Nov. 21, 1950 H. P. NORDMARK 2,530,625

RETRACTABLE THEATER CHAIR

Filed March 10, 1947 2 Sheets-Sheet 1

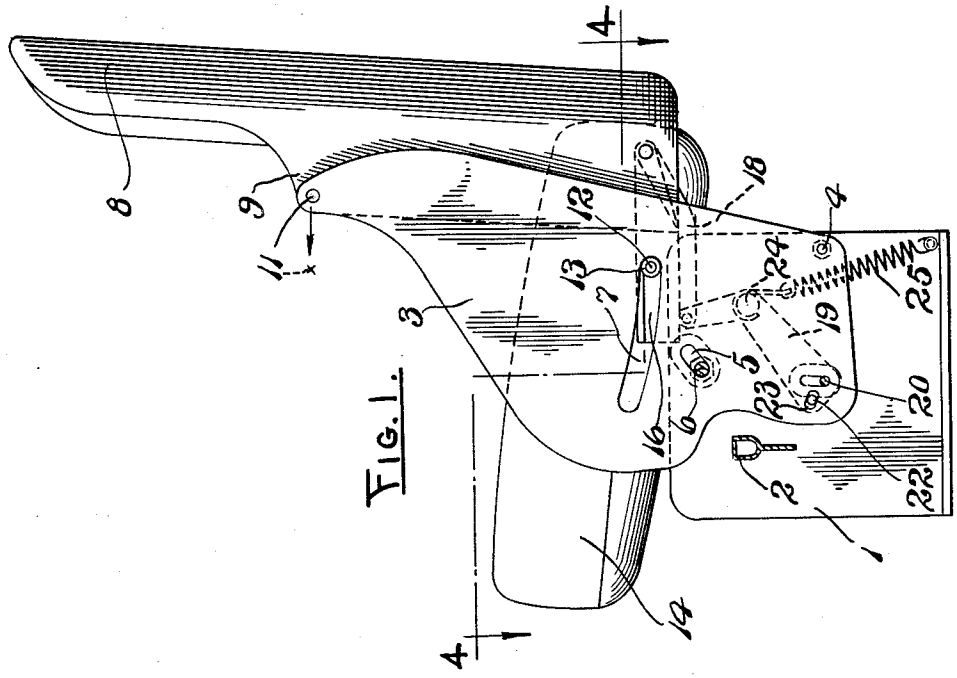


FIG. 1.

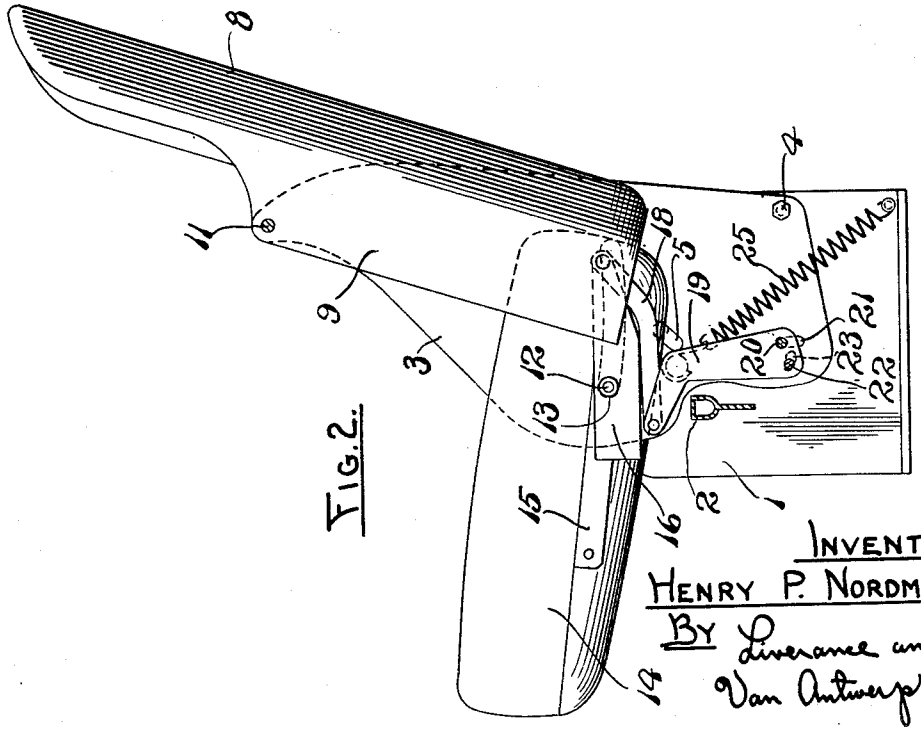


FIG. 2.

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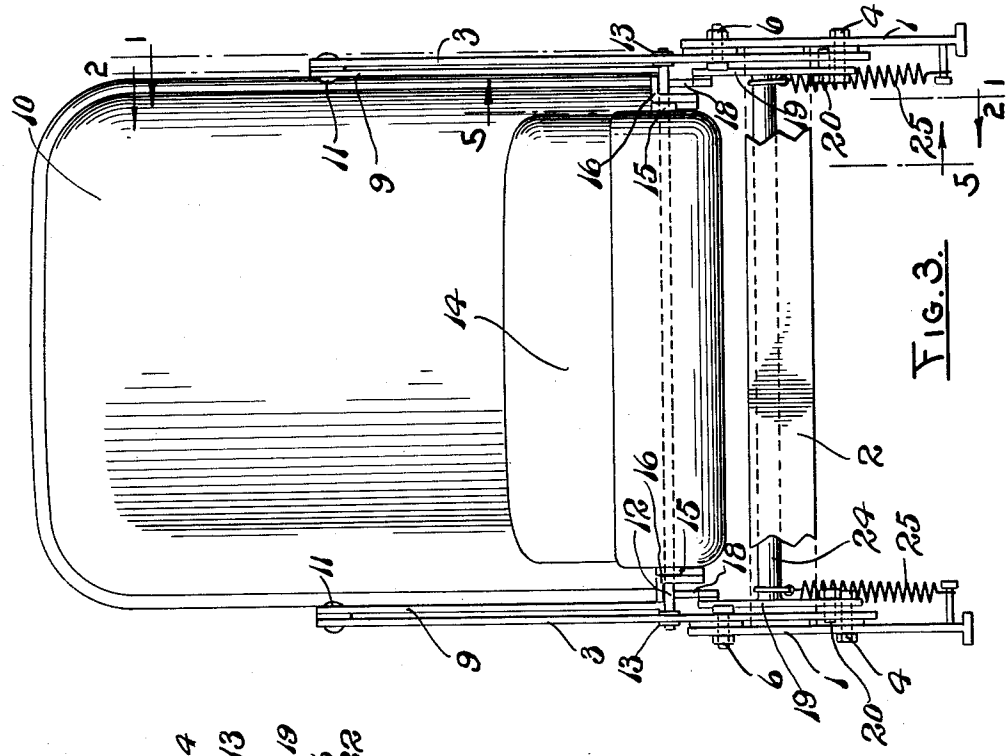


FIG. 3.

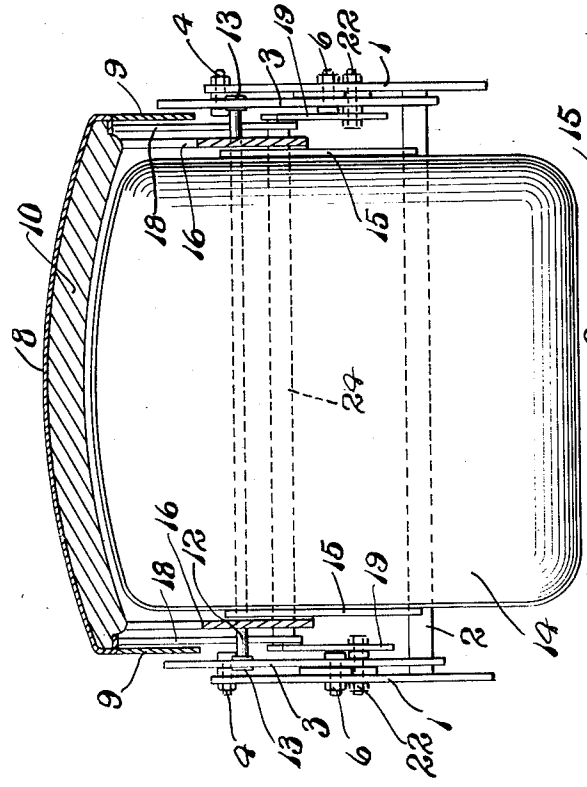


FIG. 4.

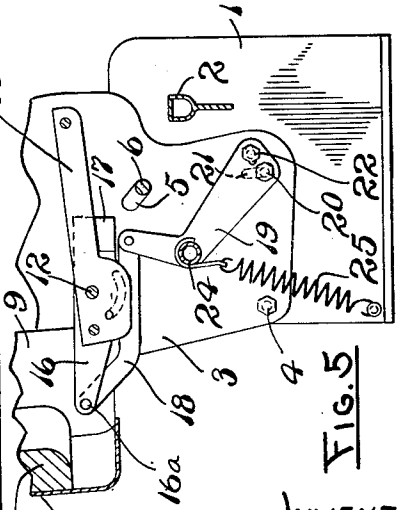


FIG. 5.

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UNITED STATES PATENT OFFICE

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RETRACTABLE THEATER CHAIR

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Application March 10, 1947, Serial No. 733,588

11 Claims. (Cl. 155—116)

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The present invention is directed to chairs, and more particularly to theater chairs. It is an object and purpose of the invention to provide a theater chair which is horizontally retractable and may be turned to upper position at which time the back at its upper end portion is moved forwardly to take nearly a vertical position; and when the seat is down for occupancy, the back is tilted rearwardly to an inclined position and one of greater comfort to the seat occupant.

Such construction of theater chair utilizes, in the most efficient manner, the theater space which the theater patrons occupy. The spaces between rows of chairs, when the seats are turned to upper position, is increased so that access to or departure from a seat by a patron is facilitated and made more easy, yet when the seats are occupied there is still ample space for the occupants. With a seat occupied, it may be pushed horizontally to the rear for passage of others without the seat occupant rising. A further object and purpose of the invention is to produce a novel structure of theater seat which very practically and effectively obtain such space utilization and other advantages in theaters or the like, and one which is of a sturdy, durable and lasting character and will sustain the severe usage to which theater seats are subjected for long times without damage or getting out of order so as to require repairing.

An understanding of the invention may be had from the following description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a side elevation of the chair with one of the outer front supports thereof removed, the view being substantially on the plane of line 1—1 of Fig. 3 looking in the direction indicated.

Fig. 2 is a similar view taken on the plane of line 2—2 of Fig. 3 in the same direction.

Fig. 3 is a front elevation of the chair.

Fig. 4 is a horizontal section substantially on the plane of the broken line 4—4 of Fig. 1 looking downwardly, and

Fig. 5 is a fragmentary vertical section from front to rear substantially on the plane of line 5—5 of Fig. 3.

Like reference characters refer to like parts in the several figures of the drawings.

In the disclosure of the invention shown in the drawings, two spaced side supports 1, substantially in the form of vertical rectangular plates, at their lower edges have flanges for floor attachment, and between them a cross bar 2 is located, permanently connected at its ends to said supports and in a position where it is underneath

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the movable seat. At the inner side of each of the supporting members 1 a flat metal plate 3 of the form shown is located having pivotal connection to its adjacent support 1 near its lower rear corner at 4. Said members 3 extend upwardly in a generally vertical direction and have a limited pivotal movement about the pivots at 4, a slot 5 (Fig. 1) made through each member 3 having associated therewith a stud 6 which is fixed to the adjacent support 1. Thus a member 3 is tiltable about its pivot 4 to the extent that such member may be moved in shifting the slot so that the stop stud 6 moves from one end or the other thereof. Each of the members 3 between its upper and lower ends is provided with a generally horizontal slot 7 of an arcuate form, the radius of the arc being relatively large as shown.

The back of the seat includes a flat metal rear side 8, which at its lower edge portions is extended forwardly in sides 9 which reach from the lower end of the back slightly more than one-half of the distance to its upper end and to the upper end of the members 3. Within the metal back member 8 the usual upholstering or other back filler 10 is permanently secured. Said sides 9 at their upper forward corner portions are pivotally connected by pivots 11 to the upper ends of the members 3.

A horizontal rod 12 extends between the side members 3 its ends passing through the slot 7 and carrying rollers 13 to traverse the slots. Said rod 12 passes through the retractable and tiltable seat 14. In practice the rod extends through the seat, but it is evident that two short rod portions, one at each side of the seat and permanently connected therewith extending to and through the slot 7, would serve the same purpose and be an equivalent. At each side of the seat a flat metal bar 15 is permanently connected (Fig. 5), rod 12 passing therethrough. At the outer side of each bar 15 a link 16 is located, rod 12 passing through the links between the ends thereof, and at the forward end of link 16 it is provided with a stop 17 extending laterally therefrom adapted to come underneath its associated bar 15 to limit the downward movement of the seat. The link 16 is connected at its rear end at 16a to the lower portion 9 of the back. The bars 15 and link 16 form hinges for raising and lowering the seat about the horizontal axis of rod 12.

A bent link 18 (Fig. 5) is pivotally connected at the outside and rear end of each of the hinge links or members 16 at 16a extending forwardly and at its front end having pivotal connection to a bent lever 19 of the shape best shown in Fig.

5. There are two of such links 18 and levers 19 and each of said levers 19 at its adjacent lower corner portion, as shown, has a pivot stud 20 secured thereto which extends outwardly through a short substantially vertical slot 21 in the adjacent member 3. A second stud 22 is connected with the lower end portion of each lever 19 a short distance above and in front of the pivotal stud 20 and passes through a second generally horizontal short slot 23 in the adjacent member 3. The slots 21 and 23 are cut or made in the side members 3 at the front lower corner portion thereof, substantially in horizontal alinement with their pivotal mountings 4 (Fig. 2). The two bent levers 19 are permanently connected together by a tubular cross rod 24 which is welded or otherwise permanently secured to the levers 19 between their ends. Coiled tension springs 25 are connected at one end with the rod 24 and extend downwardly and to the rear therefrom, at their lower ends having suitable connections to the supports 1 as shown.

With a theater chair structure as disclosed, the seat being down, as in Fig. 2, and at its front position, the back is tilted to the rear. The pivots 11 connecting the back to the side members 3 are at a forward position ahead of the position occupied when the seat 14 is pushed back or retracted to the rear with an accompanying tilting forwardly of the side members 3 about the pivotal connections 4. The studs 6 are at the upper ends of the slots 5 and the weight is carried by rollers 13 and transmitted to the side plates 3 and the supports 1. If at any time, for example, upon a theater patron passing in front of a seated occupant, such seat is to be pushed to the rear, it is readily done by pressure exerted against its front edge, the rollers 13 traversing the slots 7 from front to rear, with a simultaneous bodily movement of the links 18 in the same rearward direction, thereby causing the bent levers 19 to be turned in a clockwise direction about the pivot studs 20 and with a simultaneous movement of said studs in the slots 21 from upper to lower position accompanied by a change of position of the studs 22 in the slots 23 as shown in Figs. 1 and 2. The back 8 is tilted about its pivotal mountings 11 to a nearly vertical position and the side members 3 are turned rearwardly about the pivots 4, the extent of movement being governed by the lengths of the slots 5 and 21. At the same time the springs 25 which are stretched when the seat is at its forward normal position (Fig. 2) aid in easing and facilitating the movements of the said seat, back and side members 3, so that a patron of the theater, occupying the chair, very readily and easily moves the seat 14 to the rear and without rising, the one passing in front having ample space for such passage.

When these chairs are used in balconies where the floor incline is quite sharp, it is occasionally necessary to place them close to high risers extending upward behind them which will either limit or wholly prevent the retracting movement.

When it is desired to limit the movement a spacer may be attached to the stud 6 so that it will enter the slot 5 and engage the end thereof thus in effect shortening the length of the slot. When it is desired to wholly prevent the retracting movement, the nut on the stud 6 can be tightened to rigidly clamp the parts 1 and 3 together.

It will be noted that when the forward edge of the seat is raised about the pivot 12 its rear edge will lower behind the cross rod 24. This can only be done when the seat is retracted and in this

position the cross rod holds the seat in retracted position.

The construction described is practical, very effective, sturdy and is relatively economical to build. The rearward movement of the seat 14 is accompanied by a straightening up of the back nearly to vertical position so that theater patrons at the rear upon such retraction of the seat 14, are not crowded or inconvenienced. The pivots 11 move between the position shown in Fig. 1 and a position in front thereof, arrow-indicated, which last position is that occupied by said pivots in Fig. 2 when the seat is in normal operative position. The seat 14 may be readily turned to the vertical when, upon leaving the theater, it is pushed back, unoccupied seats being as in Fig. 1 with the exception that the seat 14 is normally turned to vertical position and the space occupied by the theater chair is at its minimum.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structures coming within their scope.

I claim:

1. In a chair of the class described, spaced vertical supports, vertically positioned plates pivotally connected adjacent their lower rear portions to said supports and extending upwardly therefrom, means for limiting the pivotal movements of said plates, a seat back pivotally connected at its sides, between its upper and lower ends, to said vertical plates adjacent the upper ends thereof, a seat adapted to be positioned horizontally between said vertical plates at the intermediate portion thereof, said vertical plates having generally horizontal slots therein at opposite sides of the seat, means extending from the seat into said slots movable lengthwise of the slots and about which said seat may be turned on a horizontal axis to and between substantially vertical horizontal positions, hinge connections at opposite sides of the seat having as a hinge axis said means extending from the seats into said slots, said seat and hinges being movable in a generally horizontal direction from front to rear and vice versa, said movement being controlled by the slots in said vertical plates and the means extending from the seat thereinto, and spring actuated means connected with said hinge means and to said vertical plates adapted to tilt said vertical plates in a forward direction upon the seat being moved rearwardly, thereby moving the seat back bodily rearwardly a limited distance and simultaneously tilting the upper portion of the back in a forward direction.

2. In a theater chair structure, spaced supports secured in fixed relation to each other, vertical plates one at the inner side of each support tiltably mounted thereon at a lower rear portion thereof, a seat slidably and pivotally mounted on said plates at an intermediate portion thereof disposed between the plates, said seat being bodily movable a horizontal direction from front to rear and vice versa, a back tiltably mounted on and between the upper end portions of said plates to turn about a horizontal axis, said back being located at its lower portion at the rear of the seat, and spring actuated connections between said plates and the seat actuated by the forward and rear movements of the seat for tilting said vertical plates in a rearward direction about their pivotal connections to the supports accompanied by a simultaneous tilting of the back in a forward direction at its upper portion, and rearwardly at its lower portion, and means for

limiting the tilting movement of said vertical plates.

3. In a theater chair, two vertical spaced supports connected together in fixed relation to each other, a vertical plate at the inner side of each of said supports extending thereabove, means pivotally connecting each plate to its adjacent support at a lower rear portion of the plate, said plates substantially adjacent the upper ends of said supports each having a generally horizontal slot therein closed at both ends, a seat located between the plates, horizontal rod means extending laterally from the seat at each side thereof, into said slots having anti-friction means thereon adapted to traverse the slots, means limiting the pivotal movement of said plates, a link pivotally mounted on said rod means, one outwardly of and each side the seat, a second link pivotally connected to each of the first links at the rear ends thereof, said second links extending in a forward direction, a bent lever pivotally connected at its upper end to the front end of each of said second links and extending downwardly and forwardly therefrom, means pivotally and slidably connecting each of said bent levers adjacent their lower ends to an adjacent vertical plate, said bent levers and plates having, the one, a pivotal stud extending therefrom and the other a short vertical slot into which said stud extends, and each of said bent levers and plates having the one a second short horizontal slot and the other a stud extending into the slot, said horizontal slot being located in front of the adjacent vertical slot and between its ends, and spring means connected with said bent levers tending to move them in a rearward counter-clockwise direction.

4. A structure as defined in claim 3, said seat at each side having a bar connected thereto through which said seat mounting rod means extends, and each of said first mentioned links extending at its forward end portion alongside its adjacent bar and provided with a laterally extending stop means passing underneath said adjacent bar for stopping the seat when turned down in a substantially horizontal position.

5. In a construction as defined in claim 3, a transverse rod connecting the bent levers between their ends, said spring means having attachment at one end to said rod and comprising coiled tension springs extending from the rods downwardly and rearwardly and connected at their lower ends to the vertical supports.

6. In a theater chair, spaced vertical supports, a tiltable member mounted on and extending upwardly from each of said supports, each tiltable upon a horizontal axis, means for limiting the tilting movement thereof, a back pivotally mounted between its ends to said tiltable members to turn about a horizontal axis, a seat tiltably mounted and slidable upon said tiltable members for movement in a generally horizontal direction from a forward to a retracted position and vice versa and for turning movement about a horizontal axis between a substantially horizontal and substantially vertical position, and means connecting said seat with said tiltable members for tilting said members forwardly at their upper ends when the seat is moved to a forward position and rearwardly when the seat is moved to a retracted position and simultaneously tilt the back at its upper portion to the rear when the heat is moved to its forward position and forwardly when the seat is moved to its rear position.

7. In a theater chair, spaced vertical supports, a tiltable member mounted on and extending upwardly from each of said supports, each tiltable upon a horizontal axis, means for limiting the tilting movement thereof, a back pivotally mounted between its ends to said tiltable members to turn about a horizontal axis, a seat tiltably mounted and movably supported upon said tiltable members between their ends for movement in a generally horizontal direction from a forward to a retracted position and vice versa and for turning movement about a horizontal axis between a substantially horizontal and substantially vertical position, and means directly connecting said seat with said tiltable members for tilting said members forwardly at their upper ends when the seat is moved to a forward position and rearwardly when the seat is moved to a retracted position and means to simultaneously tilt the back at its upper portion to the rear when the seat is moved to its forward position and forwardly when the seat is moved to its rear position.

8. The elements of claim 7 in which said means for tiltably and movably mounting said seat includes guideways on said tiltable members and supports extending from the seat and traversing the guideways.

9. The elements of claim 7 in which said means for tiltably and movably mounting the seat includes arcuate guideways on the tiltable members and supports extending from the seat and traversing the guideways.

10. The elements of claim 7 in which said means for tiltably and movable mounting the seat includes guideways on the tiltable members, supports extending from the seat and traversing the guideways, plates mounted on said seat supports and also pivotally connected to the lower part of the seat back and extensions on the plates engageable with the seat when in horizontal position.

11. The elements of claim 7 in which the means for tilting the tilting members includes rocking members pivoted to said vertical supports and having their free ends connected with the seat and operative connections between said rocking members and said tilting members.

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