United States Patent

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[73] Assignee **American Seating Company**
Grand Rapids, Mich.

[54] **STUDY UNIT**
6 Claims, 16 Drawing Figs.

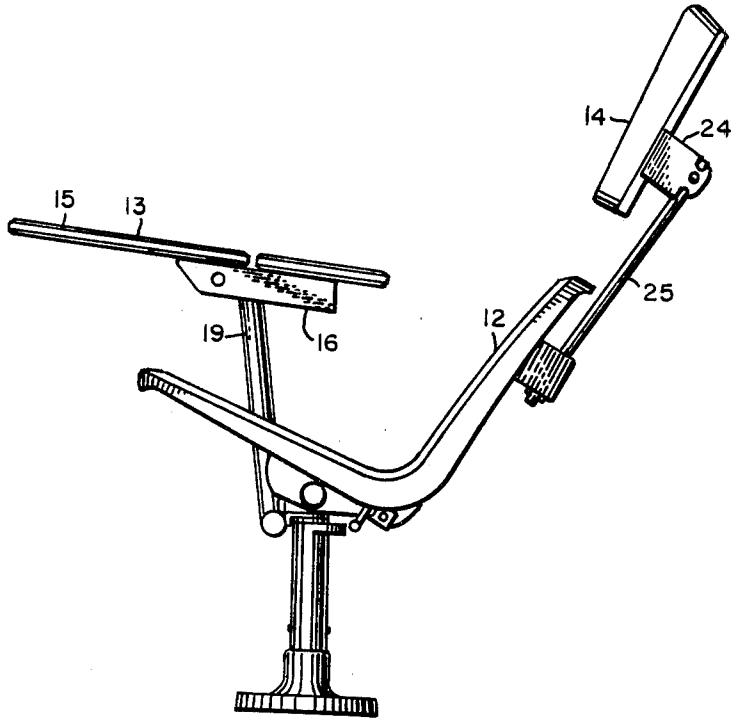
[52] **U.S. Cl.** **297/349,** 297/403, 297/410
[51] **Int. Cl.** **A47c 1/02,** A47c 1/10
[50] **Field of Search** ..... 297/61, 160—162, 170, 172, 167, 169, 326, 349, 391, 397, 403, 408, 410

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Primary Examiner—Bobby R. Gay
Assistant Examiner—James C. Mitchell
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ABSTRACT: A planetarium chair convertible to a lecture room chair which includes a chair having a back and seat mounted on a pedestal wherein the chair can both swivel and tilt, the chair being equipped with a headrest with means interconnecting the chair back and headrest for moving the headrest from a head-supporting position to a stowed position.



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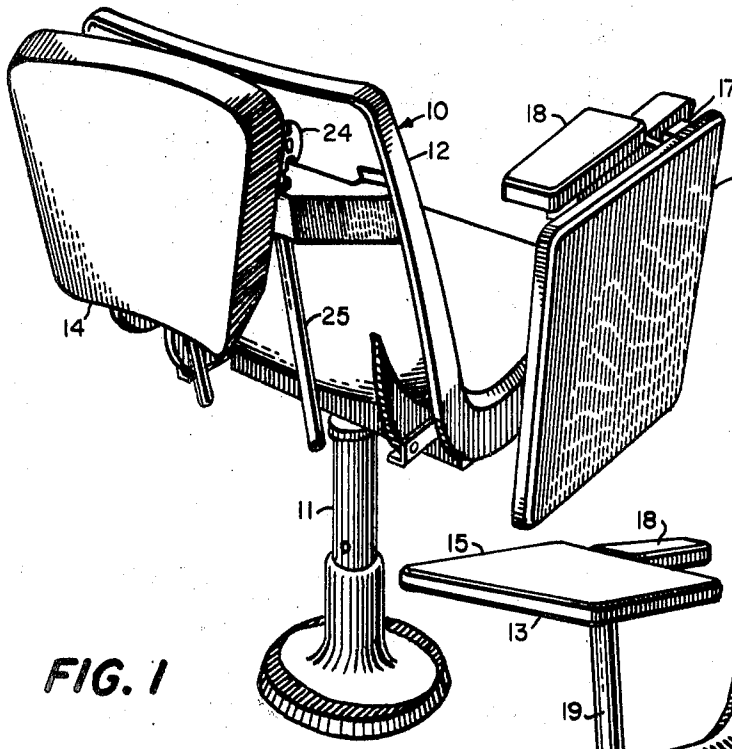


FIG. 1

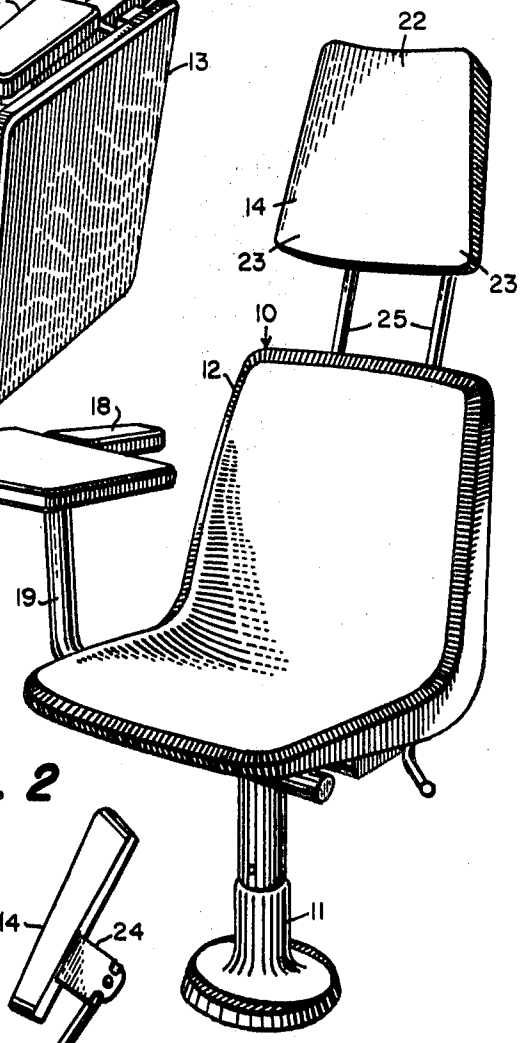


FIG. 2

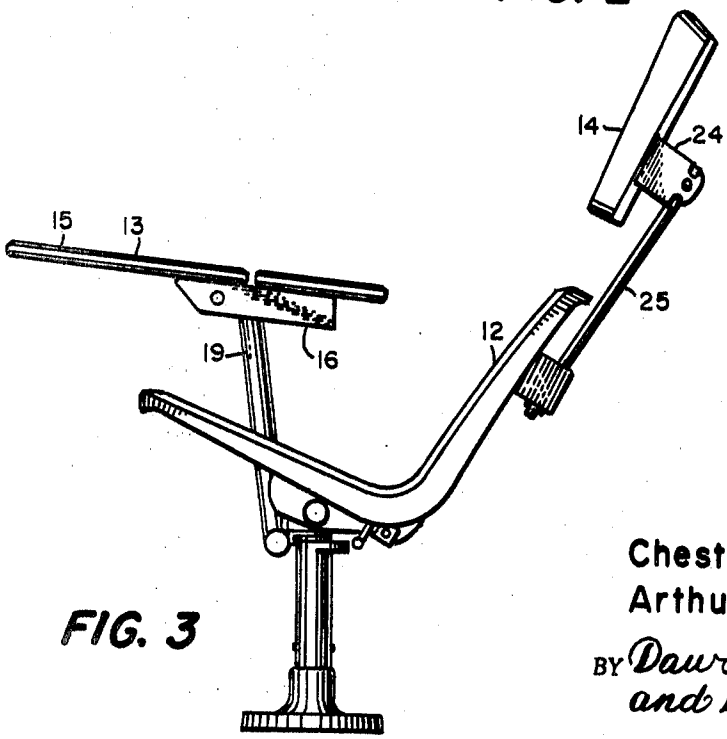


FIG. 3

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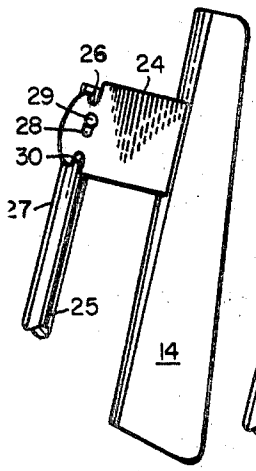


FIG. 4

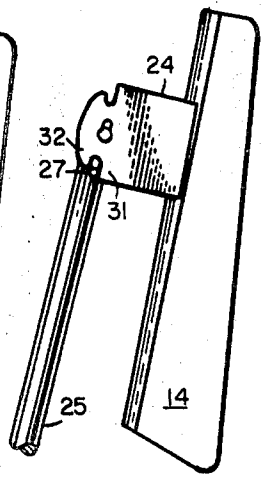


FIG. 5

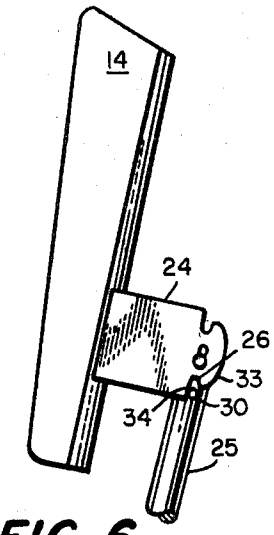


FIG. 6

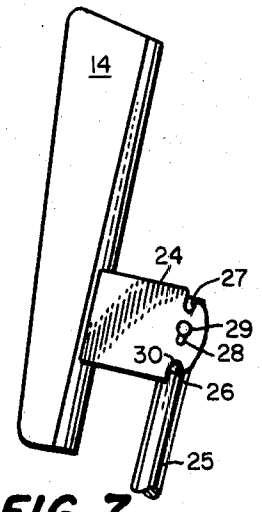


FIG. 7

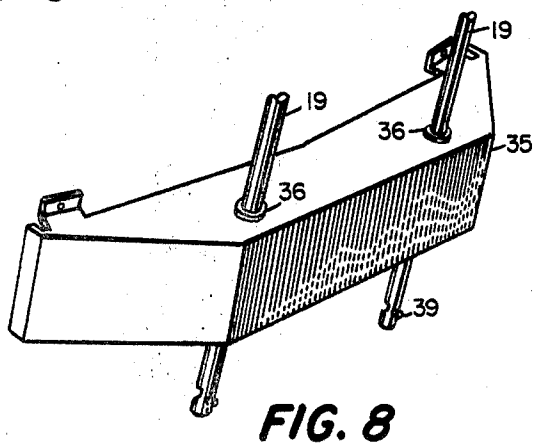


FIG. 8

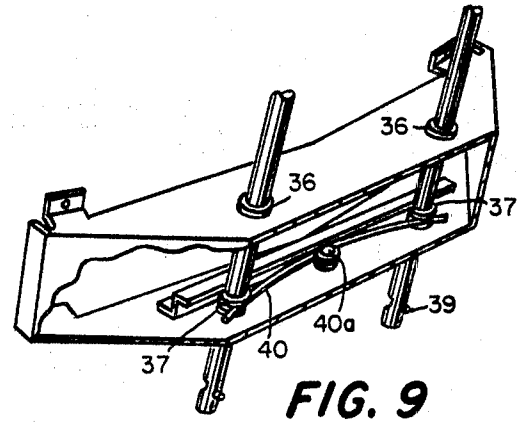


FIG. 9

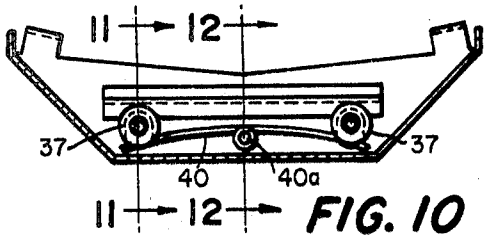


FIG. 10

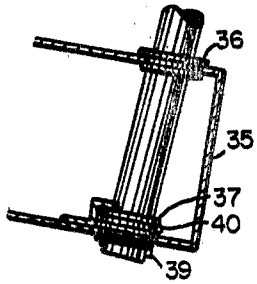


FIG. 11

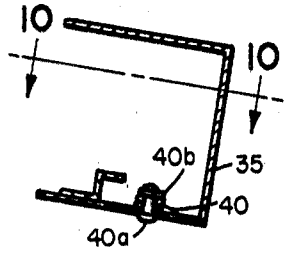


FIG. 12

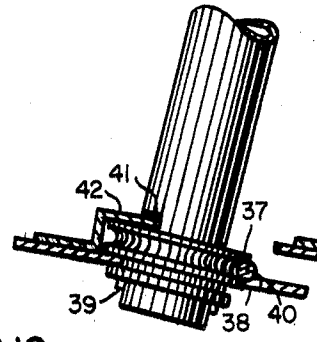


FIG. 13

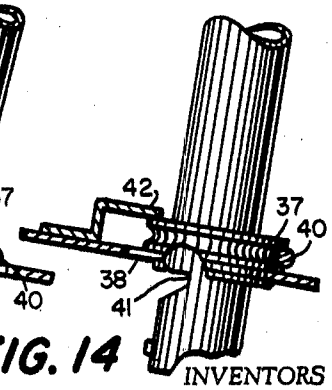


FIG. 14

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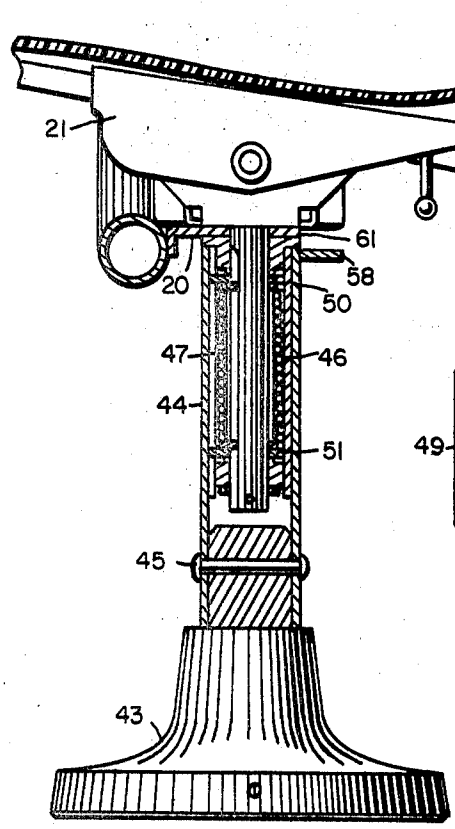


FIG. 15

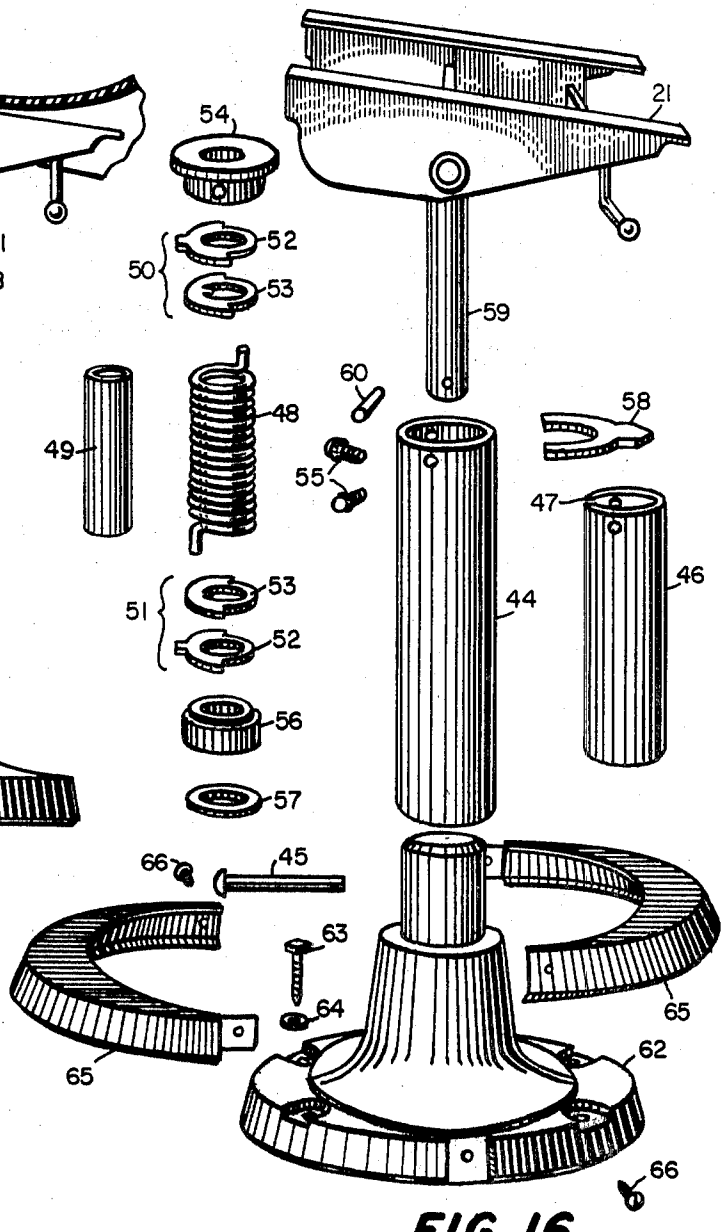


FIG. 16

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STUDY UNIT

BACKGROUND AND SUMMARY OF INVENTION

In contemporary education, it has become increasingly prevalent to study the heavens, as by a planetarium in a domed lecture hall. Heretofore, there has not been available a comfortable study unit for this purpose, and the instant invention provides such in the form of a tiltable, swiveling chair equipped with a headrest.

In view of the short supply of schoolrooms, it is also necessary from time to time to utilize planetariums for a lecture hall, and the instant invention makes possible the ready conversion of the study unit to a chair suitable for taking lecture notes, being equipped with a headrest readily stowed. Also, the invention provides a chair which has an automatic centering feature so that swiveling of the chair does not result in helter-skelter arrangement of the chairs. Further, the study unit is equipped with an armrest facilitating note-taking both during the condition of the chair as a lecture hall unit and while being used for planetarium studies.

The invention is described in conjunction with the accompanying drawings, in which:

FIG. 1 is a rear perspective view of the chair with the tablet arm and headrest in folded position;

FIG. 2 is a front perspective view of the chair with the headrest and tablet arm in the position to be used in the initial stages of study in a planetarium;

FIG. 3 is a side view of the chair tilted back at a 20° angle, the tablet arm being fixed to the pedestal so as not to be tiltable;

FIGS. 4—7 are fragmentary side elevational views of the headrest portion showing the positions gone through in changing the headrest from the stowed position to the head-supporting position;

FIG. 8 is a fragmentary perspective view of the support assembly on the chair back for supporting the headrest;

FIG. 9 is a view similar to FIG. 8, but partially cut away to show the interior thereof;

FIG. 10 is a horizontal sectional view taken on the line 10–10 of FIG. 12, showing the mechanism provided in the interior of the support assembly of FIGS. 8 and 9;

FIG. 11 is a vertical sectional view taken on line 11–11 of FIG. 10;

FIG. 12 is a sectional view taken along the line 12–12 of FIG. 10;

FIG. 13 is a fragmentary view of the lower end of a tube element provided as part of the headrest assembly;

FIG. 14 is a view similar to FIG. 13, but showing the parts thereof in a different operational condition;

FIG. 15 is a fragmentary sectional view of the chair and pedestal; and

FIG. 16 is an exploded view of the portions seen in FIG. 15.

In the illustration given, and with reference to FIG. 1, the planetarium chair 10 is seen to include a pedestal 11, a swiveling and tilting chair seat 12. The pedestal 11 is equipped with a tablet arm 13 which is fixed thereto, and therefore independent of the tilting of the chair seat 12. The numeral 14 designates the headrest. The tablet arm 13 is of the folding type that is stored on the side of the chair. FIG. 3 illustrates that the tablet arm does not tilt when the chair tilts back, as at 20° as shown. However, the tablet arm does swivel with the chair through the angle provided. In the illustration given, the chair is enabled to swivel 300°.

The tablet arm panel 15 (see particularly FIGS. 2 and 3) is attached to the support channel 16 by means of a pivot hinge 17. Also included is a relatively short armrest piece 18. The support channel 16 is attached to the top end of tube 19 which, in turn, is attached to the chair pedestal top 20 below the tilting mechanism 21 (see FIG. 15). This permits the tablet arm to swivel with the chair, but prevents it from tilting with the chair seat.

The headrest 14 is large enough to support the head of the occupant of the chair as well as the occupant's shoulders. In the illustration given, the head of the occupant is supported in the region 22, while the lower corners 23 provide support for the occupant's shoulders. Thus, when the chair is tilted back for planetarium usage, the headrest gives a comfortable support, getting support for the occupant's head and upper back. This headrest has two pivot and locking brackets 24 (see FIGS. 4—7). The brackets 24 project rearwardly from the headrest, and are pivotally connected to tubes 25, one for each of the brackets. Each pivot and locking bracket 24 is equipped with a pair of recesses as at 26 and 27. When the headrest is in the stored position as in FIG. 4, the recess 26 faces upwardly, while recess 27 faces downwardly. On the other hand, when the headrest is in the head-supporting or operational position, the reverse is true, i.e., the recess 27 faces upwardly while the recess 26 faces downwardly (see FIG. 7). Between the recesses, each bracket 24 is equipped with a short transversely elongated slot 28 through which a shoulder rivet 29 extends to secure each bracket 24 (hence the headrest 14) to its associated tube 25. There is provided a latching pin 30 projecting from the side of the tube 25 below the rivet 29. When the headrest is in the stored position (see FIG. 4), it is supported by the rivets 29 which extend through the slots 28, serving as a pivot point or fulcrum, and is prevented from swinging to and fro by the pin 30 being latched or seated deeply within the recess 27.

To move the headrest to the operational or head-supporting position, it is raised, i.e., moved vertically, to the condition seen in FIG. 5, whereby the rivet 29 is positioned in the bottommost portion of the slot 28. Simultaneously, the recess 27 is disengaged from the pin 30. However, a shoulder 31, which partially defines the recess 27, prevents the headrest from swinging toward the tubes 25 (and hence the chair itself). The headrest can only be swung counterclockwise to the position seen in FIG. 6. Simultaneously with this, the bracket is so moved as to position the rivet 29 at the other end of the slot 28, but still having the slot providing a void portion above the rivet 29. This is achieved because the other recess-defining side of the bracket 24, i.e., the portion 32 in FIG. 5, is rounded and foreshortened so that the pin 30 is cleared by the bracket portion 32. As the headrest 14 is swung into position for use (approximated in FIG. 6), the other rounded end 33 of the bracket 24 swings past the pin 30, but the shoulder 34 strikes the pin and stops the swinging action of the headrest.

Finally, the headrest 14 is lowered into a locked position (see FIG. 7) where the pin 30 is nestled deeply within the recess of the bracket 24, preventing a rearward movement of the headrest.

The headrest is moved vertically, i.e., raised or lowered, by means of the tubes 25 sliding inside of a boxlike support frame 35 (illustrated in FIGS. 8—14). Each tube 25 slides inside of an upper bushing 36 and a lower bushing 37. The upper bushing fits into a round hole (see the upper portion of FIG. 8), while the lower bushing fits into a slot 38 (see FIGS. 13 and 14), permitting the bushing to slide forwardly and rearwardly so as to lock or unlock the tubes. A pin 39 near the lower end of each tube prevents the tube from pulling out of and free of the support assembly 35.

When the headrest is raised all the way up (fully extended, as seen in FIGS. 11 and 13), a spring 40 pushes against the lower bushing 37 to force the tube 25 forwardly whereby a notch 41 in the lower part of the tube 25 is forced into latching engagement with a flange 42 attached to the bottom of the support frame 35 (see FIG. 13). To lower the headrest, the arrangement seen in FIG. 4 is used as the starting configuration, with the headrest 14 being pulled forwardly. This results in the lower extremities of the tubes being forced backward to the condition seen in FIG. 14, with the bushing 37 sliding rearwardly in the slot 38. This disengages the notch 41 from the flange 42, permitting the tubes to slide downwardly, aided by gravity, until the pivot locking bracket 24 rests on top of the frame (as in FIG. 1).

The latched condition of the tubes 25 so as to maintain the headrest 14 in extended or projected condition (conforming

to the showing in FIG. 13) is achieved through the use of a biasing spring 40 attached to the bottom of the support frame by means of a rivet 40*a* and a washer 40*b* (compare FIGS. 9--12).

The chair pedestal as seen in FIGS. 15 and 16 consists of a cast iron base attached to the floor in a conventional fashion (as by bolts or wood screws, not shown). The pedestal includes a tubular column 44 which is attached to the base 43 by means of a rivet 45. Positioned within the column 44 is an inner tube 46 having a slotted opening 47. Housed within the inner tube 46 is a resilient spring element 48, and interiorly of that is a fiber sleeve 49. Positioned around the axially projecting extensions of the spring element 48 is an upper set of washers 50 and a lower set of washers 51, each with a spring index washer 52 and a spring return washer 53. The arrangement in the lower set 51 of the index and spring washers 52 and 53 is reversed relative to upper set 50, so as to control the swiveling and return in the opposite direction. An upper bushing 54 is made secure within the tube 46 and the column 44 by means of two sems screws (external tooth washer attached to the screw) 55, a lower bushing 56, a flat washer 57, and a swivel stop 58. The tilting mechanism has a slotted post 59 hanging from it, with a hole to receive a pin 60 which keeps the bushings, washers, and spring as a single unit. The swiveling mechanism 61 rests on top of the pedestal between the swivel stop 58 and the tilting mechanism 21.

The chair base 43 consists of a cast iron piece 62 attached to the floor with four screws 63 and washers 64. This method of attachment is concealed by covering the outer portions of the base with two identical stainless steel shields 65 which are held in place by two screws 66. The shields not only hide the screw heads, but they protect the occupant's shoes from being snagged by the screw heads. Further, the shields make the cleaning of the room easier and enhance the aesthetics of the chair.

In operation, the planetarium chair can be both swiveled and tilted. When swiveled, there is an automatic return to a centered position by virtue of the coaction of the spring element 48 and the washer units 50 and 51. This results in alignment of the chairs as desired for classroom usage. The tilting accommodates the use of the unit as a planetarium chair, and this is significantly enhanced through the provision of the erectable headrest. When the headrest is not needed, it is merely folded from the FIG. 6 toward the FIG. 5 position, and the headrest falls practically by its own weight into the stowed position of FIG. 4.

We claim:

1. A headrest equipped seating unit comprising a chair having a back portion, a support frame on said back portion, a pair of relatively elongated tubes slidably supported in said support frame and adapted to project above said chair portion, a headrest equipped with a pair of brackets extending therefrom, said brackets being pivotally interconnected to said tubes, first latch means interposed between said brackets and tubes for fixing said headrest in head-supporting and stowed positions, and second latch means interposed between said support frame and post for maintaining said tubes in projected condition.

2. The unit of claim 1 in which each of said brackets is equipped with slots, said tubes being equipped with pins received in said slots to provide the pivotal interconnection therebetween, each tube being equipped with a latch pin for engagement with recesses on said brackets to constitute said first latch means.

3. The unit of claim 1 in which said second latch means comprises a notch in each of said tubes, latching elements on said frame for engagement with said notches, said support frame being equipped with elongated openings for receiving said tubes whereby said tubes are movable to disengage said latching element from said notches, spring means urging said tubes into latch element contact.

4. The unit of claim 3 in which said support frame is equipped with a pair of bushings slidably mounted in said elongated openings and ensleeved about said tubes.

5. A headrest equipped seating unit, comprising a chair having a back portion, a support frame on said back portion, a post slidably carried by said support frame, a headrest equipped with a bracket extending therefrom, said bracket being pivotally interconnected to said post for movement to a head-supporting position and to a stowed position, and latch means on said bracket, post and support frame for fixing said headrest in head-supporting and stowed positions.

6. The structure of claim 5 in which said chair is provided with a base on which it is rotatably mounted and with spring means for rotating the chair to a predetermined position.