

[54] SEAT PEDESTAL WITH VERTICAL AND SWIVEL ADJUSTMENTS

[75] Inventor: Robert A. Wahls, Evanston, Ill.

[73] Assignee: Freedman Seating Company, Evanston, Ill.

[22] Filed: Apr. 2, 1973

[21] Appl. No.: 347,214

[52] U.S. CL..... 248/162, 248/408, 248/411, 248/418

[51] Int. Cl..... F16m 11/30

[58] Field of Search 248/162, 407, 408, 409, 248/411, 412, 157, 401, 402, 418, 354 P, 354 C; 108/146, 142

[56] References Cited

UNITED STATES PATENTS

3,533,583 10/1970 Azim..... 248/411

FOREIGN PATENTS OR APPLICATIONS

227,908 6/1963 Australia..... 248/402

360,111	11/1931	Great Britain.....	248/162
806,321	12/1958	Great Britain.....	248/403
1,026,494	6/1958	Germany.....	248/407
1,219,290	6/1966	Germany.....	248/411

Primary Examiner—Marion Parsons, Jr.

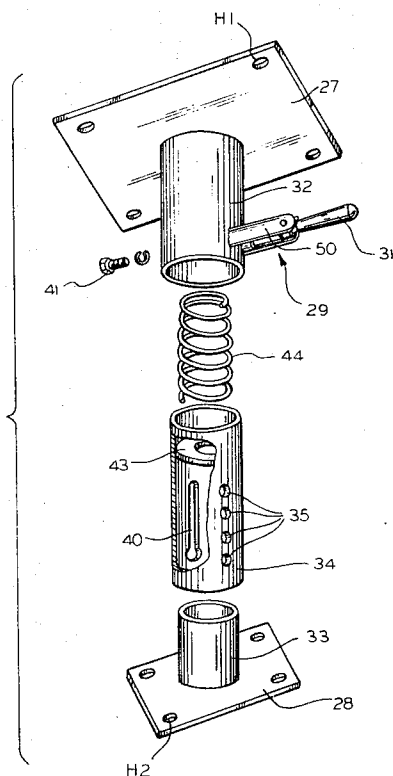
Attorney, Agent, or Firm—Alter, Weiss, Whitesel & Laff

[57]

ABSTRACT

A seat pedestal has upper and lower plates separated by a vertically extending double telescoping tube. To adjust seat height, a bat handle controlled toggle linkage locking arrangement includes a sliding bolt which engages any one of several discrete, vertically displaced, keeper holes formed in an intermediate one of the telescopic tubes. By turning the bat handle, a friction bite may be secured against the innermost one of the telescopic tubes to hold the seat in any of an infinite number of swivel positions.

11 Claims, 13 Drawing Figures



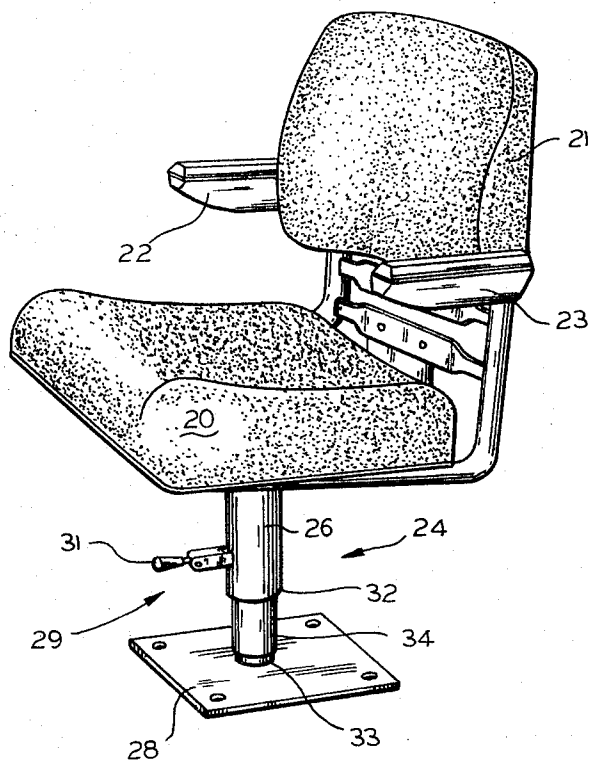


FIG. 1

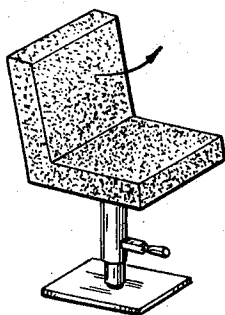


FIG. 2A

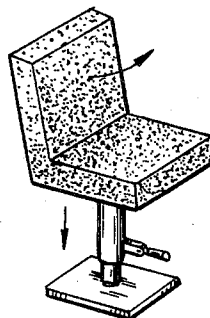


FIG. 3A

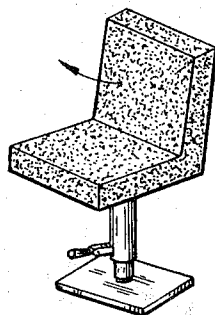


FIG. 2B

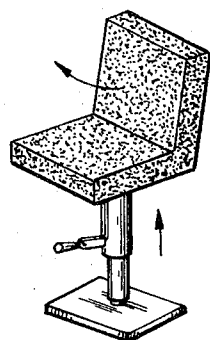
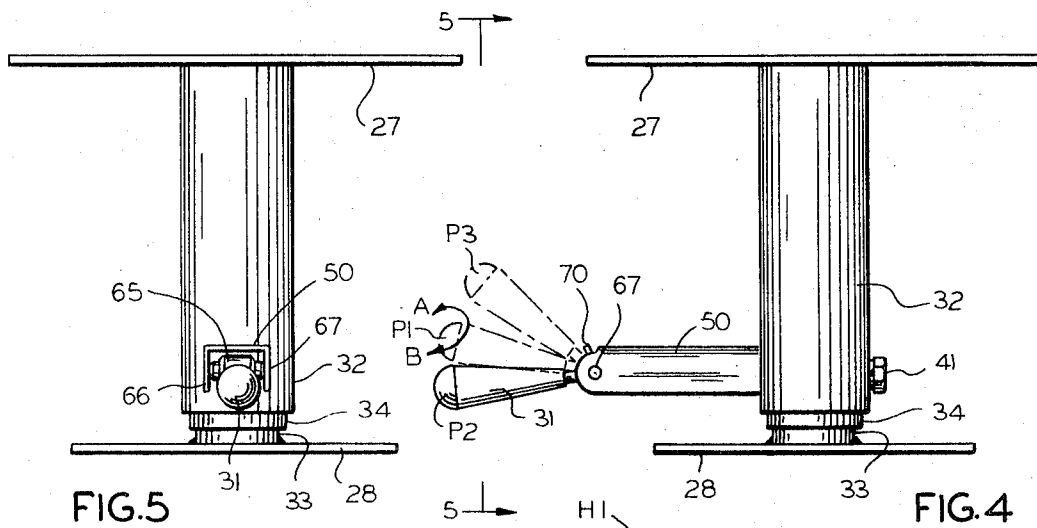
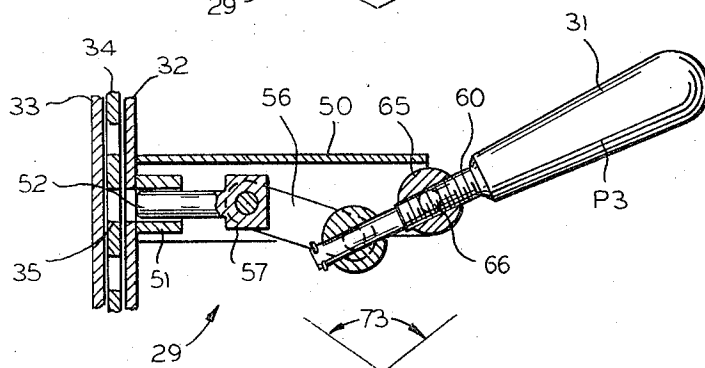
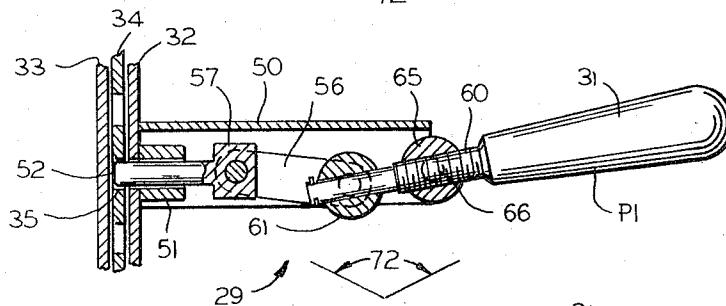
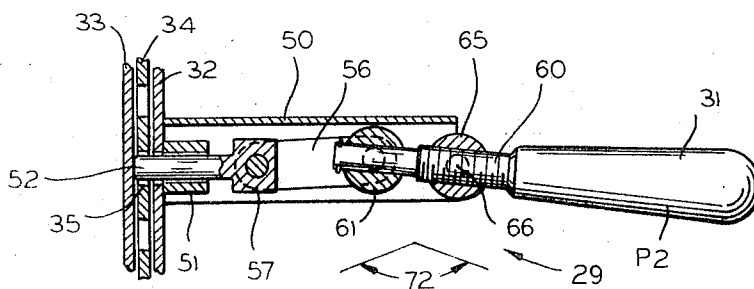
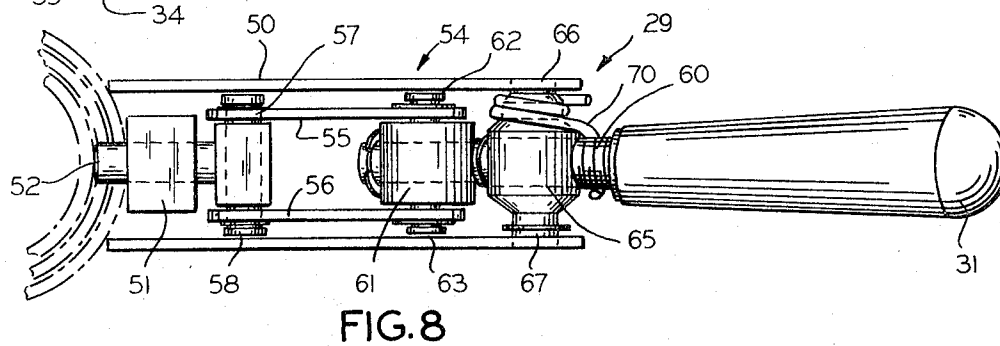
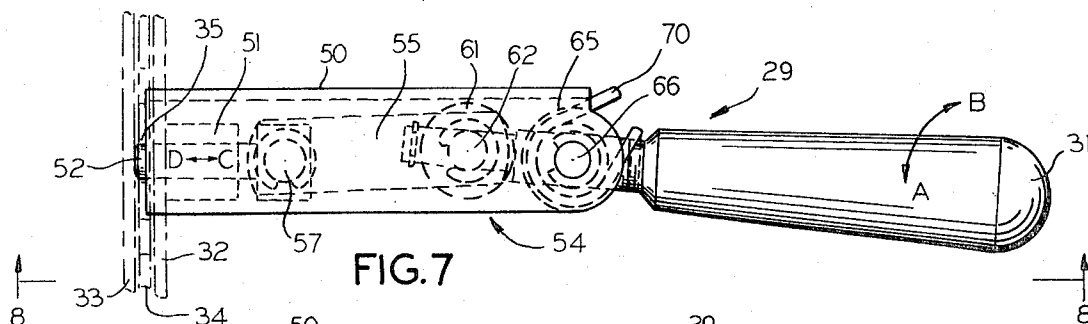


FIG. 3B





SEAT PEDESTAL WITH VERTICAL AND SWIVEL ADJUSTMENTS

This invention relates to adjustable seat pedestals and, more particularly — although not exclusively — to pedestals for automotive seats such as those used in trucks, buses, mobile homes, farm implements, heavy construction equipments, tractors, and the like.

Vehicle seats of the described type share a number of common problems. First and presently foremost, they must meet highway safety standards of government and industry. Second, they must be sufficiently comfortable so that people will be willing to ride in them. Third, they should be easy to operate, free of serious maintenance problems, and reliable in service.

In addition to these general requirements for all automotive seats, there are special requirements for individual seating needs. One present need relates to swivel seats which may also be adjusted vertically. For example, it is convenient for a driver to face one direction when he drives a vehicle down the street, and then to face another direction while the vehicle is parked and he operates a crane, shovel, or hoe, for example. Or, a mobile home may include chairs which are occupied by passengers who may wish to swivel about to look out a front, back, or side window.

Another reason for providing swivel chairs of the described type resides in the recent technical progress in both the seating and the automotive vehicular fields. At one time drivers simply drove vehicles and looked through windshields. Swivel chairs were neither necessary nor desirable. Multipurpose vehicles of the above-described and other types are of fairly recent origin. Simultaneously, the automotive seats have become more expensive because of both demand for comfort and new safety regulations. At one time, drivers simply sat on seat cushions and no one cared about their kidneys, slouch, health, or safety. Then, as the users became more aware of the reasons and needs for better seating, more was built into the seats and they became more expensive. Hence, it is now more important to make maximum use of a seat instead of building two or three separate seats at each operator position.

Accordingly, an object of this invention is to provide new and improved seats of the described type. Here an object is to provide an automotive seat which may swivel to any of an infinite number of horizontal positions and adjust vertically to any of a number of discrete positions.

Another object of the invention is to provide relatively low cost, trouble free seating of the described type. Here, an object is to provide seating which may be made with general purpose tools without requiring a high investment of capital in special purpose tooling.

Yet another object of the invention is to provide an automotive seat having maximum flexibility so that it may be used in any of many different types of vehicles.

In keeping with an aspect of the invention, these and other objects are accomplished by providing a seat pedestal comprising upper and lower plates separated by a double telescoping tube. A toggle lock arrangement engages any one of several discrete keeper members formed in one of the telescopic tubes. By turning a handle on the toggle lock, a friction bite may be secured

against a second one of the telescopic tubes to hold the seat in any of an infinite number of swivel positions.

The nature of a preferred embodiment of a seat for accomplishing these and other objects may be understood best from a study of the following specification when taken in conjunction with the attached drawings wherein,

FIG. 1 is a perspective drawing showing the inventive seat;

FIGS. 2A and 2B schematically shows how the seat of FIG. 1 swivels in a horizontal direction to any desired position;

FIGS. 3A and 3B schematically shows how the seat of FIG. 1 may be raised or lowered to a selected discrete vertical position;

FIG. 4 is a side elevational view of the inventive pedestal showing three handle positions for locking the seat, adjusting its horizontal swivel position, and adjusting its vertical position, respectively;

FIG. 5 is a front elevation view of the pedestal looking in direction 5—5 of FIG. 4;

FIG. 6 is an exploded view of the pedestal of FIGS. 4 and 5;

FIG. 7 is a side view of the locking device showing the toggle mechanism in phantom;

FIG. 8 is a plan view of the locking device looking upwardly in direction 8—8 of FIG. 7; and

FIGS. 9A, 9B and 9C includes three stop motion views which schematically represent the operation of the locking device.

The seat of FIG. 1 comprises seat 20, back 21, arms 22, 23, and pedestal 24. The seat, back, and arms are of substantially conventional construction. The pedestal 24 includes a double telescoping tube 26, having spaced parallel upper and lower plates 27, 28 attached thereto. The bottom of the seat is secured to upper plate 27 and the lower plate 28 rests on and, preferably, is secured to the floor. A unitary double acting locking device 29, attached to an outside telescoping tube member 32 (FIG. 4), controls both the height and swivel position of the seat. The double telescoping tube also includes an intermediate tube 34 and an inner tube 33 which are free to rotate with respect to each other, unless they are locked together by the device 29.

When handle 31 of locking device 29 is lifted to position P1, it acts in one way to release a frictional bite on the inner one of the telescoping tubes 33 is released so that the intermediate tube 34 may rotate freely about it. The seat may then be horizontally swiveled left (FIG. 2A) or right (FIG. 2B). When the seat is in a comfortable horizontal position, the handle 31 is lowered to position P2 to frictionally bite the inner one of the double telescoping tubes 33. If the bite is too tight or loosens, it may be adjusted by rotating handle 31 in the directions A or B, respectively.

When the end of handle 31 is fully lifted to position P3, it acts in another way and the seat may raise (FIG. 3B) or lower (FIG. 3A) to any one of several discrete positions determined by a selection of one of several vertically displaced keeper holes. The driver simply moves bat handle 31 to position P3, lifts or lowers his body weight, and the spring-loaded seat 20 follows his body movement. Then, the handle 31 is released to position P2, and a bolt in the lock 19 snaps into the first discrete keeper hole passing before it as the driver thereafter lowers or raises his weight.

FIGS. 4 and 5 show the inventive pedestal, per se, in side and front views, and FIG. 6 shows the same pedestal in exploded view. In greater detail, the principal parts of the pedestal are a double telescoping tube comprising an outer tube 32, an inner tube 33, and an intermediate tube 34. The outer tube 32 is perpendicularly welded to depend from plate 27 which is attached to the bottom of the seat at holes H1.

The intermediate tube 34 is slidingly received inside the outer tube 32. A plurality of vertically aligned, incrementally spaced keeper holes 35 are formed in the tube 34. Circumferentially spaced away from keeper holes 35 is a capture slot 40 which extends over the full traverse provided for restricting the excursions of the seat in its allowed vertical adjustment. The keeper holes 35 are aligned with the locking device 29. The capture slot 40 is aligned with a bolt 41 threaded through a nut (not shown) welded to the outside of the tube 32.

The inner tube 33 is perpendicularly welded to the base plate 28 used to attach the seat (at holes H2) to a floor or other supporting structure. The outside diameter of inner tube 33 slides freely inside the inside diameter of the intermediate pipe 34.

It should now be apparent that the plate 27 (and therefore the seat attached to it) is free to swivel horizontally with respect to the base plate 28. The height of the seat is fixed by the extension of the double telescoping tubes 32-34. That extension is, in turn, fixed by the one of the keeper holes 35 which is selected to receive a bolt of the locking device 29.

A spring retainer 43 is welded inside the intermediate tube 34. A spring 44 is compressed inside intermediate tube 34 between plate 27 and the spring retainer 43. Therefore, if the bolt of lock 29 is withdrawn from a keeper hole 35, the person sitting on the seat may raise or lower himself in the seat, and the compression of spring 44 will automatically adjust the seat height accordingly. When the bolt of device 29 is returned to normal, it snaps into the first keeper hole 35 passing before it.

The nature of the locking device 29 should be apparent from a study of FIGS. 7-9. More particularly, an elongated U-shaped channel support member 50 is welded perpendicularly to the outside periphery of the outer telescoping tube 32. Also welded to the outside periphery of pipe 32 is a cylindrical guide 51 having an axial bore for slidingly receiving a bolt 52, used to lock the vertical length of the telescoping tubes.

As seen in FIGS. 7 and 8, a bat handle 31 is connected to a two-arm toggle linkage mechanism 54. One arm of the toggle linkage includes a pair of spaced parallel plates 55, 56 pivotally connected at 57, 58 to the bolt 52. The other arm of the toggle linkage includes a threaded shaft 60 journaled at one end in a block 61 which is pivotally connected at 62, 63 to the other end of the spaced parallel plates 55, 56. The other end of the shaft 60 is rigidly secured to the bat handle 31 (which is preferably molded thereon). A threaded nut 65 is pivotally secured to the guide 50 at 66, 67. The threads are such that nut 65 and shaft 60 cooperate as a nut and a bolt. Thus, when bat handle 31 is rotated in directions A, B, bolt 52 slides back and forth in directions C, D, respectively.

A coiled bias spring 70 wraps around pivot point 66 and fits between the channel support member 50 and the bat handle 31, to bias it downwardly toward posi-

tion P2 (FIG. 4). This downward bias urges device 29 to a locking position and prevents the toggle from inadvertently releasing.

The operation of the toggle linkage in FIGS. 7 and 8 should now be clear. As the handle 31 is rotated, the shaft 60 moves longitudinally in the nut 65 and the bolt 52 slides through the axial bore of the guide 51. Thus, as seen in FIG. 7, by turning handle 31 in direction B, the bolt 52 may be pressed in direction D to bite against inner tube 33 for frictionally engaging it and locking the seat in its swivel position. If the handle 31 is turned in the opposite direction A, the threaded shaft 60 moves in the other direction in nut 65. This pulls the bolt 52 in direction C away from the bite engagement with the inner tube 33 to allow it to rotate freely inside intermediate tube 34. The bolt 52 may still project far enough through a keeper hole 35 to retain the vertical height adjustment of the seat. In this manner, the bolt position may be selected and occasionally readjusted thereafter.

As shown by FIG. 9, the locking device 29 has a threestep mode of operation. In a normal position (FIG. 9A), bolt 52 has captured both the intermediate tube 34 by passing through a selected keeper hole 35 and the inner tube 33 by frictionally engaging the wall periphery of the inner tube 33. The two toggle arms 56, 60 are in an over center obtuse angle 72 position so that bolt 52 exerts a clamping pressure upon tube 33 applied by the toggle linkage responsive to the leverage of the handle 31.

To swivel the seat to any of an infinite number of positions (FIG. 2), bat handle 31 is raised to a first step position P1 which is slightly more than the obtuse angle 72 and over center with respect to FIG. 9A. This handle motion slides the bolt 52 away from contact with the wall of tube 33 without disengaging the wall surrounding the keeper hole 35. In this position, the seat may swivel (FIG. 2), but it may not be changed in vertical height. The handle 31 may be rotated (as required from time to time) to adjust the longitudinal length position of bolt 52 to a point where the toggle passes over center from the locking obtuse angle 72 of FIG. 9A to the unlocking at slightly less than the obtuse angle 72 of FIG. 9B. Once adjusted, there is normally no need to readjust the rotary position of handle 31.

If the handle 31 is lifted further (P3) to an angle 73 which is much smaller than the angle 72, bolt 52 slides out of engagement with keeper hole 35 (FIG. 9C). The seat is now free to rotate (FIG. 2) or to raise or lower (FIG. 3) over the excursion permitted by bolt 41 riding in the capture slot 40. The occupant raises or lowers himself to his desired sitting height. Then, he returns the handle 31 toward the normal position P2. The bolt 52 thereafter slides through the first keeper hole 35 passing before it under the influence of compression spring 44, as the occupant shifts his weight. The occupant also swivels the seat to a desired position. As the handle 31 is pushed downwardly to position P2, the toggle linkage moves over center to a locked position (FIG. 9A) where all parts are clamped in position.

While the pedestal is described above in connection with a seat for an automotive vehicle, it may have many uses. For example, it might also be used to support a table or the like.

It should now be apparent that the invention may find use in many different environments. Therefore, the appended claims should be construed to cover all equiva-

lent structures falling within the spirit and the scope of the invention.

I claim:

1. A pedestal comprising a double telescoping vertical tube including at least a rotary-free tube, a unitary double acting locking means secured to an outer one of said telescoping tubes, means in an intermediate one of said tubes for receiving said locking means to fix the telescoping length and therefore the vertical height of said pedestal, and means associated with said locking means acting in one way for selectively releasing or restraining the rotation of said tubes with respect to each other so that they may or may not rotate with respect to each other depending upon the operated condition of said locking means and associated with said locking means acting in another way for releasing said tubes so that they may telescope.

2. The pedestal of claim 1 wherein said locking means comprises a toggle leverage device.

3. The pedestal of claim 2 wherein said keeper means comprises an aligned series of longitudinally displaced holes in the intermediate tube, and a capture slot in at least one of said tubes for restricting the telescopic excursion of said tubes to fix the allowable height excursions of said pedestal, said toggle cooperating with said holes and slot.

4. The pedestal of claim 1 and compression means inside said telescoping tube for urging said telescoping tubes to a fully extended position.

5. A pedestal for a seat comprising a double telescoping vertical tube including at least a rotary-free tube, locking means secured to an outer one of said telescoping tubes, keeper means in an intermediate one of said tubes for receiving said locking means to fix the telescoping length and therefore the vertical height of said pedestal, said locking means comprising a two-arm toggle linkage movable between three positions, means responsive to movement of said toggle linkage to one position for selectively restraining both the rotation and telescoping of said tubes, means responsive to movement of said toggle linkage to a second position for restraining the telescoping while enabling the rotation of said tubes, and means responsive to movement of said toggle linkage to a third position for enabling both said rotation and telescoping of said tubes.

6. The pedestal of claim 5 wherein said locking means comprises sliding bolt controlled in its longitudinal extension position by said toggle linkage, said sliding bolt being positioned to slide through said keeper holes and bite against an inner tube, and means for adjusting the horizontal extremity of said bolt position.

7. An automotive seat pedestal comprising upper and lower plates separated by a double telescoping tube means, bat handle controlled toggle linkage lock means attached to an outer one of said telescoping tubes and engaging any one of several discrete longitudinally displaced keeper means formed in an intermediate one of the telescoping tubes, and means responsive to a turning of the bat handle on the toggle lock for adjusting a frictional bite on a second one of the telescopic tubes for holding the seat in any of an infinite number of swivel positions.

8. The seat of claim 7 wherein said locking toggle linkage comprises two arms which are movable between three positions, means responsive to movement of said toggle linkage into one position for selectively restraining both the swivel and height positions of said seat, means responsive to movement of said toggle linkage into a second position for retaining said height position while enabling alteration of said swivel position, and means responsive to movement of said toggle linkage into a third position for enabling a change in both said swivel and height position.

9. The seat of claim 8 and compression means inside said telescoping tube for urging said telescoping tubes to a fully extended position.

10. The seat of claim 9 wherein said keeper means comprises an aligned series of longitudinally displaced holes in the intermediate tube, and a capture slot in at least one of said tubes for restricting the telescoping of said tubes to fix the allowable extremities of height adjustments of said seat.

11. The seat of claim 10 wherein said locking means further comprises a sliding bolt controlled in horizontal position by said toggle linkage, said sliding bolt being positioned to slide through a selected one of said keeper holes and frictionally bite against an inner one of said tubes, and means for incrementally adjusting the horizontal extremity of said bolt position.

* * * * *

50

55

60

65