July 31, 1928. 1,678,668

D. R. COLLIER

TILTING CHAIR

Filed June 2, 1923 2 Sheets-Sheet 1

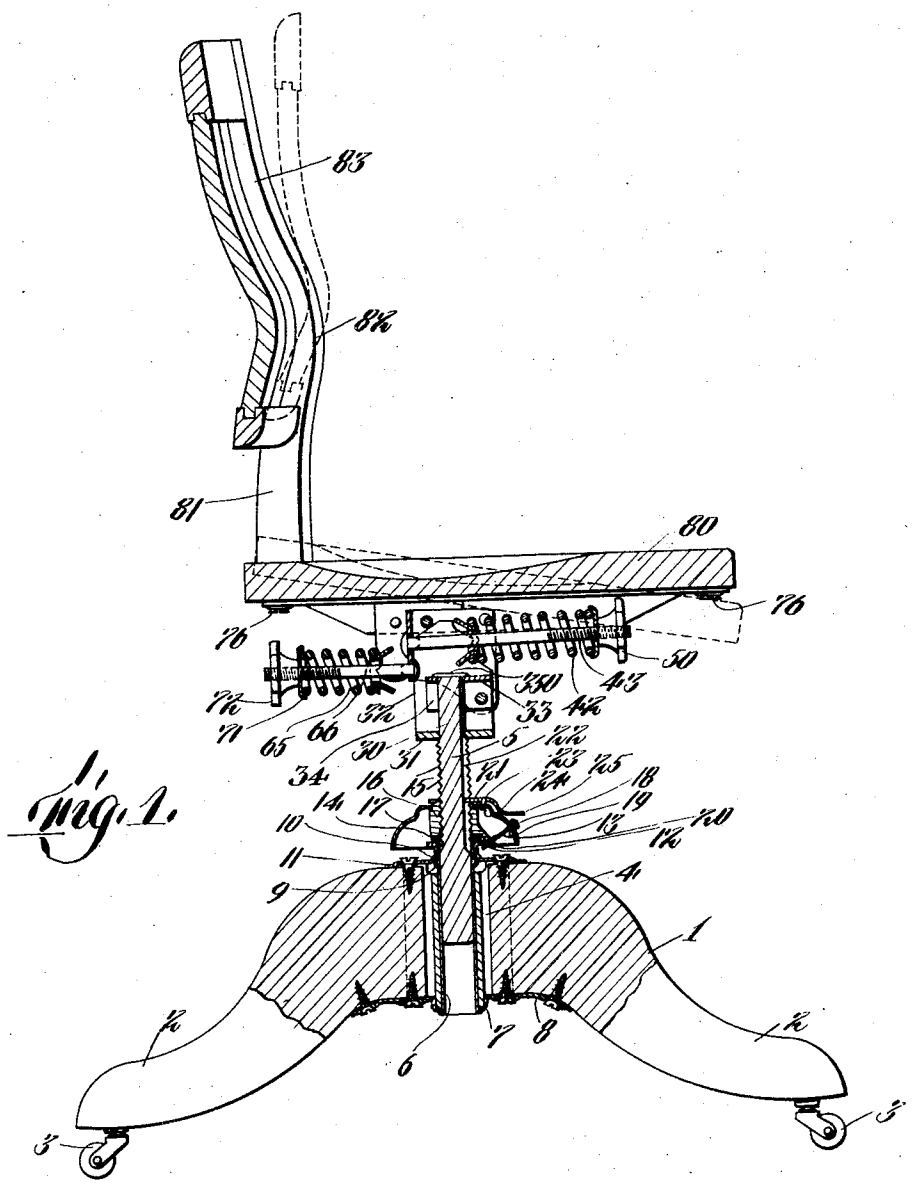


Fig. 1.

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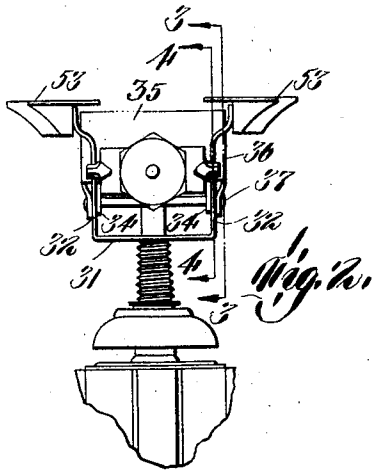


Fig. 2.

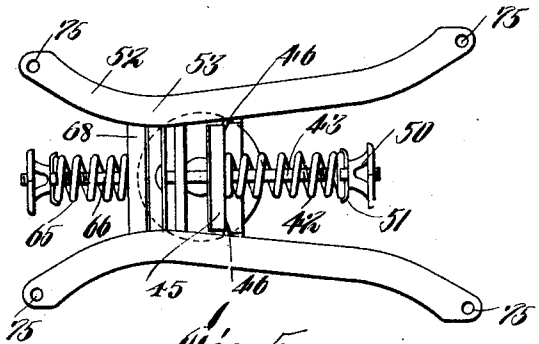


Fig. 5.

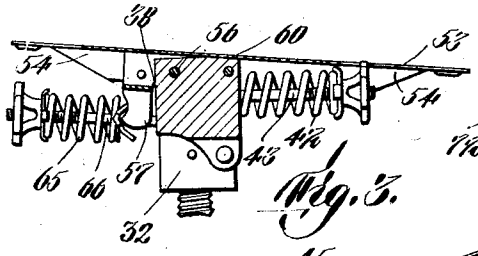


Fig. 3.

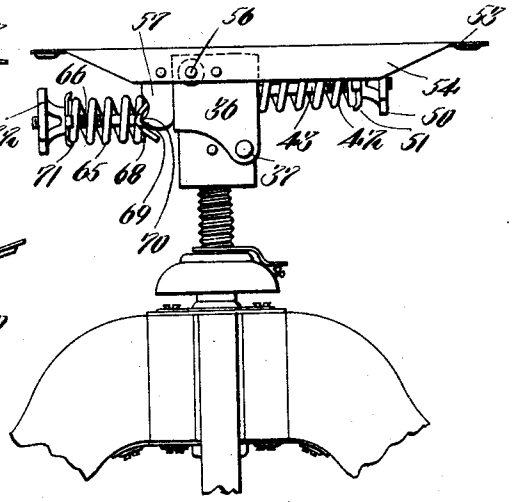


Fig. 6.

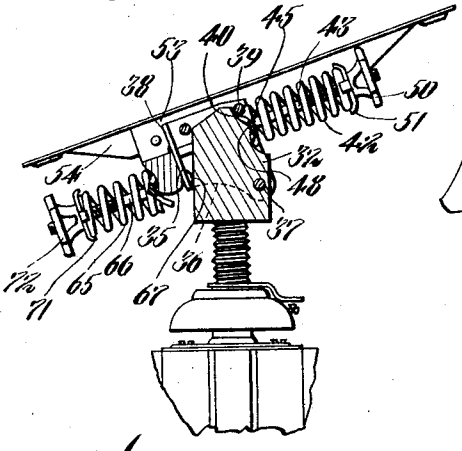


Fig. 4.

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Patented July 31, 1928. 1,678,668

UNITED STATES PATENT OFFICE.

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TILTING CHAIR.

Application filed June 2, 1923. Serial No. 642,900.

This invention relates to tilting chairs and provides a construction by which the chair may be tilted forwardly as well as backwardly from an intermediate normal substantially horizontal position. The back of the chair is so constructed that when the seat is tilted forwardly it forms a firm back support, slightly forwardly inclined, and when in its normal horizontal or backwardly tilted position it also functions properly as a back rest. A novel mechanism for adjusting the height of the clair is also provided.

For a more complete understanding of this invention together with further objects and advantageous details and combinations of parts, reference may be had to the accompanying drawings in which

Figure 1 is a central vertical section through the chair.

Figure 2 is an end elevation of the chair iron and related parts.

Figures 3 and 4 are detailed sections on lines 3—3 and 4—4, respectively, of Figure 2.

Figure 5 is a top plan of the iron.

Figure 6 is a side elevation of the iron and related parts.

Referring to Figure 1, 1 indicates a chair base which is shown of the conventional type having legs 2 provided with castors 3 at their outer ends and having a central perforation as at 4 to receive the chair spindle 5. A suitable socket is formed to receive this spindle, this socket comprising a sleeve 6 in which the spindle is slidably and rotatably mounted, this sleeve being seated within a bushing 7 which is held in position by a lower clamping plate 8 made fast to the lower face of the base 1. Near its upper end the sleeve 6 is provided with an outwardly extending annular bead 9 and engaging over this bead is a curved annular portion 10 of a retaining plate or cap 11 which is made fast to the upper face of the base 1. This portion 10 is upwardly extended and turned outwardly to form a flange 12. The upper end of the sleeve 6 may also be turned outwardly as at 13 overlying this flange and seated thereon may be a washer 14. The spindle 5 is threaded for a portion of its length, as shown at 15, and in engagement with these threads is a nut 16. Fixed to this nut is a dome shaped shell 17 which encloses the nut and hides the flange 12 from view. The spindle may be retained in the sleeve 6 by means of a screw 18 passing through an opening 19 in the shell so that its head is accessible from above the same, it being threaded through a lug 20 extending downwardly from the nut 16 and being adapted to pass beneath the flange 12. By relative turning motion of the spindle and the nut 16 it is evident that the chair may be raised or lowered as desired. In order to lock the chair against vertical adjustment while permitting it to turn about its spindle as an axis, means is provided for locking the nut from turning relative to the spindle. This may be accomplished by means of a plate 21 having a hole through which the spindle passes and having a lug engaging in a keyway 22 cut longitudinally in the spindle. This plate has a finger 23 struck downwardly therefrom which may enter a perforation 24 in the shell. Engagement of this finger within the shell opening acts to prevent rotation of the nut relative to the spindle. The plate 21 is preferably formed with a finger piece 25 by which it may be raised to remove the finger 23 from the opening 24 so as to permit the height of the chair to be adjusted by turning the nut 16 relative to the spindle.

The upper end of the spindle is of reduced diameter as shown at 30 and passes through a spreader or support comprising a U-shaped member 31 having upwardly extending sides 32. An inverted U-shaped member 33 has its arms 34 extending between and embraced by the sides 32 to form a substantially box shaped member, the upper end of the spindle passing through the member 33 and being headed over at 350 thereabove. A horizontally disposed U-shaped plate 35 has side arms 36 embracing the sides 32 and these side arms are pivoted on a rod 37 extending through the sides 32 and also through the arms 34 of the inverted member 33. The base portion 38 of the member 35 is adapted to be brought up against the rear edges of the sides 32 which are extended above the inverted U-shaped member, these edges forming stops to limit its pivotal motion in one direction. Its motion is limited in the other direction by means of lugs 39 extending inwardly from the portions 36 which strike on surfaces 40 at the opposite edges of the sides 32. The base 38 is normally held in such position against the sides 32 by a spring 42. This spring surrounds a

bolt 43 which extends rearwardly through the base 38, its head 44 engaging the forward face thereof, the spring bearing against an equalizer bar 45 through which the bolt 43 passes and whose ends are formed as V shaped trunnions 46 which rest over angular projections 48 in the edges of the sides 32. The spring is held against this equalizer bar by means of a thumb nut 50 threaded on the rear end of the bolt 43, a washer 51 being preferably interposed between the spring and the inner face of the nut.

The member 35 is also designed to support spider members 52. Each of these members is formed angular in cross section, the horizontal flange 53 overlying the upper edges of the member 35 on the sides 32, while the depending flanges 54 extend outwardly of the side arms 36. The spider members are pivoted as at 56 to these side arms adjacent their forward upper corners and each side arm has fixed thereto a lug 57 which depends rearwardly of the base 38 and when brought thereagainst limits the tilting movement of the spider members in one direction, which it should be noted, is in the opposite direction from the limit imposed by impingement of the base 38 against the edges of the sides 32. The upper edges of the side arms 36 are beveled slightly at their rear portions as at 60 to furnish stops for the tilting of the spider arms 52 relative thereto in the other direction, this being shown in Figure 3. The lugs 57 are normally held in contact with the base 38 by means of a spring 65 which surrounds a bolt 66 extending through the base 38 and having its head 67 bearing against its forward face. At one end the spring 65 bears against an equalizer bar 68 which has at its ends V shaped trunnions 69 engaging over angle projections 70 on the lugs 57. At its other end the spring 65 engages against a washer 71 and the pressure exerted by this spring against the equalizer is adjustable by means of a thumb nut 72 threaded on the rear end of the bolt 66 and bearing on the washer 71.

At the ends of the spider arms 52 are shown holes 75 for the reception of screws 76 by which a seat 80 is fixed in position thereto. To the rear of this seat 80 is fixed a back 81 which is shown provided with a forward bend or swell 82 some distance above the seat and above this a concave portion as at 83. These are so shaped that when the seat 80 is tilted forward against the pressure of the spring 65, the spider arms 52 tilting about the pivot 56 swinging the lugs 57 away from the base 38 as shown in Figure 3, the upper portion of this back, as at 83, furnishes a slightly forwardly inclined back rest, as shown in dotted lines in Figure 1 which provides a proper support for the back when the occupant of the chair is leaning slightly forward. When the chair is in upright position (Figures 1 and 6) or tilted rearwardly (Figure 4), the swell 82 conforms sufficiently to the curve of the back to provide proper support therefor. When the seat is tilted backwardly the member 35 pivots about the axis 37, this member 35 and the spider arms pivoting as a unit; this action being opposed by the forward spring 42 as shown in Figure 4.

It will be noted that the seat tips forwardly about a pivot closely adjacent thereto and rearwardly about a pivot more remote so that there is little forward movement but considerably more rearward movement when the seat is tilted.

The mounting of the chair in this manner causes it to assume a normally mid or untilted position from which it may be removed only by the exertion of substantial pressure in either forward or backward directions. When in this mid position therefore the chair is in a stable condition in which it tends strongly to remain, though whenever it is desired to tilt it either forwardly or backwardly this may be done by exerting sufficient pressure on the seat to overcome the action of the springs resisting such motion.

Having thus described an embodiment of this invention it should be evident to those skilled in the art that many changes and modifications may be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

1. A chair having a seat, a spindle for supporting said seat, and pivoted about a pair of axes thereto, means permitting said seat to be tilted forwardly from a central portion about one of said pivots only, and means for permitting said seat to be tilted rearwardly about the other of said pivots only.

2. A chair having a seat, a spindle for supporting said seat, and pivoted about a pair of axes thereto, means permitting said seat to be tilted forwardly from a central portion about one of said pivots only, means for permitting said seat to be tilted rearwardly about the other of said pivots only, and spring means for normally holding said seat in substantially horizontal position.

3. A chair iron comprising a support, a member pivoted to said support, means for urging said member in one direction to its limit of pivotal motion, a pair of spider arms each pivoted to said member, and means urging said arms to the limits of their pivotal motion in the opposite direction.

4. A chair iron comprising a spreader, a member pivoted to said spreader, and seat-attaching spider arms each pivoted to said member.

5. A chair iron comprising a spreader, a member pivoted to said spreader on one axis, and seat attaching spider arms each pivoted to said member on another axis.

6. A chair iron comprising a support, a U shaped plate having its side arms embracing and pivoted to said support, means urging the base of said plate against the rear face of said support, a pair of angle bar spider arms each having its horizontally disposed flange overlying said side arms and support, and its vertical flange downwardly extended outwardly of its adjacent side arm and pivoted thereto, lugs depending from each vertical flange rearwardly of the rear face of said base, and means for urging said lugs against said base.

7. A chair iron comprising a support consisting of a U shaped member having its sides upwardly extending, and an inverted U shaped member having its arms extending between and embraced by said sides, said sides extending above said inverted member, a normally horizontally disposed U shaped plate having its side arms embracing said sides and pivoted thereto adjacent their lower forward edges, a bolt passed through the base portion of said horizontal plate, the head of said bolt bearing against the rear face thereof, a forward equalizing plate bridging said sides and through which said bolt passes, a thumb nut threaded on the forward end of said bolt, a spring surrounding said bolt and bearing between said bar and nut and urging said base portion against the rear edges of said sides, and means carried by said horizontally disposed U shaped plate for supporting a chair seat.

8. A chair iron comprising a support consisting of a U shaped member having its sides upwardly extending, and an inverted U shaped member having its arms extending between and embraced by said sides, said sides extending above said inverted member, a normally horizontally disposed U shaped plate having its side arms embracing said sides and pivoted thereto adjacent their lower forward edges, a bolt passed through the base portion of said horizontal plate, the head of said bolt bearing against the rear face thereof, a forward equalizing plate bridging said sides and through which said bolt passes, a thumb nut threaded on the forward end of said bolt, a spring surrounding said bolt and bearing between said bar and nut and urging said base portion against the rear edges of said sides, spider arms each pivoted to to said side arms and overlying the upper edges thereof, said edges being shaped to permit a limited motion of said spider arms, and spring means for urging said spider arms to one limit of their pivotal motion.

9. A chair iron comprising a support consisting of a U shaped member having its sides upwardly extending, and an inverted U shaped member having its arms extending between and embraced by said sides, said sides extending above said inverted member, a normally horizontally disposed U shaped plate having its side arms embracing said sides and pivoted thereto adjacent their lower forward edges, a bolt passed through the base portion of said horizontal plate, the head of said bolt bearing against the rear face thereof, a forward equalizing plate bridging said sides and through which said bolt passes, a thumb nut threaded on the forward end of said bolt, a spring surrounding said bolt and bearing between said bar and nut and urging said base portion against the rear edges of said sides, angle spider arms each having one flange overlying the upper edges of said sides and side arms, and the other flange depending outwardly of said side arms and pivoted thereto, the upper edges of said side arms being beveled inwardly to permit the seat of a chair supported by said spider arms to tilt forwardly, lugs extending downwardly from said spider arms, and a spring for urging said lugs against said base portion.

10. A chair iron comprising a support having upwardly extending sides a U shaped plate having its side arms pivoted to said sides and its base engageable with one edge of each of said sides, a forward equalizer bar bridging the opposite edges of said sides, a forward bolt passing through said base plate and equalizer bar, a thumb nut threaded on said bolt forwardly of said equalizer bar, a compression spring reacting between said bar and nut, a pair of spider arms each having a downwardly extending flange pivoted to one of said side arms and having a depending lug adapted to contact with the rear face of said base, a rear equalizer bar bearing on the rear portions of said lugs, a rear bolt passing through said base plate and rear equalizer bar, a rear thumb nut on the rear end of said bolt, and a spring bearing between said rear thumb nut and said rear equalizer bar.

11. A chair iron comprising a support having upwardly extending sides, a U shaped plate having its side arms pivoted to said sides and its base engageable with one edge of each of said sides, a forward equalizer bar bridging the opposite edges of said sides, a forward bolt passing through said base plate and equalizer bar, a thumb nut threaded on said bolt forwardly of said equalizer bar, a compression spring reacting between said bar and nut, a pair of spider arms each having a downwardly extending flange pivoted to one of said side arms and having a depending lug adapted to contact with the rear face of said base, a rear equalizer bar bearing on the rear portions of said lugs, a rear bolt passing through said base

plate and rear equalizer bar, a rear thumb nut on the rear end of said bolt, a spring bearing between said rear thumb nut and said rear equalizer bar, an inwardly extending lug on each of said side arms adapted to contact with the adjacent side plate to limit the rearward tilting of said spider arms, said side arms each having its top edge rearwardly of said spider arm pivot beveled to form stops against which said spider arms bear to limit the forward tilting of said spider arms.

12. A chair having a seat, a support for said seat having a pair of pivotal connections with said seat at different distances therefrom, said seat being tilted forwardly from a mid position about the nearer of said pivotal connections, and rearwardly from said mid position about the more remote pivotal connection, and means for yieldingly holding said seat in said mid position.

13. A chair iron comprising seat supporting spider arms pivoted about one axis, means to limit the tilting of said arms about said axis in one direction, said arms being pivoted about another axis, means to limit the tilting of said arms about said other axis in the opposite direction, and springs for urging said arms to their limited positions in both directions about said axes.

In testimony whereof I have affixed my signature.

DAVID R. COLLIER.