

[54] **RECLINER CHAIR**
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 [51] Int. Cl.**B60n 1/02, A47c 1/026**
 [58] **Field of Search**.....**297/341, 342, 343, 367, 368, 297/369, 349, 347, 348, 355, 359, 360, 361, 378, 380, 381; 248/418, 415; 108/142**

39,135 10/1930 France**297/341**

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[57] **ABSTRACT**

A recliner chair particularly adapted for use in recreational vehicles. The recliner includes a mount for attachment to fixed structure of the vehicle and for rotatably mounting a bottom frame to permit the chair to be swiveled about a generally vertical axis. A back frame is pivotally mounted to a relatively fixed portion of the bottom frame, and braces are attached between the back frame and a relatively movable portion of the bottom frame. A seat lock mechanism locks the fixed and movable portions of the bottom frame in any position of recline or tilt of the back frame to prevent movement of the seat back during a vehicle accident or the like.

[56] **References Cited**

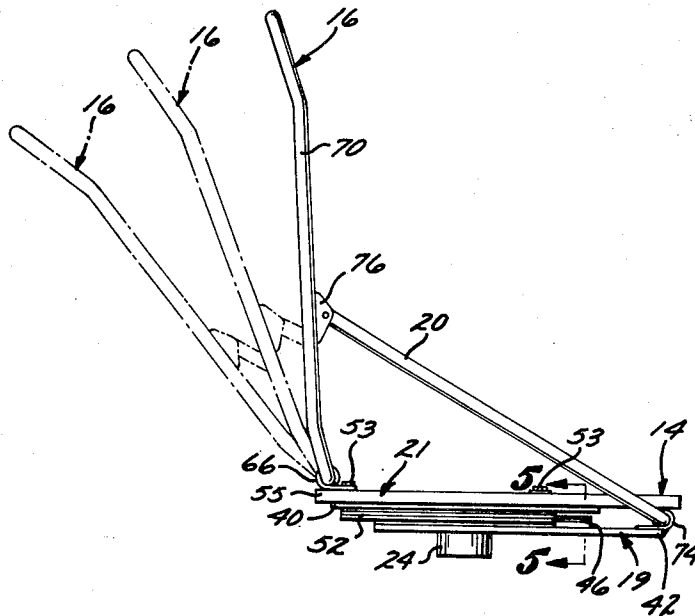
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4 Claims, 6 Drawing Figures



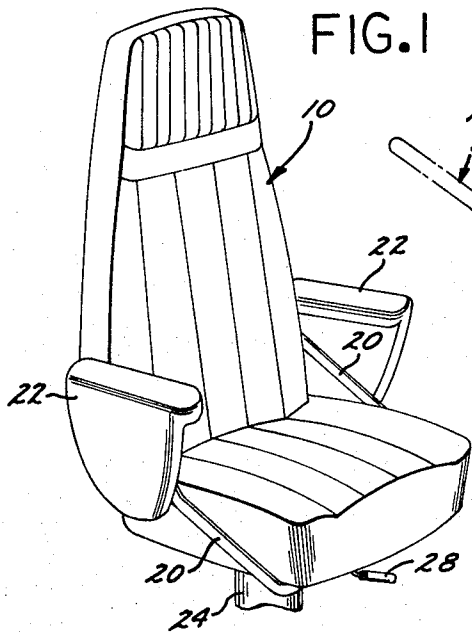


FIG. 1

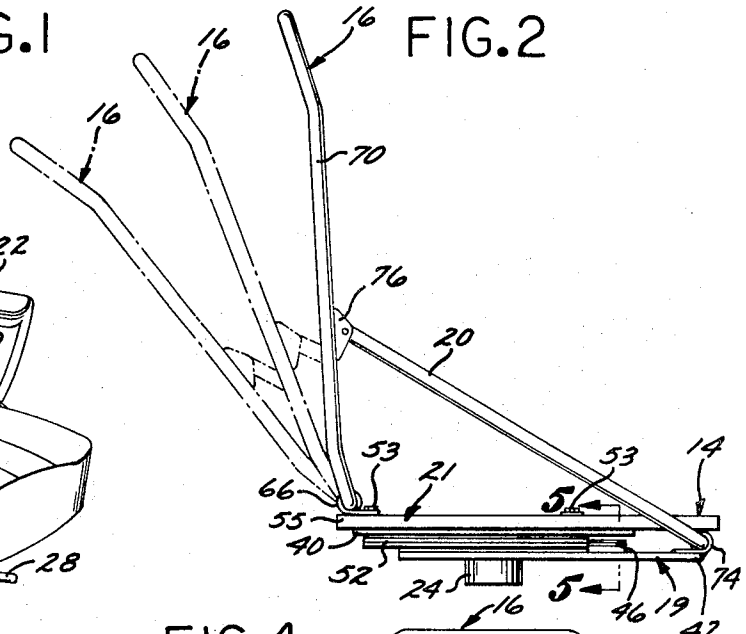


FIG. 2

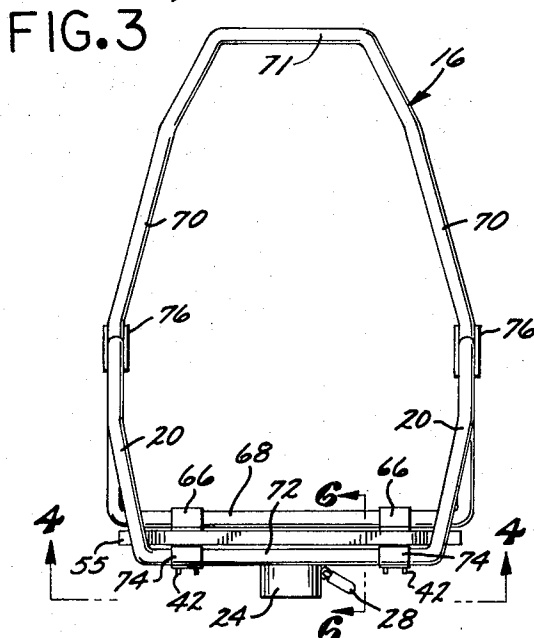


FIG. 3

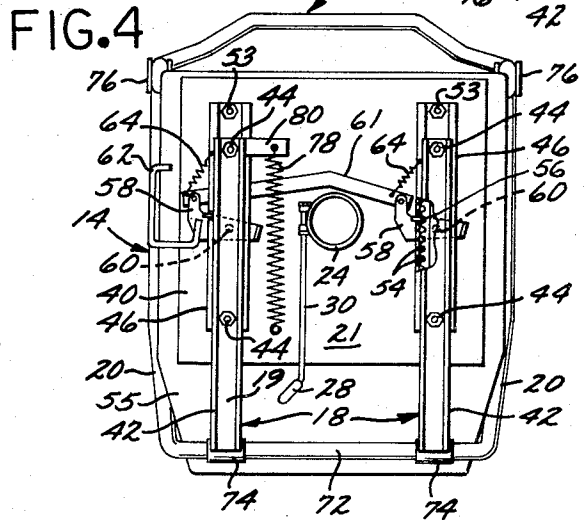


FIG. 4

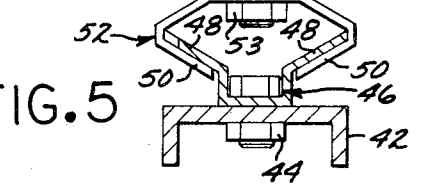
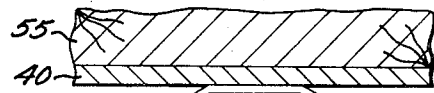


FIG. 5

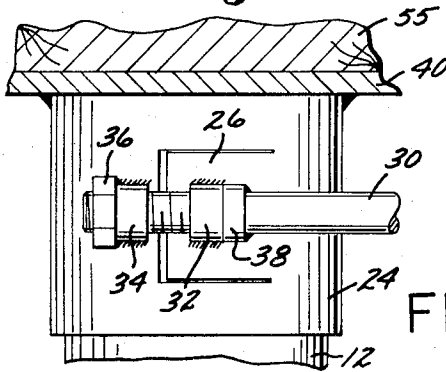


FIG. 6

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RECLINER CHAIR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a recliner chair and more particularly to a recliner chair for use in vehicles.

2. Description of the Prior Art

The recliner chairs of the prior art generally lack a satisfactory means for locking the back frame relative to the bottom frame in the various positions of tilt of the back frame. Prior art locking means typically include an element rotatable with the back frame and including a detent into which is disposed a locking dog carried by the bottom frame. This type of locking arrangement is flimsy, inclined to malfunction, and subject to relatively high loads during a vehicle collision or the like.

SUMMARY

According to the present invention, a recliner chair is provided which includes a back frame adapted to be locked to the bottom frame in any of a variety of pivoted or tilt positions. The locking means provided is easily operated by one person, and is effective to lock the frames together quickly and easily without affecting the capability of the recliner for swiveling movement about its floor mount. The locking means preferably takes the form of a pair of interengaged tracks whose relative movement in a longitudinal or fore-and-aft direction is controlled by operation of a locking lever. A major proportion of vehicle impact forces are isolated from the locking means and borne instead by a pair of diagonal side braces pivotally mounted to the frames.

The seat cushion is preferably carried by the fixed portion of the bottom frame so that it does not move fore and aft as the back frame tilts. However, if desired the seat cushion could be mounted in association with the movable portion of the bottom frame so that it would move backward and forward on tilting of the back frame.

The present recliner chair is relatively inexpensive to fabricate, easy to maintain, and is quickly and simply operated to adjust the position of the back frame relative to the bottom frame.

Other objects and features of the invention will become apparent from consideration of the following description taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a recliner chair according to the present invention;

FIG. 2 is a side elevational view of the chair of FIG. 1, the arm rests and upholstery being removed for clarity, and illustrating in phantom outline various recline or tilt positions of the back frame;

FIG. 3 is a front elevational view of the chair of FIG. 2;

FIG. 4 is a view taken along the line 4—4 of FIG. 3;

FIG. 5 is an enlarged detail view taken along the line 5—5 of FIG. 2; and

FIG. 6 is an enlarged detail view taken along the line 6—6 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, there is illustrated a recliner chair 10 according to the present invention and comprising, generally, a mount 12 adapted for attachment to relatively fixed structure (not shown) such as the floor of a motor vehicle. The chair also comprises a bottom frame 14 carried by the mount 12; a back frame 16 located adjacent the bottom frame 14; a track mechanism 18 including tracks carried by the relatively movable and fixed portions 19 and 21 of the bottom frame 14 to enable forward and rearward movement of the back frame 16 relative to the bottom frame 14, as will be seen. Also comprising a portion of the chair 10 are a pair of generally diagonally oriented braces 20 which are pivotally mounted at their opposite extremities to the frames 14 and 16 to pivot the back frame 16 in response to any forward or rearward movement of the back frame 16 relative to the bottom frame 14.

As will be apparent, the present recliner chair 10, although particularly adapted for use in motor vehicles, is also adapted for use in other types of structures. Moreover, although the components of the chair 10 are described as having a particular configuration, it will be apparent that other configurations may be employed if desired. The components are made up almost entirely of lightweight structural tubing and metal plate which is appropriately covered by cushions and similar items of upholstery, including a pair of arm rests 22. Since the mounting of the arm rests to the braces 20 does not form a part of the present invention, the manner of mounting will not be described in detail. However, it is noted that the arm rests 22 are secured to suitable brackets (not shown) on the braces 20 so that the arm rests can be easily swung out of the way in order to facilitate side entry of a passenger onto the seat cushion.

The capability of the back frame for reclining or tilting not only provides improved comfort for the passenger, but also enables the back frame 16 to be pivoted to an almost vertical position to permit passengers to more easily walk in the sometimes confined space behind the chair 10.

Details of the chair upholstery are not part of the present invention. However, as previously indicated, the seat cushion is normally mounted to the relatively fixed portion of the bottom frame 14 so that it does not move with the back frame 16. The relatively movable portion 19 of the bottom frame 14 is located on the underside of the frame 14 so that it is freely movable in a forward and rearward direction beneath the seat cushion when the back frame 16 is tilted. Of course, the seat cushion could be mounted to the movable portion 19, if desired, so that it would slide forwardly and rearwardly when the back frame 16 is tilted, but attachment to the fixed portion 21 of the bottom frame 14 is preferred.

The mount 12 is a cylindrical pedestal fixedly secured to the vehicle floor (not shown). The mount 12 rotatably supports a sleeve 24 which is welded to the underside of a rectangular plate 40 which forms a part of the fixed portion 21 of the bottom frame 14. The sleeve 24, as seen in FIG. 6, includes a flap or section 26 which is punched or otherwise formed out of the

metal of the sleeve. The section 26 is sufficiently resilient that it can be deformed inwardly to bind against the mount 12 and constrain the sleeve 24 against rotation.

Pressing in of section 26 is controlled by rotating a handle 28 which, in turn, rotates a rod 30. The rod 30 passes through a pair of trunnions 32 and 34 which are welded to the section 26 and to the adjacent fixed portion of the sleeve 24. The end of the rod 30 is threaded and is coupled to an internally threaded nut 36 which is welded to the trunnion 34. A collar 38 which is integral with the rod rotatably bears against the adjacent face of the trunnion 32. With this arrangement, rotation of the rod 30 in one direction causes the nut 36 to exert a force on the rod 30 which pulls the collar 38 against the trunnion 32 and pivots the section 26 inwardly. This causes a binding action upon the periphery of the mount 12 and locks the chair 10 in one of its positions of rotation about the vertical axis of the mount 12. Conversely, rotation of the rod 30 in the opposite direction relieves the binding action so that the chair 10 can be rotated or swiveled into a new position.

The movable portion 19 of the bottom frame 14 includes a pair of channels 42 disposed in parallel, longitudinally extending, transversely spaced apart relation. The channels 42 are secured to a pair of movable tracks 46 by a plurality of nut and bolt assemblies 44. The tracks 46 form a part of the track mechanism 18 and each is characterized by upwardly and outwardly divergent portions 48 which complementally fit within and are longitudinally slidable relative to inwardly and convergently extending portions 50 of a pair of parallel stationary tracks 52 which also form a part of the track mechanism 18. The tracks 52 are secured to the underside of the plate 40 by nut and bolt assemblies 53 which also secure the plate 40 to the underside of a generally rectangular cushion support 55 which also forms part of the frame fixed portion 21.

As best seen in FIG. 4, each movable track 46 includes a plurality of cut out portions or detents 54 along one margin thereof which are adapted to receive an inwardly projecting tab 56 forming a part of an elongated lock arm 58. Each arm 58 is pivotally mounted to the adjacent stationary track 52 by a pin 60 (shown in dotted outline).

The pair of arms 58 are coupled for common movement by a link 61, and the end of one arm 58 carries a handle 62 to facilitate pivotal movement of the arms 58 about the axes of the pins 60 to move the tabs 56 in and out of the selected detents 54. Each stationary track 52 includes a cut out portion to enable entry of each tab 56 into the detents 54, as best seen in FIG. 4. A pair of tension springs 64 are connected from the opposite ends of the link 61 to the adjacent stationary tracks 52 to bias the tabs 56 into engagement with the detents 54, as will be apparent.

A pair of bearing sleeves 66 are welded to the rearward extremities of the stationary tracks 52 of the fixed frame portion 21. These sleeves 66 pivotally receive the lower horizontal portion 68 of the tubular back frame 16. In addition to the portion 68, the back frame 16 includes generally upwardly extending side portions 70 and a horizontal top portion 71, as best seen in FIG. 3. The back frame 16 forms the mounting structure for the chair upholstery, as will be apparent.

The back frame 16 is pivotable in the sleeves 66 through various angles of tilt, as generally indicated in phantom outline in FIG. 2, and is reinforced against impact loads and the like by the pair of braces 20. These constitute the side portions of a generally U-shape tubular structure whose forward or bottom portion 72 is pivotally disposed between a pair of sleeves 74 welded to the forward extremities of the movable tracks 46 of the frame movable portion 19. The upper or rearward extremities of the braces 20 are pivotally secured to U-shape brackets 76 welded to the side portions 70 of the back frame 16.

In operation, a passenger seated in the chair 10 can rotate the handle 28 to ease the force with which the section 26 presses against the mount 12. The chair 10 is then swiveled to the desired position. The handle 28 can then be tightened to secure the chair in the adjusted position.

The angle of tilt of the chair back is adjusted by pulling upon the handle 62. This disengages the lock tabs 56 from the detents 54 so that the back frame 16 can be pivoted against the bias of a tension spring 78. The spring 78 is connected between the stationary plate 40 and a tab 80 welded to the rearward end of one of the movable tracks 46. It normally biases the chair back to an upright position.

As the back frame 16 is tilted rearwardly, the movable tracks 46 of the frame movable portion 19 slide forwardly, and the braces 20 are therefore enabled to also pivot rearwardly. When the desired angle of recline is reached, knob 62 is released to allow the bias of the springs 64 to move the tabs 56 into the detents 54 and lock the back frame 16 in the new position.

Mounting of the back frame 16 on the track mechanism 18 provides a rugged, inexpensive, and relatively easily maintained means for adjusting the angle of tilt of the chair back, and the braces 20 provide greatly improved structural rigidity for withstanding high impact forces such as might be encountered in a vehicle collision. The attachment of the braces 20 to the back frame 16 at points located well above the horizontal axis of tilt of the frame 16 greatly reduces structural loading of the lock and track mechanisms.

Various modifications and changes may be made with regard to the foregoing detailed description without departing from the spirit of the invention.

I claim:

1. A vehicle recliner chair comprising:

- a bottom frame including relatively movable and fixed portions;
- a mount including a generally vertically oriented pedestal for attachment to a floor, an element secured to said fixed portion and rotatable relative to said pedestal about a substantially vertical axis, and rotation constraining means carried by said pedestal and said element and manually operable to constrain said element, and thereby said fixed portion, against any said rotation;
- a back frame located adjacent said bottom frame and secured to one of said portions for pivotal movement about a generally horizontal axis;
- track means including complementary tracks on said movable and fixed portions, respectively, said tracks being slidable relative to one another and enabling forward and rearward movement of said movable portion relative to said fixed portion;

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elongated brace means having upper and lower extremities connected, respectively, to said back frame above said horizontal axis and to the other of said portions whereby the upper extremities of said brace means are movable with said back frame; and

lock means adapted for locking said portions against relative movement.

2. A recliner chair according to claim 1 wherein said back frame is secured to said fixed portion and said brace means is secured to said movable portion.

3. A recliner chair according to claim 1 wherein said

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brace means comprises a pair of elongated members at opposite sides of said bottom frame, the upper ends of said members being pivotally secured to said back frame at approximately arm rest level, and the lower ends of said members being pivotally secured to that one of said portions to which said back frame is not secured.

4. A recliner chair according to claim 3 wherein the lower ends of said members are pivotally secured to said movable portion of said bottom frame.

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