

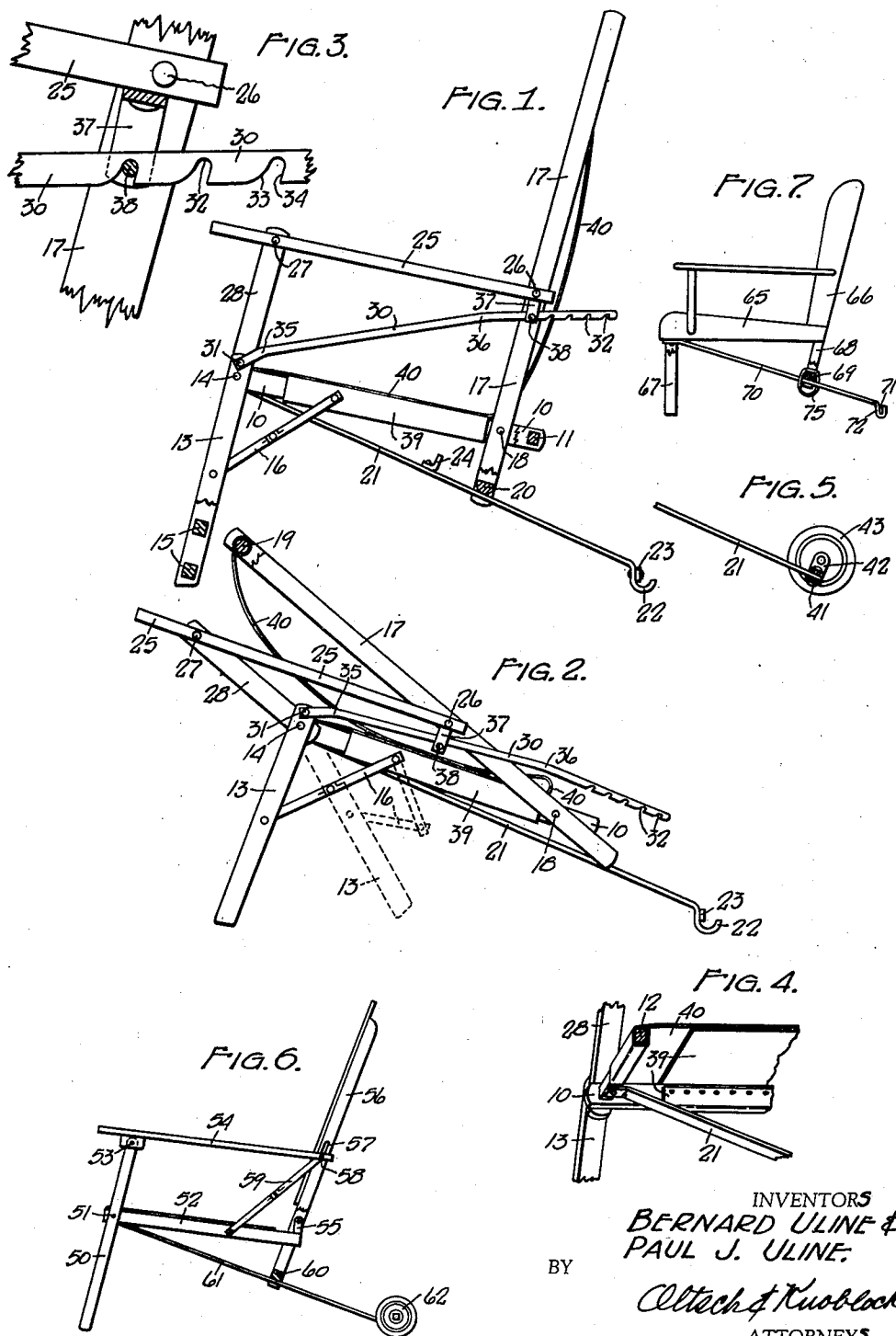
March 11, 1941.

B. ULINE ET AL

2,234,359

CHAIR

Filed Jan. 24, 1938



UNITED STATES PATENT OFFICE

2,234,359

CHAIR

Bernard Uline and Paul J. Uline, Nappanee, Ind.

Application January 24, 1938, Serial No. 186,543

9 Claims. (Cl. 155—76)

This invention relates to improvements in chairs.

The primary object of the invention is to provide a novel folding chair construction which is simple in construction and comfortable in use.

A further object is to provide a folding chair having an adjustable back, operable by a person while seated therein.

A further object is to provide a folding chair having a shiftable back which may be tilted forwardly above the chair seat to protect the seat when not in use, but without requiring complete folding of the chair.

A further object is to provide a novel inexpensive resilient supporting structure for a chair.

A further object is to provide a chair having front legs and a seat, with an elongated substantially straight resilient member extending rearwardly and downwardly from the front of a seat and supporting a member depending below the rear of the seat.

A further object is to provide a folding chair with a resilient support accommodating rocking.

Other objects will be apparent from the description and appended claims.

In the drawing:

Fig. 1 is a side elevation of a folding chair in operative position with parts broken away.

Fig. 2 is a side elevation of the chair partially folded to protect the seat, and illustrating folded position of the legs in dotted lines.

Fig. 3 is an enlarged fragmentary detail view of the chair back positioning means.

Fig. 4 is a fragmentary detail perspective view looking up at the bottom of the seat from the front.

Fig. 5 is a fragmentary detail sectional view of a modified chair supporting construction.

Fig. 6 is a side elevation of a folding chair constituting a modified embodiment of our invention.

Fig. 7 is a side elevation of a non-folding chair constituting a modified embodiment of our invention.

Referring to the drawing, and particularly to Figs. 1 to 4, which illustrate the preferred embodiment of our invention as applied to a folding type of chair, numeral 10 designates the side rails of the frame of the seat of the chair. Rails 10 are rigidly interconnected by a rear transverse cleat 11, and by a transverse cleat 12 (Fig. 4) at the front which is preferably rotatable. A pair of legs 13 are pivotally connected at 14 at their upper ends to the front ends of seat rails 10, and are rigidly interconnected by transverse

cleats 15. A foldable brace 16 extends diagonally between intermediate portions of legs 13 and seat rails 10 to normally brace and lock said legs and rails in predetermined operative angular position.

Side bars 17 of a seat back are pivotally connected to the rear ends of seat rails 10 at 18 in spaced relation above the lower ends thereof. The side bars 17 are rigidly connected at their upper ends by a transverse cleat 19, and at their lower ends by a transverse cleat 20, which is preferably part round. The spacing of cleat 20 below pivot 18 thereof is substantially less than the length of legs 13.

A pair of elongated, straight leaf spring members 21 are secured at their ends adjacent the ends of front seat cleat 12, and extend rearwardly and downwardly therefrom. The opposite ends of spring members preferably terminate in downwardly off-set arcuate bearing portions 22, and are rigidly interconnected by a cross brace 23. The members 21 underlie and support the lower cleat 20 at an intermediate portion of said members and in spaced relation above the floor or surface upon which the chair rests. Stops 24 are fixedly secured to the upper faces of spring members 21 in predetermined position located forwardly of the normal point of engagement of cleat 20 therewith as illustrated in Fig. 1.

A pair of arm rests 25 are pivoted at 26 adjacent their rear ends to the side bars 17 of the back in spaced relation above pivot 18. The arm rests 25 are pivoted at 27 adjacent their front ends to the upper ends of supports 28 which are pivoted to the seat and legs at 14. The spacing between pivots 14 and 27 is substantially equal to the spacing between pivots 18 and 26; and the spacing between pivots 26 and 27 is substantially equal to the spacing between pivots 14 and 18; whereby the seat rails 10, back, side bars 17, arm rests 25, and arm rest supports 28 constitute a substantial parallelogram.

A pair of elongated metal braces 30 are pivoted at 31 at their forward ends to the legs 13 in slightly spaced relation above pivot 14. The braces 30 have their major width faces substantially vertically disposed, and the lower edges thereof adjacent the rear ends thereof are provided with a plurality of spaced notches 32 defined by forward curved edges 33 merging with the lower brace edge and by rear straight diagonal edges 34 forming an acute angled shoulder with the lower brace edge, as best illustrated in Fig. 3. Braces 30 extend generally diagonally rearwardly and upwardly from their pivot 31,

and are bent at 35 and 36 adjacent the pivot 31 and the notched rear end portion respectively, whereby the notched rear end portion is substantially horizontally positioned in use, as best illustrated in Fig. 1, for purposes to be hereinafter set forth. At its rear end, each arm rest 25 has a U-shaped bracket 37 rigidly secured to its under side with the legs of said bracket extending downwardly from said arm rest. A cross piece 38 is rigidly secured to and extends between the lower ends of the bracket legs in substantially spaced relation below arm rest 25. The brace 30 extends through bracket 37, and bracket cross piece 38 is adapted to snugly but releasably seat in one of the notches 32.

A sheet 39 of cloth, such as canvas, extends transversely of the seat rails 10, the same being passed around the rails and secured to the inner sides thereof, with the center portion extending between the upper edges of the rails. A second sheet 40 of similar material is secured to the cleat 12 at one end, said sheet being passed around said cleat, thence extending rearwardly to overlie sheet 39, and thence extending loosely upwardly with its upper end secured to cleat 19.

When operatively positioned for use, the parts are arranged as illustrated in Fig. 1, with brace 16 locking seat frame 10 in fixed angular relation to legs 13, the adjustment of the back frame and arm rest assembly being locked in desired adjustment relative to the seat frame by the locked adjustment of brace 30 with the cross piece of bracket 37, and with the rear portion of the chair supported on members 21. By swaying slightly backwardly and forwardly, a user seated on the chair may obtain a rocking movement by flexing of spring members 21 as is well understood. The member 21 rocks upon its arcuate rear support 22 incident to the periodic flexing of the spring to obtain the rocking action, thus eliminating sliding of the member 21 on the ground or the floor.

When the user of the chair desires to adjust the back to a reclining position, he may do so while remaining seated by raising braces 30 clear of cross piece 38, and then leaning backwardly until the desired back angle is reached, whereupon the brace 30 may be released for seating of the adjacent brace notches 32 on the cross pieces 38. The substantially horizontal positioning of the notched rear portion of the brace 30 permits this adjustment without interference from arm rests 25. Likewise, the sliding of lower back frame cleat 20 on spring member 21 while supporting the weight of the user, coupled with the pivoting of the arm rest assembly to accommodate the inclination of the back, serves to slightly retard the reclining movement of the backs to afford control of the degree of inclining adjustment of the back; while the stops 24 prevent rearward tilting of the back beyond the end of brace 30 or to such a point where the chair would rearwardly collapse. When the user desires to adjust the chair back forwardly to a more nearly upright position, he may do so while seated by leaning forward slightly and pushing forwardly on the arm rests, which forwardly shifts the upper end of the back rest frame and causes the curved edges 33 of the brace notches to freely ride over cross pieces 38 until the desired adjustment is effected. Thus the device enables a user to effect any adjustment of the chair desired, while remaining seated therein, by a simple operation which requires but little effort. It will, of course, be understood that the

back adjustment may be incorporated in a folding chair of the rigid or non-rocking type by simply forming the diagonal supports 21 of rigid or non-resilient material.

Folding chairs of this type are largely used out of doors, and hence are subject to rapid discoloration or sun fading, and rapidly become objectionably dirty. The instant construction permits the back frame to be folded forwardly whereby the upper end of the sheet 40 overlies the seat portion and is in substantially inverted position, as illustrated in Fig. 2. To effect this adjustment it is only necessary to tilt the back frame forwardly after arising from the chair, the curved notch edges 33 sliding over cross piece 38 without retarding such forward tilting. Thus, the chair may remain in any desired location without danger of dirtying or discoloring the normally exposed face of sheet 40, and is ready for use by merely tilting the back frame rearwardly, since the legs 13, seat frame 10 and diagonal support 21 remain in operative upright supporting relation. To completely fold the chair, it is only necessary to pivot folding brace 16 after the back is forwardly tilted, whereby all parts may move to compact substantially parallel relation. For the purpose of the partial and complete folding above described, the front cleat 12 of the seat frame to which member 21 is secured, is rotatable.

It may be desired in some instances to construct the chair with means for simplifying movement thereof from place to place. For this purpose the free lower rear ends of diagonal supporting members may be secured to the cross piece 41 of a U-shaped frame member whose arms 42 extend upwardly and journal wheels 43, as illustrated in Fig. 5. Such an arrangement accommodates positioning of the rear ends of members 21 sufficiently low to give the necessary inclination of said member without sacrifice of the length of such member as might render the same unstable upon application of rearward tilting stress. At the same time, the wheels roll incident to springing of said member, and the cross piece 41 affords the same lateral stability and reinforcement of members 21 as is afforded by cross brace 23.

While the above described folding chair construction is preferred, the elongated inclined resilient supporting member may be used in other types of folding chairs, as illustrated in Fig. 6. In this construction, legs 50 have pivoted thereto at 51, intermediate their ends, the front of a seat frame 52. The upper ends of legs 50 are pivoted at 53 to the front ends of arm rests 54. The rear end of seat frame 52 carries brackets 55 which are pivoted to the side bars 56 of the chair back in spaced relation above the lower ends of said bars. Side bars 56 are provided with elongated slots 57 therein for receiving pivot members 58 which mount the rear ends of arm rests 54. A folding brace 59 is connected with bars 56 of the back by pivot member 58 at one end, and is pivoted to seat frame 52 at its opposite end. A transverse cleat 60 is secured between the lower ends of bars 56 of the back. A pair of straight elongated leaf spring members 61 are pivotally connected to the front of seat frame 52 and extend rearwardly and downwardly therefrom. Cleat 60 rests upon spring members 61 intermediate the ends of said springs, and at the lower ends of said springs 61 are supported by wheels 62. The same supporting and interconnecting

arrangement illustrated in Fig. 5 may be used with this construction.

Thus, this modified type of chair is supported by front legs and inclined resilient members engaged by a part depending below the rear of the seat frame, as in the previously described construction; and the same vertical rocking chair action may be obtained through the substantially straight elongated inclined springs. At the same time, the pivotal connection of the parts normally reinforced by foldable brace 59, coupled with the pivotal connection of spring 61 to seat frame 52, accommodates complete and compact folding of the chair upon pivoting of brace 59, as will be readily apparent.

The resilient chair mounting may also be applied with equal advantage to non-folding chairs, as illustrated in Fig. 7. Thus, chair seat 65 and back 66 form a rigid unit supported at its forward end by legs 67. Frame members 68 depend from this unit at the rear of seat 65 a distance less than the length of legs 67, and are interconnected at their lower ends by transverse cleat 69. The front ends of a pair of substantially straight elongated leaf springs 70 are rigidly secured to the seat bottom adjacent the forward end thereof and extend rearwardly downwardly therefrom to support cleat 69 intermediate their ends. The rear ends of the springs 70 are rigidly interconnected by a cross brace 71 which is preferably secured at a downwardly off-set arcuate end bearing portion 72 of said springs, said portions 72 constituting a bearing upon which the springs may rock incident to flexure of the springs to prevent sliding of said springs upon the floor.

In all constructions utilizing the inclined leaf spring support for a transverse member spaced below the chair seat, a suitable strap 75 or the like, as illustrated in Fig. 7, may loosely encircle the transverse member and the leaf spring to hold said parts together conveniently and at the same time permit sliding of one relative to the other to accommodate the rocking action, and also to accommodate the back adjustment and complete folding in the folding type of chair.

We claim:

1. A chair comprising a seat, front legs, a resilient member secured to the front of the seat and inclined rearwardly downwardly therefrom, and seat supporting means depending from the rear of said seat and resting on said resilient member between the ends of said member to slide on the resilient member upon flexing thereof.

2. The construction of claim 1, wherein said resilient member terminates in a downwardly off-set curved portion at its lower end on which said member rocks incident to flexing.

3. A chair comprising a seat, legs supporting the front of said seat, a pair of spaced, elongated resilient members secured to the front of said

seat and extending rearwardly downwardly therefrom in substantially parallel relation, means rigidly interconnecting the lower end portions of said resilient members, and rigid means projecting below the rear of said seat and including a rigid transverse member spaced below said seat and bearing on said resilient members intermediate the ends of the latter to slide on said resilient members incident to flexing thereof.

4. A chair comprising a seat, front legs, an elongated supporting member secured to the front of said seat and inclining rearwardly downwardly therefrom, said supporting member being vertically resilient, rigid means depending from the rear of said seat and bearing on an intermediate portion of said supporting member, and means connecting said rigid means and supporting member against separation, said last named means accommodating sliding of said rigid means longitudinally of said supporting member incident to flexing of said supporting member.

5. A folding chair, comprising a seat, legs pivoted to the front of said seat, a back pivoted to the rear of said seat and extending therebelow, means for locking said seat, legs and back in operative angular relation, and an elongated resilient member secured to the front of the seat and extending rearwardly downwardly therefrom, the lower end of said back bearing on an intermediate portion of said resilient member.

6. The construction defined in claim 5, wherein said resilient member is pivotally connected to said seat.

7. A folding chair, comprising a seat, legs pivoted to the front of said seat, a folding brace between said legs and seat, a back pivoted to the rear of said seat and extending therebelow, means for locking said back in desired angular relation to said seat, and an elongated resilient support secured to the front of said seat and extending rearwardly downwardly therefrom, said back resting on an intermediate portion of said support.

8. A chair comprising a seat, legs supporting the front of said seat, an elongated resilient support secured to the front of said seat and extending rearwardly downwardly therefrom, a back pivoted to the rear of said seat and extending therebelow to slidably bear on said support, and adjustable means for locking said back in desired angular relation to said seat and support.

9. The construction defined in claim 8, wherein said means comprises an elongated brace pivoted at its front adjacent the front of said seat and having a plurality of spaced notches adjacent its rear end, and locking means carried by said back and adapted to seat in one of said notches.

BERNARD ULIN.
PAUL J. ULIN.