Nov. 9, 1937. M. W. HARD 2,098,623

THEATER CHAIR

Filed July 24, 1935 3 Sheets-Sheet 1

FIG. 1.

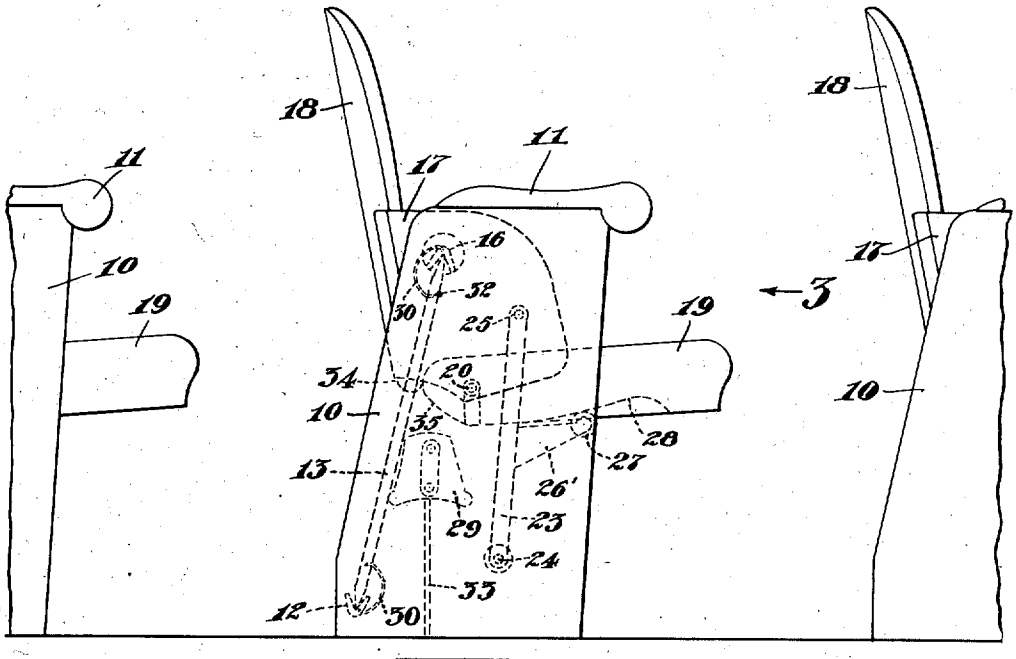
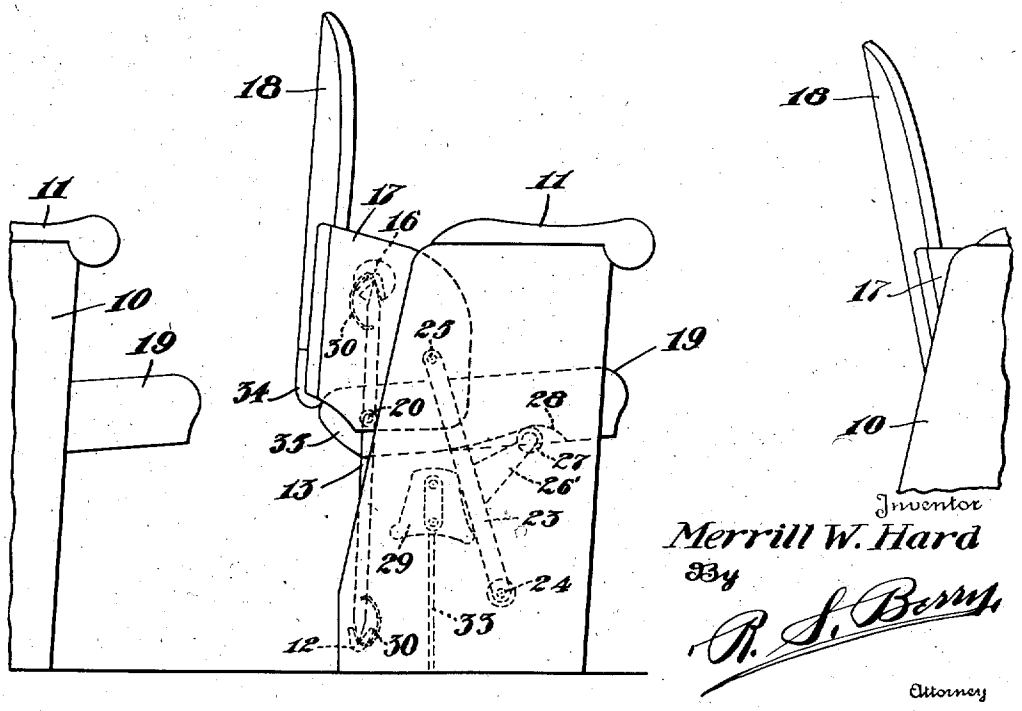


FIG. 2.



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FIG. 3.

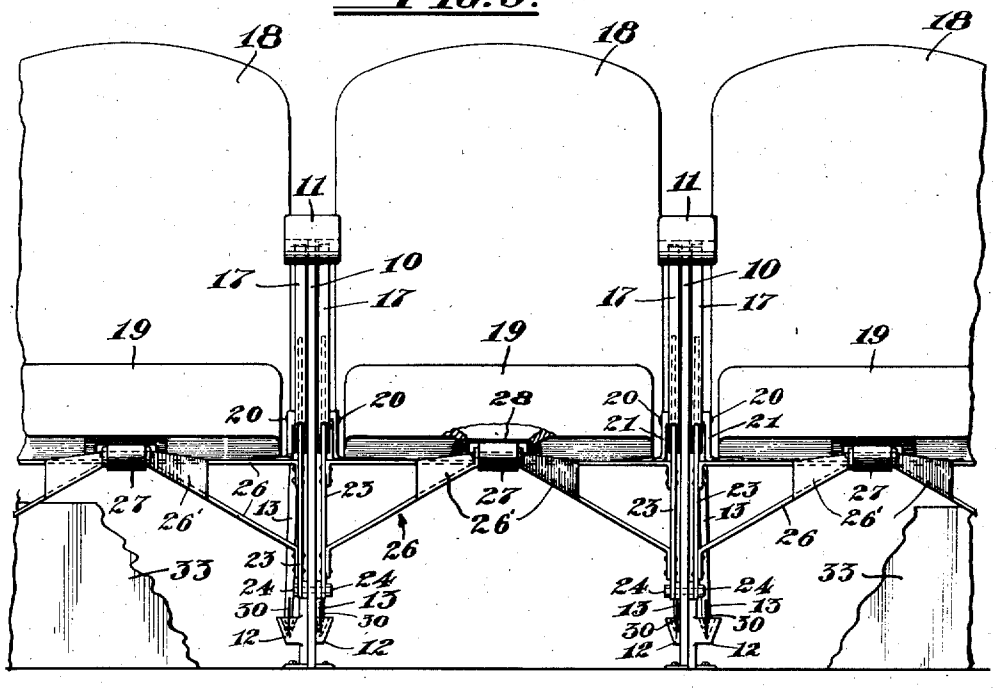
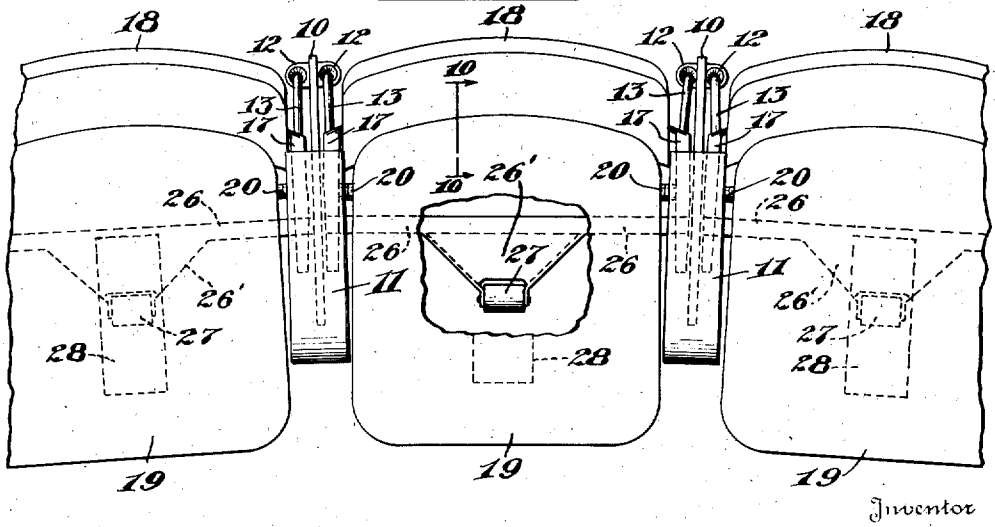


FIG. 4.



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THEATER CHAIR

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FIG. 5.

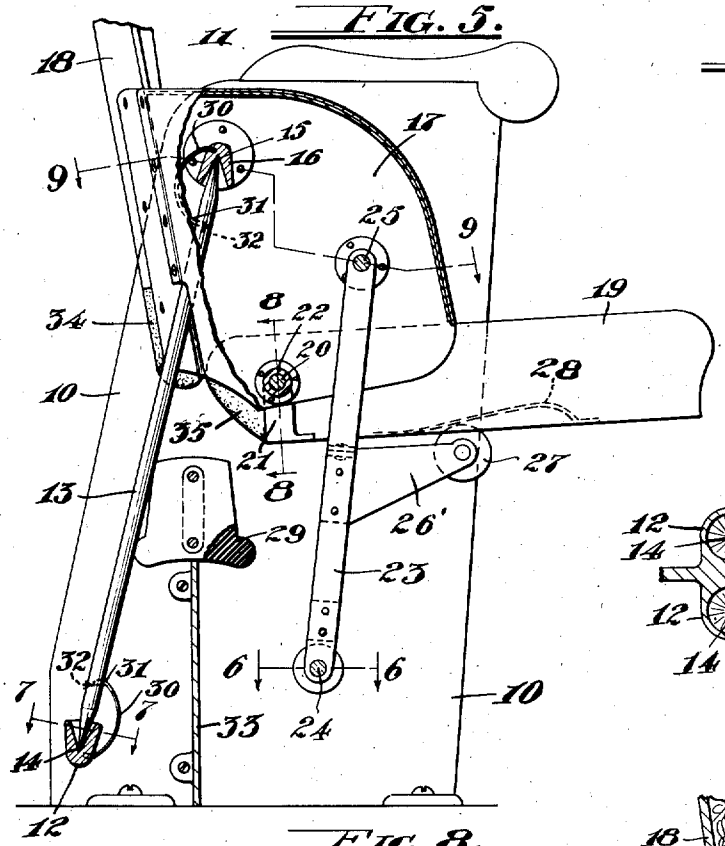


FIG. 6.

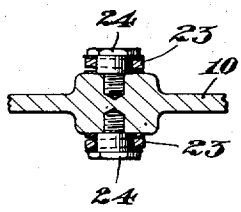


FIG. 7.

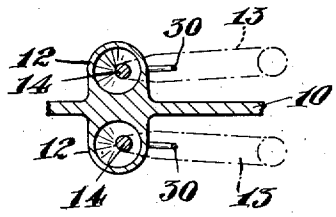


FIG. 8.

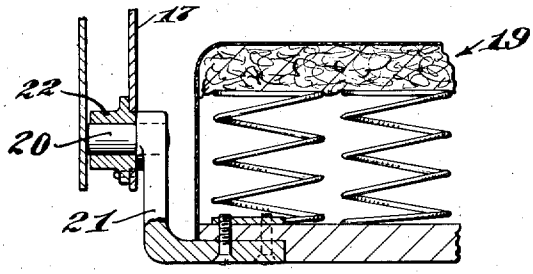


FIG. 10.

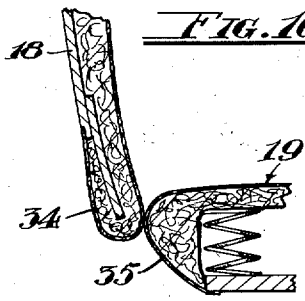
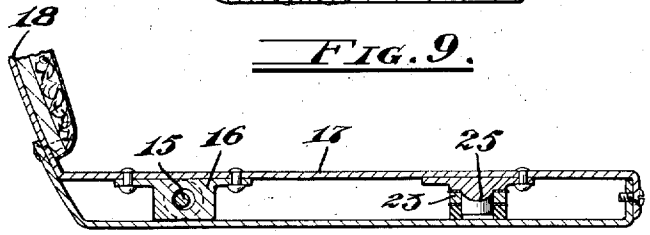


FIG. 9.



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UNITED STATES PATENT OFFICE

2,098,623

THEATER CHAIR

Merrill W. Hard, Los Angeles, Calif.

Application July 24, 1935, Serial No. 32,899

15 Claims. (Cl. 155—115)

This invention relates to chairs, and more specifically pertains to chairs of the character employed in theaters, auditoriums and the like, where a series of rows of chairs are provided for accommodating audiences; the present invention particularly pertaining to improvements in chairs of the type set forth in Letters Patent Number 1,456,235, issued to me May 22, 1923.

An object of the invention is to provide a chair in which the seat may be easily moved back by the occupant thereof to permit the passing of persons between rows of chairs without compelling the occupant to arise from the seat.

Another object is to provide a mounting for the chair seat and back, so constructed and arranged that when the occupant of the seat assumes the natural position preparatory to arising from the seat, the weight of the occupant together with the natural rearward thrust imparted to the seat on attempting to arise therefrom will act to effect rearward movement of the seat and thereby permit rearward movement of the seated occupant such as to provide ample space for the passage of a person between the back of a seat in front of the occupant and the knees of the seated occupant.

Another object is to provide an arrangement whereby the partition between adjacent seats will afford a support for the operative mountings of the contiguous sides of the adjacent seats and also to provide a construction in the mounting whereby a series of connected seats may be arranged in an arc.

Another object is to provide a mounting for a rearwardly movable seat and back in which the operating mechanism is disposed in a guarded fashion so as to protect occupants in the chairs from possible pinching during movement of the chair.

A further object is to provide a construction in the operating parts of the chair whereby the latter will be rendered noiseless in operation without the necessity of employing lubricants and yet wear of relatively movable parts be reduced to a minimum.

A further object is to provide a construction whereby movement of the seat back and forth from its normal position will be cushioned so as to avoid jolt or jar.

Various additional objects and features of the invention will appear and will be more fully understood from the following detailed description of a present preferred embodiment thereof, reference for this purpose being had to the accompanying drawings, in which:

Fig. 1 is a view of the chair in end elevation showing it in its normal position and depicting the chair in its relation to adjacent chairs spaced in front and to the rear thereof:

Fig. 2 is a view similar to Fig. 1 showing the chair in its operated position with the seat thereof retracted:

Fig. 3 is a view of a chair as seen in front elevation as associated with chairs on each side thereof:

Fig. 4 is a plan view of the structure shown in Fig. 3 with portions broken away:

Fig. 5 is a view of the chair as seen in vertical section and elevation:

Fig. 6 is a detail in horizontal section taken on the line 6—6 of Fig. 5:

Fig. 7 is a detail in horizontal section taken on the line 7—7 of Fig. 5:

Fig. 8 is a view in section and elevation as seen on the line 8—8 of Fig. 5:

Fig. 9 is a detail in horizontal section as seen on the line 9—9 of Fig. 5:

Fig. 10 is a detail in section taken on the line 10—10 of Fig. 4:

In the drawings the sectional views are viewed as looking in the direction of the arrows at the ends of the section lines, and corresponding reference characters refer to corresponding parts throughout the several views.

Referring to the drawings more specifically 10 indicates the side pedestal of a chair; a pair of such pedestals being employed with each chair with a single pedestal serving for each of adjacent chairs arranged side by side, as in constructing a row of chairs. The pedestal 10 as here shown comprises an upstanding panel which may be of any suitable construction, being here shown as formed of cast metal. The upper end of the pedestal is fitted with an arm-rest 11.

Projecting from adjacent faces of each of a pair of the pedestals near the lower ends and rear edges thereof are upwardly opening sockets 12, particularly shown in Fig. 7, the recesses of which are conical. A pair of standards 13 is provided for each chair, the ends of which are tapered and converge to points as indicated at 14 and 15; the standards being arranged with their pointed ends 14 seated in the sockets 12 with the standards extending upwardly normally at a forward inclination along-side of and in close proximity to the pedestals 10. The upper pointed ends 15 of the standards seat in downwardly opening conical sockets 16 carried on side plates 17 rigidly affixed to and projecting forwardly from the side edges of the seat back 18

as particularly shown in Figs. 5 and 9. The side plates 17 project along-side the standards 10 with their upper margins normally disposed below the arm rests 11 and proximate the under sides thereof, and with their forward edges disposed rearwardly of the front edges of the pedestals, while the lower margins of the side walls 17 are disposed approximately midway of the heights of the pedestals.

The sockets 16 are located adjacent the upper and rear margins of the side plates, being disposed a short distance forward of the front face of the seat back 18.

A chair seat 19 is pivotally carried on the side plates 17 by means of trunnions 20 formed on brackets 21 carried by the seat 19 adjacent the rear margin of the latter; the trunnions 20 being journalled in bearings 22 carried on the side plates 17 adjacent the lower margins of the latter. The axes of a pair of the trunnions 20 are aligned and are disposed normally in a plane intermediate the ends of the standards 13 in a vertical plane spaced forward of but adjacent to the upper ends of the standards 13 which upper ends by reason of the inclination of the standards are disposed in a plane forward of the lower ends of the standards. The seat 19 is free to swing vertically on the trunnions 20 and has its rear margin disposed proximate to the front face of the lower marginal portion of the back 18 when the seat is disposed in its substantially horizontal position; the seat being designed to be swung upwardly to extend longitudinally adjacent the front face of the seat back to fold the chair as is common in theater chair construction.

Means are provided for limiting downward movement of the seat whereby the latter will be disposed in its substantially horizontal position, which means is here shown as embodying a pair of upright links 23 having their lower ends pivotally connected to the lower portions of the pedestals 10 by pivot pins 24 arranged in a horizontal plane slightly above the lower ends of the standards 13 and in a vertical plane forward of the axes of the trunnions 20; the upper ends of the links 23 being connected by pivot pins 25 to the side plates 17 in a vertical plane forward of the axes of the trunnions 20 and in a horizontal plane intermediate the trunnions 20 and the upper ends of the standards 13.

The links 23 normally incline forwardly relative to the vertical as particularly shown in Fig. 5 when the seat is in its normal position, but when the seat is retracted as will later be described the links incline rearwardly to the vertical as indicated in dotted lines in Fig. 2. Carried on the pair of links 23 of a seat is a frame 26 which rigidly connects the said links, as shown in Figure 3 and maintains them in parallel relation. Said frame includes a forwardly extending bracket 26' carrying a roller 27 the axis of which extends horizontally transversely of the seat 19, and which roller is adapted to engage a track 28 on the under side of the seat 19 extending longitudinally of the latter centrally thereof; the track 28 abutting the roller 27 when the seat 10 is in its lower position as particularly shown in Fig. 5. When thus disposed the track 28 inclines upwardly and forwardly from the roller relative to the horizontal so as to present an inclined plane to the periphery of the roller. The axis of the roller 27 is disposed in a plane below the axis of the trunnions 20 and in a plane forwardly of the pivoted ends of the links 23 so that when the seat is retracted to its rearward limit of movement, said roller will still be forward of dead center, as shown in Figure 2.

It will now be seen that the standards 13 and links 23 are supported for vertical swinging movement. As a means for limiting such movement stops 29 are mounted on the pedestals to project therefrom between associated standards 13 and links 23; the stops being arranged so as to form an abutment for the standards 13 when the latter are in their forwardly inclined position, and to form an abutment for the links 23 when the latter are inclined in their rearwardmost position. The stops 29 are designed to cushion impact of the standards and links thereagainst and for this purpose are preferably formed of rubber or other suitable resilient material.

As a means for retaining the ends of the standards 13 in their seated positions within their associated sockets spring wires 30 are affixed to the sockets 12 and 16 and have hooked outer ends 31 which are detachably engaged with recesses 32 formed in the standards adjacent their ends as particularly shown in Fig. 5.

As a means for preventing persons occupying chairs from extending their feet beneath the seats of chairs immediately in front of such occupied chairs, partitions 33 are disposed to extend between the pair of pedestals 10 of each chair as particularly shown in Fig. 5; the partitions being erected from the floor and terminating a suitably spaced distance below the under side of the seats 19 such as not to interfere with the operation of the latter. By this arrangement occupants of chairs are prevented from extending their legs beneath the forward seat such distance as to materially interfere with the rearward swinging movement of the seat and back.

As the seat and back of a chair are moved rearward, the lower edge of the back and the rear edge of the seat may possibly move into contact with the legs of persons occupying a chair back of a rearwardly moving seat, and accordingly means are provided for insuring against any possible injury of a person by reason of impact of a rearwardly moving seat. This means is here shown as embodying a cushion 34 formed on the rear face and lower margin of the seat back 18, and a cushion 35 formed on the rear edge of the seat 19 as particularly shown in Fig. 10; the cushions 34 and 35 being padded in a suitable manner so that in event that if brought into contact with persons rearward of a seat, no injury to the person will occur.

In the application of the invention the seats 19 with their associated backs 18 are mounted and arranged between a pair of spaced pedestals 10, as before described, ordinarily with a series of the chairs thus formed arranged side by side in either a straight row or a row disposed in the arc of a circle, in the fashion commonly employed in seating arrangements in theaters, auditoriums, and the like; a series of such rows being usually provided with adjacent rows spaced such distance apart as to afford adequate room for persons occupying the seats, but which distance is ordinarily insufficient to permit the easy passage of persons between the occupants of the seats and the backs of the chairs in front thereof.

In the operation of the invention the seats are normally disposed as shown in Figs. 1 and 5, and when occupied by a person sitting on the seat in a normal position, that is with the body well back on the

seat, with the back resting against the seat back 18, and with the lower limbs below the knees disposed in an upright or forwardly extended position. The weight of the person will then act to maintain the seat in its forwardmost position by reason of the forward inclination of the standards 13 and also the weight of the person imposed on the seat 19 bearing on the roller 27 tending to maintain the links 23 in their forwardly inclined position. The cushion abutment 29 will then act to limit the forward inclination of the standards 13, and also the forward position of the seat 19 by reason of the connections between the seat and the standards afforded by the trunnions 22, side plates 17 and sockets 16.

When the occupant of the seat leans forwardly and moves the feet rearwardly as in assuming a position preparatory to arising from the seat, a slight rearward thrust is imposed on the seat such as to move the latter rearwardly and thereby shift the side plates 17 rearwardly and thus cause the links 23 to swing rearwardly past a vertical position whereupon the weight of the occupant, then being imposed in most part in the forward part of the seat, causes the inclined track 28 to ride downwardly on the roller 27 thereby exerting a retractive thrust on the seat and thereby assisting in effecting retrograde movement of the seat 19 and causing the links 23 to swing to their rearward inclined position; the upper ends of the links then co-operating with the rearward movement of the seat to further swing the side plates 17 on their pivotal connection with the sockets 16. During this movement the standards 13 will be rocked rearwardly on their pivotal connections with the sockets 12 towards but somewhat short of vertical position as shown in Fig. 2, in which position the parts come to rest by reason of the links 23 abutting against the cushion stops 29. By this action the seat 19 is retracted considerably at its forward edge without the occupant arising therefrom and by reason of the retraction of the seat the occupant is automatically moved rearwardly by reason of having retracted the feet, as is ordinarily done to permit persons to pass in front of the occupant without tripping over the latter's feet, thus moving the occupant's knees rearwardly thereby increasing the space between the occupant and the chair in front.

On the occupant again assuming a normal position by advancing the feet and leaning back the seat will move forwardly and the parts will be restored to their normal position.

By providing the pointed pivotal mountings for both ends of the standards 13 and forming the stop 29 to have a cushioning action, the movements of the seat will be silent and by arranging the rollers 27 to engage the under side of the seat 19 at the center thereof any possible pinching or injury of the occupant of the seat during movement thereof will be obviated.

The pointed pivotal mountings for the standards 13, providing as they do for universal pivotal movement of said standards as to the pedestals at the bottom and as to the side plates at the top, are of special advantage when assembling the chairs in a row arranged in the arc of a circle. In this case the pedestals are disposed at an angle to each other, as shown in Figure 4 and the said pivotal mountings permit such arrangement of the pedestals when installing the chairs, without interfering with the free pivotal movement of said standards, whatever said angle may be.

It is to be noted from an examination of Figures 1 and 2, that the front end of the seat moves in a substantially horizontal plane when going from its normal position, as shown in Figure 1, to its fully retracted position, as shown in Figure 2. This prevents any tendency to lift the feet of the occupant off the floor and interfere with the pressure required to push the seat backward. It will also be noted that the top of the chair back, when the seat is in the retracted position, does not encroach upon the space occupied by those in the proximate back row.

It is important in designing the chair, that the standards 13, when the seat is retracted, should never pass through the vertical position, but should be arrested just short of that position. If they should pass back of that position, when the seat is retracted, it is obvious that the seat would be locked in its retracted position. With the links 23 designed as shown, to pass through but a short arc at either side of dead center position and the standards 13 arrested short of vertical position when the seat is retracted, and with the seat supporting roller 27 never back of a dead center, the seat may be restored to normal position by the occupant simply relaxing and assuming his normal position, the parts moving with a smooth easy movement in their return to normal position without jar.

I claim:

1. A chair comprising a pair of pedestals, a pair of standards associated with said pedestals pivotally mounted thereon at their lower ends, a chair back having side plates pivotally supported on said standards, a seat pivotally connected to said side plates, a pair of upwardly extending links pivoted at their lower ends to said pedestals and pivotally connected at their upper ends to said side plates, a bracket carried by said pair of links projecting forwardly therefrom, a roller carried on the outer end of said bracket bearing on the under side of said seat.

2. A chair comprising a pair of pedestals, a links pivoted at their lower ends to said pedestals pivotally mounted thereon at their lower ends, a chair back having side plates pivotally supported on said standards, a seat pivotally connected to said side plates, a pair of upwardly extending links pivoted at their lower ends to said pedestals and pivotally connected at their upper ends to said side plates, a bracket carried by said pair of links projecting forwardly therefrom, a roller carried on the outer end of said bracket and bearing on the underside of said seat, the underside of said seat leading upwardly and forwardly relative to said roller.

3. A chair comprising a pair of pedestals, a pair of standards associated with said pedestals pivotally mounted thereon at their lower ends, a chair back having side plates pivotally supported on said standards, a seat pivotally connected to said side plates, a pair of upwardly extending links pivoted at their lower ends to said pedestals and pivotally connected at their upper ends to said side plates, a bracket carried by said pair of links projecting forwardly therefrom, a roller carried on the outer end of said bracket, a track on the underside of said seat bearing on said roller, and means on said pedestals for limiting vertical swinging of said standards and links.

4. A chair comprising a pair of pedestals, a pair of standards associated with said pedestals pivotally mounted thereon at their lower ends, a seat back having side plates pivotally supported on said standards, a seat pivotally connected to

said side plates, a pair of upwardly extending links pivoted at their lower ends, to said pedestals and pivotally connected at their upper ends to said side plates, a bracket carried by said pair of links projecting forwardly therefrom, a roller carried on the outer end of said bracket, a track on the underside of said seat bearing on said roller, and cushion abutments carried by said pedestals projecting between said standards and links, said abutments arranged to limit forward rocking movement of said standards and rearward rocking movement of said links.

5. A chair comprising side pedestals, standards pivotally mounted at their lower extremities on the pedestals, a seat, means for pivotally suspending said seat at its rear portion from said standards, upstanding links pivoted at their lower ends on said pedestals and at their upper ends to said seat suspending means, means carried by said links supporting the forward portion of said seat, and means for limiting swinging movement of said standards and links relative to said pedestals.

6. In a chair, side pedestals, standards pivotally mounted at their lower ends on the pedestals, side plates pivotally connected to the upper ends of said standards, a seat pivotally connected at the rear portion thereof to said side plates, upwardly extending links pivoted at their lower ends on said pedestals and at their upper ends on said side plates, a roller carried by said links, and a track carried on said seat seating on said roller.

7. In a chair, a pair of spaced pedestals, upstanding standards pivoted at their lower ends on said pedestals, plates pivoted on the upper ends of said standards, a back carried by said side plates, a seat pivotally connected at its rear portion to said side plates in a horizontal plane below and in a vertical plane normally forward of the pivotal connection between said side plates and standards, a pair of links pivoted at their lower ends on said pedestals forwardly of the pivotal connection of the seat and side plates and in a horizontal plane below said connection, the upper ends of said links being pivotally connected to said side plates in a horizontal plane intermediate the connections between said side plates and standards and the pivotal connections of the seat and in a vertical plane forward of the latter, means on said links supporting the forward portion of said seat, said standards and links normally inclining forwardly relative to the vertical, cushion means for limiting forward movement of said standards, said links being adapted to swing rearwardly to an inclined position past the vertical, and means for limiting rearward movement of said links.

8. In a seat, a pair of upstanding standards, a pair of upstanding links spaced forwardly from said standards, said standards and links being adapted to be pivoted at their lower ends for swinging movement in an approximately vertical plane, a pair of side plates to which the upper ends of said standards and links are pivotally connected, a seat pivotally connected at its rear portion to said side plates, and means on said links for slidably supporting said seat.

9. In a seat, a pair of upstanding standards, a pair of upstanding links spaced forwardly from said standards, said standards and links being pivoted at their lower ends for swinging movement on a pair of pedestals, a pair of side plates to which the upper ends of said standards and links are pivotally connected, a seat pivotally connected at its rear portion to said side plates, said standards and links normally inclined forwardly, means for limiting swinging movement of said links, supporting means on said links engaging the forward portion of said seat, and means on said seat co-operating with said supporting means whereby a load on the forward portion of said seat exerts a retractive thrust on said seat.

10. A chair comprising a pair of pedestals, a pair of upright standards pivotally mounted at their lower ends on said pedestals, side members pivotally supported on the upper ends of said standards, a seat pivotally connected to said side members, a pair of upright links forward of said standards pivotally connected at their lower ends to said pedestals and at their upper ends to said side members, and means carried by said links for movably supporting said seat forward of said links.

11. A chair comprising a pair of pedestals, a pair of upright standards mounted for universal pivotal movement at their lower ends on said pedestals, side members mounted for universal pivotal movement on the upper ends of said standards, a seat pivotally connected to said side members, a pair of upright links forward of said standards pivotally connected at their lower ends to said pedestals and at their upper ends to said side plates, and means including a rigid frame connecting said links in parallel relation for movably supporting said seat forward of said links.

12. A chair comprising a pair of pedestals, a pair of upright standards pivotally mounted at their lower ends on said pedestals, side members pivotally supported on the upper ends of said standards, a seat pivotally connected to said side members, a pair of upright links forward of said standards pivotally connected at their lower ends to said pedestals and at their upper ends to said side members, means carried by said links for movably supporting said seat forward of said links, the pivotal points of said standards and links being so located that in the normal position of said seat they are inclined forwardly of dead center, and means for arresting the rearward movement of said seat before said standards have passed a dead center toward the rear.

13. A chair comprising a pair of pedestals, a pair of upright standards pivotally mounted at their lower ends on said pedestals, side members pivotally supported on the upper ends of said standards, a seat pivotally connected to said side members, a pair of upright links forward of said standards pivotally connected at their lower ends to said pedestals and at their upper ends to said side members, means carried by said links for movably supporting said seat forward of said links, the pivotal points of said standards and links being so located that in the normal position of said seat they are inclined forwardly of dead center, and means for arresting the rearward movement of said seat before said standards have passed a dead center towards the rear, and the pivotal points of said links being so located that they will pass beyond dead center at the rearward limit of their movement.

14. A chair comprising a pair of pedestals, a pair of upright standards mounted for universal pivotal movement at their lower ends on said pedestals, side members mounted for universal pivotal movement on the upper ends of said standards, a seat pivotally connected to said side members, a pair of upright links forward of said standards pivotally connected at their lower ends to said pedestals and at their upper ends to said side members, means carried by said links for

movably supporting said seat forward of said links, the pivotal points of said standards and links being so located that in the normal position of said seat they are inclined forwardly of dead center, and means for arresting the rearward movement of said seat before said standards have passed a dead center toward the rear.

15. A chair comprising a pair of pedestals, a pair of upright standards mounted for universal pivotal movement at their lower ends on said pedestals, side members mounted for universal pivotal movement on the upper ends of said standards, a seat pivotally connected to said side members, a pair of upright links forward of said standards pivotally connected at their lower ends to said pedestals and at their upper ends to said side members, means including a rigid frame connecting said links in parallel relation for movably supporting said seat forward of said links, the pivotal points of said standards and links being so located that in the normal position of said seat they are inclined forwardly of dead center, and means for arresting the rearward movement of said seat before said standards have passed a dead center toward the rear, and the pivotal points of said links being so located that they will pass beyond dead center at the rearward limit of their movement.

MERRILL W. HARD.

CERTIFICATE OF CORRECTION.

Patent No. 2,098,623. November 9, 1937.

MERRILL W. HARD.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 44, claim 2, strike out the words "links pivoted at their lower ends to" and insert instead pair of standards associated with; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of June, A. D. 1939.

Henry Van Arsdale

(Seal) Acting Commissioner of Patents.

movably supporting said seat forward of said links, the pivotal points of said standards and links being so located that in the normal position of said seat they are inclined forwardly of dead center, and means for arresting the rearward movement of said seat before said standards have passed a dead center toward the rear.

15. A chair comprising a pair of pedestals, a pair of upright standards mounted for universal pivotal movement at their lower ends on said pedestals, side members mounted for universal pivotal movement on the upper ends of said standards, a seat pivotally connected to said side members, a pair of upright links forward of said standards pivotally connected at their lower ends to said pedestals and at their upper ends to said side members, means including a rigid frame connecting said links in parallel relation for movably supporting said seat forward of said links, the pivotal points of said standards and links being so located that in the normal position of said seat they are inclined forwardly of dead center, and means for arresting the rearward movement of said seat before said standards have passed a dead center toward the rear, and the pivotal points of said links being so located that they will pass beyond dead center at the rearward limit of their movement.

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