

[54] **MOVABLE AUDIENCE CHAIR**

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[58] **Field of Search** 297/334, 331; 248/371, 248/377, 376, 398

[56] **References Cited**

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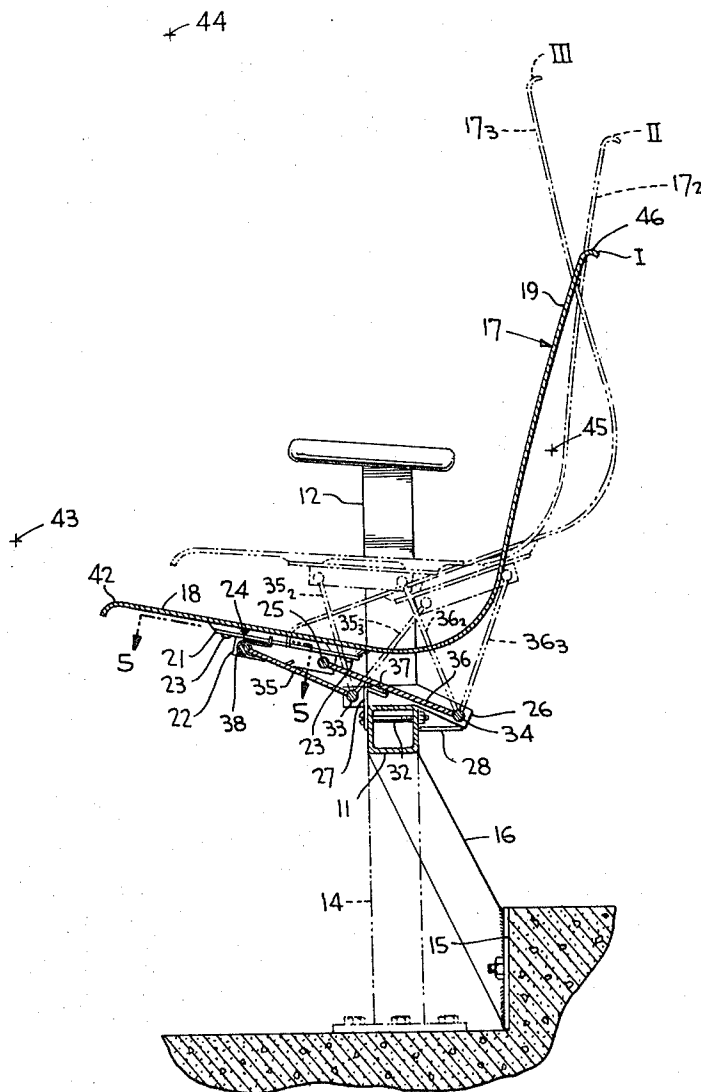
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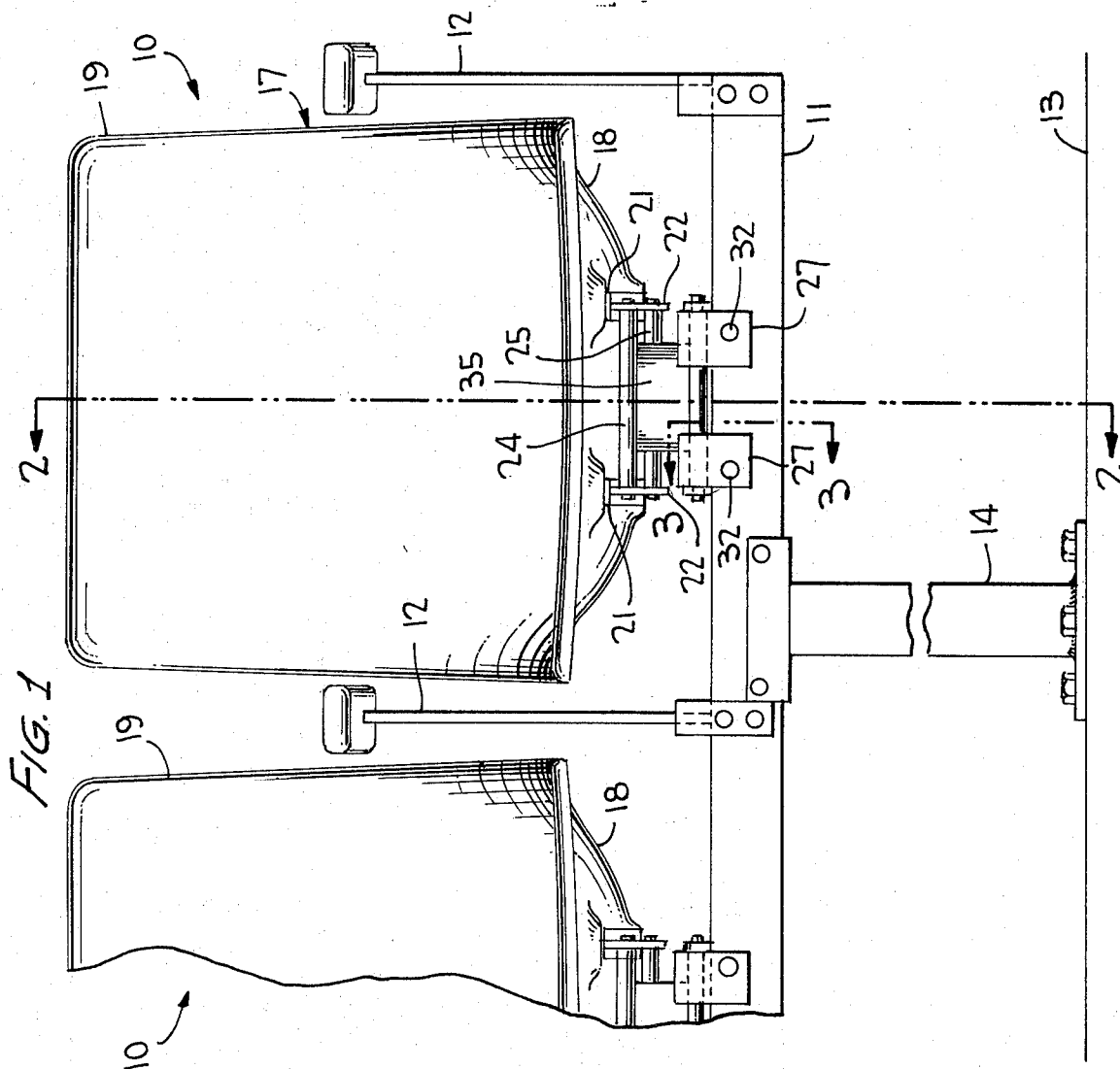
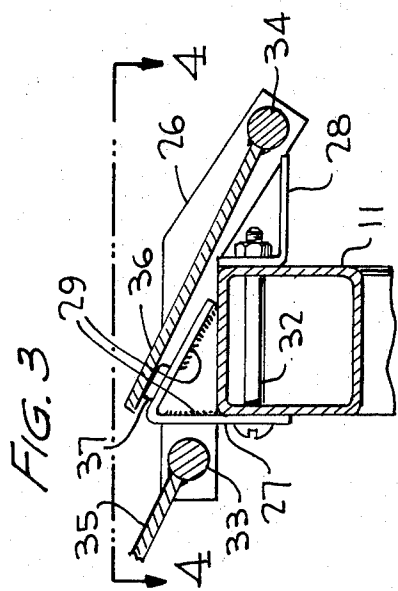
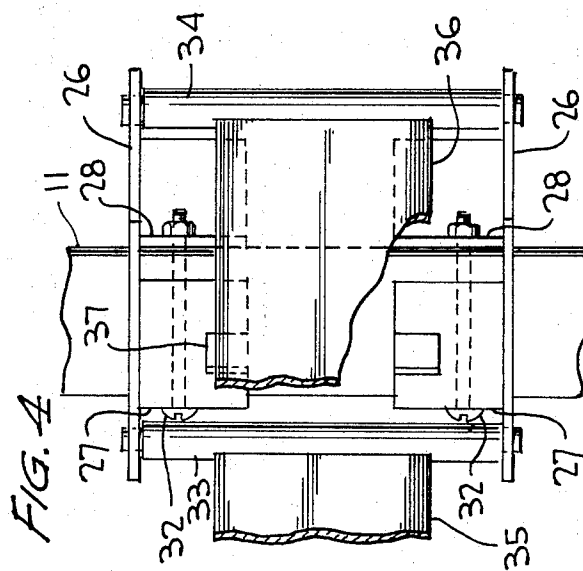
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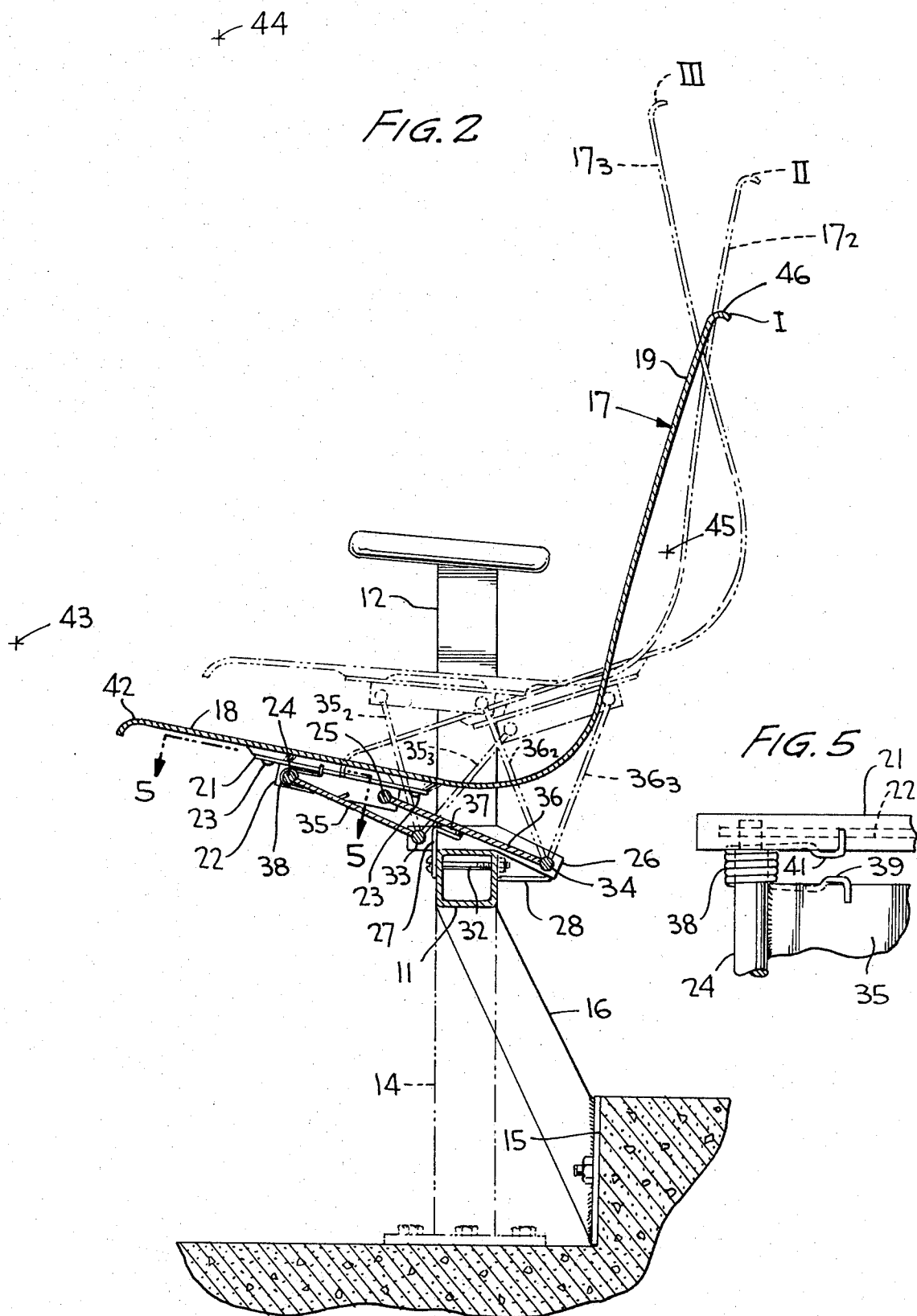
[57] **ABSTRACT**

An audience chair is movable between a seating position and a push-back position by means of link members interconnecting the seat bottom with a seat support. The link members are spaced, inclined forwardly and slightly inclined toward one another thereby permitting the chair to be moved initially upwardly and slightly rearwardly about the pivotal connections of the link members whereupon the seat bottom remains in a substantially horizontal position. The chair may continue to be moved rearwardly about such pivotal connections whereupon the seat bottom is placed in a downwardly inclined position.

3 Claims, 7 Drawing Figures







MOVABLE AUDIENCE CHAIR

This invention relates generally to a movable audience or stadium chair, and more particularly to such a chair made movable by means of inclined link members.

Audience chairs are normally movable in some manner into a pushed-back position to facilitate the passage of a person in front of the seat occupant. The seat bottom is either movable between a horizontal and upright position, or both the seat bottom and seat back are movable or collapsible in some manner. However, such movable seats oftentimes interfere with either the seat occupant or the person seated behind him, or the structural arrangement thereof is too cumbersome and costly to warrant its widespread use.

An object of the present invention is therefore to provide an audience chair of simple design requiring a minimum number of moving parts while at the same time permitting the seat to be easily and effectively moved both partially and fully into a pushed-back position without interfering with either the seat occupant or the person seated behind him.

A further object of this invention is to provide such a chair arrangement wherein link members are used to guide the chair between a seating position and a push-back position, the link members being spaced apart, inclined forwardly and inclined slightly toward one another so that the chair may be moved slightly rearwardly and upwardly about the pivotal connections of the link members, the chair being capable of further movement in a rearward direction whereupon the seat bottom is placed in a downwardly inclined position.

A further object of the present invention is to provide such an audience chair which is supported by means of a link member resting against a bracket forming a part of the seat support.

A still further object of the present invention is to provide such an audience chair which is supported directly on a hollow rigid box element secured to a link member and movable therewith, the seat bottom resting directly on such box element.

A still further object is to provide such an audience chair wherein spring means are provided for urging the link members and seat bottom away from one another thereby resulting in a self-rising chair.

Other objects, advantages and novel features of the invention will become apparent from the following detailed description of the invention when taken in conjunction with the accompanying drawings wherein:

FIG. 1 is an elevational view showing a portion of a row of seats of the type according to the present invention;

FIG. 2 is a vertical sectional view taken along line 2—2 of FIG. 1 showing the details of the chair arrangement and the movement between its seating position and its pushed-back position;

FIG. 3 is a detail sectional view taken along the line 3—3 of FIG. 1;

FIG. 4 is a plan view of the section viewed along line 4—4 of FIG. 3;

FIG. 5 is a detail view taken along the line 5—5 of FIG. 2;

FIG. 6 is a side elevational view of a chair arrangement in accordance with another embodiment of the present invention; and

FIG. 7 is a partial front elevational view taken along line 7—7 of FIG. 6.

Turning now to the drawings wherein like reference characters refer to like and corresponding parts throughout the several views, a chair arrangement generally designated 10 is shown in FIG. 1 in accordance with one embodiment of the invention, a plurality of such chairs being mounted in place along a row on an elongated box beam 11. Arm rests 12 are also securely mounted along the length of the box beam on opposite sides of each chair. Beam 11 is conveniently mounted on a floor 13 of the stadium by means of a support post 14, or is otherwise mounted on a riser 15 of the stadium floor by means of an inclined post 16 as in FIG. 6.

Chair assembly 10 generally comprises a seat 17, of molded or stamped non-metallic or metallic construction or the like, having an integral seat bottom 18 and seat back 19. A bracket 21 having a depending side plate 22 is secured to the underside of the seat bottom as by rivets 23. As can be seen in FIG. 1, a pair of such brackets is provided between which upper rods 24 and 25 extend, the opposite ends of which are rotatably secured within suitable openings in side plates 22.

A pair of upstanding side plates 26 are mounted spaced apart on box beam 11 by means of brackets 27 and 28 (see FIGS. 3 and 4). Bracket 27 is welded or otherwise secured as at 29 to the inner side surface of respective plates 26, and brackets 28 are welded or otherwise secured to the lower edge of the respective side plates. An elongated fastener 32 extending through suitably provided openings in brackets 27, 28 and beam 11 serves to secure each side plate 26 to the box beam.

Lower rods 33 and 34 respectively extend between side plates 26, their respective opposite ends projecting into suitably provided openings in the spaced side plates as seen in FIG. 4.

A link member in the form of a plate 35 is welded or otherwise secured at its opposite ends to rods 24 and 33. Likewise, a link element in the form of a plate 36 is welded or otherwise secured at its opposite ends to rods 25 and 34. The chair of this embodiment is so arranged that seat 17 is supported on box beam 11 by means of link member 36 resting against a resilient bumper pad 37 mounted on the top surface of each bracket member 27 as shown in FIG. 4.

As an optional feature, a spring means in the form of springs 38 may be disposed about rod 24 near its opposite ends in the manner as shown in FIG. 5. Spring leg 39 thereof is engaged with plate link member 35, and spring leg 41 is engaged with bracket 21. Link member 35 is therefore urged away from seat bottom 18 thereby rendering seat 17 self-rising to the extent that, when the seat occupant lifts himself off the seat bottom, the seat will rise under the action of springs 38 from its position of I to that of II (FIG. 2). At position II, seat bottom 18 remains in a substantially horizontal position although it is raised somewhat from its position I and its forward edge 42 is moved slightly rearwardly. Of course, without the use of springs 38, the seat occupant merely moves the seat rearwardly and slightly upwardly as he lifts off the seat to move it to its position II.

Rearward movement of the chair in the above-described manner takes place as the chair rotates counterclockwise about axes extending through rods 24, 25, 33 and 34. By reason of the particular disposition of link members 35 and 36, a point 43 is defined at the in-

tersection of those planes in which links 35 and 36 lie, and about which chair 17 pivots initially upon movement thereof. This forward or initial hinge point must be in front of the seat so as to render the seat stable for any vertical load placed on it. An intermediate hinge point 44 is similarly defined for position II of the chair at the intersection of the planes in which link members 35 and 36 lie. Further, a rear hinge point 45 is defined for position III of the chair at the point of intersection of those planes in which link members 35 and 36 lie for their rearwardmost position shown in phantom in FIG. 2. In the rear or raised position, hinge point 45 must be located in front of the center of gravity of the seat so that the raised seat will seek the lower position, i.e., so that it will fall toward the lower position I. Also, the forward or initial hinge point 43 must be well above the front edge or lip 42 of the seat so that the center of gravity of the seat will be caused to be raised by a small force causing rearward movement of the chair. Point 43 must also be well below the top 46 of seat back 19 so that a horizontal rearward force (or even a somewhat upward and mostly rearward force) at the top of the seat back when the chair is empty will not cause the chair to move. This is necessary because the seat back is sometimes pushed on by the occupant in the process of seating himself, and the chair is sometimes pulled on by the person behind the chair when in the process of sitting or rising. The forward or initial hinge point 43 must further be above the front lip 42 of the seat bottom so that, as the seat occupant stands up, lip 42 will be moved rearwardly and slightly upwardly to match the extended leg motion of such person.

As indicated above, the rear or raised hinge point 45 must be above the initial center of gravity so that the seat will move downwardly with ease and reach its original lower position I. It should be noted that the seat is shown in phantom outline in its positions II and III, and that the various elements of the chair in these two positions are identified by subscripts 2 and 3, respectively.

When the seat is raised, rearward movement thereof is simply limited by the forward link member 35 resting against brackets 27. And, when the seat is lowered, downward movement is simply limited as the rearward link member 36 contacts and rests against pads 37.

In accordance with another embodiment of the invention, a seat 17' is shown in FIG. 6 as having an interconnected seat bottom 18' and seat back 19'. The seat is substantially similar to the FIG. 2 embodiment although its structural arrangement for effecting the raising and lowering thereof is slightly different. For example, a pair of link members in the form of link arms 47 and 48 are pivotally secured to the underside of seat bottom 18' at one end thereof as by respective brackets 49, 51. The link arms are pivotally secured at their opposite ends in suitable openings provided in a side plate 52 similar to side plate 26 for the FIG. 2 embodiment except that it is of slightly thicker dimension as shown in FIG. 7. Two pair of link arms 47, 48 are provided in the above-described manner in spaced-apart relationship as shown in FIG. 7 wherein only the pair of forward link arms 47 can be seen. Also, each of the link arms is substantially C-shaped to facilitate mounting of the link arms in place as described. And, each pair of link arms 47, 48 are inclined forwardly and slightly toward one another in exactly the same manner as link members 35, 36 of the FIG. 2 embodiment. Therefore, an initial hinge point 43 and a rearward hinge point 45

are likewise defined in the same manner and for the same purpose as described for the earlier embodiment.

Bracket plates 53, 54 are welded or otherwise secured at the lower edge of respective side plates 52 to facilitate mounting thereof on box beam 11. Fastening means in form of an elongated bolt 32 extends through aligned openings in brackets 53, 54 and the box beam for mounting each of the side plates 52 in place.

In lieu of brackets 27 provided in the FIG. 2 embodiment which serve as a stop means for the chair in its lowermost position, a hollow and rigid box-like member 55 is provided which extends between and is welded or otherwise secured to the spaced pair of link arms 48. The box 55 rests against the top surface of box beam 11 in position I of the chair shown in FIG. 6, and the box serves as a support upon which seat bottom 18' rests. By reason of its interconnection with link arms 48, box 55 is moved therewith as the chair moves between its positions I and III respectively shown in FIG. 6 in solid outline and in phantom lines. Box 55 is therefore moved out of interference with any portion of seat 17' during such movement, although it conveniently serves as a stop element for the seat in its lowermost position.

From the foregoing, it can be seen that a simple yet highly effective arrangement has been devised for moving an audience chair from its seat occupant position to its pushed-back position. The seat in both embodiments may be made self-rising by means of coil springs although it may otherwise be slightly pushed back between positions I and II whereupon the seat bottom remains in a substantially horizontal position, and its forward lip is moved slightly rearwardly and is slightly elevated. Continued movement of the chair in a rearward direction pivots the chair about its link member pivot connections easily and effectively with few moving parts. Movement of adjacent chairs in a row may be so moved beside one another so that no spaces are opened and closed between the chairs during movement thereof which would only be hazardous to stray fingers or arms by causing pinching or entrapment thereof. The link members in both embodiments are so disposed as to define initial, intermediate and rearward hinge points for the chair to thereby effect a stabilized and a smooth movement of the chair. Location of initial hinge point 43 in front of the chair stabilizes it under vertical loads. Such point being above the front lip of the seat assures that, as the seat occupant stands up, the seat will be moved slightly upwardly and rearwardly to match his leg movement. The chair may be self-rising during such initial movement or it may be effected manually by a small force of the legs of the person causing rearward movement of the chair. And, since the forward hinge point is well below the top of the chair back, a horizontal rearward force of the top of the chair when it is empty will not cause the chair to move. The rear position hinge point, being in front of the center of gravity of the seat, permits the seat to seek the lower position I without complication.

Obviously, many modifications and variations of the invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. An audience chair arrangement movable between a seating position and a pushed-back position, compris-

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ing: a seat bottom interconnected with a seat back; chair support means supporting the chair; a pair of spaced link members pivotally connected at one end thereof to said seat bottom and pivotally connected at the other end thereof to said support means, said link members being inclined toward the forward edge of said seat bottom and being slightly inclined toward each other in the seating position of the chair, said link members lying in planes intersecting forwardly and slightly upwardly of said forward edge, one of said link members being disposed forwardly of the other thereof toward said forward edge, and the length of said one link member between its ends being shorter than the length of said other link member between its ends; and said support means including a bracket plate on which a first of said link members rests for horizontally supporting said seat bottom in the seating position of the chair; whereby the chair is movable upwardly and rearwardly about said link member pivotal connections from its seating position to an intermediate position during which said seat bottom remains horizontal, and whereby the chair is further movable rearwardly about said link member pivotal connections from its intermediate position to its pushed-back position, said seat bottom gradually moving downwardly at its forward end between the intermediate and pushed-back positions.

2. The audience chair according to claim 1 further comprising spring means disposed between a first of said link members and said seat bottom for urging said link members and said seat bottom apart thereby facilitating easier upward movement of the chair between its

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seating and intermediate positions.

3. An audience chair arrangement movable between a seating position and a pushed-back position, comprising: a seat bottom interconnected with a seat back; chair support means supporting the chair; a pair of spaced link members pivotally connected at one end thereof to said seat bottom and pivotally connected at the other end thereof to said support means, said link members being inclined toward the forward edge of said seat bottom and being slightly inclined toward each other in the seating position of the chair, said link members lying in planes intersecting forwardly and slightly upwardly of said forward edge, one of said link members being disposed forwardly of the other thereof toward said forward edge, and the length of said one link member between its ends being shorter than the length of said other link member between its ends; and said support means including a support element secured to said other link member and on which said seat bottom rests for horizontally supporting it in the seating position of the chair; whereby the chair is movable upwardly and rearwardly about said link member pivotal connections from its seating position to an intermediate position during which said seat bottom remains horizontal, and whereby the chair is further movable rearwardly about said link member pivotal connections from its intermediate position to its pushed-back position, said seat bottom gradually moving downwardly at its forward end between the intermediate and pushed-back positions.

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