June 22, 1926. 1,589,847

O. H. HANSEN

CHAIR

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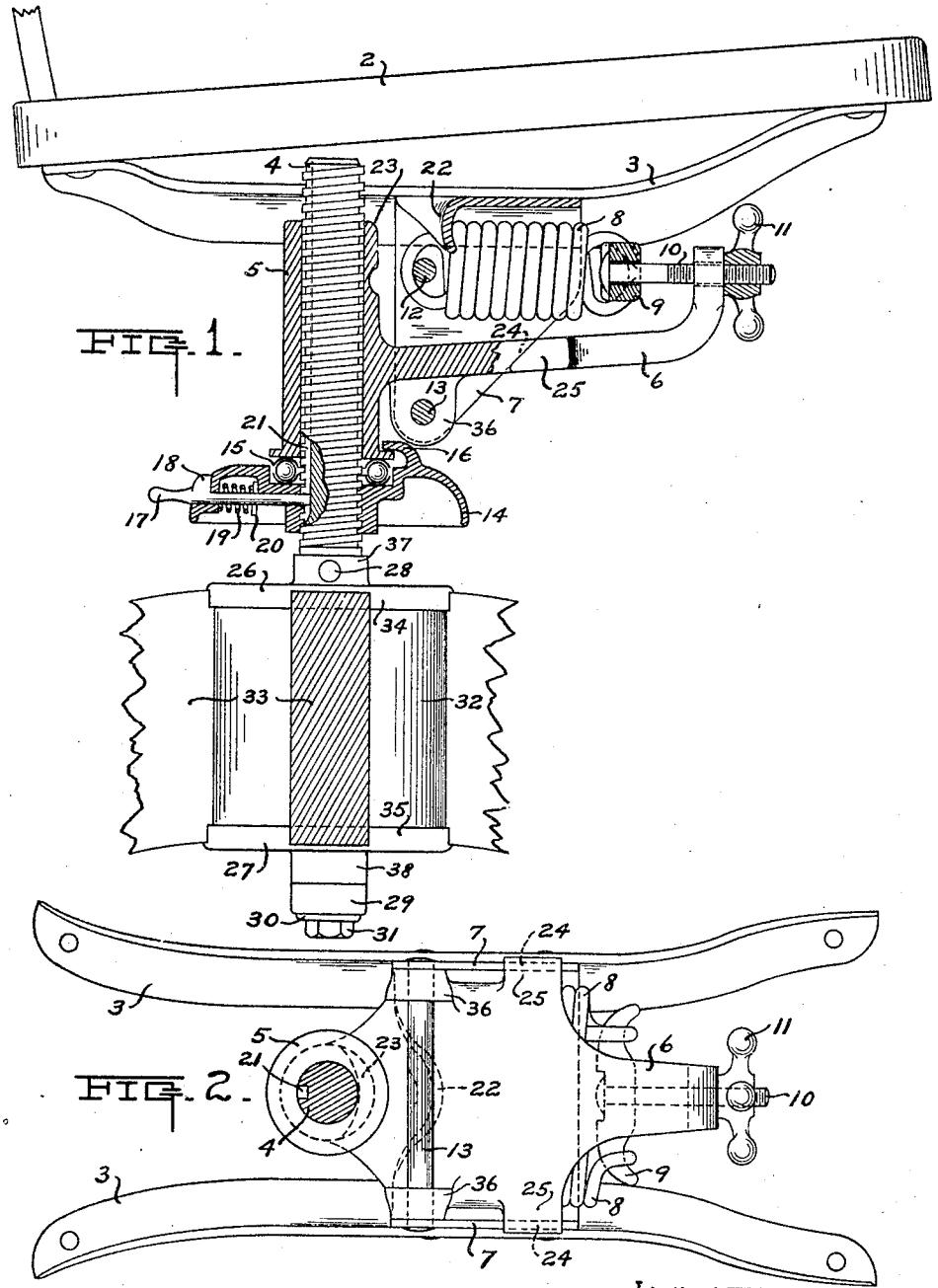


FIG. 1.

FIG. 2.

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UNITED STATES PATENT OFFICE.

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CHAIR.

Application filed November 15, 1920. Serial No. 424,015.

This invention relates in general to improvements in the art of manufacturing articles of furniture, and relates more specifically to improvements in the construction and method of manipulating tiltable revolving chairs.

An object of the invention is to provide a seat supporting structure for tiltable revolving chairs and the like, which is simple in construction and efficient in operation.

Some of the more specific objects of the invention may be summarized as follows:—

To provide a seat support for revolving chairs and the like, which is simple and rugged in construction but which will present a neat and highly finished appearance.

To provide a chair supporting structure which will enhance the comfort afforded by using the chair, and which will permit rapid and convenient adjustment of the height of the seat and of the degree of effort required to tilt the seat.

To provide a chair support which may be readily assembled and dismantled, and all parts of which are freely accessible for inspection and for lubrication.

To provide a sub-structure for tiltable revolving chairs, which may be manufactured at minimum cost and various elements of which are interchangeable.

To provide an improved base structure for revolving chairs and the like, in which the legs are rigidly connectible to and readily removable from the hub and central standard.

To provide other improvements in the details of construction of so-called "chair irons", which will minimize the cost of manufacture and which will increase to a maximum the efficiency of operation.

Several of the novel features of chair base construction disclosed but not specifically claimed herein, form the subject of a copending application for Letters Patent bearing Serial Number 420,595, which was filed on October 30, 1920.

Other novel features of chair base construction disclosed herein, form the subject of copending application Serial Number 455,732 filed March 26, 1921.

A clear conception of embodiments of the several features of the present invention and of the operation of devices constructed in accordance therewith, may be had by referring to the drawings accompanying and forming a part of this specification, in which like reference characters designate the same or similar parts in the various views.

Fig. 1 is a fragmentary part sectional side elevation of a tiltable revolving chair.

Fig. 2 is a bottom view of the upper portion of the chair support which is attached directly to and is rotatable with the seat.

The tiltable revolving chair disclosed in Fig. 1 comprises in general a base, a vertical spindle or standard 4 having its lower portion rigidly connected to the base, a bracket 5 freely rotatably mounted upon an upper portion of the standard 4, an inverted U-shaped spreader 7 pivotally mounted upon the bracket 5, spider arms 3 rigidly secured to the upper side portions of the spreader 7, and a seat 2 attached to the front and rear portions of the spider arms 3.

The base of the chair consists generally of a plurality of legs 33 radiating from the lower end of the standard 4; a top plate 26 having a central flange 37 snugly fitting and rigidly attached to the standard 4 by means of a locking rivet 28; a bottom plate 27 having a central flange 38 snugly fitting the lower extremity of the standard 4; and filler blocks 32 located in the corners formed by the coacting leg ends. The top plate 26 is provided with a downwardly extending continuous peripheral flange 34 which fits within upper recesses in the legs 33 and also coacts with the upper outer corners of the filler blocks 32. The bottom plate 27 is provided with an upwardly extending continuous peripheral flange 35 which fits within lower recesses in the legs 33 and also coacts with the lower outer corners of the filler blocks 32. A cap 29 is fitted over the lower extremity of the standard 4 and engages the flange 38 of the bottom plate 27. A screw 31 associated with the end of the standard 4 engages a washer 30 which coacts directly with the cap 29. With this assemblage of elements, the screw 31 may be urged upwardly to cause the cap 29 to force the bottom plate 27 toward the fixed top plate 26, thus rigidly uniting the base elements.

The central spindle or standard 4 which has its lower extremity rigidly united with the base, has its upper portion screw threaded and provided with a longitudinal recess 21 in one side thereof, see Figs. 1 and 2. An

adjusting hand nut 14 has a central bore provided with screw threads coacting with the threads on the standard 4. The upper central portion of the nut 14 is provided with an annular recess within which ball bearings 15 may be located. Within a transverse bore of the nut 14 is mounted a locking pin 17 the inner end of which is adapted to engage the recess 21 of the standard 4 to lock the nut 14 against movement relative to the standard. The pin 17 is urged toward the recess 21 by means of a helical compression spring 19 one end of which reacts against an inner surface of the nut 14 and the opposite end of which engages a transverse pin 20 which penetrates the locking pin 17. A lateral lug 18 on the pin 17 is adapted to hold this pin out of the recess 21, when the pin 17 has been withdrawn and given a quarter turn.

The main bracket 5 which is freely rotatably mounted upon the upper portion of the standard 4, has an elongated upright hub bored to receive the standard 4 and provided at its lower extremity with a flange which rests upon the ball bearings 15. The nut 14 is provided with one or more upper inwardly projecting lugs 16 which extend over the lower bracket flange and prevent axial separation of the nut 14 and bracket 5. The bracket 5 has a forwardly projecting arm 6 the lower rear portion of which is provided with a pair of spaced depending ears or lugs 36, and the foremost upper extremity of which is bored to support a spring adjusting bolt 10. The upper extremity of the hub of the bracket 5 is provided with an abutment surface or stop 23, while the lower portion of the bracket arm 6 is provided with a pair of opposed lugs 25 which also form abutments or stops.

The inverted U-shaped spreader 7 is preferably formed of sheet metal and has its lowermost side portions pivotally connected to the bracket lugs 36 by means of a horizontal pivot pin 13 which may be riveted to the spreader. The spreader 7 is oscillatory about the pivot pin 13 and transversely of the standard 4, and has an upper abutment or stop 22 engageable with the bracket stop 23 to limit the rearward swing of the spreader, and lower abutment surfaces or stops 24 engageable with the bracket stops 25 to limit the forward swing of the spreader 7. The spreader 7 is urged forward against the bracket stops 25 by means of a pair of coiled tension springs 8, the rear ends of which engage a transverse rod or pin 12 secured to the opposite side walls of the spreader 7, and the forward ends of which hook over a spring yoke 9 carried by the square headed end of the adjusting bolt 10. The tension of the spring 8 may be varied by means of a hand nut 11 coacting with the threaded end of the bolt 10 and with the bracket arm 6.

The spider arms 3 are preferably formed of sheet metal and are rigidly attached to the upper side portions of the spreader 7. The chair seat 2 is rigidly secured to the ends of the spider arms 3 and has its forward portion located above the spreader 7 and the elements associated therewith. The seat 2 preferably has an inclination of about five degrees relatively to the horizontal when the spreader 7 is against the forward bracket stops 25.

During the normal operation of the chair, the seat 2, spider arms 3, spreader 7 and bracket 5 may be freely revolved about the standard 4 upon the ball bearings 15, without varying the height of the seat 2. The weight of these elements and of the occupant of the chair, is supported by the base through the standard 4 and nut 14. The chair seat 2 may be tilted rearwardly until the upper spreader stop 22 engages the upper bracket stop 23, the springs 8 being stretched during such tilting, and the spring supporting pin 12 being formed so as not to interfere with the stops afforded by the spreader and bracket.

If it is desired to vary the height of the chair seat 2, this may be readily accomplished by releasing the locking pin 17 and rotating the hand adjusting nut 14 relatively to the stationary standard 4. The nut 14 will then travel along the standard 4 to the desired position of adjustment, when it may be again locked to the standard by releasing the locking pin 17 and allowing the end of this pin to snap into the recess 21. If it is desired to vary the degree of effort required to tilt the chair seat 2, this may be readily accomplished by rotating the hand wheel 11 relatively to the bolt 10, thereby either increasing or decreasing the tension of the springs 8, as desired. It will be noted that these adjustments may be quickly made, and that all parts of the mechanism are readily accessible for inspection and lubrication.

The hub structure provides simple and efficient means for rigidly securing the legs 33 to the standard 4 and positively prevents wear and resulting looseness of parts which will tend to produce wabbling movement of the chair seat 2. The ring elements provided by the peripheral flanges 34, 35 of the top and bottom plates 26, 27 positively prevent displacement of the legs 33 away from the standard 4, and the rivet 28 and locking screw 31 as well as the friction between the ends of the legs 33 and the standard 4, positively prevent displacement of the legs along the standard. The hub may be readily assembled and dismantled by merely manipulating the locking screw 31, and the entire structure may be manufactured at minimum cost.

It should be understood that it is not de-

sired to limit the invention to the exact details of construction and of operation herein shown and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:—

1. In combination, a base, a standard supported by said base, a bracket element supported by said standard, a spreader element pivoted to said bracket element in front of said standard, and a substantially horizontal spring connecting said elements, the outer end of said spring being connected to one of said elements in front of said standard and the inner end of said spring being connected to the other of said elements between said standard and said outer spring end.

2. In combination, a base, a standard supported by said base, a bracket element supported by said standard, a spreader element pivoted to said bracket element in front of said standard, and a substantially horizontal spring connecting said elements, the outer end of said spring being connected to one of said elements in front of said standard and the inner end of said spring being connected to the other of said elements directly above the spreader element pivot.

3. In combination, a base, a standard supported by said base, a bracket supported by said standard, a spreader pivoted to said bracket in front of said standard, and a coil spring connecting said bracket and said spreader, the outer end of said spring being connected to said bracket in front of said standard and the inner end of said spring being connected to said spreader between said standard and said outer spring end.

4. In combination, a base, a standard supported by said base, a bracket supported by said standard, a spreader pivoted to said bracket in front of said standard, and a spring connecting said bracket and said spreader, the outer end of said spring being connected to said bracket in front of said standard and the inner end of said spring being connected to said spreader directly above the spreader pivot.

5. In combination, a base, a standard rigidly attached to said base, a bracket element rotatably associated with said standard above said base, a spreader element horizontally pivoted to said bracket element in front of said standard, and a substantially horizontal coil spring connecting said elements, the outer end of said spring being connected to one of said elements in front of said standard and the inner end of said spring being connected to the other of said elements between said standard and said outer spring end.

6. In combination, a base, a standard having its lower end rigidly secured to said base, a bracket element rotatably associated with said standard above said base, a spreader element horizontally pivoted to said bracket element in front of said standard, and a substantially horizontal coil spring connecting said elements, the outer end of said spring being connected to one of said elements in front of said standard and the inner end of said spring being connected to the other of said elements directly above the spreader element pivot.

7. In combination, a base, a standard having its lower end rigidly secured to said base, a bracket having screw thread coaction with said standard above said base, a spreader horizontally pivoted to said bracket in front of said standard, and a substantially horizontal coil spring connecting said bracket and said spreader, the outer end of said spring being adjustably connected to said bracket in front of said standard and the inner end of said spring being pivotally fixedly connected to said spreader between said standard and said outer spring end and directly above the spreader pivot.

8. In combination, a base, a standard having its lower portion rigidly secured to said base, a bracket rotatably associated with said standard above said base, a spreader horizontally pivotally connected to said bracket in front of said standard, and a horizontal spring secured to said spreader directly above the spreader pivot and connected with a forward portion of said bracket.

9. In combination, a base, a standard supported by said base, a bracket element supported by said standard, a spreader element horizontally pivoted to said bracket element in front of said standard, and a transversely immovable coil spring horizontally connecting said bracket and said spreader elements, the outer end of said spring being connected to one of said elements in front of said standard and the inner end of said spring being connected to the other of said elements between said standard and said outer spring end and directly above the spreader element pivot.

10. In combination, a base, a standard supported by said base, a bracket element vertically adjustably associated with said standard above said base, a spreader element horizontally pivoted to said bracket element in front of said standard, and a horizontal coil spring connecting said elements, the outer end of said spring being adjustably connected to one of said elements in front of said standard and the inner end of said spring being pivotally connected to the other of said elements directly above the spreader element pivot.

11. In combination, a standard, a bracket element vertically adjustably associated with said standard, a spreader element horizontally pivoted to said bracket element in front of said standard, and a horizontal coil spring

connecting said elements, the outer end of said spring being adjustably connected to one of said elements in front of said standard and the inner end of said spring being pivotally connected to the other of said elements between said standard and said outer spring end and directly above the spreader element pivot.

12. In combination, a standard, a bracket vertically adjustably associated with said standard, a spreader horizontally pivoted to said bracket in front of said standard, and a horizontal coil spring connecting said bracket and said spreader, the outer end of said spring being adjustably connected to said bracket in front of said standard and the inner end of said spring being pivotally connected to said spreader between said standard and said outer spring end and directly above the spreader pivot.

13. In combination, a base, a bracket element vertically pivotally associated with said base, a seat horizontally pivotally associated with said bracket element, and a tension spring having one end attached to said bracket element and having its opposite end secured to said seat vertically and directly above the horizontal seat pivot, said spring being disposed entirely in front of the vertical bracket element pivot at all times.

14. In combination, a base, a bracket vertically pivotally and adjustably associated with said base, a seat horizontally pivotally associated with said bracket, and a horizontal coil spring having its forward end adjustably secured to said bracket and having its rear end pivotally attached to said seat vertically and directly above the horizontal seat pivot, said spring being disposed entirely in front of the vertical bracket pivot at all times.

15. In combination, a base, a bracket element vertically adjustably associated with said base, a seat element horizontally pivotally connected to said bracket element, and a horizontal coil spring having one end adjustably secured to one of said elements and having its opposite end pivotally secured to the other of said elements vertically and directly above the horizontal seat element pivot.

In testimony whereof, the signature of the inventor is affixed hereto.

OSWALD H. HANSEN.