

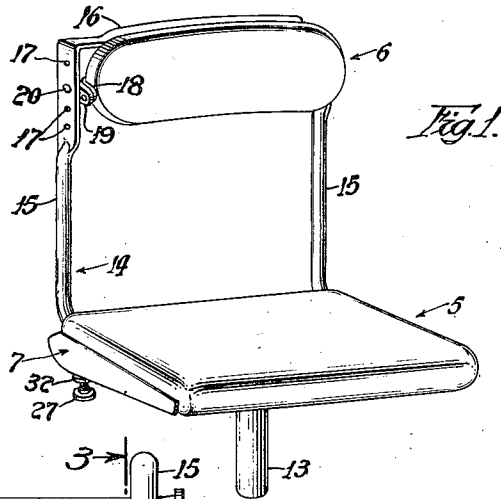
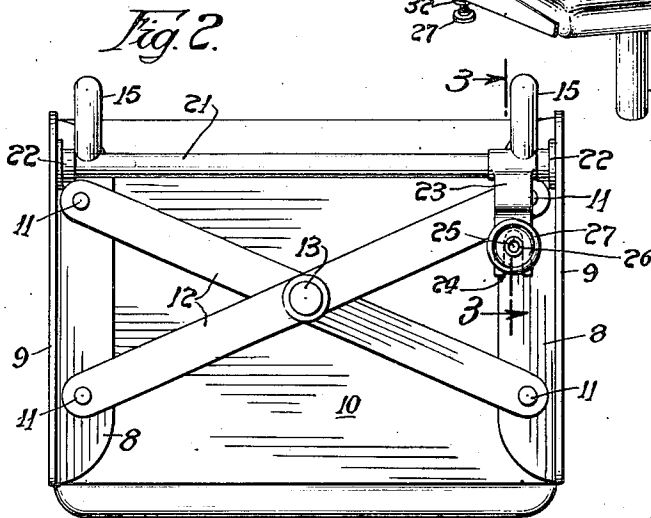
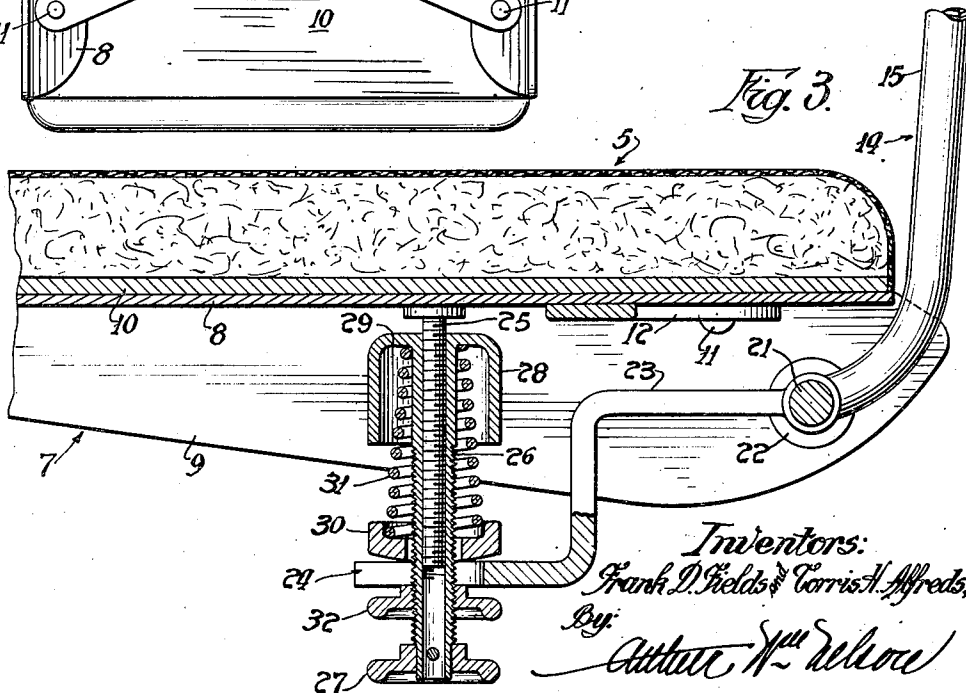
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SPRING BACK SUPPORT

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SPRING BACK SUPPORT

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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 chairs with which the invention is more especially concerned, are those intended for use by office and bench workers and include a seat and back rest that is mounted for a backward and a forward movement with a cushioning action.

One of the objects of the present invention is to provide a chair of this kind wherein not only the normal position of the back rest but the cushioning action thereof may be readily adjusted by the occupant of the chair.

Another object of the invention is to provide a chair having a back rest adjustment of this kind which is simple in construction, is strong and durable and is free from noises and squeeks when the chair is occupied.

Also, it is an object of the invention to provide a chair having a back rest adjustment which may be readily actuated to hold the back rest rigidly in the desired position and in which position the cushioning action thereof is rendered ineffective.

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 drawing:

Fig. 1 is a perspective view of the seat and associated back rest of a chair embodying the preferred form of the invention.

Fig. 2 is a view in elevation on an enlarged scale of the bottom of the seat of the chair.

Fig. 3 is a detail vertical sectional view, on a further enlarged scale, through a part of the chair and associated seat as taken on the line 3—3 of Fig. 2.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawing, 5 indicates as a whole the seat of a chair and 6 indicates as a whole the back rest associated therewith. At each side of the seat, on the bottom thereof, is secured a supporting member 7 in the form of an angle bar having a horizontally disposed flange 8 and a vertically disposed flange 9 that deepens toward the rear end of the seat. The supporting members 7 are secured to the wooden bottom 10 of the seat by bolts or the like 11 which pass through the horizontal flanges 8 of said members 7—7 and through the ends of diagonally extending bars 12—12. These bars which coact to form a seat supporting spider, intersect each other midway

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between the sides of the seat and somewhat toward the rear of the seat and a seat post or spindle 13 is fixed to the intersection of said bars. This post or spindle is adapted for operative swivelling engagement in the usual barrel of the base for the chair which is not shown herein.

14 indicates as a whole the means by which the back rest 6 is operatively connected to the seat 5 for support thereby. As shown herein said means consists of an inverted U shape frame that includes a pair of laterally spaced upright side arms or posts 15—15 and a top cross bar 16. Said inverted U shaped frame is made of metal tubing and the upper end portion of the arms or posts 15 are flattened and formed with vertically spaced holes 17 therein. The back rest is provided with a pair of end ears 18, each operatively connected to a clip 19 that engages the inner surfaces of the flattened top end part of an associated arm 15. Each clip 19 is fastened to the flattened top end part of the associated arm or post 15 by a bolt 20 that passes through the desired hole 17. It is apparent that by inserting the bolts 20 through the clips 19 and the desired holes 17 in the arms or posts 15, the back rest may be adjusted as to height with respect to the seat 5.

The bottom ends of the arms 15 are curved forwardly and are operatively secured to a rock shaft 21. End portions of this shaft, outwardly of the arms or posts 15 are journaled in bearing ears 22—22, one fixed to the rear end portion of the inner surface of each vertical flange 9 of the supporting members 7—7. By this arrangement it is apparent that the arms or posts 15 may be swung about the axis of the shaft 21, toward or away from the rear end of the seat.

A power transmitting arm 23 is fixed to the shaft 21, near that arm 15 at the right hand side of the seat and said arm 23 extends toward the front of the seat. The front end of said arm is bifurcated as at 24.

A bolt-like member 25 is operatively attached at one end to and depends from the flange 8 of one of the supporting members 7 and is disposed in the plane of the bifurcation 24. A sleeve 26 is threaded on said bolt-like member and the lower end portion of said sleeve is externally threaded (see Fig. 3). A hand wheel or other element 27 is fixed to the bottom end of said sleeve whereby said sleeve may be manually turned in either direction so that it may be made to travel upwardly or downwardly of the member 25 into the desired position thereon. The externally threaded lower end portion of said

sleeve extends freely through the bifurcation 24 in the arm 23.

The sleeve 26 is formed at its top end with a downwardly opening bell-like skirt or housing 28, the junction of said bell or housing with said sleeve forming a shoulder or abutment 29.

The threaded lower end portion of said sleeve also passes freely through a shoe or abutment plate 30 that rests upon the top surface of the bifurcated end of the arm 23. A helical expansion spring 31 surrounds that portion of the sleeve 26 between said shoe or abutment plate 30 and the shoulder 29 and is substantially enclosed by the bell-like skirt or housing which has a bottom end diameter approximating that of the shoe or abutment 30. A nut or hand wheel 32 is operatively engaged on the bottom externally threaded end portion of the sleeve below the bifurcated end of the arm 23 and normally engages the underside of said bifurcated end of said arm.

When the occupant leans back against the back rest, the posts 15 swing clockwise rearwardly (as viewed in Fig. 3) and swing the arm 23 clockwise upwardly. This movement of the arm 23 through the shoe or abutment 30 compresses the spring 31 by reason of its engagement with the stationary shoulder 29 and thus cushions this movement of the back rest. When pressure against the back rest is eased off, the spring 31 expands and acts to swing the posts 15 and arm 23 counterclockwise as appears in Fig. 3, until said arm engages the nut or hand wheel 32 which acts as a limiting stop therefor.

The tension of the spring may be changed to make its action "softer" or "harder" as desired and this adjustment may be made either when the seat is occupied or when it is unoccupied. Should it be desired to make the action of the spring "harder," when the seat is occupied, the wheel 27 is turned to cause the sleeve 26 to travel downwardly of the bolt-like member 25. In this movement of the sleeve, wherein the wheel 32 moves with the sleeve, the occupant leans back against the back rest to hold the posts 15—15 against forward movement, after which the occupant turns the wheel 32 to travel upwardly on the sleeve 26 into engagement with the bottom of the arm 23.

Should this adjustment be made when the seat is unoccupied, the hand wheel 27 is turned to cause the sleeve 26 to move downwardly on the bolt-like member 25 as before and this through the spring 31 will cause the arm 23 to swing counterclockwise while still engaged against the wheel 32. Thereafter the nut 32 is turned to travel upwardly on the bolt and this will return the arm 23 to its original position and will compress the spring between the shoe 30 and the shoulder 29.

If it is desired to convert the back rest into a rigid one, that is one wherein the cushioned back and forth movement of the back rest is ineffective, the wheels 27 and 32 are so manipulated that the bottom edge of the skirt 28 is brought into engagement with the shoe 30 and the wheel 32 is brought into engagement with the underside or bottom of the arm. Thus the arm 23 is rigidly fixed to the member 25 through the nut or wheel 32 and the sleeve 26 and its skirt 28 in conjunction with the shoe or abutment 30. The manipulation of the wheels 27 and 32 may be accomplished by the occupant of the seat, merely by reaching under the flange 9 of the associated supporting member 7.

It is apparent that with the construction mentioned the back rest may be rocked forward or backward with a cushioning action of the desired tension or it may be made rigid with the seat.

The structure described is simple, strong and sturdy, is easy to manipulate in making the desired adjustments, and is free from objectionable noises or squeeks.

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 seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a member carried by said seat supporting means, means providing a shoulder on said member, an arm rigid with the back rest support and having a portion disposed in operative relation in said member, means surrounding said member between said shoulder and said arm portion for cushioning the movement of said arm in one direction, and means movable longitudinally of said member for limiting the movement of said arm in the other direction.

2. A chair embodying therein, seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a member carried by said seat supporting means, means providing a shoulder arranged for movement longitudinally of said member into different positions thereon, an arm rigid with the back rest support and having a portion disposed in operative relation to said member, means surrounding said member between said shoulder providing means and said arm portion for cushioning the movement of said arm portion in one direction, and means movable longitudinally of said member for limiting the movement of said arm in the other direction.

3. A chair embodying therein seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and backward rocking movement, a threaded member carried by said seat supporting means, means providing a shoulder having a depending portion in threaded engagement with said member so as to be adjustable into different positions longitudinally thereon, an arm rigid with the back rest support and having a portion disposed in operative relation to said threaded member, means surrounding a part of the depending portion of said shoulder providing means for cushioning the movement of said arm in one direction, and means movable longitudinally of said threaded member for limiting the movement of said arm in the other direction.

4. A chair embodying therein, seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a member carried by said seat supporting means, means providing a shoulder having a depending portion arranged for movement longitudinally of said member into different positions thereon, an arm rigid with the back rest support and having a portion disposed in operative relation to said member, means surrounding

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a part of the depending portion of said shoulder providing means for cushioning the movement of said arm in one direction, and means movable longitudinally of said member for limiting the movement of said arm in the other direction, said shoulder providing means and said means movable on said member being capable of being moved relatively into positions cooperating in holding said arm against movement in either direction.

5. A chair embodying therein seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a threaded member carried by said seat supporting means, means providing a shoulder on said threaded member and adjustable into different longitudinal positions on said threaded member, an arm carried by the back rest support and having a portion disposed in operative relation to said member, a cushioning means surrounding a portion of said member between said shoulder and said arm for cushioning the movement of said arm in one direction, said shoulder including a skirt portion at least partially enclosing said cushioning means, and means movable longitudinally of said threaded member for limiting the movement of said arm in the other direction.

6. A chair embodying therein seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a member carried by said seat supporting means, means providing shoulder on said member, an arm carried by the back rest support and having one end bifurcated to straddle said member so as to dispose a portion on each side of said member, an abutment member engaged on said arm portions and surrounding said member, means arranged between said shoulder and said abutment member for cushioning the movement of said arm in one direction, and means movable longitudinally of said first mentioned member for limiting the movement of said arm in the other direction.

7. A chair embodying therein seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a member carried by said seat supporting means, a tubular member having a screw threaded engagement on said member and carrying a shoulder, an arm carried by the back rest support and having a portion disposed in operative relation to said tubular member, means surrounding said tubular member between said shoulder and said arm for cushioning the movement of said arm in one direction, and means having a threaded engagement on said tubular

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member for limiting the movement of said arm in the other direction.

8. A chair embodying therein seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a member carried by said seat supporting means, a tubular member having a screw threaded engagement on said member and carrying a shoulder, an arm carried by the back rest support and having a portion disposed in operative relation to said tubular member, means surrounding said tubular member between said shoulder and said arm for cushioning the movement of said arm in one direction, and means having a threaded engagement in said tubular member for limiting the movement of said arm in the other direction, said tubular member including a skirt portion partially enclosing said cushioning means.

9. A chair embodying therein seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a member depending from said seat supporting means, a tubular member having a screw threaded engagement on said member, and provided at its bottom end with means for turning the same, an arm carried by the back rest support and having a portion disposed in operative relation to said tubular member, means surrounding the tubular member between said shoulder and said arm for cushioning the movement of said arm in one direction, and means threaded on said tubular member for engagement against the bottom surface of said arm for limiting the movement of said arm in the other direction.

10. A chair embodying therein seat supporting means, a back rest and a support therefor pivotally connected to the seat supporting means for a forward and a backward rocking movement, a member depending from said seat supporting means, a tubular member having a screw threaded engagement on said member, and provided at its bottom end with means for turning the same, an arm carried by the back rest support and having a portion disposed in operative relation to said tubular member, an abutment member surrounding the tubular member and engaged with the top surface of said arm, a spring surrounding that portion of said tubular member between said shoulder and said abutment member for cushioning the movement of the arm in one direction, and means threaded on said tubular member for engagement against the bottom surface of said arm for limiting the movement of said arm in the other direction.

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