

Sept. 6, 1932.

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1,876,247

CAR SEAT

Filed March 21, 1930

3 Sheets-Sheet 1

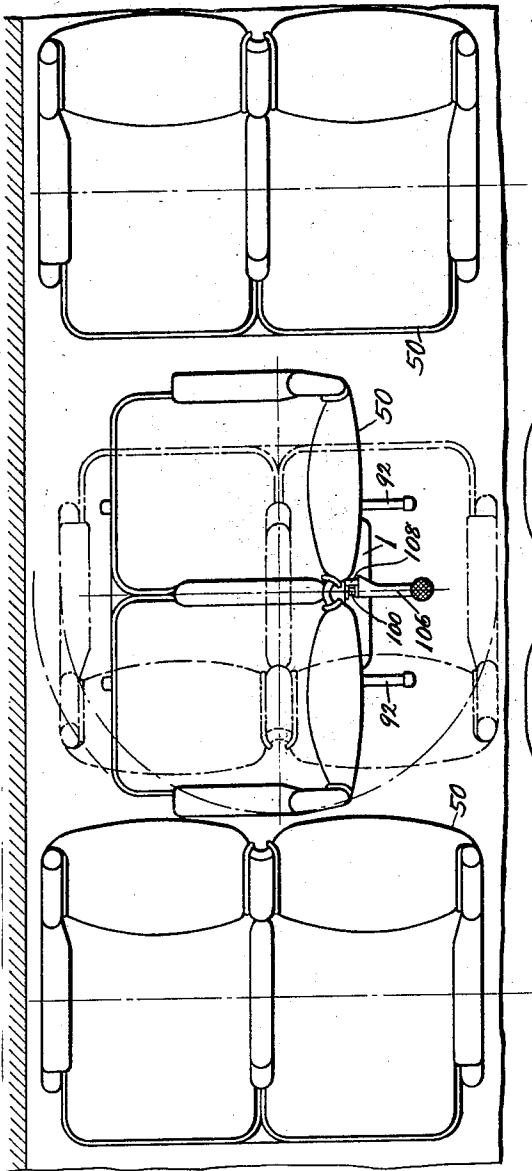


Fig. 1.

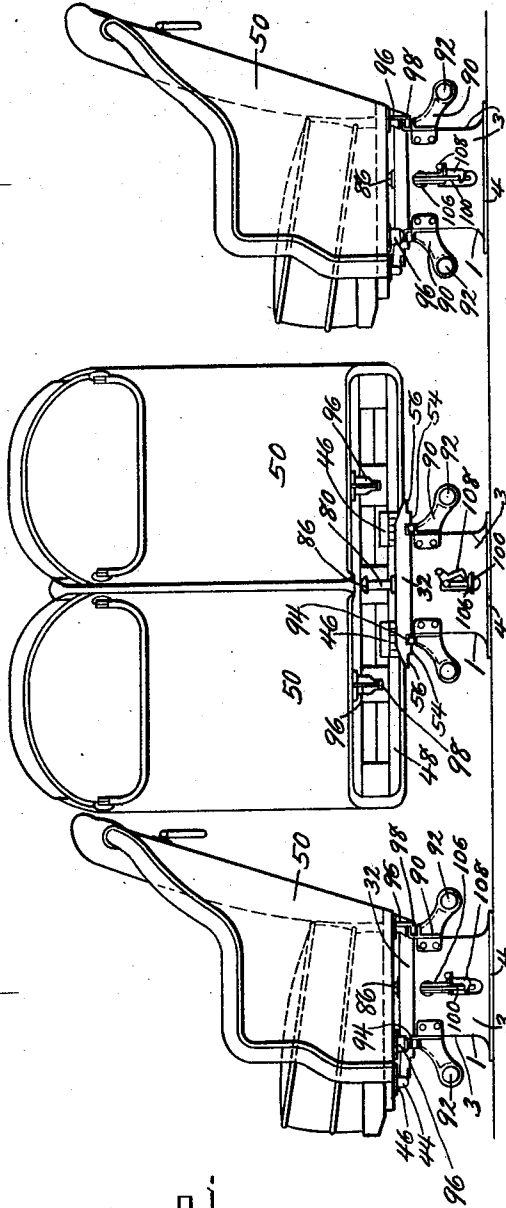


Fig. 2.

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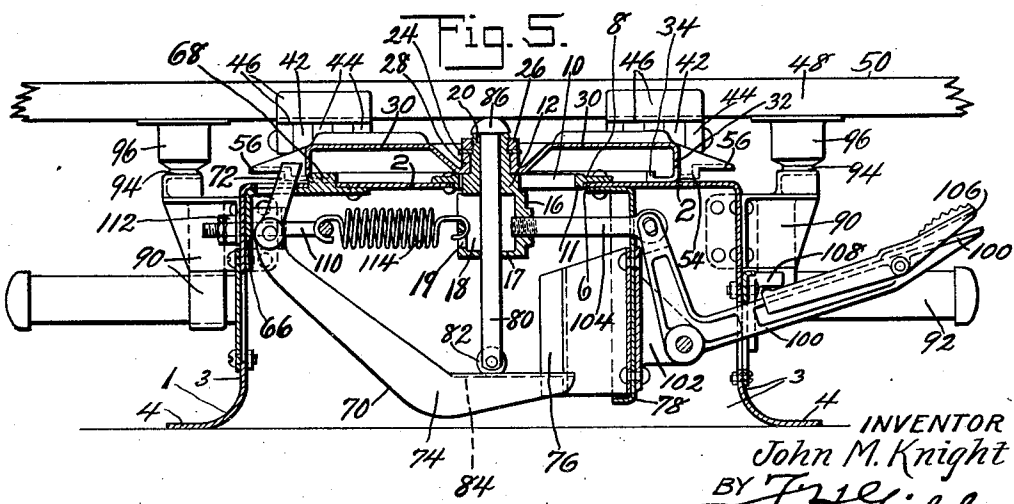
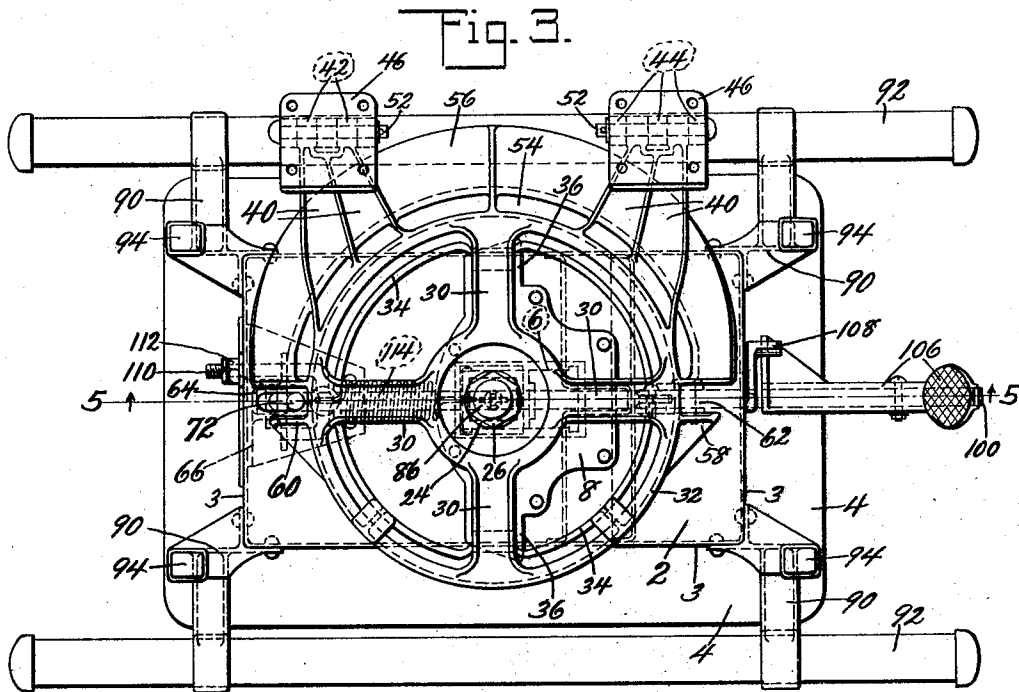
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CAR SEAT

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3 Sheets-Sheet 2



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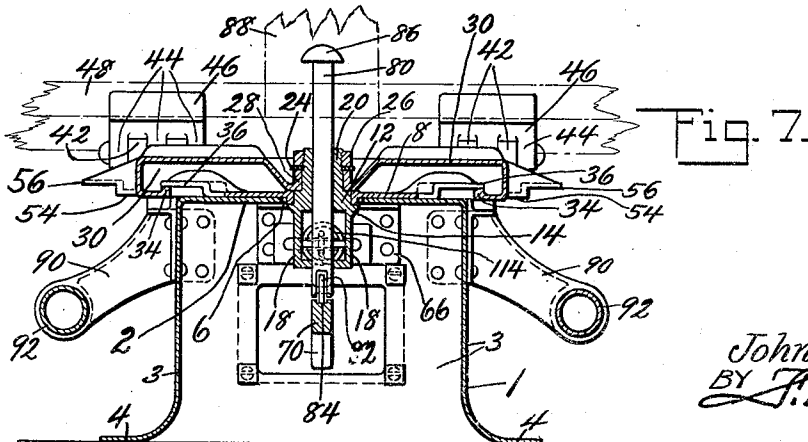
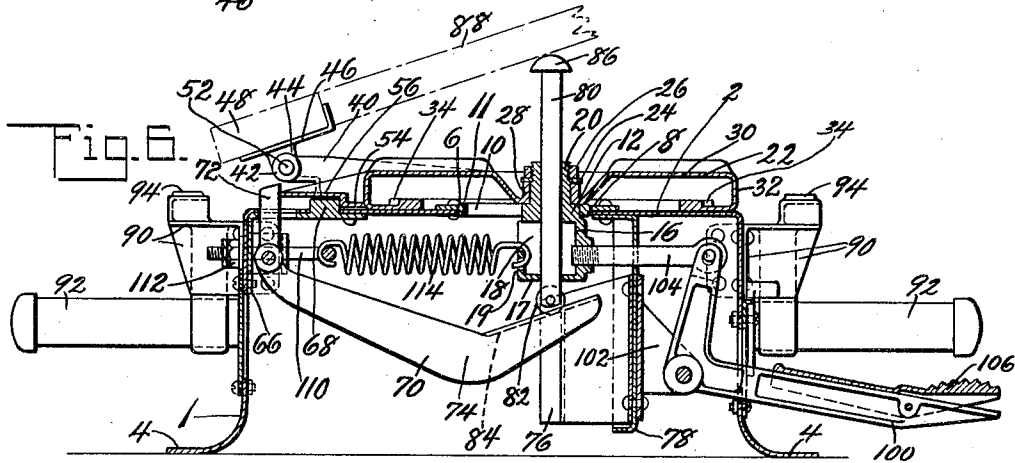
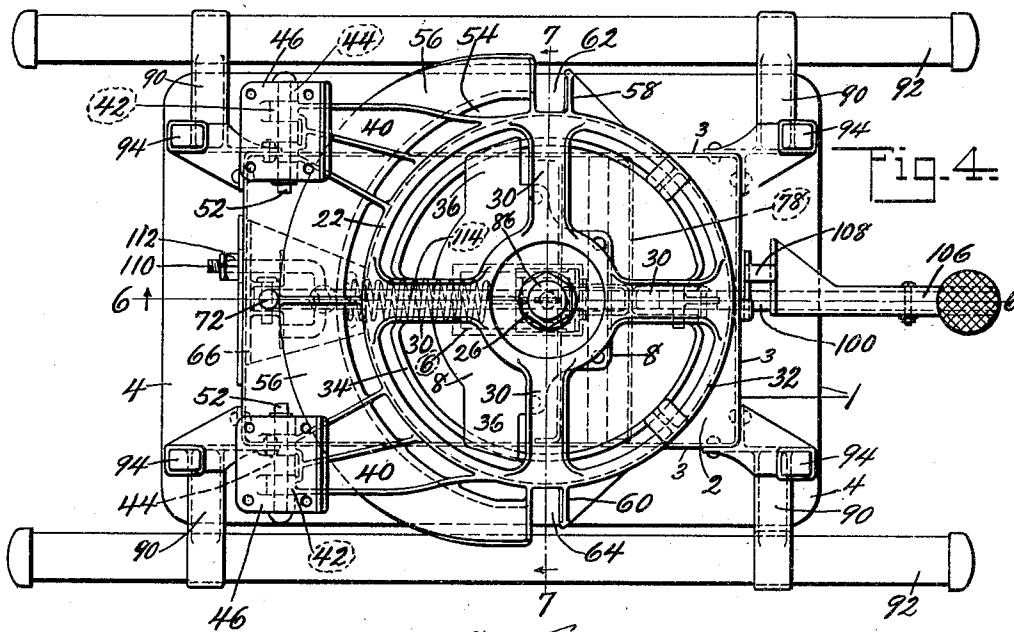
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CAR SEAT

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3 Sheets-Sheet 3



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CAR SEAT

Application filed March 21, 1930. Serial No. 437,750.

This invention relates to car seats and more particularly to revolving seats for railway passenger cars and it is the object of this invention to provide an improved mechanism for a revolving seat which will automatically tilt the seat body during the rotation thereof. It is also the object of this invention to provide a revolving seat mechanism in which a lever mechanism having a fixed fulcrum is operated by a rotating part to maintain the seat body in a tilted position during a predetermined part of the rotation of the seat body.

In the drawings:

Fig. 1 is a top plan view showing part of the row of seats along one side of a car, the center seat being shown in partly turned and fully turned positions;

Fig. 2 is a view of an elevation of the seats shown in Fig. 1, the center seat being shown in a partly turned position;

Fig. 3 is a normal position view in a normal position of one of the seat structures shown in Figs. 1 and 2 with the seat body removed in order to show the seat mechanism more clearly;

Fig. 4 is a view similar to Fig. 3 but showing the position of the mechanism with the seat body partly turned;

Fig. 5 is a vertical section taken on the line 5-5 of Fig. 3 with a fragment of the seat body frame attached thereto;

Fig. 6 is a vertical section taken on the line 6-6 of Fig. 4 with the position of the bottom of the seat frame indicated in broken lines; and

Fig. 7 is a vertical section taken on the line 7-7 of Fig. 4 with the position of the bottom of the seat body frame indicated in broken lines.

As shown in the drawings a car seat constructed in accordance with this invention comprises a pedestal 1 substantially of box shape and having a flat top 2 and vertical sides 3, the sides 3 being flared at their lower edges to provide attaching flanges 4 by means of which the pedestal 1 is secured to the car floor or frame. While the pedestal has been indicated in the drawings as formed as a single pressed member it will be understood

that it may be formed of a number of parts united together in any desired manner. In the top 2 of the pedestal 1 is an elongated rectangular opening or slot 6 and to the top 2 is attached a guide plate 8 of irregular shape and having an opening 10 corresponding to the opening 6 in the top 2, the opening 10 being defined by flanges 11 which fit the sides of the opening 6.

As shown more clearly in Figs. 6 and 7, a slide block 12 is provided which has shoulders or flanges 14 (see Fig. 7) engaged beneath the flanges 11 of the guide plate 8 and a downwardly projecting arm or wall 16 braced by ribs or side walls 18. The lower edges of the arm 16 and the ribs 18 are joined by a web 17 having a flange 19 which also connects the ribs 18. The slide block 12 is also provided with a cylindrical portion 20 which projects above the plate 8 and about which fits the hub of a spider 22. The spider 22 defines a seat plate or hinge plate and rests on the guide plate 8 and top 2 and is secured to the slide block 12 by washer 24 and nut 26, the hinge plate 22 and the shoulders 14 serving to retain the slide block 12 in position in the opening in the guide plate 8.

The hinge plate 22 comprises a hub portion 28 which fits about the cylindrical portion 20 of the slide block 12 and arms 30 (see Fig. 4) which connect the hub portion 28 to an annular rim 32 of substantially channel shape, said rim, as shown in Fig. 7, having its inwardly projecting lower flange resting on the top 2 and formed at its free edge with a thickened portion 34 which fits beneath offset portions or outwardly projecting arms 36 formed integral with the guide plate 8. The hinge plate 22 is also provided with spaced projecting arms 40 formed at their ends with spaced perforated lugs 42 which cooperate with similar lugs 44 formed on plates 46 attached to the member 48 of the base frame at the front edge of the seat body 50, the openings in the lugs 42 and 44 being aligned to receive hinge pins 52 which pivotally connect the plates 46 to the arms 40 of the hinge plate 22. The hinge plate 22 is also formed with a flange 54 which projects outwardly

from the annular portion 32 for substantially one-half of the perimeter of the annular portion 32 and with a flange 56 attached to the flange 54 but offset therefrom and projecting outwardly beyond the flange 54. The flange 56 is of the same extent as the flange 54 and while the perimeter of the flange 54 is substantially circular in shape and concentric with the rim 32, the perimeter of the flange 56 is not but projects a greater distance from the flange 54 at its central position than at its ends. Spaced between the ends of the flanges 54 and 56 are stops 58 and 60 formed integral with the hinge plate 22 and forming with the ends of the flanges 54 and 56 slots 62 and 64.

Attached to the pedestal 1 at one side thereof is a bracket casting 66 (see Figs. 5, 6 and 7) having formed integral therewith a lug 68 which projects through an opening in the top 2 of the pedestal 1 in position to engage with the perimeter of the flange 54 as shown in Fig. 6. The lug 68 is of such a height as to be received beneath the flange 56. Pivotaly attached to the bracket casting 66 is a lever 70 having a short arm 72 projecting upwardly through an opening in the top 2 of the pedestal 1 and positioned to engage with the perimeter of the offset flange 56 as shown in Fig. 6. The lever 70 has also a longer bent arm 74 which projects into the base of the seat and has its outer end extending between guides 76 attached to a diaphragm 78 which is secured to the pedestal 1 and extends between the sides thereof. Extending through aligned openings in the slide block 12 and the web 17 is a vertically reciprocable rod or plunger 80 having at its lower end a roller 82 mounted to travel in a groove 84 formed in the upper surface of the outer end portion of the arm 74. The upper end of the plunger 80 is rounded as at 86 and engages with a member 88 of the seat base frame.

Attached to the pedestal 1 at the corners thereof are foot rest brackets 90 supporting the foot rests 92 thereon and formed with pads 94 which cooperate with similar pads formed on brackets 96 attached to the seat body 50. As can be seen in Fig. 2, the brackets 96 at the rear of the seat are provided with lips 98 spaced from the pad portions of the brackets which lips engage beneath the pad portions 94 of the brackets 90 to prevent tilting of the seat.

To operate the seat there is provided a foot pedal 100 pivotally mounted in a bracket 102 attached to the diaphragm 78 and having one arm thereof pivotally connected to a rod 104 threaded into the wall 16 of the slide block 12. On the other arm of the foot lever 100, there is pivotally mounted a latch operating lever 106, which, when its outer portion is depressed, engages with and trips a latch 108 secured to the pedestal as shown in Figs. 3 and 5 to permit the foot lever 100

to be depressed. To one side of the pedestal 1 there is secured a J-bolt 110 which extends through openings in the bracket casting 66 and the side of the pedestal 1 and is secured in position therein by a nut 112. To the J-bolt 112 is attached one end of a tension spring 114 the other end of which is attached to the flange 19 extending between the ribs 18.

When placed in a car, the seats are arranged in a row with the foot levers 100 projecting towards the aisle of the car and the seat bodies positioned with an arm adjacent the side wall of the car. In their normal positions as shown in Fig. 5 each seat body 50 will be facing towards one end of the car, the slide block 12 will be at the extreme left of the slot 10 and the lug 68 on the casting 66 will be in one of the slots 62 and 64 and engaged with one of the stops 58 and 60. The foot lever will also be in its raised position and the lips 98 on the rear brackets 96 will be engaged beneath the pads 94 at the rear of the seat. In the usual placing of the seats the spacing between the seats is such that when it is desired to turn all the seats of the row this may be accomplished by beginning with the front seat of the row and turning the seats in succession but sufficient distance between seats is not provided that any intermediate seat may be turned without interfering with the back of the seat ahead. In the present invention, however, to turn any seat in the row whether the seat is being turned in succession to the seats ahead or is the only seat being turned, the operator depresses the lever 106 releasing the latch 108 and depresses the foot lever 100 which through its connection with the rod 104 and slide block 12 slides the hinge plate 22 on the pedestal 1, shifting the seat on the pedestal 1 outwardly from the car side wall and disengaging the lips 98 from beneath the pads 94. This movement of the hinge plate 22 on the pedestal 1 also shifts the hinge plate 22 so that the lug 68 is disengaged from the slot 62 or 64 whereupon the seat is free for turning movement. Turning the seat body 50 also turns the hinge plate 22 and the turning movement of the hinge plate 22 engages the perimeter of the flange 54 with the lug 68 (see Fig. 6) which engagement maintains the hinge plate 22 and seat body 50 in the position to which they were shifted by the operation of the foot pedal 100. As the hinge plate 22 is rotated the flange 56 engages with the arm 72 of the lever 70 and the camming shape of the flange 56 is such that during the first portion of the rotating movement of the hinge plate 22 the arm 72 will be forced outwardly raising the arm 74 and the plunger 80. The upward movement of the plunger 80 through its engagement with the member 88 with the seat base tilts the seat body 50 (see Fig. 6) so as to bring

the upper edge of the seat back more nearly over the plunger 80 in which position the seat requires less space for its turning movement. The flange 56 is so shaped that following the elevation of the plunger 80 the arm 72 will be held to its outward position and the plunger 80 held in its upper position and during the latter part of the movement the flange 56 will permit the gradual return of the arm 72 and hence the downward movement of plunger 80. Upon the completion of the rotation of the seat body 50 and hinge plate 22, the seat body has been returned to its horizontal position and the lug 68 is engaged with the other stop 58 or 60 preventing the further movement of their hinge plate in that direction. With the engagement of the lug 68 with the other of the stops 58 or 60 the spring 114 retracts the slide block 12 and hinge plate 22 bringing with it the seat body 50 thus returning the seat to the car side wall and bringing the lips 98 of the bracket 96 beneath the pads 94 at the rear of the seat and engaging the lug 68 in the other slot 62 or 64. While the shape of the flange 56 may be varied to suit conditions it has been found satisfactory to tilt the seat during substantially the first 45 degrees of rotation of the hinge plate 22 and to maintain the seat in the tilted position during substantially 90 degrees of rotation and to permit the seat to drop during 45 degrees of rotation at the end of the movement.

While the preferred form of the invention has been shown and described, it is to be understood that the invention is not limited to the exact details of construction shown and described as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

What is claimed is:

1. In a seat, a base, a seat plate rotatably mounted thereon, a seat body hinged to said seat plate, lever means pivotally mounted on said base and operated by said seat plate upon rotation thereof and a plunger engaging the seat body and operated by said lever to tilt said seat body.

2. In a seat, a base, a seat plate rotatably mounted thereon and having a cam surface, a seat body hinged to said seat plate, lever means operated by said cam surface upon rotation of said seat plate, and means engaging the seat body upon operation of the lever to tilt said seat body.

3. In a seat, a base, a seat plate rotatably mounted thereon and having a cam surface, a seat body hinged to said seat plate, lever means pivoted on said base and operated by said cam surface upon rotation of the seat plate, a body engaging means actuated by the lever for tilting said seat body upon rotation of said seat plate.

4. In a seat, a base, a seat plate rotatably mounted thereon and having a cam surface,

a seat body hinged to said seat plate, lever means operated by said cam surface upon rotation of said seat plate and a plunger engaging the seat body and operated by said lever to tilt said body.

5. In a seat, a base, a seat plate rotatably mounted thereon, a seat body hinged to said seat plate, bell crank lever means operated by said seat plate upon rotation thereof and a plunger engaging the seat body and operated by said lever to tilt said body.

6. In a seat, a base, a seat plate slidably and rotatably mounted thereon, a seat body hinged to said seat plate, stop means on said base, means on the seat plate cooperating with said stop means to normally prevent rotation of said seat plate, means to slide said seat plate on said base to disengage said seat plate from said stop means and means secured to said base and operated by said seat plate upon rotation thereof to tilt said seat body.

7. In a seat, a base, a seat plate slidably and rotatably mounted thereon, a seat body hinged to said seat plate, stop means on said base, means on the seat plate cooperating with said stop means to normally prevent rotation of said seat plate, means to slide said seat plate to disengage said seat plate from said stop means, lever means pivotally secured to said base and operated by said seat plate upon rotation thereof, and seat body engaging means operated by the lever means to tilt said seat body.

8. In a seat, a base, a seat plate slidably and rotatably mounted thereon, a seat body hinged to said seat plate, stop means on said base, means on the seat plate cooperating with said stop means to normally prevent rotation of said seat plate, means for shifting said seat plate to disengage said seat plate from said stop means, lever means pivotally mounted on said base and operated by said seat plate upon rotation thereof and a plunger engaging the seat body and operated by said lever means to tilt said seat body.

9. In a seat, a base, a seat plate slidably and rotatably mounted on said base and provided with a cam surface, a seat body hinged to said seat plate, a stop on said base, means on the seat plate cooperating with said stop to normally prevent rotation of said seat plate, means to slide said seat plate on said base to disengage it from said stop, and lever means in cooperative relation with and adapted to be operated by said cam surface upon rotation thereof with the seat plate to tilt the seat body relative to said seat plate.

10. In a seat, a base, a seat plate slidably and rotatably mounted thereon, a seat body hinged to said seat plate, stop means on said base, means on the seat plate cooperating with said stop means to normally prevent rotation thereof, means to slide said seat plate on said

base to free the seat plate from the stop means to permit rotation of said seat plate, said stop means engaging said seat plate to hold it shifted during rotation thereof, and means operated by said seat plate during rotation thereof to tilt said seat body.

11. In a seat, a base, a seat plate slidably and rotatably mounted thereon, a seat body hinged to said seat plate, stop means on said base, means on said seat plate cooperating with said stop means to normally prevent rotation of said seat plate, means to slide said seat plate on said base to free the seat plate from the stop means to permit rotation of said seat plate, said stop means engaging said seat plate to hold it shifted during rotation thereof, and movable means secured to said base and operated by said seat plate during rotation thereof to tilt said seat body.

12. In a seat, a base, a seat plate slidably and rotatably mounted thereon, a seat body hinged to said seat plate, stop means on said base, means on said seat plate cooperating with said stop means to normally prevent rotation thereof, means to slide said seat plate on said base to free the seat plate from the stop means to permit rotation of said seat plate, said stop means engaging said seat plate to hold said seat plate shifted during rotation thereof, and means including a lever pivotally mounted on said base and operated by said seat plate during rotation thereof to tilt said seat body.

13. In a seat, a base, a seat plate slidably and rotatably mounted thereon, a seat body hinged to said seat plate, stop means on said base, means on said seat plate cooperating with said stop means to normally prevent rotation thereof, means to slide said seat plate on said base to free the seat plate from the stop means to permit rotation of said seat plate, said stop means engaging said seat plate to hold it shifted during rotation thereof, a lever pivotally mounted on said base and operated by said seat plate upon rotation thereof and a plunger operated by said lever to tilt said seat body.

14. In a seat, a base, a seat plate having a cam surface slidably and rotatably mounted on said base, a seat body hinged to said seat plate, stop means on said base, means on said seat plate cooperating with said stop means to normally prevent rotation thereof, means to slide said seat plate on said base to free the seat plate from the stop means to permit rotation of said seat plate, said stop means engaging said seat plate to hold the latter shifted during rotation thereof, and means operated by said cam surface to tilt said seat body upon rotation of said seat plate.

15. In a seat, a base, a seat plate rotatably mounted on the base, a seat body hinged to said seat plate, lever means operated by said seat plate upon rotation thereof, and shiftable means arranged in cooperative relation with

the lever means and seat body and shiftable by the said lever means upon actuation of the latter to tilt said body when the latter is being rotated.

16. In a seat, a base, a seat plate rotatably mounted on the base, a seat body hinged to said seat plate, lever means pivoted to the base and arranged in cooperative relation with the seat plate to be operated by said seat plate upon rotation thereof, and means interposed between the lever and seat body adapted to be actuated by said lever to tilt said seat body.

17. In a seat, a base, a seat plate slidably and rotatably mounted on said base and provided with a marginal cam surface, a seat body hinged to said seat plate, a stop secured to the base and engaging a portion of the seat plate to normally prevent rotation of the latter, means to slide said seat plate on said base to disengage it from said stop, and lever means operated by said cam surface upon rotation thereof with the seat plate to tilt the seat body relative to said seat plate.

18. In a seat, a base, a seat plate rotatably mounted on the base, a seat body hinged to said seat plate, lever means pivoted to the base and operated by said seat plate upon rotation of the latter and vertically shiftable means actuated by said lever means upon pivotal movement of the latter for tilting the seat body.

19. In a seat, a base, a seat plate rotatably mounted on the base about an axis fixed with respect to said seat plate and shiftable relative to the base, a seat body hingedly connected to the seat plate and lever means actuated by said seat plate upon rotation thereof for tilting the seat body.

20. In a seat, a base, a longitudinally shiftable seat plate mounted on the base, a slide block on said base to which the seat plate is rotatably connected, said slide block defining the axis of rotation of the seat plate, and said axis of rotation being fixed relative to the seat plate and shiftable relative to said base, a seat body hingedly connected to the seat plate, and lever means actuated by the seat plate upon rotation of the latter and cooperating with the seat body for tilting the latter.

21. In a seat, a base, a seat body, a seat plate to which the seat body is hingedly connected, a seat plate support on the base to which the seat plate is rotatably connected, said support defining a fixed axis of rotation for the seat plate, resiliently actuated means for normally positioning the support and seat plate, a stop with which the seat plate cooperates when in normal position for preventing rotation of said seat plate, lever means for shifting the support and seat plate to disengage the latter from the stop to permit rotation of the seat plate about said fixed axis of rotation, and lever means actuated by

the seat plate upon rotation thereof to tilt said seat body.

22. In a seat, a base, a seat body, a seat plate to which the body is hinged, a shiftable element on the base to which the seat plate is connected for rotation about a fixed axis, a stop with which said seat plate cooperates when the latter is in normal position for restraining the seat plate against rotation, lever means for sliding the shiftable element on the base to shift the seat plate and its axis of rotation relative to the base and to disengage the seat plate from said stop whereby to permit rotation of the seat plate, and lever means actuated by the seat plate upon rotation thereof for tilting the seat body during rotation of the seat plate.

23. In a seat, a base, a seat plate mounted on the base for rotation about a fixed axis, a seat body hinged to said seat plate, and lever means operated by the seat plate upon rotation thereof to tilt the seat body.

In witness whereof I have hereunto set my hand.

JOHN M. KNIGHT.