

Feb. 9, 1954

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2,668,580

CHAIR

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2 Sheets-Sheet 1

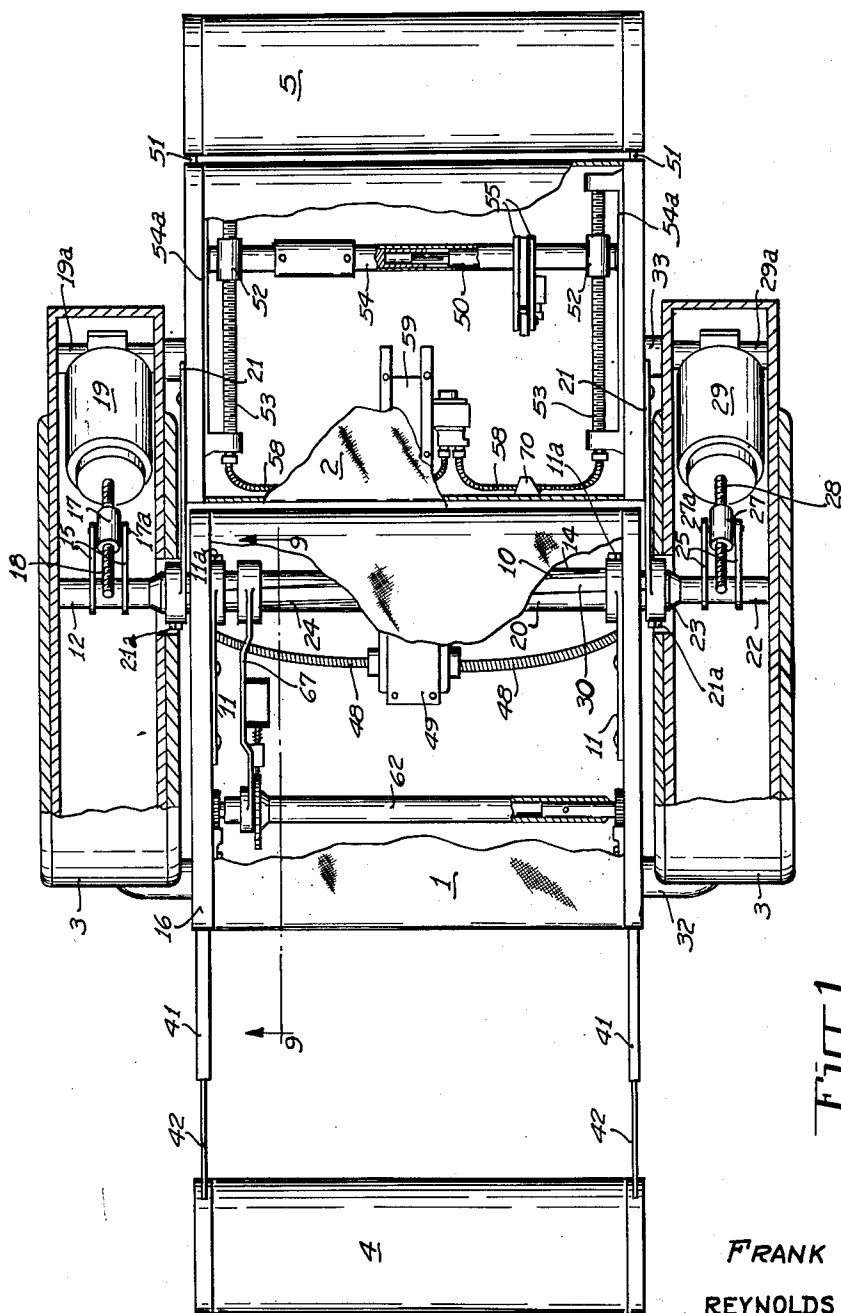


Fig. 1

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2 Sheets-Sheet 2

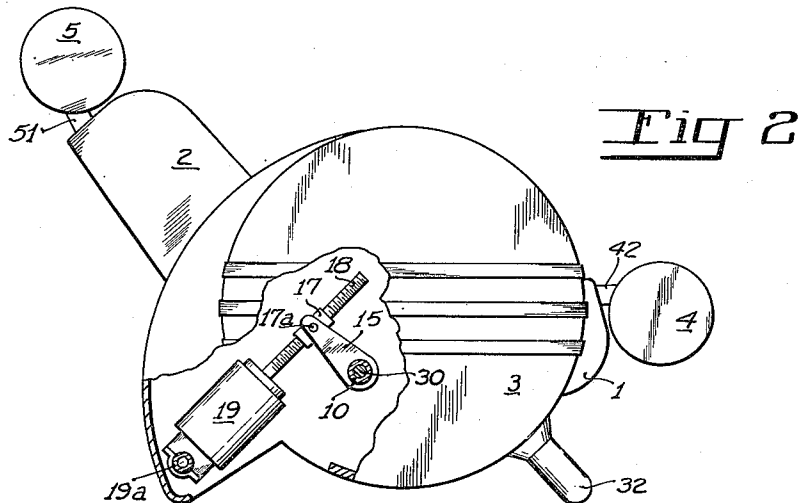


Fig. 2

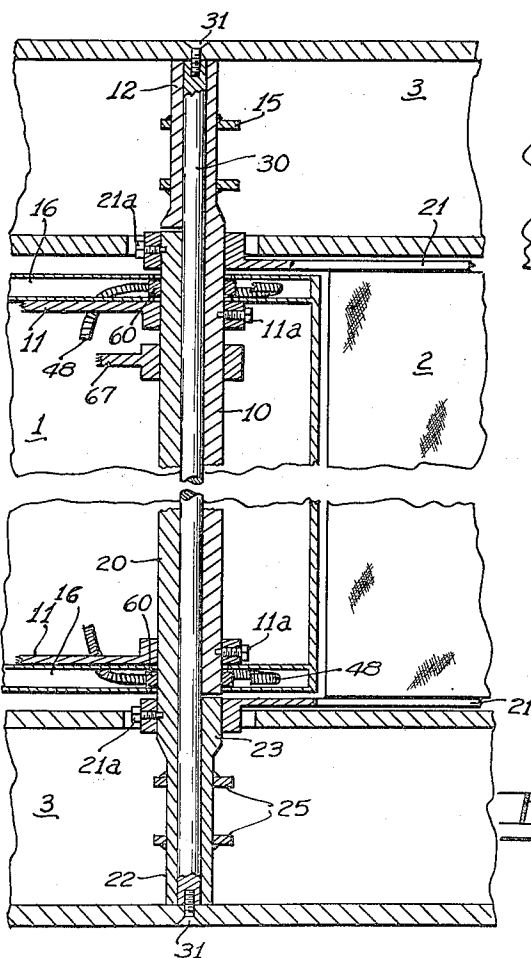


Fig. 3

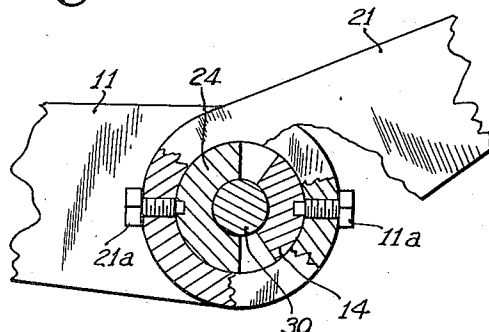


Fig. 4

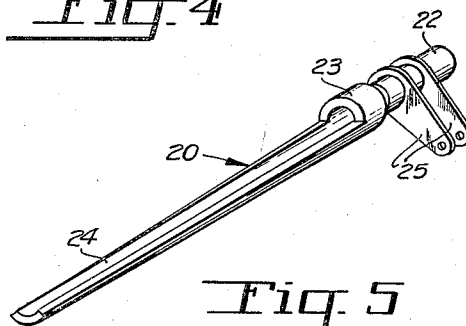


Fig. 5

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CHAIR

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6 Claims. (Cl. 155—105)

1

The present invention is one of a series dealing with lounge chairs, whereon copending applications are filed in the United States Patent Office. In substantially all such cases a seat and a back are supported from a floor-engaging frame, or fixed support, for tilting, each independently of the other, about a tilting axis which is located adjacent the rear edge of the seat, and which extends as an unbroken solid or hollow shaft from one side to the other.

The present invention concerns a chair of the same general nature, and particularly concerns a chair wherein simplicity of construction and compactness are promoted, without loss of essential ruggedness, rigidity, or flexibility of operation and adjustment, by the substitution of segmental shafts located adjacent the pivot axis and extending from one side to the other of the respective main body-supporting elements, in lieu of the unbroken solid or hollow shafts heretofore used. The arrangement is such as will still permit the independent tilting of the seat and the back.

By thus achieving simplicity of construction, not only is the cost of the chair lessened, but the ease of assembly or disassembly is greatly enhanced, and, moreover, by reason of the omission of parts likely to get out of order, the ruggedness of the chair as a whole is materially improved, and the manufacture and assembly of its various parts is simplified.

It is a further specific object in such a chair, wherein the seat and the back are independently tiltable about a common axis, in effect to split that axis between them, so that while still maintaining the ruggedness and rigidity of adequate torque-transmitting cross-connections between the two sides of each of the seat and back, and adequate flexibility of independent movement for each thereof, there is a minimum of interior parts, and a maximum of mutual support, and which as a result makes possible the substantially direct connection to each of the seat and back of the motor means which accomplishes tilting thereof, thereby materially simplifying the construction and assembly of all parts of the chair.

With these objects in mind, and others as will appear as this specification progresses, the present invention comprises the novel chair, and the novel combination and arrangement of the parts thereof relative to one another, and the novel individual subcombinations, all as are shown in the accompanying drawings in a typical form, and as will be more fully explained and defined hereinafter.

Figure 1 is in general a plan view of such a chair, with various parts broken away and shown in section, with the seat and back disposed in substantially horizontal position, and with the foot rest projected.

Figure 2 is a side elevational view, with parts broken away to illustrate the simplicity of the tilting means for one of the main body-supporting elements.

2

Figure 3 is a horizontal axial sectional view, with parts substantially in the positions of Figure 1, taken along the tilting axis of the seat and back, and Figure 4 is a transverse sectional view through the axis, with certain parts omitted for clearer understanding of the parts illustrated.

Figure 5 is an isometric view of one of the complementary segmental shaft elements.

The seat 1 and the back 2 are supported for tilting about an axis in the vicinity of the rear edge of the seat, from a floor-engaging frame 3. A foot rest 4 may be supported for projection and retraction relative to the forward edge of the seat, and in the construction shown is semi-independent of the seat frame. In addition it is tiltable with respect to the seat 1, and although not necessarily so arranged, herein its tilting axis coincides with the axis which is common to the seat and back. A head rest 5 is supported from the back 2, with respect to which it is projectable and retractable.

The frame 3 is made up of two hollow side arms cross-connected by elements 32 and 33, one of which, at least, may constitute a foot. In addition, a rod 30 extends between the hollow side arms, and is secured to each, as indicated at 31 (see Figure 3), whereby it becomes a simple matter for the rod 30 and the elements carried thereby to be dismounted from the supporting frame.

Secured for oscillation about the rod 30, which thereby becomes a pivot support, is a composite shaft made up of two shaft segments, which are generally alike. One such segment is shown in Figure 5. This may be assumed to be the segmental shaft section which supports and rotates the back, and which will therefore be designated generally by the numeral 20, and a companion section 10 supports the seat. Referring particularly, then, to the section 20, this includes an outer end or terminal section 22, an enlarged cylindrical section 23, and a long segmental section 24. The shaft section 10 in similar fashion is formed with a cylindrical end section 12, and a long segmental section 14. Taken together, the segmental portions 24 and 14 do not occupy 360°, but allow relative rotational movement of perhaps 90°. This is best seen by reference to Figure 4.

To the shaft section 10 are secured the arms 11, by means such as are indicated at 11a, which arms are secured in turn to the frame of the seat 1. Each such arm, in the portion which embraces the composite shaft, is formed with a cylindrical collar. Hence with respect to the arms 11 that are secured to the shaft 10, the segmental portion 24 of the shaft 20 is merely journaled within the bore in the end of the arm 11. In similar fashion arms 21, which are secured to the back 2, are secured at 21a to the shaft 20, and embrace the shaft 10, the segmental portion 14 of which, therefore, is journaled within the arms 21.

By such means the segmental shafts are provided with ample bearings at both ends, and yet

3

afford the necessary degree of cross rigidity between the two sides of the seat and of the back, respectively. Taken together, the composite shaft 10, 20 is bored to receive, and oscillates about the pivot rod 30, yet each shaft 10 and 20 is left with a free cylindrical end 12 or 22, for the direct connection of power means to effect their tilting.

To the latter end double arms 15 are secured to the end portion 12 of the shaft 10, and a jack screw 18, directly rotated by the motor 19 located within one frame arm 3, threads within a nut 17, which is tiltably supported at 17a in the outer end of the arms 15. The seat-tilting motor 19 is pivotally mounted at 19a in the floor-engaging frame at a point offset from the pivot axis at 30 of the seat and back. In similar fashion arms 25 are secured to the cylindrical end 22 of the shaft 20. A nut 27 pivotally mounted at 27a receives the jack screw 28 driven from the motor 29, pivotally mounted at 29a within the other frame arm 3.

Controls for the motors (not shown) are located conveniently to the occupant, so that he may, by pressure upon a button, determine the sense of operation of any motor, and initiate and stop its operation at will. Thus he may tilt upwardly or downwardly either the seat 1 or the back 2, or both thereof, or actuate other controls, later alluded to.

The connection between the motor which effects such movement, and the seat or back which is so moved, is about as direct as can be obtained, and the mechanism is throughout extremely simple and yet effective. It occupies a minimum of space, its bulk and weight are small, and it is readily accessible for servicing.

Conveniently the foot rest is projectable and retractable with respect to the seat, and is supported in effect from the seat, although for retraction and projection it reacts from the frame. The side marginal portions of the frame of the seat, see Figure 3, define a channel 16. This guide or channel 16 receives a first slide 41, for projection and retraction, and the latter also is formed as a guide for a second slide 42. The foot rest 4 is secured to the outer end of the second slide 42.

The mechanism for tilting the foot rest 4 includes a shaft 62, journaled in the seat frame, and an arm 67, journaled about the composite shaft 10, 20, but it is unnecessary to describe the mechanism in detail. Neither is it necessary to describe the retracting and projecting mechanism for the foot rest. The motor 49 and its flexible shafts 48 assist in such movements, through mechanisms not herein illustrated. These elements form no part of the present invention.

The head rest 5 is also mounted for projection and retraction upon and relative to the back 2, and for tilting, upon arms 51, pivotally mounted at 50, and the pivot shaft 50 is movable inwardly and outwardly along the frame of the back 2, in guides 54a. A nut or nuts at opposite sides of the back, indicated at 52, are threaded upon jack screws 53, which are rotated at like speeds in one sense or the other from a motor 59 carried by the frame of the back, through the flexible shafts 58. The nuts 52 are joined through and are connected rigidly to a sleeve 54, within which the shaft 50 is received and journaled. The arms 51 are secured to the shaft 50. Tilting is accomplished by means of an arm or arms 55, and other mechanism not necessary to describe,

4

since these provision are not part of this invention.

I claim as my invention.

1. A chair comprising a floor-engaging frame, a seat, a back, two segmental shaft elements disposed one alongside the other to constitute conjointly a single but interrupted cylindrical shaft, the two parts whereof are mutually relieved angularly to oscillate relatively through a limited angle about their common axis, the frame constituting a journal support for said composite shaft, the seat and the ends of one such shaft element being rigidly interconnected, and the back and the ends of the other shaft element being similarly rigidly interconnected, and means carried by the respective shaft elements for engagement by tilting means, whereby to tilt either or both said shaft elements, and the corresponding seat or back, about the shaft's axis.

2. In a chair of the type wherein a seat and back are supported from a floor-engaging frame for independent tilting about a common axis located adjacent the rear edge of the seat, a support for the seat and the back comprising a cylindrical shaft for journal support in the frame, located in the tilting axis, and formed as two segmental shaft elements disposed one alongside the other, and having overlapping confronting portions, said overlapping confronting portions being conjointly of an angular extent less than 360°, whereby either may oscillate about the common axis independently of the other through a restricted angle, means at the ends of each for securement to the seat and to the back, respectively, and means carried by each shaft element for tilting engagement by tilting means, independently of the other shaft element.

3. In a chair as in claim 2, four collars embracing both shaft elements, two adjacent each end, one such collar at each end, for securement to the seat, being secured to one such shaft element, and the other shaft element being journaled therein, and the other such collars, for securement to the back, being secured to the other shaft element, and the first shaft element being journaled therein.

4. In a chair as in claim 2, wherein the shaft elements are complementally axially bored to constitute a hollow shaft, a pivot rod received in such bore for securement at its ends to the frame, to constitute a support about which each of the shaft elements, and hence the seat and back, may tilt.

5. A chair as in claim 2, characterized in that each shaft element, at one terminus, is completely cylindrical, and the respective means for tilting engagement are connected to such terminal ends.

6. A chair as in claim 5, wherein each means for tilting engagement comprises a radial arm on each cylindrical terminal end, and a nut tiltably carried by each such arm, for the reception of a complemental jack screw on the frame.

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