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E. R. MOORE

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TILTING DEVICES FOR CHAIR SEATS AND CHAIR BACKS

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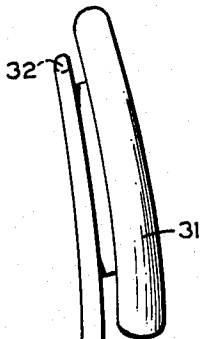


FIG. 1

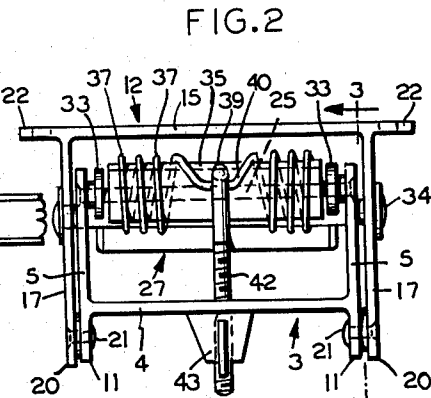


FIG. 2

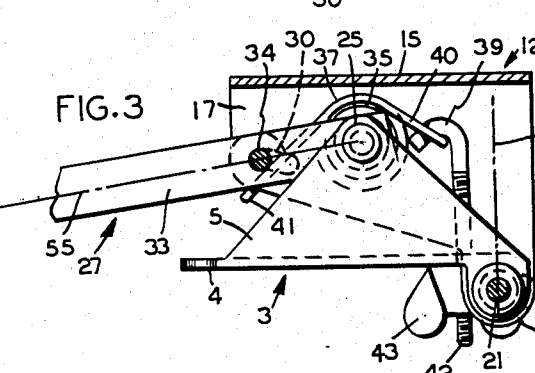


FIG. 3

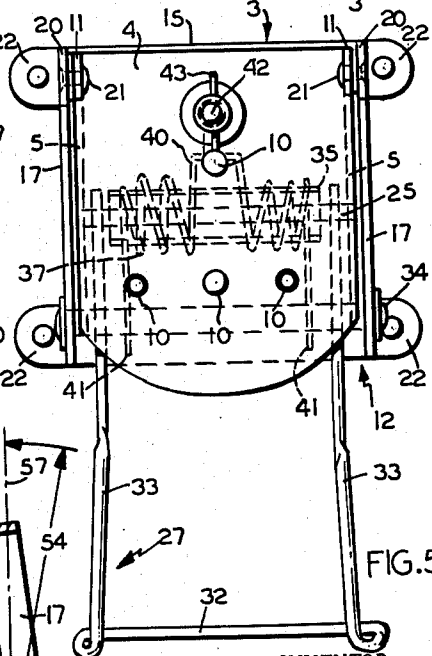


FIG. 4

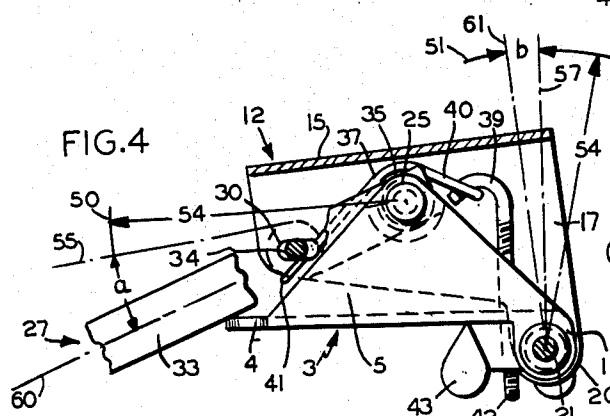


FIG. 5

INVENTOR.
EDWIN R. MOORE

BY *Harry J. Metzger*

ATTORNEY

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TILTING DEVICES FOR CHAIR SEATS AND CHAIR BACKS

Edwin Rosco Moore, 160 W. 106th St., New York, N.Y.

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My invention relates generally to improvements in chairs of the type having a tilting seat and back and in particular to a new and improved tilting device which I prefer to call an "occupant pattern ratio tilting device for a chair seat and back."

One object of the present invention is the provision of a device of the character described which is designed for facilitating an angular movement of the body of an occupant of a chair in the hips and legs relative to his trunk by pivoting the chair seat at a lower pivot point than the back of the chair, and by causing the chair back to tilt at a larger angle than the seat at each movement, thus giving to the seat and the back the relative motions necessary for pattern unison with the occupant.

Another object of the present invention is the provision of a device of the character described which is easily adjustable without the use of any tools as well as without necessitating any particular amount of effort or skill, and in which the springs are shielded and are normally not exposed to the view of an onlooker, so that the device is of pleasing, simple outer appearance and that a breaking or a snapping of a spring is not hazardous.

A further object of the present invention is the provision of a device of the character described which is compact, relatively small in size and light in weight, which consists of only a few simple and inexpensive parts that can be assembled easily and quickly, and which also is sturdy, durable, and well adapted for withstanding the rough usage to which devices of this type ordinarily are subjected.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangements of parts without departing from the spirit of the invention as claimed.

In the accompanying drawing a preferred form of the invention has been shown.

In said drawing:

FIGURE 1 is a fractional side elevation of a chair provided with my new and improved tilting device;

FIG. 2 is an enlarged end view of the tilting device;

FIG. 3 is a sectional view on the line 3-3 of FIG. 2;

FIG. 4 is a sectional view as FIG. 3 showing the parts of the device in different angular positions; and,

FIG. 5 is an enlarged bottom plan view of the tilting mechanism.

Similar reference characters refer to similar parts throughout the several views.

In the drawing the numeral 1 denotes a fractional portion of a base or supporting pedestal which has an upper swivel portion 2. A substantially U-shaped stationary member 3, which has a horizontal web portion 4, and a pair of upright preferably triangular flange portions 5, is secured to the upper portion 2 of the base 1 by means of a pivot 7 or the like, which are extended through holes 10 (FIG. 5) in the web portion 4. A pair of lug portions 11 are downwardly extended from one end section of the web portion 4 of the member 3.

A tiltable member 12, which is substantially of an inverted U-shaped formation and has an upper horizontal web portion 15 as well as a pair of downwardly ex-

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tending flange portions 17, is at one end of each flange portion provided with a lug section 20, that is pivoted to one of the lug sections 11 by means of a rivet 21 or the like. Thus the member 12 can swing relative to the member 3 on the pivot points or rivets 21. Horizontal eye portions 22 or the like are horizontally extended from the corner sections of the web portion 15, and a chair seat 23 is secured to the web portion 15 of the member 12 by means of screws 24 or the like, which are extended through the eye portions 22, as may be seen in FIG. 1. A bolt 25 is transversely extended through the upper end sections of the web portions 5 of the member 3, and a chair-back carrying tubular member 27 is pivoted thereto. The member 27 may be of any suitable formation, so that a chair back 31 can be attached thereto in a simple and practical manner. In the instance shown, the member 27 is U-shaped, having a web portion 32 and a pair of partially flattened flange portions 33. A transverse rod 34 is horizontally extended through the member 27 as well as through a pair of slots 36 in the flange portions 17 of the member 12.

Since the member 12 is pivoted at 21 to the member 3, the rod 34 obviously is not a pivot pin but a stop, limiting the tilting movement of the members 12 and 27 relatively to the member 3.

Any suitable resilient means are interposed between the member 3 and the members 12 and 27, for forcing the seat 23 and the back 31 back into their respective original positions, when released. In the instance shown, this feature of my invention is carried out in the manner illustrated in the drawing, where it will be seen that a tubular member 35 encompasses that portion of the bolt 25 which is extended between the end sections of the flange portions 33 of the member 27, and major portions of a coiled spring 37 are wound around the tubular member 35 while an elongated center portion 40 of the spring 37 is engaged by a hook member 39, and the end portions 41 of the spring 37 rest against the rod 34. The member 39 preferably is adjustable, which can be carried out in an extremely simple manner, by threading its shaft portion 42, extending it shiftably through the web portion 4 of the member 3, and screwing thereon a wing nut 43. Thus the tension of the spring 37 can be regulated easily and simply by turning the wing nut 43. Moreover, the U-shaped members 3 and 12 encompass the spring 37 lie a casing to such an extent that they protect the occupant of the seat 23 against any possible injury should the spring 37 snap or break.

The dual pivotal arrangement described above, according to which the member 12 is pivoted to the member 3 at a low pivot 21 whereas the member 27 is pivoted to the member 12 at an elevated pivot 25, will cause the chair back 31 and the parts 27 and 30 to swing at a larger angle (α) than the angle (β) at which swings the chair seat 23 relative to the stationary member 3 at each movement of the seat 23. This important feature of my invention is illustrated in FIG. 4, where arcs 50 and 51 are drawn at equal radii 54 from the points 21 and 25 respectively. The dash-and-dotted lines 55 and 57 indicate the original positions of the members 12 and 27, as shown in FIGS. 1, 2, 3 and 5, whereas the dash-and-dotted lines 60 and 61 indicate the positions of the members 12 and 27 shown in FIG. 4, and it can be seen plainly that the angle (α) is about twice as large as the angle (β). This arrangement causes a highly desirable relative motion of chair seat and chair back, which is necessary for a movement of the chair seat and the chair back in unison with the thighs and the back respectively of the occupant of the chair.

Since certain changes may be made in the above ar-

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ticle and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent is:

1. A device of the character described comprising a stationary member having upper and lower pivot portions which are vertically and horizontally spaced from each other and having also a horizontal portion between said pivot portions, a seat supporting member having a substantially horizontal portion adapted for mounting thereon a chair seat and having vertical portions provided with slots at one end and being tiltably secured at the other end to lower pivot portions of said stationary member, a chair back carrying member tiltably attached to upper pivot portions of said stationary member, a rod extended from said chair back carrying member being slidably extended through the slots in the vertical portions of said seat supporting member, spring supporting means provided at the pivot portions at which said chair back carrying member is secured to said stationary member, a spring attached to said spring supporting means having end portions engaging said rod and having a laterally extending portion, a hook member engaging the laterally extending portion of said spring and having a shaft portion slidably extended through the horizontal portion of said stationary member, and means for adjusting the length of the shaft portion of said hook member extending above the horizontal portion of said stationary member

2. A tilting device for chair seats and backs comprising a stationary member of U-shaped formation having a horizontal web portion and upwardly extending flange portions as well as a pair of lug portions downwardly extended from an end section of the web portion, a seat supporting member of an inverted U-shaped forma-

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tion having a horizontal web portion and downwardly over said stationary member extending flange portions provided with registering slots and having their lowermost ends pivoted to the lug portions of said stationary member, a seat back carrying member having a pair of parallel arm portions of which end sections are pivoted to the upper ends of the flange portions of said stationary member, a rod transversely extended through the arm portions of said seat back carrying member intermediate the ends thereof and also extended through the slots in the flange portions of said seat supporting member, and adjustable resilient means interposed between said rod and said stationary member tending to force said seat back carrying member into a predetermined position relative to said seat supporting member

3. A tilting device for chair seats and chair backs comprising a stationary first U-shaped member having a horizontal web portion and upwardly extending flange portions as well as lug portions downwardly extending from the flange portion, a secondary U-shaped member having a web portion adapted for supporting a seat and having downwardly extending flange portions pivoted to the lug portions of said first U-shaped member and provided with slots, a chair back carrying member tiltably attached to the flange portions of said first U-shaped member, slot engaging means secured to said chair back carrying member and slidably extended through said slots in said second U-shaped member, and adjustable resilient means interposed between said U-shaped members.

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