinging movement occurs in the clip.

Of course, action of the U-shaped spring is such as to return the means 11 to the normal position of rest when the occupant leaves the seat 17.

With the parts of the chair in the position shown in Fig. 1 and wherein the seat is substantially horizontal, the rocking action of the means is one between a so-called "soft" rocking action and a "stiff" one. If the "soft" rocking action is desired, then the screw 46 is turned to thread "down" through the boss so as to tilt the seat 17 downwardly toward the rear. Thus, the action of the weight of the occupant functions in a plane substantially perpendicular to the plane of the leg 24 of the spring element and such weight is more effective.

If a stiffer rocking action is desired, the screw 46 is turned in the other direction so that the means 11 is tilted slightly forwardly about the axis of the shaft 15 so as to impart a slight inclination to the front part of the seat. This change in inclination is enough so that the weight of the occupant is imposed on the legs of the spring element at an angle less than the perpendicular and is thus less effective to flex said legs so that relatively the spring becomes stiffer. These two positions of adjustment appear in full lines and in dotted lines in Fig. 3.

The chair is of a relatively simple construction, is quiet and free from squeaks under rocking action and the rocking action may be readily adjusted without the use of tools, by turning only the member 26. The operating parts of the chair, while disposed so as to be concealed from view from the front of the chair, are readily accessible from the rear of the chair to make the desired adjustment.

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 only in the illustrative sense so that we do not wish to be limited thereto except as may be specifically set forth in the appended claims.

We claim as our invention:

1. A chair embodying therein a base and a seat supporting means mounted thereon for a backward and forward rocking movement, said base including a forwardly and rearwardly extending member which is capable of a longitudinal flexing, a spring-like element arranged between said base and said seat supporting means for cushioning said rocking movement, said element including upper and lower legs extending forwardly and rearwardly of the chair and being operatively connected together at one end, said lower leg having supporting engagement upon and being operatively connected to said forwardly and rearwardly extending member, and means operatively connecting the other end of said upper leg of said spring-like element to said seat supporting means.

2. A chair embodying therein a base and a seat supporting means mounted thereon for a back-

ward and forward rocking movement, a longitudinally flexible member extending forwardly and rearwardly of the base and operatively secured at one end to said base, means for supporting the other end of said member from said base so as to be capable of a limited longitudinal movement relative to the base, a spring-like element arranged above said member for cushioning the rocking movement of said seat supporting means, said element including upper and lower legs extending forwardly and rearwardly of the chair and being operatively connected together at one end, said lower leg having supporting engagement upon and being operatively connected to said forwardly and rearwardly extending member, and means operatively connecting the other end of said upper leg of said spring-like element to said seat supporting means.

3. A chair embodying therein a base and a seat supporting means mounted thereon for a backward and forward rocking movement, a member extending forwardly and rearwardly of the base and operatively secured at one end to said base, means including a link swingably mounted upon the base and to which the other end of said member is operatively connected for support, a spring-like element arranged above said member and arranged substantially parallel therewith for cushioning the rocking movement of said seat supporting means, said element including upper and lower legs, said lower legs having supporting engagement upon and being operatively connected to said forwardly and rearwardly extending member, and means operatively connecting the other end of said upper leg of said spring-like element to said seat supporting means.

4. A chair embodying therein a base and a seat supporting means mounted thereon for a backward and forward rocking movement, said base comprising side members and front and rear cross bars, a longitudinally flexible forwardly and rearwardly extending member operatively disposed between the side members of the base and connected at one end to one of said cross bars, means connecting the other end of said last mentioned member to the other of said cross bars so as to be capable of a limited longitudinal movement toward and away from said other of said cross bars, a spring-like element for cushioning the rocking movement of said seat supporting means, said element including upper and lower legs operatively connected together at one end, said lower leg bearing upon and being operatively connected to said forwardly and rearwardly extending member for support thereby, and means operatively connecting the other end of the upper leg of said spring-like element to said seat supporting means.

5. A chair embodying therein a base and a seat supporting means mounted thereon for a backward and forward rocking movement, said base comprising side members and front and rear cross bars, a forwardly and rearwardly extending member associated with the base and disposed in a plane between the side members of the base, means operatively connecting the front end of said member to said front cross bar, means providing a swinging link connection for the other end of said member with said rear cross bar of the base, a spring-like element arranged above said member and having upper and lower legs that extend forwardly and rearwardly of the chair, said lower leg engaging upon and being operatively connected to said forwardly and rearwardly extending member, and means operatively connecting the other end of said upper leg to the seat supporting means.

6. A chair embodying therein a base and a seat supporting means mounted thereon for a backward and forward rocking movement, said base comprising side members and front and rear cross members, a forwardly and rearwardly extending member operatively disposed between said side members of the base and connected at one end to the front cross member, a pendently hanging U-shaped link pivotally connected to the rear cross member of the base and operatively receiving and having the other end of said forwardly and rearwardly extending member operatively connected thereto, a spring-like element between the seat supporting means and the base and including upper and lower legs connected together at one end, said lower leg having its free end disposed in and operatively connected to said U-shaped link, means surrounding a part of said forwardly and rearwardly extending member and a part of said lower leg at a point between its ends to prevent lateral separation of said leg and said forwardly and rearwardly extending member, and means operatively connecting the other end of said upper leg to said seat supporting means.

7. A chair embodying therein a base and a seat supporting means mounted thereon for a backward and forward movement, a spring-like element disposed between said base and said seat supporting means for cushioning said rocking movement, said element including upper and lower legs extending from the front to the rear of the chair and operatively connected together at one end, means for operatively securing the other end of the lower leg to said base, means for operatively securing the other end of said upper leg to said seat supporting means and including a member pivoted to said seat supporting means, and a screw-like member swivelled in said last mentioned member and having a threaded engagement with said other end of said upper leg of said spring-like element.

8. A chair embodying therein a base and a seat supporting means mounted thereon for a backward and forward movement, a spring-like element disposed between said base and said seat supporting means for cushioning said rocking movement, said element including upper and lower legs extending from the front to the rear of the chair and operatively connected together at one end, means for operatively securing the other end of the lower leg to the base, means for operatively securing the other end of said upper leg to said seat supporting means and including laterally spaced ears secured to a part of said seat supporting means, a member pivotally connected to said ears about an axis disposed at a right angle to said upper leg, and a screw member swivelled in said pivoted member and having a screw-threaded engagement with the associated end of said upper leg of the said spring-like element.

9. A chair embodying therein a base and a seat supporting means mounted thereon for a backward and forward movement, a spring-like element disposed between said base and said seat supporting means for cushioning said rocking movement, said element including upper and lower legs extending from the front to the rear of the chair and operatively connected together at one end, means for operatively securing the other

end of the lower leg to said base, means for operatively securing the other end of said upper leg to said seat supporting means and including a bar extending transversely of said seat supporting means toward the rear portion thereof, laterally spaced ears depending from said bar, a U-shaped clip pivotally mounted between said ears, and a screw member having a swivel connection with said clip and having a screw-threaded connection with the associated end of said upper leg of said spring-like element.

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