Sept. 14, 1937. W. F. HEROLD 2,093,319

POSTURE CHAIR

Filed July 30, 1936 2 Sheets-Sheet 1

Fig. 1.

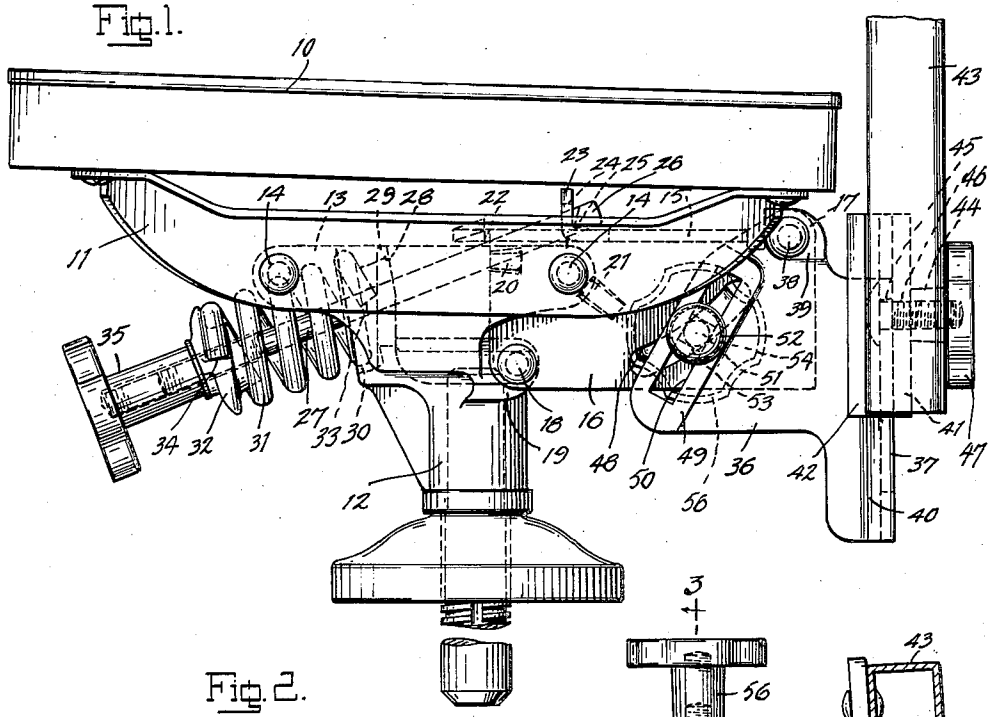
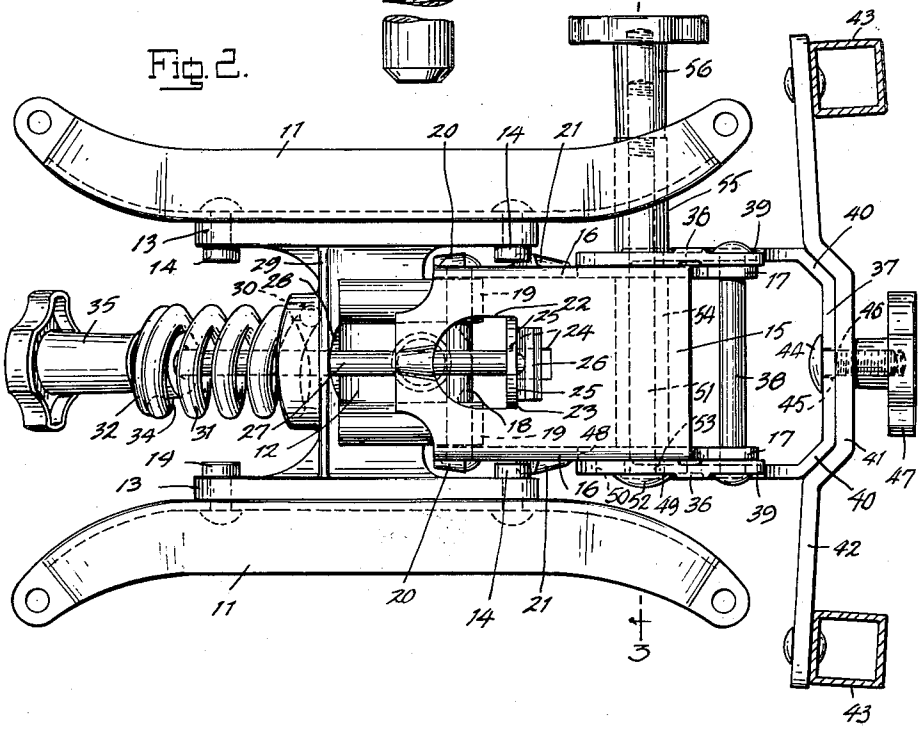


Fig. 2.



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Filed July 30, 1936 2 Sheets-Sheet 2

Fig. 3.

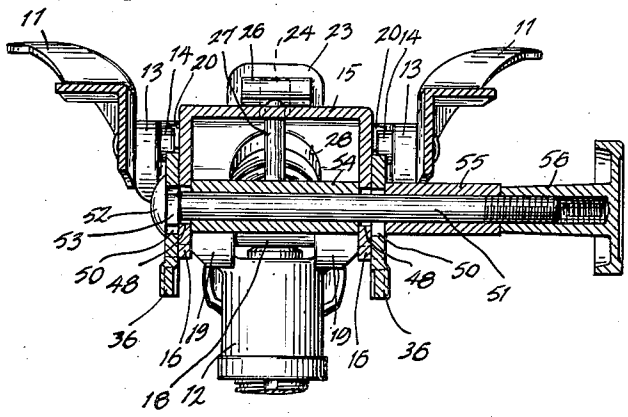
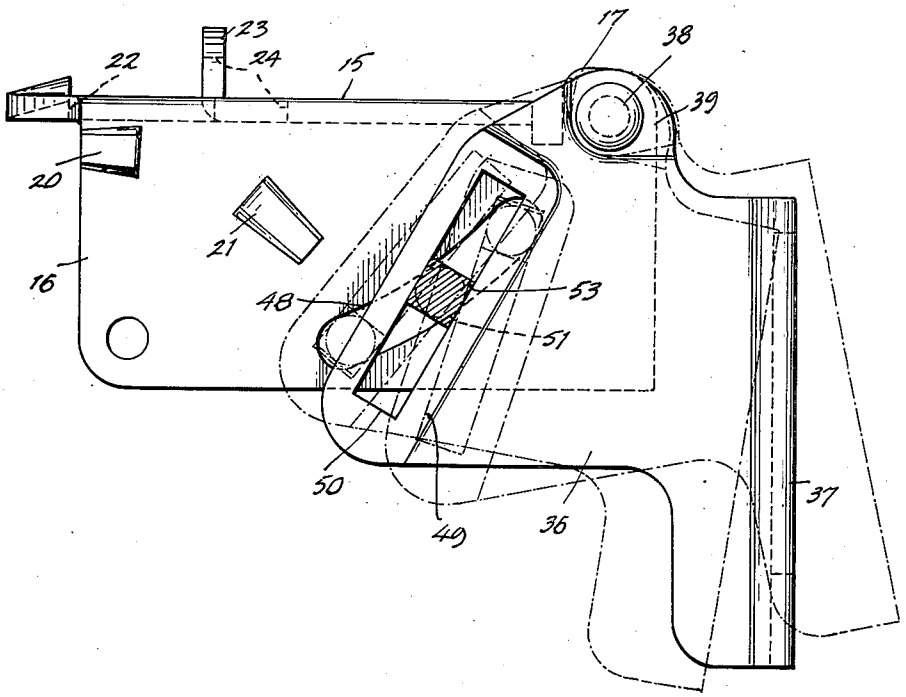


Fig. 4.



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UNITED STATES PATENT OFFICE

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POSTURE CHAIR

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Application July 30, 1936, Serial No. 93,351

5 Claims. (Cl. 287—14)

The present invention relates to an improvement in posture chair, particularly of the type in which the chair back is tiltably supported and is adapted to be adjusted as to angularity, height, and tension, for the purpose of adapting the back to the particular person using the chair.

The present improvement relates especially to the means for adjusting the angle of the chair back, an object being to provide such means which will be of simple and sturdy construction, which will reliably support the back in adjusted position without slippage, and which may be easily and conveniently operated to adjust the angularity. To this end it is proposed to provide slots in the tilting member which cooperate with slots in the angle adjusting back supporting member pivotally secured to the tilting member, these slots being engaged by a shaft, and being arranged in such angular relation to each other that the shaft is frictionally engaged by the slots with a scissors-like gripping action, which while permitting convenient angular adjustment of the back in the unsecured relation of the shaft will rigidly support the back against movement upon axial tightening of the shaft.

Due to the scissors-like gripping action of the slots upon the shaft only a relatively slight axial friction is required in the securing of the shaft, so that the latter may be secured by a comparatively easy and slight turning of the hand nut on the end of the shaft, as distinguished from certain previous types of angle adjusting means in which the shaft engaged slotted means but in which the whole securing action depended upon the axial tightening of the shaft, or upon axially engaged interlocking means, as teeth or the like.

With the above and other objects in view an embodiment of the invention is shown in the accompanying drawings, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawings:

Fig. 1 is a side elevation of a chair back tilting mechanism, according to the invention, the chair base and the upper portion of the chair back being removed.

Fig. 2 is a plan view, the seat being removed and the upright chair back supports being shown in horizontal section.

Fig. 3 is a transverse vertical sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a side elevation, enlarged, of the tilting member and the angle adjusting member, showing in full lines one position of adjustment, and showing in dot-and-dash lines two other positions of adjustment.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, the chair seat 10 has secured to its under side a pair of angle iron spider arms 11—11 between which there is disposed a bearing post member 12, the side portions 13—13 of which are secured to the respective inner sides of the spider arms by means of rivets 14.

The tilting member, preferably formed of sheet metal, is mounted for tilting movement upon the bearing member 12, and comprises an upper transverse portion 15 and side portions 16—16 bent downwardly at right angles therefrom, the side portions extending rearwardly beyond the rearward edge of the upper portion and being provided at their rearward upper corners with apertured bearing portions 17 for pivotally mounting the angle adjustment member, hereinafter more fully referred to. The tilting member is mounted for tilting movement at the forward lower corners of the side portions by means of a bolt 18 engaged through apertured bearing lugs 19—19 formed upon the bearing post 12, the sides 16—16 being disposed between these bearing lugs 19—19 and the side portions 13—13 of the bearing post.

The sides 16—16 are provided with outwardly embossed stop portions 20 and 21 between which are disposed the inner head ends of the rearwardly disposed rivets 14, and which head ends act as limit stops for determining the range of tilting movement of the tilting member, the stop portions 21 being engaged with the rivet heads in the non-tilted position, and the stop portions 20 engaging the rivet heads in the fully tilted position.

In the upper transverse portion 15 there is provided near the forward edge an opening 22 from the rearward edge of which there is bent upwardly a flange 23 having a slot 24 therein, which slot also extends rearwardly in the top portion 15, the rearward surface of the flange 23 at each side of the slot 24 forming with the upper surface of the top portion 15 V-shaped pockets in which are engaged the knife edge portions 25—25 of the head 26 provided upon the end of the spring bolt 27.

The bolt 27 extends forwardly at a downward angle through the opening 22 and through an opening 28 provided in a vertically disposed bearing wall portion 29 of the bearing post member

12, this portion 29 being integrally formed with and extending between the side portions 13—13 of the bearing member. At the forward side of the bearing wall 29 there is formed an annular groove 30 in which is seated one end of the spring 31, the other end of the spring being engaged by a washer 32, the groove 30 being provided with a shoulder 33 and the washer 32 being provided with a shoulder 34, which shoulders are respectively engaged by the ends of the spring. The forward end of the bolt 27 is threaded and projects loosely through the washer 32 where it is engaged by an internally threaded hand wheel or nut 35, which upon being turned adjusts the tension of the spring. The spring normally maintains the tilting member 16 and the back supported thereby in non-tilted position with the stops 21 in engagement with the rivet heads 14. Upon rearward pressure being applied to the chair back the tilting member swings downwardly to the point where the stops 20 engage the rivet heads, the spring becoming compressed and returning the chair back to non-tilted position upon release of rearward pressure thereon.

A yoke shaped angle adjusting member comprising side portions 36—36 having a connecting portion 37 is pivotally mounted upon the tilting member by means of a shaft 38 engaged in the bearing portions 17—17 of the tilting member and in inwardly embossed bearing portions 39—39 provided upon the upper ends of the sides 36—36. The corners between the side portions and the connecting portion of the angle adjusting member are preferably of bevelled form, as at 40—40, the portion 37 being engaged by the intermediate channel portion 41—41 of the lower strap portion 42 of the chair back, this strap portion carrying at its ends the tubular uprights 43—43 upon the upper ends of which the upper portion of the back is secured.

The member 42 is mounted for vertical adjustment by means of a headed bolt 44 engaged through a vertical slot 45 in the portion 37 of the angle adjusting member and through an aperture 46 in the channel portion 41, a hand wheel or nut 47 being engaged upon the bolt at the rearward side of the portion 41. Upon loosening of this nut the back may be adjusted as to height upon the angle adjustment member, the adjustment being secured by tightening of the nut.

In each side 16 of the tilting member there is provided an elongated inclined slightly arcuate slot 48 and in each side 36 of the angle adjusting member in an inwardly embossed bearing portion 49 thereof there is provided an inclined slot 50 disposed in intersecting angular relation to the slot 48 of the tilting member. A bolt 51 is engaged through the slots 48 and 50, being provided upon one end with a head 52 engaged with the outer surface of the bearing portion 49 of one of the sides 36 of the angle adjusting member and provided adjacent this head with a squared portion 53 engaged in the slot 50 of the same side of the angle adjusting member to prevent rotation of the shaft relative to the angle adjusting member. A spanner sleeve 54 is engaged upon the shaft between the sides 16—16 of the tilting member having frictional engagement at its ends with the inner surfaces of said sides adjacent the slots 48. Another sleeve 55 is engaged upon the shaft between the hand wheel or nut 56 provided upon its threaded end and the side 36 of the angle adjusting member opposed to the side engaged by the bolt head 52. Upon turning of the nut 56 a clamping action is set up between the head 52 and the sleeves 54 and 55 axially of the bolt, which frictionally binds or clamps the sides of the tilting member and the angle adjusting member together.

The angular arrangement of the slots 48 and 50 with respect to each other is such that a scissors-like binding action is set up upon the bolt 51 producing a moment of resistance against relative movement between the tilting member and the angle adjusting member, which in addition to the binding action set up upon tightening of the nut 56 rigidly secures the parts against movement. The arrangement of the double slots is such, when pressure is applied against the back in the tightened or locked relation of the parts, that the axial clamping action only takes a portion of the torque or moment around the axis of the pivot shaft 38, the resultant being taken by the shearing action between the slots and the bolt. As only a slight axial clamping action is required to prevent relative movement of the bolt in the slots, the nut 56 does not have to be tightened with much force and may therefore be operated with comparative ease. However upon loosening the nut 56 and releasing the binding action there is, as the back is adjusted forwardly or rearwardly, a camming action set up between the slots 48 and 50 and the bolt causing the bolt to move in one or the other direction in the slots.

I have illustrated and described a preferred and satisfactory embodiment of the invention, but it will be obvious that changes may be made therein, within the spirit and scope thereof, as defined in the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. Angle adjusting means comprising a supporting member, an angle adjusting member pivoted to said supporting member, each of said members having a slot, the slot of one member being at an angle to and intersecting the slot of the other member and both of said slots being non-concentric to the pivot axis, restraining means movably engaged in the intersection of said slots, said slots being so shaped that they are constantly at such angular relation at the point of engagement of said restraining means that they are adapted upon application of manual turning force to said angle adjusting member to exert both a shearing and a propelling force to move said restraining means when loose in said slots throughout the range of its motion, and adjustable means cooperating with said restraining means to exert a force thereon opposite to and at least equal to said propelling force whereby said slots are effective to exert only sheering action on said restraining means through said application of force to said angle adjusting means.

2. Angle adjusting means comprising a supporting member, an angle adjusting member pivoted to said supporting member, each of said members having a slot, the slot of one member being at an angle to and intersecting the slot of the other member and both of said slots being non-concentric to the pivot axis, restraining means movably engaged in the intersection of said slots, one of said slots being so curved that they are at a substantially constant angular relation at the point of engagement of said restraining means, said slots adapted upon application of manual turning force to said angle adjusting member to exert both a sheering and a propelling force to move said restraining means

when loose in said slots, throughout the range of its motion, and adjustable means cooperating with said restraining means to exert a force thereon opposite to and at least equal to said propelling force whereby said slots are effective to exert only sheering action on said restraining means through said application of force to said angle adjusting means.

3. Angle adjusting means comprising a supporting member, an angle adjusting member pivoted to said supporting member, each of said members having a slot, the slot of one member being at an angle to and intersecting the slot of the other member and both of said slots being non-concentric to the pivot axis, restraining means movably engaged in the intersection of said slots, one of said slots being straight and one of said slots being so curved that they are at a substantially constant angular relation at the point of engagement of said restraining means, said slots adapted upon application of manual turning force to said angle adjusting member to exert both a sheering and a propelling force to move said restraining means when loose in said slots, throughout the range of its motion, and adjustable means cooperating with said restraining means to exert a force thereon opposite to and at least equal to said propelling force whereby said slots are effective to exert only sheering action on said restraining means through said application of force to said angle adjusting means.

4. Angle adjusting means comprising a supporting member, an angle adjusting member pivoted to said supporting member, each of said members having a slot, the slot of one member being at an angle to and intersecting the slot of the other member and both of said slots being non-concentric to the pivot axis, restraining means movably engaged in the intersection of said slots, said slots being so shaped that they are constantly at such angular relation at the point of engagement of said restraining means that they are adapted upon application of manual turning force to said angle adjusting member to exert both a sheering and a propelling force to move said restraining means when loose in said slots, throughout the range of its motion, and adjustable means cooperating with said restraining means to exert a force thereon opposite to and at least equal to said propelling force whereby said slots are effective to exert only sheering action on said restraining means through said application of force to said angle adjusting means, said restraining means being slidably and non-rotatably engaged in one of said slots.

5. Angle adjusting means comprising a supporting member, having a pair of spaced side portions, an angle adjusting member having a pair of spaced side portions and pivoted to said supporting member, each of said side portions of said members having a slot, the slots of one member being at an angle to and intersecting the slots of the other member and the slots of both members being non-concentric to the pivot axis, a single bolt extending between said side portions and engaged near its ends in the intersections of said slots, said slots being so shaped that they are constantly at such angular relation at the point of engagement of said bolt that they are adapted upon application of manual turning force to said angle adjusting member to exert both a sheering and a propelling force to move said bolt when loose in said slots, throughout the range of its motion, axial tightening of said bolt adapted to exert a force thereon opposite to and at least equal to said propelling force whereby said slots are effective to exert only sheering action on said bolt through said application of force to said angle adjusting means.

WALTER F. HEROLD.