

April 3, 1951

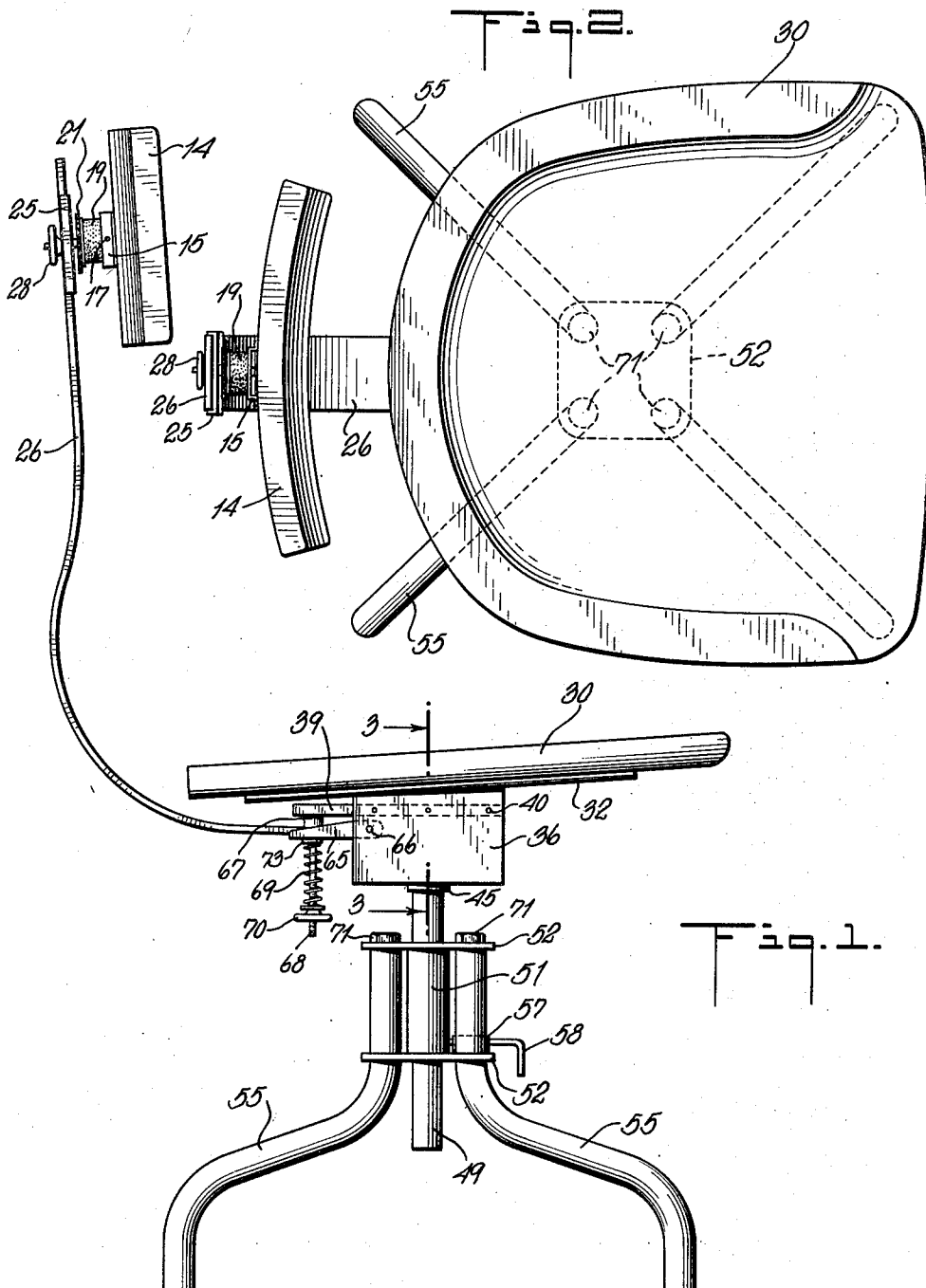
R. J. FREEMAN

2,547,455

RESILENTLY PIVOTED BACK REST

Filed Aug. 12, 1944

3 Sheets-Sheet 1



April 3, 1951

R. J. FREEMAN

2,547,455

RESILENTLY PIVOTED BACK REST

Filed Aug. 12, 1944

3 Sheets-Sheet 3

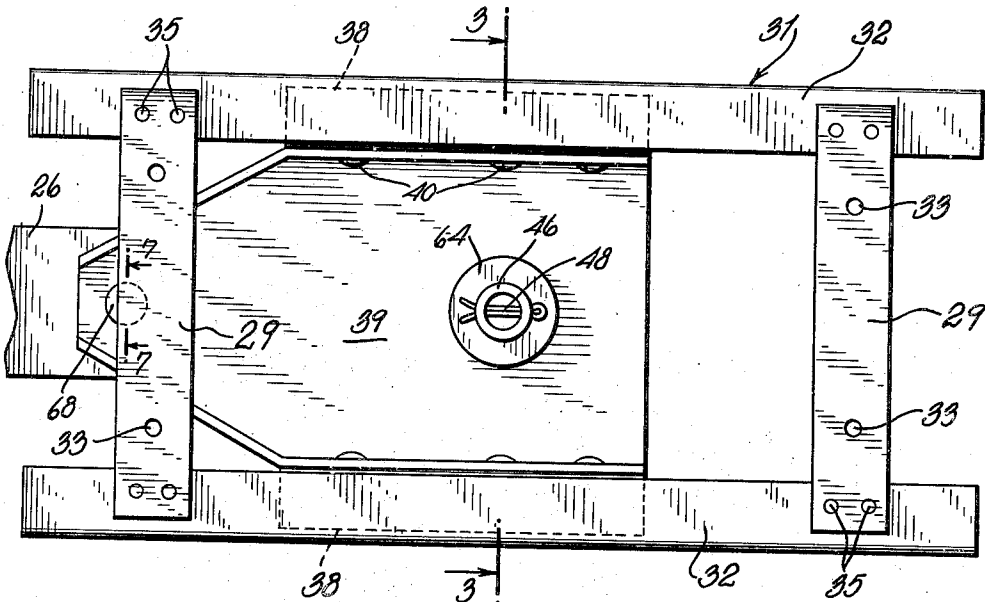


Fig. 4.

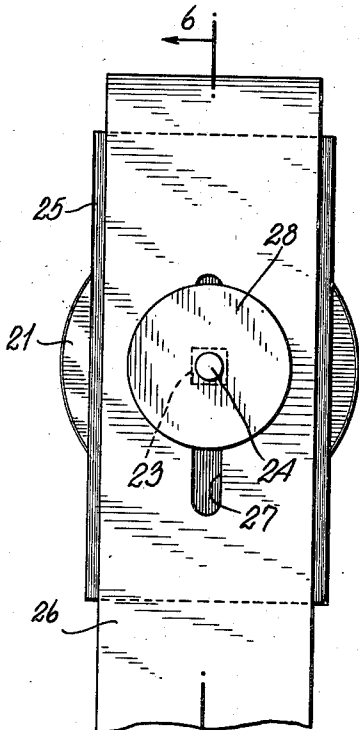


Fig. 5.

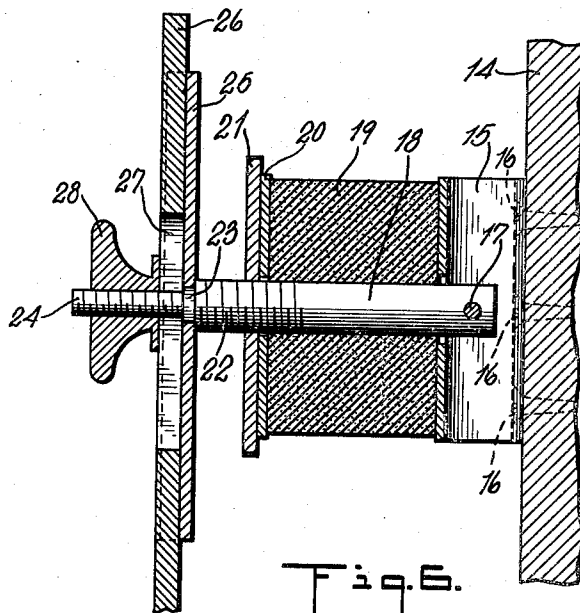


Fig. 6.

INVENTOR
ROLAND J. FREEMAN
BY
Charles A. Morton
ATTORNEY

UNITED STATES PATENT OFFICE

2,547,455

RESILIENTLY PIVOTED BACK REST

Roland J. Freeman, Baldwin, N. Y.

Application August 12, 1944, Serial No. 549,142

10 Claims. (Cl. 155—156)

1

This invention relates to improvements in posture chairs, and more particularly in the back rest mountings therefor.

The posture chairs heretofore manufactured are constructed so that the back rest is either rigidly secured to the back post, or is hinged thereto in such a way that the movement of the back rest can not be satisfactorily controlled. In some cases a spring mechanism has been employed, in an attempt to bring the back rest into approximate back-engaging position, the spring mechanism serving to return the back rest to what might be described as normal back-engaging position when pressure is removed from the back rest.

One object of this invention is a back rest for a posture chair which is so mounted that it can be quickly and simply adjusted to suit the individual postural requirements of different occupants.

Another object is a posture chair having a back rest which is so pivoted that it provides a cushioning effect when the occupant leans against the back rest.

Another object is a posture chair having a resiliently pivoted back rest.

Another object is a mechanism, including a pivotal mounting, for a back rest, which mechanism is assembled as a unitary structure, and which can be introduced between the back post and the back rest of a chair to effect cushioned pivotal movement of the back rest.

Another object is a posture chair having a revoluble seat, and simplified adjusting mechanism therefor.

Another object is a posture chair which can be manufactured at low cost, without any sacrifice in strength or durability.

Another object of this invention is a posture chair of relatively few and simple parts, and which can be fabricated out of common and inexpensive stock materials.

Other objects will appear from the detailed description.

The posture chair embodying the present invention is so constructed that the seat frame not only revolves relative to the pedestal, but may also be adjusted up and down, and back and forth, relative to the back post; the back post in turn being selectively adjustable for tilting movement responsive to various body pressures applied to the back rest; and the back rest in turn being adjustable at different heights relative to said back post. The chair is so designed that the back post and undercarriage may be fabricated out of standard steel sheets of pre-determined gauge and the pedestal or base is so designed that it may be made of steel tubing of various standard sizes as selected.

2

In the drawings comprising three sheets of seven figures, numbered Figs. 1 to 7, both inclusive, one embodiment of the invention is shown.

Fig. 1 is a side view of one form of posture chair, embodying the invention.

Fig. 2 is a plan view thereof.

Fig. 3 is a vertical cross sectional view, taken along the line 3—3 of Fig. 1, looking in the direction of the arrows, with some of the parts partially broken away.

Fig. 4 is a top view of the undercarriage.

Fig. 5 is a rear view of the upper end of the back post assembly.

Fig. 6 is a vertical cross sectional view, taken along the line 6—6 of Fig. 5, looking in the direction of the arrows, and

Fig. 7 is a fragmentary sectional view taken on the line 7—7 of Fig. 4.

Like reference characters designate corresponding parts, throughout the several figures of the drawings.

The posture chair (Fig. 1) consists of a plurality of legs 55, forming a pedestal, support or base, an undercarriage 36 (Fig. 3), mounted for rotation upon the base, a seat 30 adjustably secured to the undercarriage, a back post 25 yieldably supported by the undercarriage, and a resiliently pivoted back rest 14 adjustably secured to the back post.

The pedestal or base preferably comprises a series of legs 55, made from sections of steel tubing which are outwardly bent, so that the bent tubes when assembled form the outspreading legs of a supporting base. The upper ends of the legs are locked together by means of the upper and lower steel hub plates 52 (Figs. 1 and 3), having spaced openings formed therein co-operating with the upper ends of the legs. The hub plates 52 are attached to a hub 51, the hub being rabbeted to form a seat or shoulder for each plate 52. The hub 51 is riveted over or peened at 54 to secure the upper and lower plates 52 in place. The upper end of each leg 55 may be notched (Fig. 3) to form a cutout 56, and a bent over lug 53, may depend from each opening of the upper hub plate 52, to register in the cutout 56, the upper ends of the legs 55 passing through the spaced openings in the lower hub plate 52 and being drawn against the upper hub plate 52 by means of suitable retaining bolts 71, which engage the female threaded upper ends of the legs 55 (Fig. 3). The bent over lugs 53 register in the cutouts 56, to keep the legs from turning.

A locking pin or trigger 58 is mounted in a housing 57. A coiled spring 59 is mounted upon the trigger 58, between the wall of the housing 57 and a washer 60. The washer 60 is retained upon the trigger 58 by means of a pin 61 which engages in a hole in the trigger 58. The inner

end of trigger 58 projects through a hole in the hub 51, so that when the trigger 58 is released it may register in one of a series of spaced holes 50 formed in the central tube 49 which supports the rotatable undercarriage 36 in the hub 51 of the pedestal or base.

Rotatable undercarriage 36, includes a U shaped metal frame 37 (Fig. 3), shaped out of sheet steel or the like. Frame 37 is reinforced near its wing tips by another U shaped metal member 39. The metal member 39 is secured to the frame 37 in any preferred manner, as by means of a series of rivets 40 (Figs. 3 and 4). The wing tips of frame 37 are outwardly bent to form a pair of flanges or ears 38, which slidably register in the spaced guide channels 32 (Figs. 3 and 4). The guide channels 32 are in turn secured to the cross braces 29 in any suitable manner, as by means of a series of rivets 35. A female threaded sleeve 62, welded or otherwise attached to the metal frame 37 of the undercarriage 36, is provided with an adjustable screw bolt 63. Bolt 63 when tightened engages the wall of guide channel 32 or other part of frame 31, to lock the frame 37 of the undercarriage 36, against change of adjustment relative to frame 31 of seat 30.

The cross braces 29 are provided with a series of holes 33 for receiving suitable means such as the wood screws 34, for attaching the frame 31 to the underside of the seat 30 (Fig. 3). The seat 30 may be adjusted relative to the rotatable undercarriage 36, by sliding the seat 30 to move the guide channels 32 with respect to the flanges 38 of the undercarriage 36.

The U-shaped members 39 and 37 are provided with centrally disposed openings 42 and 44 for receiving upper bushing 43, and lower bushing 45, respectively. Bushings 43 and 45 are press fitted in the openings 42 and 44 in the U-shaped members. A short tube 46 is press fitted in the upper end of the outer tube 49, so as to extend beyond the upper end of the outer tube. Inner tube 46 and outer tube 49 in conjunction, form a seat whereon the upper bushing 43, and therefore the undercarriage 36, is rotatably supported. Bushings 43 and 45 form the bearings for the undercarriage 36, bushing 43 being the load-carrying bearing, and bushing 45 receiving the side thrust. Bushings 43 and 45 are preferably of the self-lubricating type, which not only allows undercarriage 36 to revolve freely, but also reduces wear upon the moving parts. A washer 64 fits over the end of the tube 46 and is held in position by a cotter pin 48 passing through the holes 47 extending through the wall of the upper end of the tube 46 (Figs. 3 and 4). The seat 30 and rotatable undercarriage 36, can be detached from the outer tube 49 by merely releasing the cotter pin 48. Similarly the seat 30, undercarriage 36, and outer tube 49 can be detached from the pedestal, by merely releasing the locking pin 58 and lifting the seat 30 until outer tube 49 disengages the hub 51 of the pedestal.

The U-shaped bracket 15 is attached by suitable fastening means, such as the wood screws 16, to a back rest 14, which may be any suitable material such as wood. Back rest 14 may be upholstered. A stud 18 is pivotally secured to the bracket 15 as by means of a retaining pin 17. A yieldable member 19 which may be of any suitable elastic material such as vulcanized rubber, is mounted upon the stud 18 and rests against or abuts the face of the bracket 15.

Stud 18 includes a circular intermediate section

threaded at 22, a reduced squared shoulder portion 23, and a reduced end section threaded at 24. The member 19 which consists of rubber or like elastic material, is yieldable to provide a cushioning effect. Member 19 is variously compressible between the face of the bracket 15 and the washer 20 under tension applied to the washer 20 by means of the threaded washer 21 which is adjustable upon the threaded portion 22 of the stud 18. As the washer tension is increased the cushioning limits of the member 19 are reduced accordingly. The guide member 25 is provided with a squared opening for mounting the guide member upon the squared shoulder portion 23 of stud 18. The back rest 14 is adjustably supported in the elongated slot 27 of the back post 26, by means of the hand-wheel 28, which clamps the back post guide member 25 supported upon the squared shoulder portion 23 of stud 18, against the back post 26, by turning the handwheel 28 upon the threaded portion 24 of the stud 18. Thus the position of the back rest 14 may be adjusted with respect to back post 26, by the manipulation of the hand-wheel 28 and the movement of the guide member 25 and of the stud 18, relative to the elongated slot 27 formed in the back post 26 (Figs. 5 and 6).

Back post 26, which may be shaped to conform in general to the body posture, is attached to a metal bracket 65, which is pivotally mounted at 66 upon the U-shaped metal frame 37 of the rotatable undercarriage 36, so that the back post 26 may pivot about the pivot 66, against the tension of a coiled spring 69, mounted upon a threaded bolt 68, which bolt passes through the upper U-shaped metal member 39, and carries a threaded handwheel 70 to adjust the tension of the coiled spring 69. A cup shaped washer 73 (Figs. 1 and 7), is mounted upon the bolt 68 to receive and center the upper end of coiled spring 69. The spacer washer 67 is mounted upon bolt 68 to limit the return movement of the back post 26. The surface of the U-shaped member 39 in the region of the opening for the bolt 68 is made convex at 72 (Fig. 7), to form a rounded bearing surface for the head of bolt 68 to pivot upon, when the back post 26 moves to adjust itself to the occupant's posture.

The natural resilience of the rubber of which the cushion 19 is fabricated, causes the cushion 19 to co-operate with the pivoted stud 18, the bracket 15 of the back rest 14, and the pivoted back post 26, in such a manner, that the back rest automatically and quite naturally tends to respond to every change in pressure resulting from any change in the occupant's posture thus adjusting the back rest to back engaging position.

The pedestal can be detached by releasing trigger 58 and lifting the seat 30 and rotatable undercarriage upwards, until the outer tube 49 disengages the hub 51. The outer tube 49 can be detached from the undercarriage by withdrawing the cotter pin 48.

To adjust the seat 30 relative to the back post 26 and back rest 14, the bolt 63 is released, and the seat 30 is moved in or out thus changing the distance between seat 30 and the back post 26. To adjust the height of the seat from the floor the trigger 58 is withdrawn from the hole 50 in the outer tube 49, the seat is raised or lowered and the trigger released to engage another hole 50 in the tube 49.

To adjust the height of back rest 14, the hand-wheel 28 is released and the back rest is raised or lowered, thus moving the back post guide member 25, relative to the elongated slot 27, and

handwheel 28 is turned, to lock the back rest 14 in the new position. To adjust the yieldability of the back rest 14 to the occupant's posture, the adjustable washer 21 is screwed along the threaded portion 22 of the stud 18, thus varying the spacing between the washer 20 and the bracket 15, thereby changing the degree of compressibility of the yieldable member 19 and therefore of the back rest 14. To change the support furnished by the back post 26, the handwheel 70 is rotated to vary the tension of the coiled spring 69.

What is claimed is:

1. A posture chair comprising a back post, a back rest, a pivotal connection fastened therebetween for cushioning the movement of said back rest, said pivotal connection including a rigid member mounted on the back rest, a stud mounted on the back post and a resilient bushing supported by said stud, and means co-acting with said stud to compress said bushing against said rigid member to vary the resilience of said bushing.

2. A posture chair comprising a back post, a back rest, a pivotal connection fastened therebetween including a rigid member mounted on said back rest and a stud mounted on said back post, a resilient bushing slidably mounted on said stud and abutting said rigid member to cushion the movement of said back rest upon said pivot, and a washer threadably mounted on said stud to compress said bushing against said rigid member to variously regulate the resilience of said bushing.

3. A posture chair comprising a back post, a back rest, a pivotal connection attached therebetween, said pivotal connection including a stud mounted on said back post, a rubber bushing supported by said stud, said bushing being operable when compressed to cushion the movement of said back rest about said pivot, and means including said back rest co-acting with said stud to compress said bushing.

4. A posture chair comprising a back post, a back rest, a pivotal connection mounted therebetween, said pivotal connection including a stud mounted on said back post and a rigid member mounted on said back rest and disposed transverse said stud, a rubber bushing mounted upon said stud, said rigid member bearing against one end of said bushing, said bushing cushioning the movement of said back rest about said pivot, and a washer mounted for movement along said stud and relative to said rigid member to variously compress said bushing.

5. A posture chair comprising a back post, a stud detachably secured to said back post, a back rest pivoted to the stud on a horizontal axis to effect rearward tilting movement of the back rest, a stop mounted on said back rest, a vulcanized rubber bushing slidably mounted upon said stud to engage said stop, said bushing cushioning the movement of said back rest when tilted, and a washer mounted to move along said stud to compress said bushing against said stop.

6. In a back rest mounting and in combination, a stud, a bracket having a centrally disposed opening formed therein large enough to freely accommodate one end of said stud, said stud end passing through said opening, said bracket being pivotally supported upon said stud end, a rigid member mounted upon said stud in spaced relation to said bracket, a vulcanized rubber bushing positioned between said bracket and said rigid member and compressible when en-

gaged therebetween to oppose and cushion any pivotal movement of said bracket relative to said stud, and said rigid member being movable axially along said stud to variously compress said bushing against said bracket.

7. A cushioning assembly unit comprising a bracket, a stud, a stop adjustably mounted upon one end of said stud, said bracket being rockably mounted upon the opposite end of said stud, an elastic bushing mounted upon said stud and compressed between said stop and said bracket, and said bracket in rocking being operable to compress said bushing to cushion the movement of said bracket.

8. In a posture chair and in combination a back post member, a back rest member, a stud pivotally connected to one of said members and fixedly secured to the other of said members, a resilient bushing on said stud bearing against the member to which the stud is pivotally connected, and means to regulate the compressibility of said bushing.

9. In a posture chair and in combination a back post member, a back rest member, a stud pivotally connected to one of said members and fixedly secured to the other of said members, a compressible rubber bushing on said stud bearing against the member to which the stud is pivotally connected, and means to regulate the compressibility of said rubber bushing.

10. A cushioning assembly unit comprising a bracket, a stud, a stop adjustably mounted near one end of said stud, said bracket being rockably mounted upon the opposite end of said stud, a compressible rubber bushing mounted upon said stud and compressed between said stop and said bracket, and said bracket in rocking being operable to compress said bushing against said stop to cushion the movement of said bracket.

ROLAND J. FREEMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
129,510	Babbitt	July 16, 1872
149,552	Wayland	Apr. 7, 1874
180,147	Miller	July 25, 1876
225,432	Starr	Mar. 9, 1880
274,375	Postawka	Mar. 20, 1883
577,594	Butler	Feb. 23, 1897
669,253	Fraser	Mar. 5, 1901
673,578	Johnson	May 7, 1901
740,825	Dorney	Oct. 6, 1903
755,991	Bolens	Mar. 29, 1904
758,133	Gilson	Apr. 26, 1904
899,504	Bolens	Sept. 29, 1908
909,751	Butcher et al.	Jan. 12, 1909
1,336,510	Collier	Apr. 13, 1920
1,361,178	Pipp	Dec. 7, 1920
1,652,165	Craven	Dec. 13, 1927
1,731,461	Hansen	Oct. 15, 1929
1,816,486	Johnson	July 28, 1931
1,827,627	Travis	Oct. 13, 1931
1,848,338	Garrow	Mar. 8, 1932
1,849,073	Collier	Mar. 15, 1932
1,909,018	Sengpiel	May 16, 1933
2,087,253	Herold	July 20, 1937
2,306,891	McArthur	Dec. 29, 1942
2,310,346	Bell	Feb. 9, 1943
2,312,030	Cramer et al.	Feb. 23, 1943
2,334,193	Hedeen et al.	Nov. 16, 1943
2,365,468	Herold	Dec. 19, 1944