

Dec. 20, 1949

M. K. ORTON ET AL

2,492,107

RETRACTING TYPE THEATER CHAIR

Filed Jan. 22, 1947

3 Sheets-Sheet 1

Fig. 1

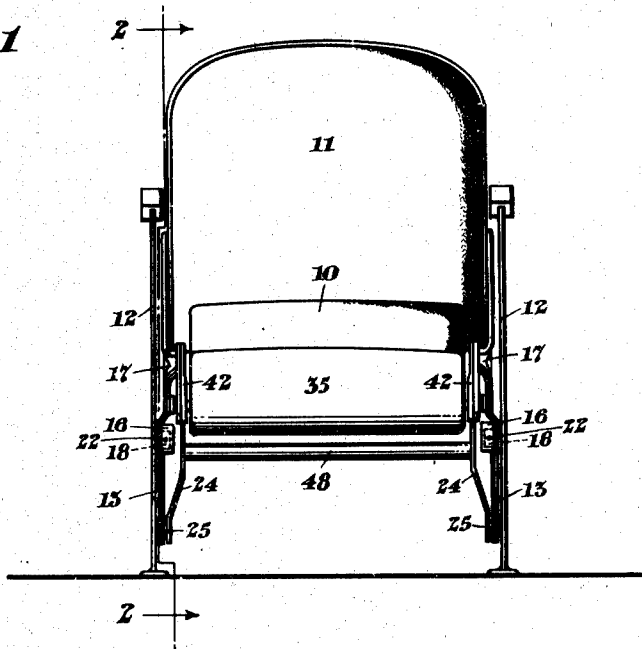


Fig. 2

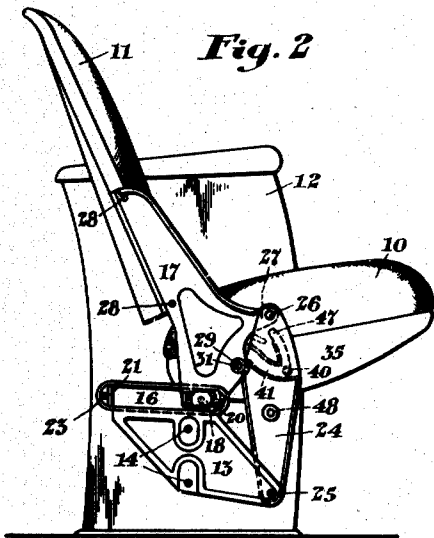
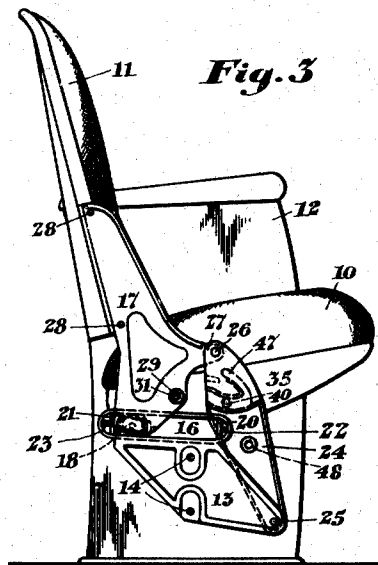


Fig. 3



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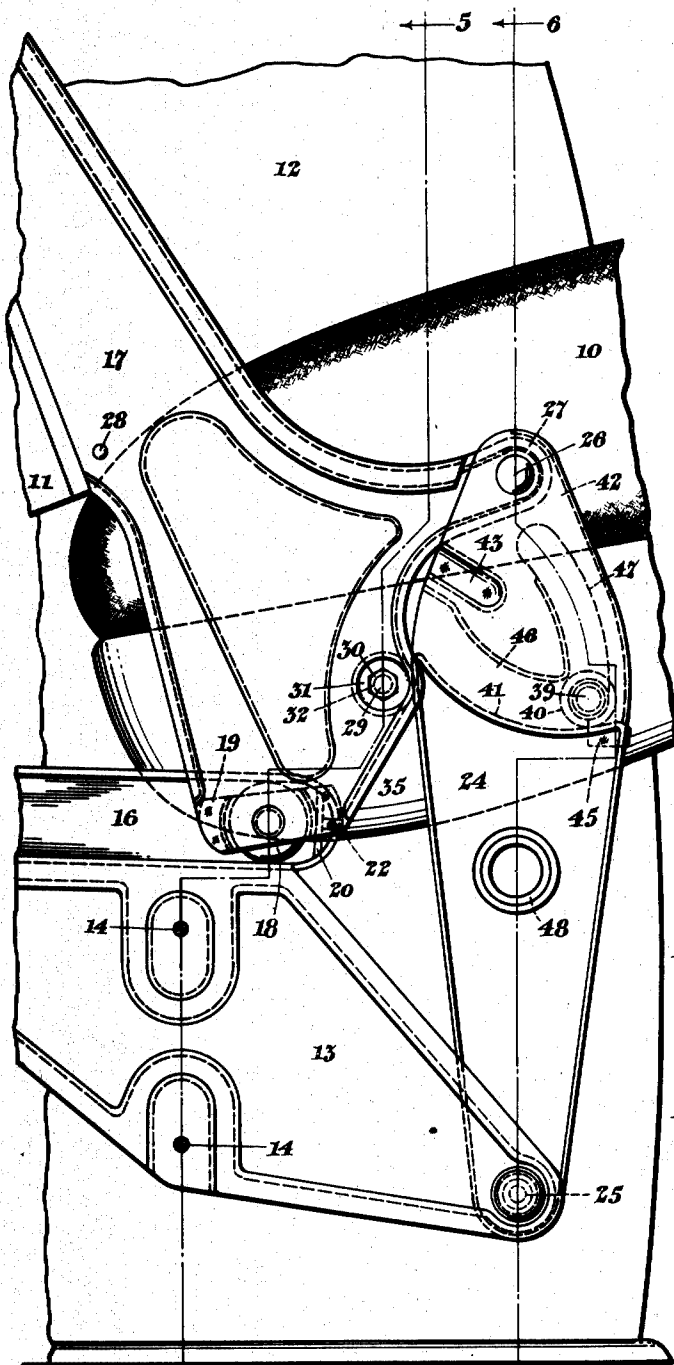


Fig. 4

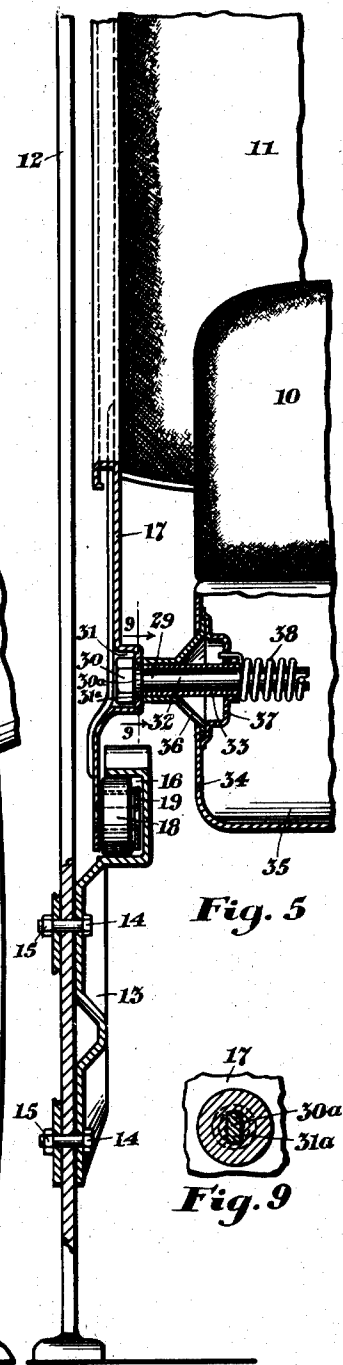


Fig. 5

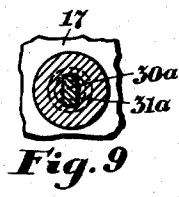


Fig. 9

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3 Sheets-Sheet 3

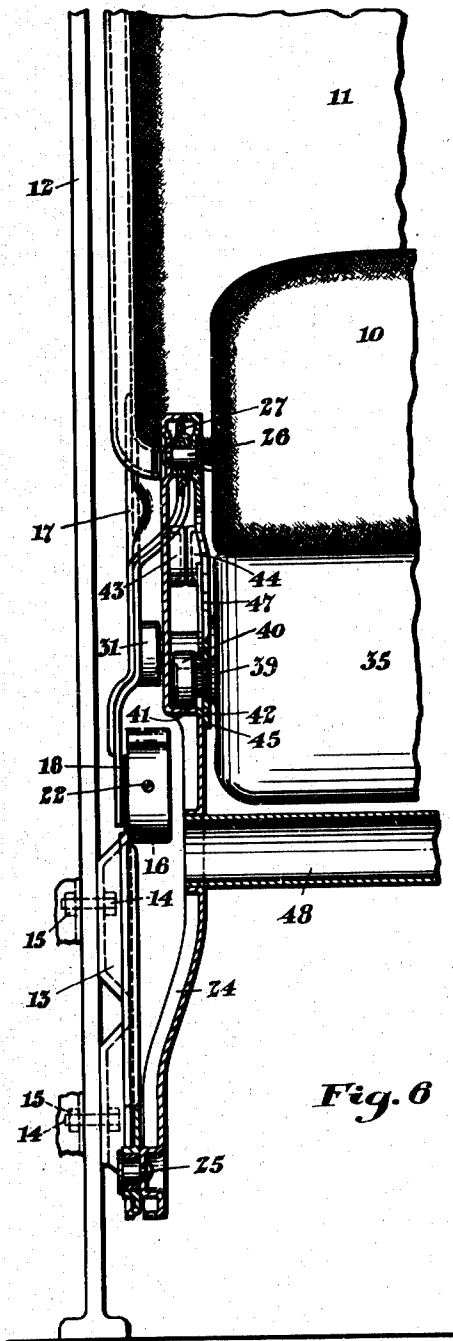


Fig. 6

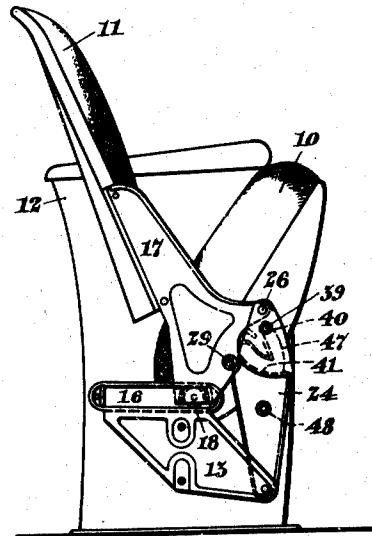


Fig. 7

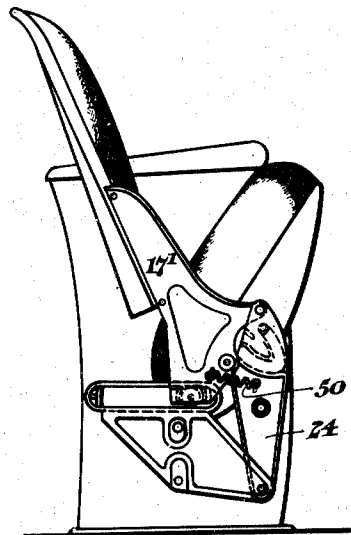


Fig. 8

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RETRACTING TYPE THEATER CHAIR

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11 Claims. (Cl. 155—116)

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The present invention relates to chairs and more particularly to chairs of the retracting type adapted for installation in theaters, auditoriums and the like.

The primary objects of the invention are to provide an improved chair of the retracting type wherein the chair occupant may move the seat and back assembly rearwardly in order to permit others to pass in front of him without his having to rise from his seat; to provide such a chair having a self-folding seat which, when the chair is in its forward or unretracted position, automatically tilts upwardly thus to increase the space in front of the chair when it is unoccupied and to facilitate ingress and egress of theater patrons between the rows of chairs in a theater, and which upward tilting of the unoccupied seat also facilitates sweeping under the chair; to provide a retracting chair in which the seat and back assembly, when unoccupied, is normally in a forward or unretracted position thus to increase the space to the rear of the chair for the added comfort of the occupant of a chair in the rear thereof; to provide a retracting chair which, in normal use, is not retractable unless occupied; to provide such a retracting chair which, when unoccupied, normally assumes a position in which the seat and back assembly are forwardly moved and in which the seat is upwardly tilted, whereby a plurality of such chairs installed in rows in a theater presents a uniform and attractive appearance; and in general to provide such a retracting chair which is quiet and efficient in operation and reasonably economical in manufacture.

Illustrative embodiments of the invention are shown in the accompanying drawings, wherein:

Figure 1 is a front elevational view of a theater chair of the retracting type installed between spaced uprights or standards;

Figure 2 is a sectional view of the same taken on line 2—2 of Figure 1 and showing the chair in a forwardly extended or unretracted position of occupancy;

Figure 3 is a view similar to Figure 2 and showing the chair in a retracted position of occupancy;

Figure 4 is an enlarged, fragmentary sectional view of certain parts as seen in Figure 2;

Figure 5 is a fragmentary view partly in front elevation and partly in section taken on line 5—5 of Figure 4;

Figure 6 is a fragmentary view partly in elevation and partly in section taken on line 6—6 of Figure 4;

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Figure 7 is a view of the chair similar to Figures 2 and 3 and showing the chair in a forward or unretracted position with the seat thereof in the upwardly tilted position which it assumes when unoccupied; and

Figure 8 is a view similar to Figure 7 and showing a slightly modified construction.

Figure 9 is a section taken on line 9—9 of Figure 5.

Referring now in detail to these drawings, the retracting chair there shown generally comprises a chair seat 10 and a chair back 11 mounted for retracting and returning movement upon a frame which comprises spaced, upright, chair-supporting standards 12 which may be secured to the floor by any conventional means (not shown). As shown the only rigid connection between the standards is the floor upon which they are installed, but if desired the standards may be connected by a suitable cross-tie beneath the seat. As herein used, the word "frame" is intended to include either spaced standards as shown, or a unitary structure adapted to support the parts hereinafter described.

Side supports 13 are secured to the inner faces of the standards 12 as by bolts 14 which pass through aligned apertures in each side support 13, the adjacent standard 12, and the side support 13 of the adjacent chair, and which bolts are provided with nuts 15 for securing these parts in assembly. The upper ends of the side supports 13 are turned inwardly, upwardly and then outwardly to form enclosed ways 16 which are slightly inclined from the horizontal in a forwardly-downwardly direction.

Carriers 17 are provided at the opposite sides of the chair and are mounted thereon for forward and rearward movements, each carrier being provided at its lower rearward corner with a roller 18 turnably mounted thereon by means of a bracket 19 secured as by welding to the inner face of the carrier. The rollers 18 bear in the ways of the side supports 13, and the forward and rearward movements of the carriers are limited by contact of the brackets 19 with stops 20 and 21 secured by any suitable means such as the screws 22, 23 in the front and rear ends respectively of the ways 16.

Supporting links 24 have their lower ends pivotally connected at 25 to the lower front corners of the side supports respectively, and have their upper ends pivotally connected at 26 to forwardly extending arms 27 on the carriers 17 respectively.

The chair back 11 is rigidly secured to and between the carriers 17 as by means of screws 28.

The chair seat 10 is mounted on the carriers 17 pivotally about a horizontal axis by means of spindles 29 (see Figure 5) each of which has a head 30 seated in a recess 31 in the adjacent carrier 17, a flattened portion 32a which is keyed in an opening 31a in the carrier 17, and a shank 32 upon which is turnably mounted a sleeve 33 fixedly mounted in the adjacent side wall 34 of the sheet-metal seat foundation 35 by means of annular brackets 36 and 37 secured to the side wall 34 as by welding. A helical spring 38 circumscribes the inner end of each spindle's shank 32 and has one end thereof secured to the inner end of the shank 32 and the other end thereof secured to the adjacent annular bracket 37. This spring 38 normally urges the seat toward its upwardly tilted or raised position of non-use shown in Figure 7.

It will be seen that the seat 10, back 11, and carriers 17 constitute a seat and back assembly which is mounted for movements to forwardly extended and rearwardly retracted positions, and it will also be seen that as the assembly is moved rearwardly the front supporting links will effect a turning movement of the carriers 17 about the axis of the rollers 19, thus causing the back 11 to assume a near-vertical position in the retracted position of the chair.

When the chair seat 10 is lowered to its position of occupancy, it is supported forwardly of the seat's pivotal connections on the seat carriers 17 by means of lateral projections or spindles 39 (see Figure 6) on the opposite sides of the seat foundation 35 which are provided with rollers 40 movable in forwardly-rearwardly extending ways 41 in the supporting links 24. When the chair is occupied, the rollers bear freely along the ways during retracting and returning movements of the chair.

The upper end of each supporting link 24 has an inner plate portion 42 which is secured to the link at three places, viz. above the pivotal connection of the link to the adjacent carrier, at the welded-together complementary embossings 43 and 44 on the link proper and the plate portion 42 respectively, and at the welded connection between the link proper and the plate's lower flange 45 (see Figures 4 and 6). It will be seen that the inner plate 42 thus forms an integral part of the adjacent link 24 and a forwardly-rearwardly extending opening 46 in the plate 42 permits forward-rearward movement of the adjacent spindle 39 which extends through said opening. This plate 42 with its opening 46 confines the adjacent roller 40 to its way 41 in any forwardly-rearwardly moved position of the seat except the forwardmost position thereof, wherein an arcuate slot 47 in the plate 42 accommodates the projection or spindle 39 during upward and downward tilting movement of the seat. Upward tilting movement of the seat is limited by contact of the projection or spindle 39 with the upper end of the slot 47.

The supporting links 24 are preferably connected by a strut 48 here shown as of tubular metal, in order to give the structure additional rigidity.

From the foregoing description it will be seen that when the chair is in its normal forward position of occupancy shown in Figure 2, it may be moved freely rearwardly to its retracted position shown in Figure 3, at the will of the occupant. However when the chair is in its forward position shown in Figure 2 and the occupant rises therefrom to leave the chair unoccupied, the seat is automatically upwardly tilted by springs 38 to

its position of non-use shown in Figure 7, in which position the projections 39 are confined within the slots 47 and are thus not free to move rearwardly relative to the links 24. This arrangement provides a latching means whereby the chair is latched in its forward or unretracted position when unoccupied, said latching means being rendered ineffective when the seat is again lowered in response to the weight of another occupant thus to permit retracting movement of the chair.

In the embodiment of the invention shown in Figures 1 through 7, it is conceivable though unlikely that a theater patron might leave his chair unoccupied in a retracted position. This situation would not detract from the utility of the present invention because the amount of space for passage in front of the retracted chair (Figure 3) is substantially the same as that in front of the forwardly positioned chair with raised seat (Figure 7). Furthermore if the chair occupant in the rear of the unoccupied, retracted chair should desire more space in front of him, it would be easy and obvious for him to push the chair in front of him forwardly whereupon said chair would assume its preferred unoccupied position shown in Figure 7. However if it is desired that all of the chairs in a theater present a uniform appearance when unoccupied, the structure may be modified as illustrated in Figure 8 by the inclusion of springs for normally urging the chair to its forwardmost position. Such a spring is designated 50 in Figure 8 and it is shown connected to the adjacent seat carrier 17 and front supporting link 24 and is thus well suited to this purpose.

The various sheet metal parts of the structure may desirably be strengthened by suitable embossings, as shown.

While but two specific embodiments of the invention have been herein shown and described, it will be understood that these embodiments might be further modified or altered without departing from the spirit of the invention as defined by the following claims.

We claim:

1. In a chair, a supporting frame, a seat and back assembly mounted on said frame for movement to forwardly extended and rearwardly retracted positions, said seat independently of the back being movable about a horizontal axis to an upwardly tilted position of non-use and to a lowered position of occupancy, latching means for positively securing said seat and back assembly against rearward movement when said assembly is in its forward position and the seat is in its upwardly tilted position, and said latching means being rendered ineffective when the weight of an occupant lowers the seat from an upwardly tilted position, thus to permit retracting movement of the seat and back assembly.

2. In a chair, a supporting frame, a seat and back assembly mounted on said frame for movement to forwardly extended and rearwardly retracted positions, said seat independently of the back being movable about a horizontal axis to an upwardly tilted position of non-use and to a lowered position of occupancy, latching means for positively securing said seat and back assembly against rearward movement when said assembly is in its forward position and the seat is in its upwardly tilted position, said latching means being rendered ineffective when the weight of an occupant lowers the seat from an upwardly tilted position, thus to permit retracting movement of the seat and back assembly, and spring

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means normally urging the seat toward its upwardly tilted position.

3. In a chair, a supporting frame, a seat and back assembly mounted on said frame for movement to forwardly extended and rearwardly retracted positions; said seat independently of the back being movable about a horizontal axis to an upwardly tilted position of non-use and to a lowered position of occupancy; latching means for positively securing said seat and back assembly against rearward movement when said assembly is in its forward position and the seat is in its upwardly tilted position, said latching means being rendered ineffective when the weight of an occupant lowers the seat from an upwardly tilted position, thus to permit retracting movement of the seat and back assembly, spring means normally urging the seat and back assembly toward its forward position, and other spring means normally urging the seat toward its upwardly tilted position.

4. In a chair, a supporting frame, a pair of spaced supporting links each having its lower end pivotally connected to said frame, a pair of carriers each pivotally connected at its forward end to the upper end of a supporting link, means on the frame for movably supporting the rearward ends of said carriers, a back mounted on the carriers, a seat mounted on the carriers for pivotal movement about a horizontal axis to an upwardly tilted position of non-use and to a lowered position of occupancy, means for limiting the movement of the carriers to forwardly extended and rearwardly retracted positions, latching means associated with the seat and with a link for positively securing the seat against rearward movement when said seat is in its forward and upwardly tilted position; and said latching means being rendered ineffective when the weight of an occupant lowers the seat from an upwardly tilted position, thus to permit retracting movement of the seat.

5. In a chair, a supporting frame, a pair of spaced supporting links each having its lower end pivotally connected to said frame, a pair of carriers each pivotally connected at its forward end to the upper end of a supporting link, means on the frame for movably supporting the rearward ends of said carriers, means for limiting the movement of the carriers to forwardly extended and rearwardly retracted positions, a back mounted on the carriers, a seat mounted on the carriers for pivotal movement about a horizontal axis to an upwardly tilted position of non-use and to a lowered position of occupancy, means for supporting the seat forwardly of its pivotal mounting on the carriers when the seat is in its lowered position comprising forwardly-rearwardly extending ways on the links and lateral projections on the seat movable in said ways.

6. In a chair, a supporting frame, a pair of spaced supporting links each having its lower end pivotally connected to said frame, a pair of carriers each pivotally connected at its forward end to the upper end of a supporting link, means on the frame for movably supporting the rearward ends of said carriers, means for limiting the movement of the carriers to forwardly extended and rearwardly retracted positions, a back mounted on the carriers, a seat mounted on the carriers for pivotal movement about a horizontal axis to an upwardly tilted position of non-use and to a lowered position of occupancy, spring means for normally urging the seat toward its upwardly tilted position of non-use, means for

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supporting the seat forwardly of its pivotal mounting on the carriers when the seat is in its lowered position comprising forwardly-rearwardly extending enclosed ways on the links and lateral projections on the seat movable in said ways and confined therein in any forwardly-rearwardly moved position of the seat except said seat's forwardmost position, said links having arcuate slots therein extending upwardly from the forward ends of the ways and adapted to accommodate said lateral projections during the seat's pivotal movement when in its forwardmost position.

7. In a chair, a supporting frame having forwardly-rearwardly extending ways at opposite sides thereof, carriers having their rearward ends bearing in said ways respectively for forward and rearward movements, supporting links having their lower ends pivotally connected to the frame and their upper ends pivotally connected to the forward ends of said carriers respectively, a back mounted on the carriers, a seat mounted on the carriers, latching means mounted on the seat and on said links for positively securing the seat against rearward movement when said seat is in its forward position and unoccupied, said latching means being rendered ineffective by the weight of an occupant of the chair, thus to permit retracting movement of the seat.

8. In a chair, a supporting frame having forwardly-rearwardly extending ways at opposite sides thereof, carriers having rollers at their rearward ends bearing in said ways respectively for forward and rearward movements, supporting links having their lower ends pivotally connected to the frame and their upper ends pivotally connected to the forward ends of said carriers respectively, a back mounted on the carriers, a seat mounted on the carriers, latching means mounted on the seat and on said links for positively securing the seat against rearward movement when said seat is in its forward position and unoccupied, said latching means being rendered ineffective by the weight of an occupant of the chair, thus to permit retracting movement of the seat.

9. In a chair, a supporting frame having forwardly-rearwardly extending ways at opposite sides thereof, carriers having their rearward ends bearing in said ways respectively for forward and rearward movements, supporting links having their lower ends pivotally connected to the frame and their upper ends pivotally connected to the forward ends of said carriers respectively, a back mounted on the carriers, a seat mounted on the carriers for pivotal movement about a horizontal axis to an upwardly tilted position of non-use and to a lowered position of occupancy, latching means mounted on the seat and on the links for positively securing the seat against rearward movement when said seat is in its forward and upwardly tilted position, and said latching means being rendered ineffective when the weight of an occupant lowers the seat from an upwardly tilted position, thus to prevent rearward movement of the seat.

10. In a chair, a supporting frame having forwardly-rearwardly extending ways at opposite sides thereof, carriers having their rearward ends bearing in said ways respectively for forward and rearward movements, supporting links having their lower ends pivotally connected to the frame and their upper ends pivotally connected to the forward ends of said carriers respectively, a back mounted on the carriers, a seat mounted on the carriers for pivotal movement about a horizontal axis to an upwardly tilted position of non-use

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and to a lowered position of occupancy, latching means mounted on the seat and on the links for positively securing the seat against rearward movement when said seat is in its forward and upwardly tilted position, said latching means being rendered ineffective when the weight of an occupant lowers the seat from an upwardly tilted position, thus to prevent rearward movement of the seat, and spring means normally urging the seat toward its upwardly tilted position.

11. In a chair, a supporting frame having forwardly-rearwardly extending ways at opposite sides thereof, carriers having their rearward ends bearing in said ways respectively for forward and rearward movements, supporting links having their lower ends pivotally connected to the frame and their upper ends pivotally connected to the forward ends of said carriers respectively, a back mounted on the carriers, a seat mounted on the carriers for pivotal movement about a horizontal axis to an upwardly tilted position of non-use and to a lowered position of occupancy, latching means mounted on the seat and on the links for positively securing the seat against rearward

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movement when said seat is in its forward and upwardly tilted position, said latching means being rendered ineffective when the weight of an occupant lowers the seat from an upwardly tilted position, thus to prevent rearward movement of the seat, spring means normally urging the seat toward its forwardmost position, and other spring means normally urging the seat toward its upwardly tilted position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|-----------|------------------|----------------|
| 329,929 | Eaton ----- | Oct. 27, 1885 |
| 1,802,606 | Krause ----- | Apr. 28, 1931 |
| 1,887,240 | Hanson ----- | Nov. 8, 1932 |
| 1,911,127 | Wasserberg ----- | May 23, 1933 |
| 2,257,583 | Wood ----- | Sept. 30, 1941 |
| 2,346,269 | Travers ----- | Apr. 11, 1944 |