

Dec. 21, 1965

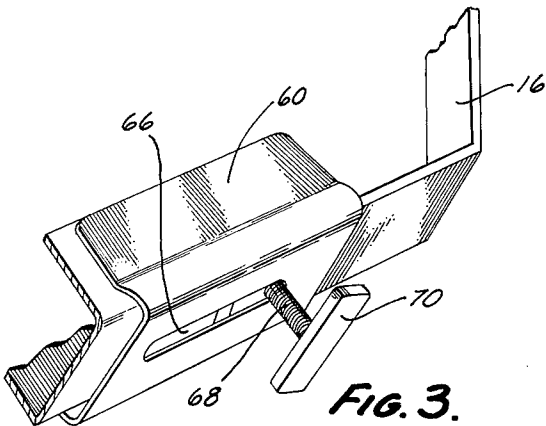
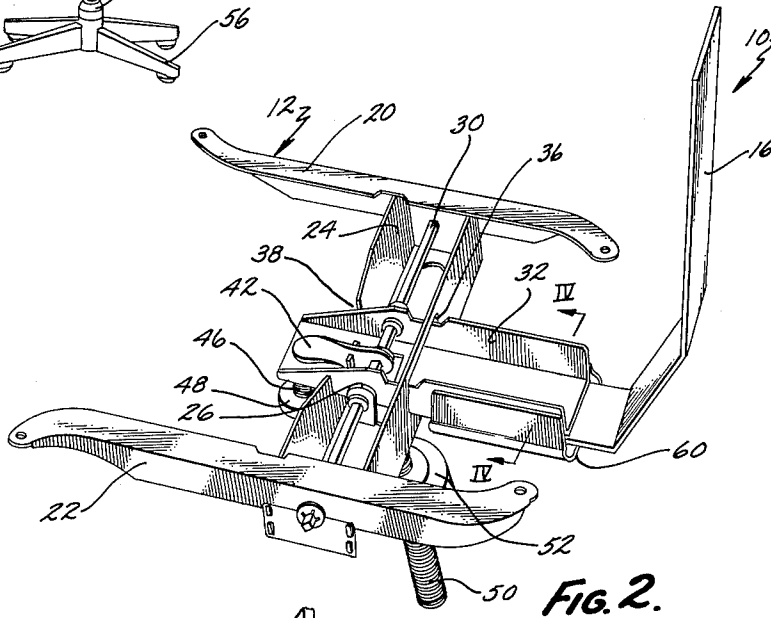
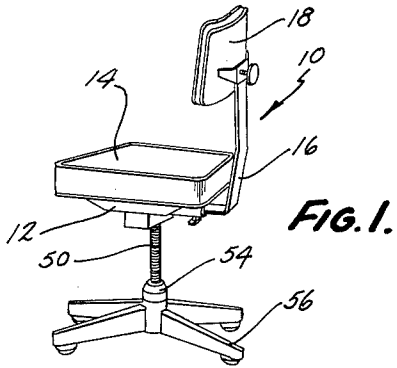
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3,224,807

BACK SUPPORT ADJUSTMENT FOR TORSION CHAIR

Filed July 19, 1963

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

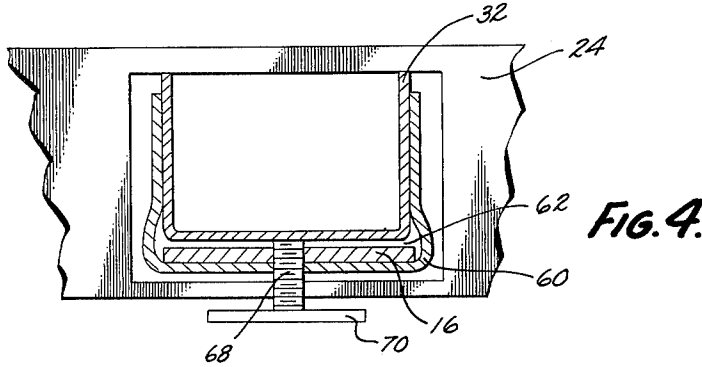


FIG. 4.

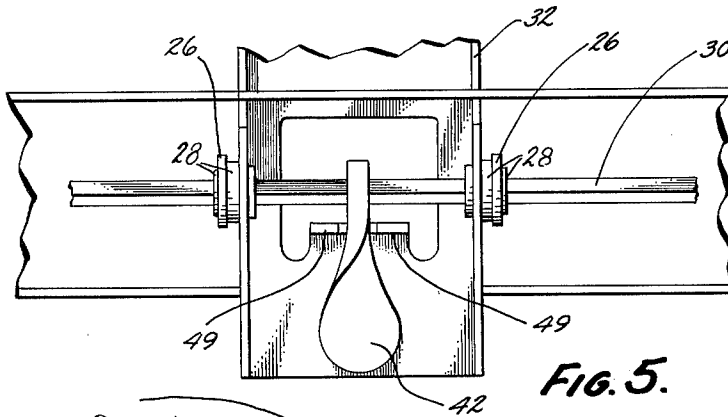


FIG. 5.

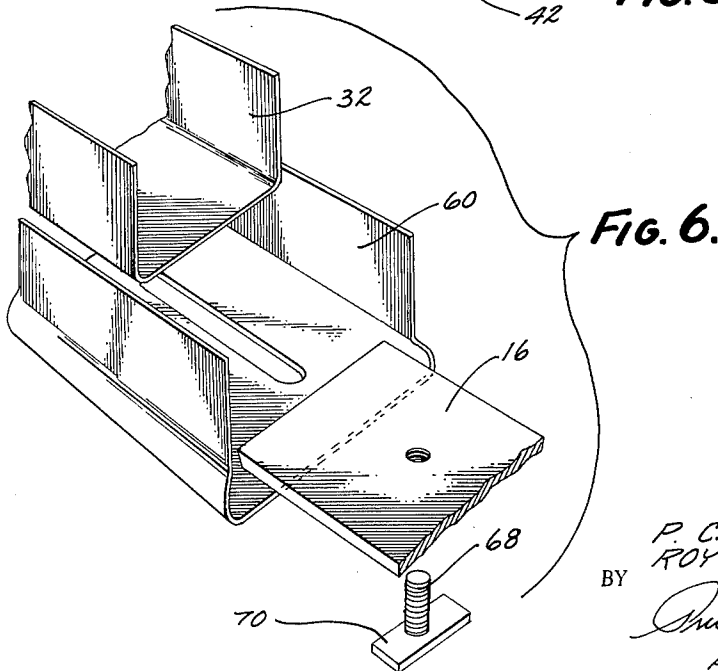


FIG. 6.

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1

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BACK SUPPORT ADJUSTMENT FOR TORSION CHAIR

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3 Claims. (Cl. 297—304)

This invention relates to torsion mounted chair backs, and more particularly to a chair having a torsion mounted back having a horizontal, straight-line, front to back adjustment capacity.

Some office chairs having a back mounted on a torsion bar for limited resilience employ a back adjusting mechanism. This mechanism conventionally provides adjustment in a tilting manner, i.e. on an arcuate path. The mechanism is expensive and complex, including members with arcuate adjustment slots, interconnecting pins, tension springs, control knobs, stop knobs and linkages. Consequently, if the torsion mounted chair back is to be adjustable, the cost of the chair is normally substantially increased.

The inventors herein, desiring to produce an adjustable torsion mounted chair back, discovered that with this type of mounting, the important direction of adjustment of the back is actually horizontal, forwardly and rearwardly. Adequate arcuate action is achieved with the torsion mounting. Vertical adjustment can be easily achieved by movement of the back pad on the back support. Therefore, all the necessary adjustments are readily obtained. In pursuance of this discovery, the inventors herein invented a unique, extremely simple and inexpensive adjusting mechanism to achieve a straight line, horizontal adjustment of a torsionally mounted chair back.

It is therefore an object of this invention to provide a novel horizontally adjustable torsion back chair having a simplified inexpensive construction enabling simple adjustment, inexpensive manufacture, requiring no spring, stop bars, linkages, etc., and cooperable with the torsion mounting to effect a highly comfortable chair.

It is another object of this invention to provide this novel construction in a manner achieving excellent comfort without undue expense.

These and other objects of this invention will become apparent upon studying the following specification in conjunction with the drawings in which:

FIG. 1 is a perspective view of a torsion mounted chair employing the inventive construction;

FIG. 2 is a perspective view of the novel chair frame employing the novel construction;

FIG. 3 is an enlarged, fragmentary, perspective view of the bottom side of the adjusting mechanism;

FIG. 4 is a sectional fragmentary enlarged view taken on plane IV—IV of the apparatus in FIG. 2;

FIG. 5 is a fragmentary, enlarged, plan view of the torsion mounting mechanism; and

FIG. 6 is a fragmentary, enlarged, perspective, exploded view of the adjusting mechanism.

Referring specifically to the drawings, the novel chair 10 includes a seat mounting frame 12 upon which a seat 14 is mounted, and a resilient, back supporting, L-shaped spring 16 to which a back pad 18 is vertically adjustably mounted.

The frame 12 includes a pair of oppositely positioned side portions 20 and 22 resembling angle irons and having outwardly flared front portions and inwardly converging rear portions for bolted attachment to seat bottom 14. Connecting these side portions, and extending transversely therebetween, is a channel element 24 welded

2

to elements 20 and 22. A pair of support ears 26 is severed from the bottom of channel 24 and deformed upwardly to form a pair of generally parallel mounts (FIG. 5). Bearing sleeves of nylon or other suitable material 28 receiving the square torsion bar 30 are mounted in the ears. The ears vertically support the torsion bar while allowing rotation thereof. The bar is nonrotatively fixed to a support channel beam 32, and more specifically with the side legs thereof, so that rotation of the beam twists the bar, since torsion bar 30 also has its ends affixed in side portions 20 and 22 to form a non-rotative connection therewith.

The support channel 32 extends from front to rear between the side elements 20 and 22, centrally of frame 12. It extends through an opening 36 in one leg of channel 24 and through a slot 38 in the other leg. Channel support 32 is mounted and supported on and by torsion bar 30 by forming a non-rotative connection therewith. The mounts 26 therefore keep the channel element 32 centered on the frame. This channel beam 32 supports the chair back.

Secured around the center of the torsion rod 30 is an adjusting ear 42. This ear is twisted to have its outer end, i.e. opposite the end attached to the bar, in a plane 90° displaced from the plane of its portion around the bar. The outer end is in abutting contact with the upper end of a threaded adjusting stud 46 extending through the bottom of the front end of channel 32, and including a knob 48. The ear is retained in a slot between a pair of fingers 49. By adjustment of knob 48 and screw 46, the initial torsion imparted to bar 30 can be varied, to thereby vary the amount of torsion remaining in the bar to flex under a back load. This, therefore, controls the degree of resilience of the chair back.

Extending downwardly from the chair frame 12 is a screw mount shaft 50 including a collar 52. The lower end of shaft 50 is inserted into a base 54 having suitable legs 56.

Secured to the rear end of support channel 32 and around it is a second channel member 60 having a width or cross section greater than channel 32 to cause the legs of the second channel 60 to overlap the legs of channel 32. This second channel is affixed to channel 32, as by welding, and the two attached channels provide what may be termed a channel means including a channel section and a flat member positioned parallel thereto. Sufficient clearance is provided between the bottoms of the two attached channels to form a horizontal, rearwardly opening receiving slot 62 (FIG. 4).

The rearwardly directed opening of slot 62 slidably receives the horizontal leg of an L-shaped, back-mounting, resilient spring bracket 16 with sufficient clearance (FIG. 3) to allow ready movement forwardly and rearwardly of the spring and thus of the back pad 18 mounted thereon. This movement in a horizontal plane and on a straight line axis is controlled by a turn screw locking means comprising tightening a screw 68 and knob 70. The screw portion 68 extends through an elongated slot 66 extending forwardly and rearwardly in the bottom of second channel 60 (FIG. 3). The screw is in threaded engagement with the horizontal leg of the L spring support 16. It extends through the support and against the bottom of channel 32. When this turn screw 68 is loosened, the leg of the back bracket may be moved forwardly or rearwardly to a desired adjusted position. The limits of this adjustment are made by contact of the turn screw 68 with the ends of slot 66. To lock the back in the adjusted position, the turn screw is tightened, causing its upper end to bear against the bottom of channel 32, and thereby force the horizontal leg of bracket 16 into bearing relationship against the bottom of channel 60

to thereby lock the same together to secure the L-shaped back member in a desired adjusted position. The adjustment does not interfere in any way with the torsional resilience of the back but rather is cooperative therewith to form a comfortable chair. Thus, there is produced a torsion back chair, with horizontal back adjustment employing a simple, but effective construction enabling adjustable arcuate movement of the torsion back, and also enabling horizontal adjustment of the back, yet at a relatively small cost as contrasted to conventional constructions.

It is conceivable that certain minor obvious structural changes could be made in the illustrated form of the invention, while incorporating the inventive principles taught. This invention is, therefore, not to be limited merely to the one preferred form of the invention depicted, but only by the scope of the appended claims and the reasonably equivalent structures to those defined therein.

We claim:

1. An adjustable torsion back chair comprising in combination: a seat frame having a pair of interconnected opposite side portions; a substantially rigid and inflexible support channel means positioned centrally between said side portions and extending toward the back of said frame; a torsion bar between said channel means and said side portions; said torsion bar fixedly connected to said support channel means and to said side portions to support the said channel means and provide limited torsional resilience thereto; said extending portion of said channel means including a channel section and a substantially flat parallel member defining together a rearwardly-opening horizontal slot; an L-shaped resilient back support having a lower leg portion; said lower leg portion slidably engaged in said slot; an aperture formed in said lower leg portion; at least one aperture formed in said channel means; at least one of said apertures having threads formed therein; at least one of the unthreaded apertures being laterally elongated; and turn screw locking means passing through each of said apertures and engaging said threads; said locking means and elongated aperture providing for position adjustment of said back support; and said locking means when tightened in said threads urging said leg portion and channel means into bearing relationship to thereby lock the same together to secure said back portion in a desired adjusted position.

2. An adjustable torsion back chair comprising in combination: a seat frame having a pair of interconnected opposite side portions; a substantially rigid and inflexible support channel positioned centrally between said side portions and extending toward the back of said frame; a torsion bar between said channel and said side portions; said torsion bar fixedly connected to said support channel and to said side portions to support the said channel and provide limited torsional resilience thereto; a second channel member interfitted with and secured to the said extend-

ing portion of said support channel to define therewith a rearwardly opening horizontal slot; an L-shaped resilient back support having a lower leg portion; said lower leg portion slidably engaged in said slot; an aperture formed in said lower leg portion; an aperture formed in the lowermost one of said slot-defining channels; one of said apertures having threads formed therein; the unthreaded one of said apertures being laterally elongated; and turn screw locking means passing through each of said apertures and engaging said threads; said locking means and elongated aperture providing for position adjustment of said back support; and said locking means when tightened in said threads urging said leg portion and one of said channels into bearing relationship to thereby lock the same together to secure said back portion in a desired adjusted position.

3. An adjustable torsion back chair comprising in combination: a seat frame having a pair of interconnected opposite side portions; a substantially rigid and inflexible support channel positioned centrally between said side portions and extending toward the back of said frame; a torsion bar between said channel and said side portions; said torsion bar fixedly connected to said support channel and to said side portions to support the said channel and provide limited torsional resilience thereto; a second channel member larger in cross-section than said support channel interfitted beneath the said extending portion of the latter and fixedly secured thereto to define therewith a rearwardly opening horizontal slot; an L-shaped resilient back support having a lower leg portion; said lower leg portion slidably engaged in said slot; a threaded aperture formed in said lower leg portion; an elongated aperture formed in said second channel; and turn screw locking means passing through each of said apertures and engaging said threads; said locking means and elongated aperture providing for position adjustment of said back support; and said locking means when tightened in said threads drawing said leg portion and second channel member into bearing relationship to thereby lock the same together to secure said back portion in a desired adjusted position.

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