Jan. 5, 1954 D. D. SPEAR 2,664,942

ADJUSTABLE CHAIR WITH LEG SUPPORTING PLATFORM

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FIG. 1.

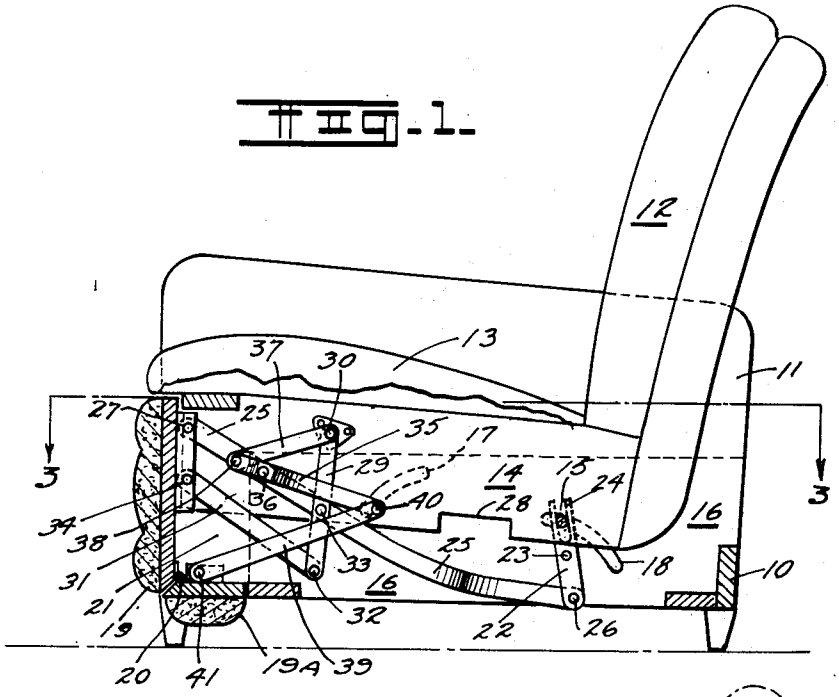
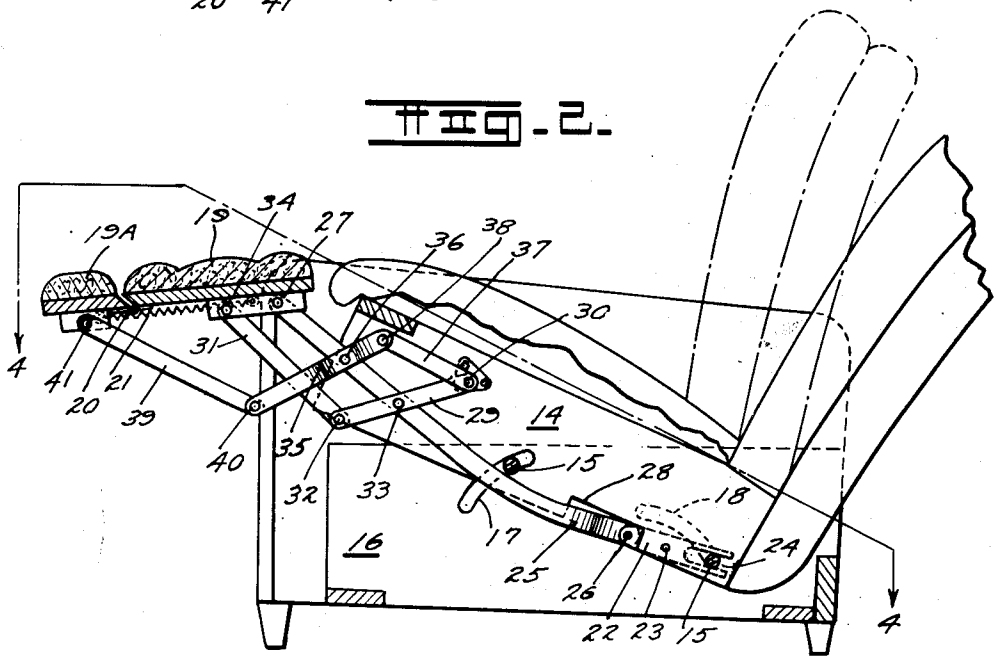


FIG. 2.



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FIG. 3.

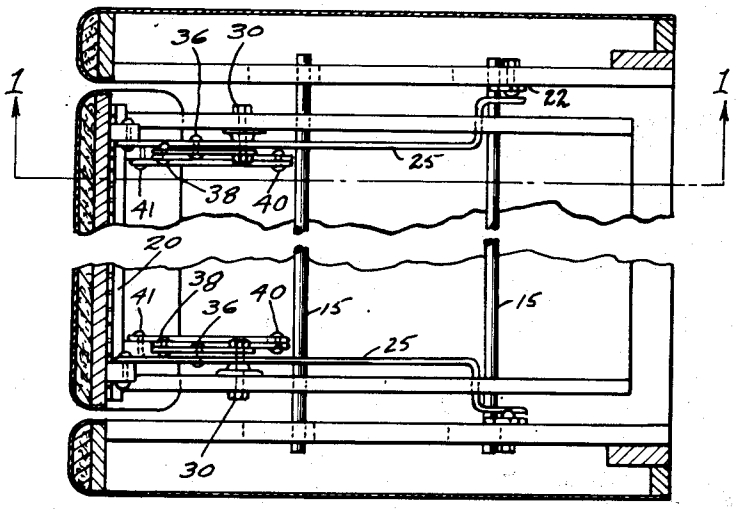
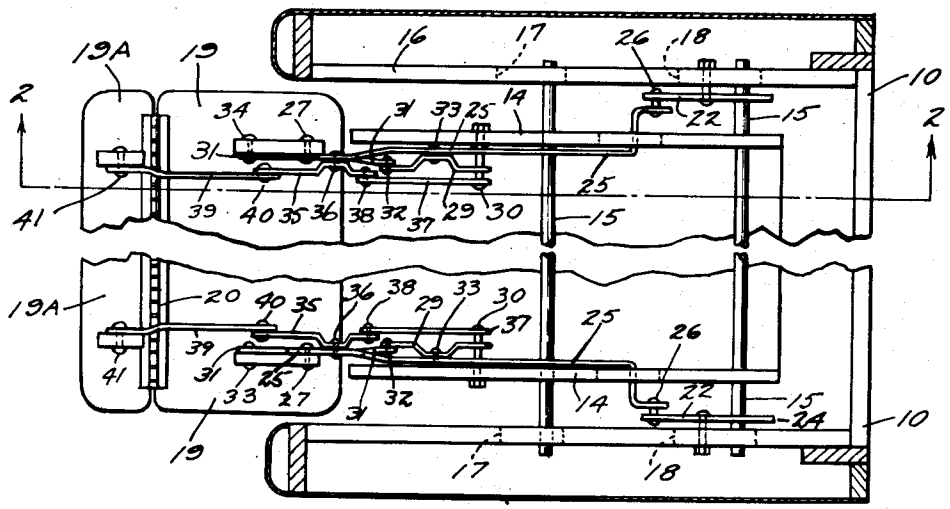


FIG. 4.



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Patented Jan. 5, 1954

2,664,942

UNITED STATES PATENT OFFICE

2,664,942

ADJUSTABLE CHAIR WITH LEG SUPPORTING PLATFORM

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Application December 2, 1952, Serial No. 323,539

6 Claims. (Cl. 155—106)

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This invention relates to chairs and more particularly to an adjustable chair wherein a unitary seat and back unit are adjustably positioned with respect to a pair of spaced stationary arms and wherein a two-part foldable leg supporting platform is operated by the movement of the unitary seat and back.

The principal object of the invention is the provision of a simple and efficient two-part foldable leg supporting platform for an adjustable chair.

A further object of the invention is the provision of an improved leg supporting platform in an adjustable chair in which the base portion includes a pair of spaced stationary arms.

A still further object of the invention is the provision of an adjustable chair with a leg supporting platform in which tilting movement of the seat and back portion of the chair results in upward and outward unfolding movement of the leg supporting platform.

A still further object of the invention is the provision of an adjustable chair and leg supporting platform in which a stationary base including arms positions a unitary seat and back and wherein movement of the unitary seat and back relative to the base results in positioning the leg supporting platform in desirable relation to the seat and back unit.

The adjustable chair with leg supporting platform disclosed herein comprises an improvement in the art and particularly with respect to Patent No. 2,516,712, issued July 25, 1950, on Reclining Chair With Stationary Arms, and Patent No. 2,604,141, issued July 22, 1952, in that an improved leg supporting platform and operating mechanism has been combined with a chair construction like that disclosed in the above Maurer Patent 2,604,141 so that reclining motion of the seat and back unit of the chair results in unfolding and elevating a two-part leg supporting platform to a position in substantial longitudinal alignment with the seat of the chair and forwardly thereof.

The improved two-part leg supporting platform is so formed that when the chair is in upright position it is folded and concealed in the front of the base portion of the chair and partially in under the seat portion and so arranged that the relative movement of the seat and back unit of the chair with respect to the arms results in the unfolding extension and folding retraction of the two-part leg platform.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being the intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

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The invention is illustrated in the accompanying drawing, wherein:

Figure 1 is a vertical section of the chair taken on line 1—1 of Figure 3.

Figure 2 is a vertical section of the chair taken on line 2—2 of Figure 4 and showing the chair in reclining position.

Figure 3 is a horizontal section taken on line 3—3 of Figure 1.

Figure 4 is a horizontal section taken on line 4—4 of Figure 2 and showing the chair in reclining position.

By referring to the drawings and Figure 1 in particular it will be seen that an adjustable chair with a two-part foldable leg supporting platform is disclosed and comprises a base 10 including a pair of spaced arms 11 affixed thereto and arranged to adjustably position a seat and back unit therebetween, the upright portion of which is a back 12 and the horizontal portion of which is a seat 13.

The seat and back unit includes a pair of spaced rails 14 positioned beneath the sides of the seat portion 13. The rails 14 serve to position a pair of rods 15—15 transversely of the seat portion 13. The base 10 has a pair of spaced vertical side sections 16—16 positioned beneath the arms 11 and parallel with and adjacent to the rails 14 heretofore referred to. Two pairs of semi-arcuate slots 17 and 18 are formed in the vertical side sections 16—16 in oppositely disposed relation so that the extending ends of the rods 15—15 loosely fit therein for sliding movement.

It will thus be observed by referring to Figure 1 of the drawings that when the seat and back unit is in position, as shown, with the seat portion 13 in substantially horizontal position, the rods 15—15 are in the forward ends of the semi-arcuate slots 17 and 18.

By referring to Figure 2 of the drawings it will be seen that the rods 15 move to the opposite or rear ends of the semi-arcuate slots 17 and 18 when the seat and back unit is tilted backwardly to reclining position. The front portion of the seat portion 13 is cut away beneath the upper edge thereof so that a two-part foldable leg supporting platform 19 and 19A may be positioned therebeneath, the portion 19 being in substantially vertical position and the portion 19A being in horizon-

tal position. The portions 19 and 19A are hinged to one another by hinges 20 and biased toward one another by a tension spring 21. The two-part foldable leg supporting platform 19 and 19A is preferably upholstered so that it matches the appearance of the seat portion 13 of the seat and back unit of the chair and is of a size and shape so that it conforms with the chair lines in upright position, as shown in Figure 1 of the drawings, and does not indicate its presence.

Mechanism is provided, as shown in Figures 1 and 2 of the drawings, for unfolding and moving the two-part leg supporting platform 19 and 19A outwardly and upwardly at such time as the seat and back unit is moved backwardly to reclining position. The mechanism for unfolding and moving the two-part leg supporting platform 19 and 19A comprises a plurality of levers which are pivotally affixed to the leg supporting platform 19 and 19A and which are actuated by the movement of the unitary seat and back portion with respect to the stationary base. The movement is initiated by a pair of oppositely disposed levers 22—22 pivoted midway between their ends by pivots 23—23 to the vertical side sections 16.

The levers 22—22 lie inwardly of the vertical side sections 16 and adjacent the rearmost pair of arcuately formed slots 18. The levers 22—22 are pivoted to the vertical side sections 16—16 so that their uppermost ends, as seen in Figure 1, move on an arc comparable with that of the arcuate slots 18 and the uppermost ends of the levers 22—22 are bifurcated as at 24 so that they may slidably engage the rods 15 at points thereon between the side rails 14 of the seat and back unit and the vertical side sections 16 of the base, as best shown in Figure 4 of the drawings.

By referring again to Figure 1 of the drawings it will be observed that a pair of offset links 25 are pivoted at their opposite ends to the lower ends of the levers 22 by pivots 26—26 and to the upper portions of the leg supporting platform 19 by pivots 27—27. It will be observed that the bottom portion of the side rails 14 of the seat and back unit have recesses 28 cut therein registering with the offset portion of the offset links 25 which permits the rearward ends of the offset links 25 to lie on a plane between the side rails 14 and the vertical side sections 16 while their forward portions lie within the area between the rails 14 of the seat and back unit.

A pair of secondary levers 29—29 are pivoted at their uppermost ends to the inner sides of the side rails 14 by means of pivots 30—30 and at their lowermost ends to a pair of secondary links 31—31 by means of pivots 32—32. The secondary levers 29—29 are also pivoted intermediate their ends to the links 25—25 by means of pivots 33—33 and the foremost ends of the secondary links 31—31 are pivoted to the portion 19 of the leg supporting platform by means of pivots 34—34. The pivots 27 and 34 are spaced with respect to one another. It will thus be seen that when the seat and back unit is in upright position, as shown in Figure 1 of the drawings, the levers 22 are in approximately vertical position with their bifurcated upper ends 24 engaged upon the rod 15 which is in the upper portion of the arcuate slots 18. The offset links 25 extend between the lower ends of the levers 22 and the upper pivotal attachment points of the leg supporting platform 19.

The portion 19 of the leg supporting platform is in vertical position by reason of the positioning of the secondary levers 29 and the secondary links 31. The secondary levers 29 are pivoted to the side rails 14 of the seat and back unit by the pivots 30 and are in substantially vertical position with their lower ends pivoted to the rear ends of the secondary links 31 through the pivots 32. The pivots 33 intermediate the ends of the secondary levers 29 are pivoted to the offset links 25 at a distance spaced from the forward end of these links such that the portion 19 of the leg supporting platform is held in vertical position, as shown in Figure 1 of the drawings.

The portion 19A of the leg supporting platform is held in horizontal position inwardly of the lower edge of the portion 19 by third levers 35—35 which are pivoted near their ends by pivots 36 to the offset links 25 heretofore referred to. The third levers 35—35 have links 37—37 pivoted to the short end of the third levers 35—35 by pivots 38—38, the links 37 being also pivoted to the pivots 30 on the rails 14 heretofore referred to.

The opposite ends of the third levers 35—35 are pivoted to links 39 by means of pivots 40, the links 39 being pivoted at their other ends to pivots 41 on the portion 19A of the leg supporting platform. It will thus be seen that when the portion 19 of the leg supporting platform is moved into vertical position, as shown in Figure 1, by the rearward movement of the offset links 25 as heretofore described, the third levers 35 turn on the pivots 36 by which they are attached to the offset links 25 by reason of the links 37 which are affixed to the pivots 30. This causes the opposite ends of the third levers 35 carrying the pivots 40 to swing in a wide arc and move the levers 39 inwardly of the chair at a more rapid rate than the levers 31, thus causing the portion 19A of the leg platform to hinge inwardly with respect to the portion 19, which action is assisted by the tension spring 21 which interconnects the portions 19 and 19A of the leg platform.

At such time as the seat and back unit is tilted backwardly, as shown in solid lines in Figure 2 of the drawings, the levers 22 move from approximately vertical position to approximately horizontal position as they follow the movement of the rod 15 in the oppositely disposed arcuate slots 18. The opposite ends of the lever 22 therefore move the offset links 25 forwardly which causes the upper end of the portion 19 of the leg supporting platform to move outwardly and upwardly as the offset links 25 are pivoted by way of the secondary levers 29 and the pivots 30 to the side rails 14 of the seat and back portion. The lower end of the portion 19 of the leg supporting platform swings outwardly and upwardly on an arc based on the pivots 27 on the ends of the offset links 25 by reason of the secondary links 31 and the secondary levers 29 to which they are pivoted.

It will also be seen by referring to Figure 2 of the drawings that when the offset links 25 move forwardly as just described, the third levers 25 also move forwardly as they are secured thereto by the pivots 36 and as the short ends of the third levers 35 are pivoted by the links 37 to the pivots 30 which are fixed on the rails 14 of the seat, the resulting movement of the longer ends of the third levers 35 causes the links 39 to move forward at a more rapid rate than the links 31 thereby moving the portion 19A of the leg supporting platform forwardly and upwardly at a more rapid rate than that of the portion 19.

and, as the portion 19 is hinged to the portion 19A of the leg supporting platform, it moves in an arc based on the hinges 20 and assumes a longitudinal alignment with the portion 19 when the same has assumed substantially horizontal position.

It will thus be seen that the portions 19 and 19A of the leg supporting platform move in predetermined patterns directly responsive to the tilting motion of the seat and back unit and that when the seat and back unit is in reclining position, as shown in Figure 2 of the drawings, the leg supporting platform has moved into substantially horizontal position in horizontal alignment with the forward end of the seat portion 13 where it forms an effective leg supporting platform. Those skilled in the art will observe that any intermediate position of the seat and back unit with respect to the base will result in a similar intermediate position of the leg supporting platform.

It will also be seen that due to the novel folding action of the portions 19 and 19A of the leg supporting platform, the leg supporting platform may be made longer than would otherwise be the case or it may be used in a chair construction having lower seat lines or, alternately, in chair constructions in which the entire base is elevated with respect to the supporting surface on suitable legs.

The improved construction disclosed herein therefore permits the leg supporting platform to be of adequate size in extended leg supporting position and at the same time to be compactly positioned inconspicuously in the chair when the same is in upright position. This avoids the heretofore common bulkiness found in chairs of this general type wherein hinged leg supporting platforms were employed and wherein the same moved from vertical to horizontal position as in the case of the aforementioned Maurer patents.

The improvement herein disclosed contributes to the efficiency of the structure in that a larger leg supporting platform can be built into a chair and at the same time into a smaller portion of the chair particularly with respect to the height of the seat of the chair above floor level.

Additionally, the mechanism may be easily shipped as to length to cause the larger portion 19 of the platform to move into an inwardly inclined position beneath the seat portion of the chair which contributes considerably to the attractiveness of the resulting chair structure as the leg supporting platform then appears to be an inwardly tapering portion of the seat itself and, in addition, increases the clearance between the floor and the leg supporting platform as the same is, in effect, folded backwardly in under the seat portion and begins to move upwardly toward the same.

It will occur to those skilled in the art that the mechanism is efficient and incapable of becoming inoperative and that it may be inexpensively formed and positioned in the chair in a minimum of space.

It will thus be seen that the improved leg supporting platform for an adjustable chair disclosed herein meets the several objects of the invention.

Having thus described my invention, what I claim is:

1. In a reclining chair having a seat and back unit and means for supporting the same in tiltable relation to a supporting surface, said supporting means comprising a base relatively wider than said seat and back unit and including vertical side sections having slots formed therein at an inclination and in oppositely disposed relation, said seat and back unit having sidewardly projecting means engaging said slots, levers pivoted intermediate their ends to said side sections adjacent said slots and engaged on said sidewardly projecting means, and secondary levers pivoted at their upper ends to said seat and back unit, the improvement comprising a two-part foldable leg supporting platform and links pivotally secured to said levers and secondary levers and to one part of said two-part foldable leg supporting platform, and secondary links pivotally secured to said secondary levers and to said one part of said two-part foldable leg supporting platform, third levers pivoted to said links between said secondary levers and said one part of said leg supporting platform, third links pivotally secured to ends of said third levers and to said seat and back unit and a last pair of links pivotally secured to the opposite ends of said third levers and to the other part of said two-part leg supporting platform for positioning said two-part leg supporting platform in movable relation to said seat and back unit.

2. The structure set forth in claim 1 and further characterized by said links pivotally engaging and wherein the two parts of the foldable leg supporting platform are hinged to one another on a horizontal axis.

3. The structure set forth in claim 1 wherein said first mentioned part of said two-part foldable leg supporting platform is at least double the size of said other part and wherein the two parts of the leg supporting platform are hinged to one another on a horizontal axis.

4. The structure set forth in claim 1 and wherein said links pivotally engage said one part of said leg supporting platform adjacent its uppermost edge and said secondary links engage said one part of said leg supporting platform adjacent its lowermost edge in downwardly spaced relation to the first links and said last pair of links engage said other part of said two-part leg supporting platform.

5. The structure set forth in claim 1 and further characterized by the pivoting of said third levers to said links at points on said third levers closer to one end thereof than the other and wherein said last pair of links are pivotally secured to the longer ends of said third levers to move said other part of said two-part leg supporting platform with respect to the first mentioned part.

6. The structure set forth in claim 1 wherein the two parts of the leg supporting platform are hinged to one another on a horizontal axis and a tension spring interconnects the two parts and urges the same to right angular relation.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,626,069	Beech	Apr. 26, 1927
2,604,141	Maurer	July 22, 1952