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[54] **AMUSEMENT RIDE SYSTEM**
12 Claims, 14 Drawing Figs.

[52] U.S. Cl..... **104/75**

[51] Int. Cl..... **A63g 7/00**

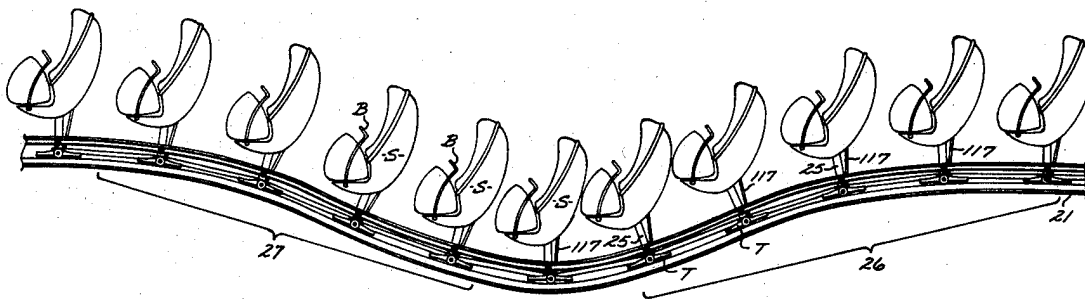
[50] Field of Search..... 104/83, 53,
84, 85, 18, 20, 25, 31, 74, 75; 272/17, 18, 43, 44

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ABSTRACT: An amusement ride system for conveying passengers past a display and including a support track having inclining and declining portions. A plurality of seats are supported on trucks that are conveyed along the track and such seats swivel to face the display as the trucks pass thereby and tilt relative to the inclining and declining portions of the track to maintain the passengers seated erect. Contoured first and second orienting rails extend longitudinally of the support track and guide first and second followers which control the swiveling and tilting, respectively, of the seat. The amusement ride system may also include a safety bar for retaining passengers in the seat and actuated by a trip which strikes an actuating rail in the unloading area.



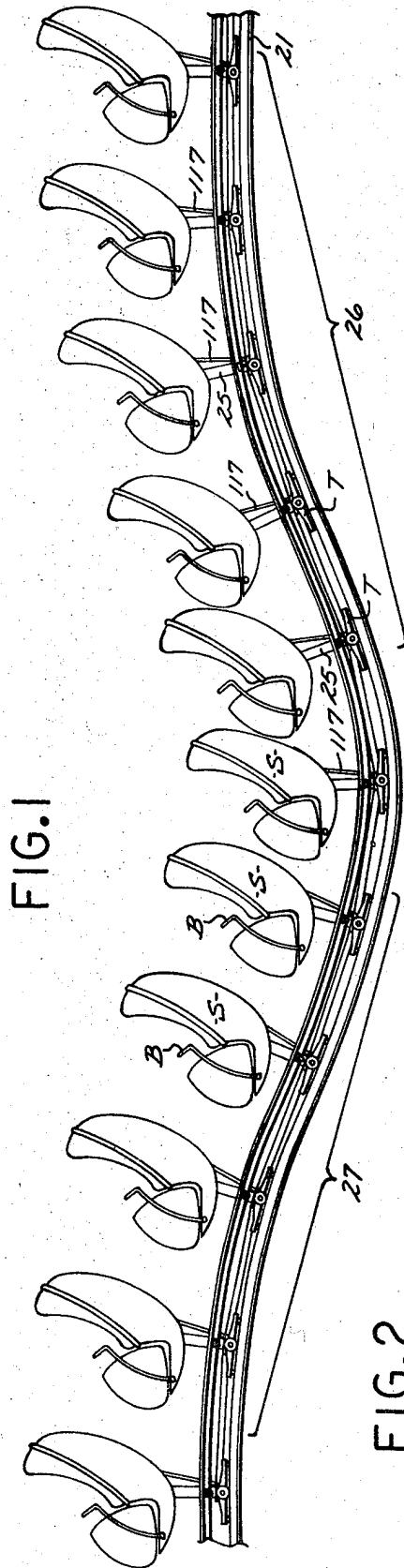


FIG. 1

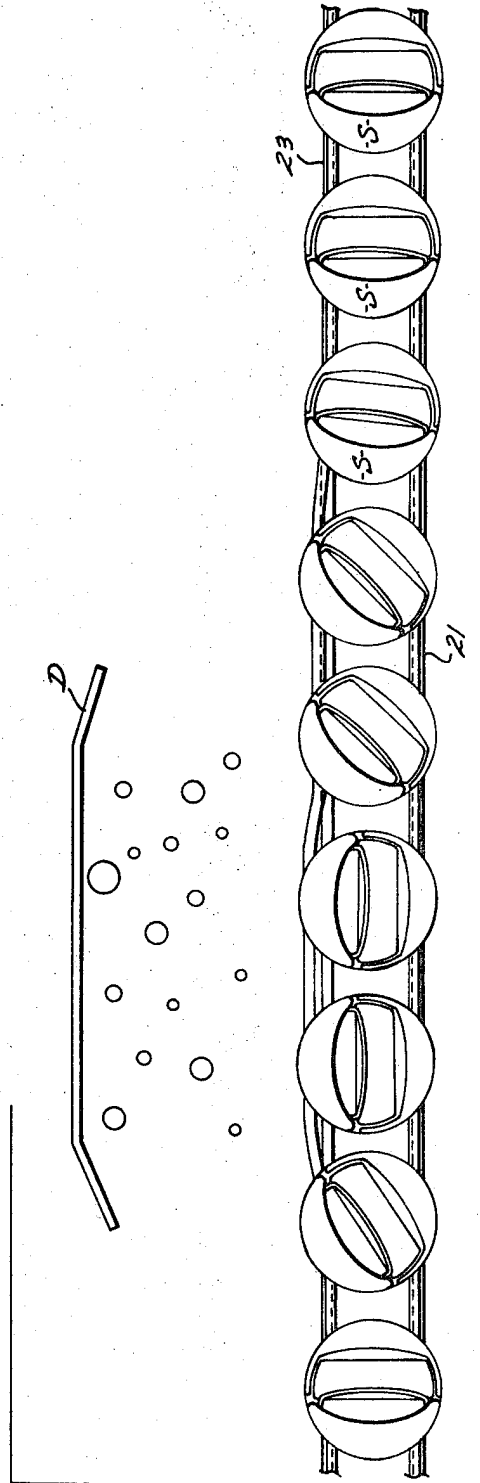


FIG. 2

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FIG. 3

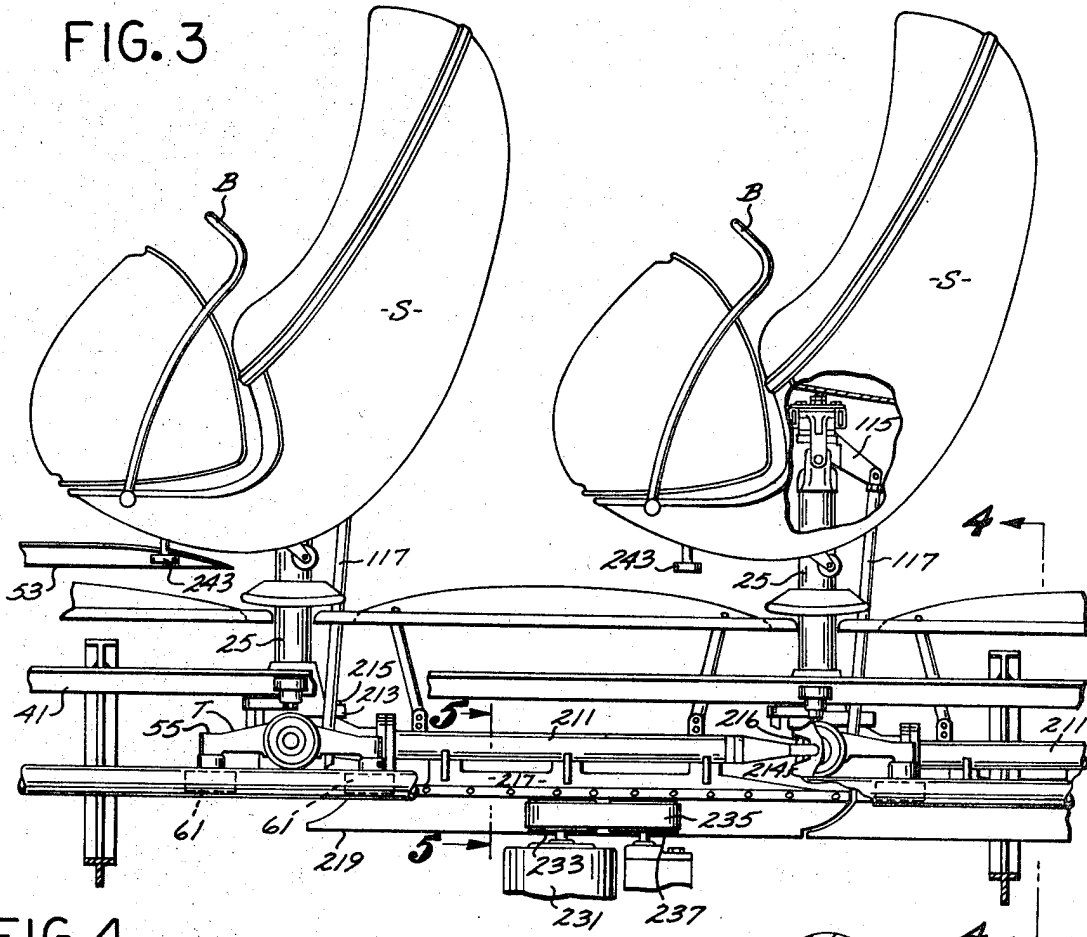


FIG. 4

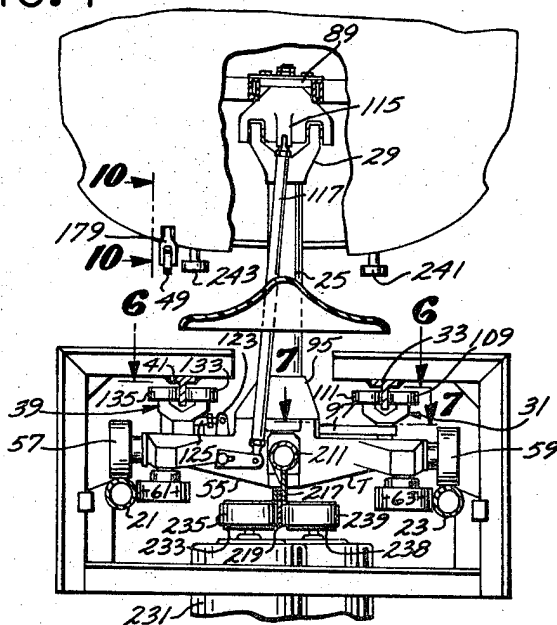
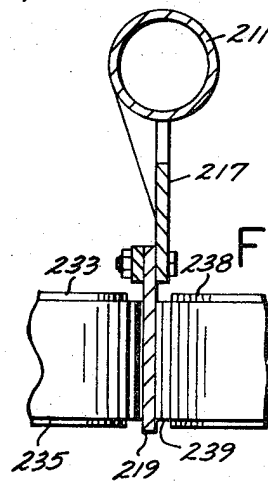


FIG. 5



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AMUSEMENT RIDE SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an amusement ride system for automatically orienting a seat to face a display as it is passed thereby and for tilting such seat relative to inclining and declining portions of a support track. The system also includes a safety bar that automatically opens for loading and unloading passengers.

2. Description Of The Prior Art

U.S. Pat. No. 620,415 relates to railway systems which control the orientation of seats but there is no system known to applicant which swivels the seats to face a display and also maintains such seats erect as such seats are conveyed over inclining or declining portions of a support track.

SUMMARY OF THE INVENTION

The amusement ride system of present invention is characterized by a seat that swivels and also tilts forwardly and rearwardly. A pair of orienting rails extend longitudinally of the supporting track and are followed by a pair of followers coupled with the seat. One follower swivels the seat to face displays adjacent the track as it is passed thereby and the other controls the forwardly and rearwardly tilt of the seat as such seat is conveyed over inclining and declining portions of the support track thereby maintaining such seat level.

The system may also include a safety bar for normally restricting egress from the seat and which is actuated by a follower which strikes a rail in the passenger loading area to open the safety bar for loading and unloading.

Other objects and features of the invention will become apparent from consideration of the following description taken in connection with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partial side view of an amusement ride system embodying the present invention;

FIG. 2 is a partial top view of the amusement ride system shown in FIG. 1;

FIG. 3 is a partially broken away side view, in enlarged scale, of the amusement ride system shown in FIG. 1;

FIG. 4 is a vertical sectional view, partially broken away, taken along the lines 4-4 of FIG. 3;

FIG. 5 is a vertical sectional view, in enlarged scale, taken along the lines 5-5 of FIG. 3;

FIG. 6 is a horizontal sectional view taken along the lines 6-6 of FIG. 4;

FIG. 7 is a partial horizontal view, in enlarged scale, taken along the lines 7-7 of FIG. 4;

FIG. 8 is a partial horizontal sectional view, in enlarged scale, taken from the circle designated 6 in FIG. 7;

FIG. 9 is a partial side view, in enlarged scale, of the conveyance system shown in FIG. 1;

FIG. 10 is a partial vertical sectional view, in enlarged scale, taken along the lines 10-10 of FIG. 4;

FIG. 11 is a horizontal sectional view taken along the lines 11-11 of FIG. 10;

FIG. 12 is a vertical sectional view taken along the lines 12-12 of FIG. 11;

FIG. 13 is a vertical sectional view taken along the lines 13-13 of FIG. 11; and

FIG. 14 is a partially broken away perspective view, in decreased scale, of the orienting mechanism included in the conveyance system shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, the amusement ride system of present invention includes a plurality of coupled together seats S mounted on trucks T which are conveyed over a pair of tubular spaced-apart support tracks 21 and 23. The seats S are sup-

ported on posts or shafts 25 and are tilted backwardly thereon as they descend down the declining track portion 26 and are tilted forwardly as they ascent the inclining track portion 27 to thereby maintain passengers seated therein erect. Referring to FIG. 2, the seats S also swivel on the posts 25 and are turned sideways to face a display D as they are passed thereby and then turn to face forwardly again.

Referring to FIG. 14, the support post 25 is hollow and supports a universal joint 29 at its upper extremity, the seat S being mounted thereon. A swivel shaft 30 extends telescopically up through the hollow support shaft 25 and includes a universal joint 32 disposed within the joint 29, the upper portion of the shaft 30 projecting from the port 25 to mount the seat S. A follower in the form of a wheel assembly, generally designated 31, is coupled with the swivel shaft 30 and rides along a swivel orientation rail 33 which is contoured relative to the support tracks 21 and 23 to control orientation of the seat S as it is conveyed along such tracks. The upper portion of the universal joint 29 is coupled with a follower, in the form of a wheel assembly generally designated 39, that tracks along a contoured pitch control rail 41 to manipulate the upper portion of such universal joint and pivot the swivel shaft 30 about its universal joint 32 thereby controlling the pitch of the seat S as the seat is conveyed along the tracks 21 and 23. A safety bar B is pivotally attached to the lower forward portion of the seat S and is normally disposed in the passenger retaining position shown in solid lines in FIG. 9 and is actuated to the passenger release position shown in broken lines in FIG. 9 by a follower in the form of a wheel 49 which contacts an actuating rail 53 disposed in the unloading area.

Referring to FIGS. 4 and 6, the truck T includes a frame 55 which is suspended from a pair of oppositely disposed support wheels 57 and 59 that roll on the support tracks 21 and 23 respectively. Two pairs of guide wheels 61 and 63 are suspended from the frame 55 for contacting the inner surfaces of the support tracks 21 and 23 to guide the truck T therealong.

Referring to FIGS. 7 and 14, a pinion, generally designated 75, in the form of upper and lower flanges circularly arranged posts 81, is attached to the lower end of the swivel shaft 30. The universal joint 32 is aligned with the support shaft universal joint 29 and the shaft section 87 projecting upwardly from the joint 43 mounts a mounting plate 89 for receiving the frame of the seat S. An opening (not shown) is formed in the wall of a fitting 95 (FIG. 4) which couples the support shaft 25 to the truck T, for receiving a pie-shaped gear portion 97 for controlling the rotation of the swivel shaft 30. The teeth of the gear portion 97 are lined with nylon 98 to reduce wear of the posts 81.

With continued reference to FIG. 14, a pivot shaft 101 is pivotally mounted on its lower end to the truck frame 55 and projects up through the gear portion 47, is keyed thereto, and fixedly mounts the wheel assembly 31 on its upper extremity. The wheel assembly 31 includes an upwardly opening U-shaped bracket, the extremities of which mount a pair of wheels 109 and 111. The wheels 109 and 111 are spaced apart for receiving the vertical portion of the T-shaped rail 33.

Referring to FIGS. 3 and 4, a lever arm 115 projects from the upper portion of the universal joint 29 and a connecting link 117 is pivotally attached thereto. As best seen in FIG. 14, the lower extremity of the connecting link 117 connects with one arm 119 of a crank, generally designated 121. The other arm 123 of the crank 121 is pivotally connected with a push rod 125 that is affixed to one end of a rocker arm 127 which is pivotally mounted on the truck T by means of a pivot pin 129. The other extremity of the rocker arm 127 is connected with an upwardly opening U-shaped bracket which mounts a pair of wheels 133 and 135 on its opposite extremities, such wheels being spaced-apart for receiving the vertical portion of the T-shaped pitch orientation rail 41.

The safety bar B is in the form of an inverted U and its lower extremities 141 are bent inwardly to form axially aligned connecting portions which are journaled in mounting brackets

(not shown. Referring to FIGS. 10 through 13, a lock frame, generally designated 145, is affixed on its rear end to the frame of the seat S by means of a mounting bolt 147. The front extremity of the frame 145 forms a fork having forwardly projecting prongs 149 and 151. The connecting portions 141 of the bar B are journaled through the legs 149 and 151.

A latching bracket, generally designated 155, is mounted between the prongs 149 and 151 and is keyed to the connecting portion 141 of the safety bar B. The latching bracket 155 includes three spaced-apart rearwardly projecting prongs 159, 161 and 163. With continued reference to FIGS. 12 and 13, a pair of rollers 165 and 167 are mounted between the respective prongs 159 and 161 and prongs 161 and 163 by means of a mounting shaft 169.

Referring to FIG. 12, a safety lock in the form of a cam 171 is mounted on the inner wall of the lock frame 145 by means of a pivot pin 173 and includes a forwardly projecting cam surface 175 that normally projects forwardly above the roller 165 to limit upward movement thereof and prevent forward movement of the upper portion of the safety bar B. The upper end of the cam 171 defines an abutting surface 176 that is moved ahead under the associated roller 165, as shown in broken lines in FIG. 12, when the bar B is in its passenger-inload position thereby locking said bar in such position. The lower extremity of the cam 171 is linked with a wheel frame, generally designated 179, by means of a connecting link 181 connected on its opposite ends by pivot pins 176 and 177. The connecting link 181 includes end portions 180 and 182 telescoped into opposite ends of a spring housing 183, and biased toward one another by compression spring S within such housing.

The wheel frame 179 is pivotally connected to the frame of the seat S by means of a pivot pin 185 and includes a portion 187 which projects upwardly beyond such pin and to which the rear end of a latch-actuating link, generally designated 189, is connected by a bolt 188. The connecting link 189 includes a spring housing 190 into the opposite ends of which is telescoped end portions 191 and 192, the end portion 191 being connected to a latch 193 by means of a pivot pin 195 and the end portion 192 being connected to the upper portion of the wheel frame 179 by the aforementioned pin 188. The latch 193 is pivotally mounted on the frame 145 by a mounting pin 197 and the forward extremity of such latch forms an arcuate forwardly opening cutout 201 for receiving the roller 167. The lower portion of the wheel frame 179 is biased forwardly around the mounting bolt 185 by means of a tension spring 205 to thereby maintain the latch 193 rotated counterclockwise as viewed in FIG. 13, and the latching bracket 155 rotated clockwise to urge the bar B to a normally closed position.

Referring to FIGS. 1, 3 and 4, the trucks T of the consecutive seats S are connected together by means of tubular-shaped connecting beams 211. The forward ends of the connecting beams 211 are received within respective clevises 213 and connecting pins 215 are inserted through aligned vertical bores. The rear extremity of the connecting beams 211 are received in forwardly facing clevises 214 in the front portion of the trucks T and vertical pins 216 are inserted through vertical bores in the respective clevises and rear extremities of the connecting beams.

Referring to FIGS. 4 and 5, the connecting beams 211 include downwardly projecting webs 217 which have resilient platens or skirts 219 fastened to their lower peripheries. Drive motors 231 are provided below the conveyance system and include drive pulleys 233 on which endless belts 235 are received, such belts 235 being threaded around idler pulleys 237. A similar pair of pulleys 238 and belt 239 are supported on the opposite side of the skirts 219 and cooperate with the belts 235 to frictionally sandwich the skirts 219.

A pair of followers in the form of horizontal stabilizing wheels 241 and 243 are mounted in spaced-apart relationship to the underside of the seat S. The wheels 241 and 243 engage the side of the rail 53 and a second stabilizing track (not shown) while the respective seats S are in the unloading area

to stabilize the seats against tilting and rotating while passengers are unloading and loading.

In operation, the personnel conveyance system of present invention is started by actuating the drive motor 231 to feed the skirts 219 suspended from the connecting beams 211 by the respective belts 235 and 239 thus advancing the trucks T on the support tracks 21 and 23. As a seat S is brought into the loading and unloading area, the wheel 49 rides into the rail 53 and pivots the wheel frame 179 rearwardly on its mounting bolt 185. Such rearward rotation of the wheel frame 179 pulls the lower extremity of the cam 171 rearwardly to enable the roller 165 to clear the cam surface 175 and roll up the front face 301 of the cam 171. Since both the links 181 and 189 can be compressed against their compression springs there is allowance for relative movement between the wheel frame 179 and the cam 171 to enable the cam surface 175 to be moved clear of the roller 165 before the latch 193 commences rotation.

Referring to FIGS. 9 and 13, rearward rotation of the lower portion of the frame 179 drives the latch connecting link 189 forwardly thus pivoting the latch 193 clockwise around its mounting pin 197 to raise the rearward extremity of the latching bracket 155 thus pivoting the connecting portion 141 of the bar B counterclockwise and moving the bar to the locked open position shown in broken lines in FIGS. 9 and 12. As described above, the cam 171 is initially rotated to move the surface 175 clear of the roller 165 and such roller travels up the face 301 of the cam 171 as the bar B is moved to its open position. During the last portion of its upward movement the roller 165 rotates the cam 171 slightly clockwise against the force of the springs in the link 181 to move the roller above the top of the cam 171. When the roller 165 clears the top of the cam 171, such cam will rotate slightly counterclockwise to move the top surface 176 under the roller 165 to hold the bar B in its locked open position. While the bar B is in such position, passengers may enter the seat S and be seated therein. The stabilizing rails extend throughout the loading area and are engaged by the wheels 241 and 243, respectively, to stabilize the seat S during loading. When the seat reaches the end of the loading area, the wheel 49 will drop off the rail 53 thus enabling the tension spring 205 to pull the lower portion of the wheel frame 179 forwardly. Such forward movement of the lower portion of the frame 179 will rotate the cam 171 clockwise thus clearing its top surface 176 from the path of the roller 165 thus freeing the bar B to close. The latch 193 will then be rotated counterclockwise thus pushing the rearward extremity of the latching bracket 155 downwardly and rotating the connecting portion 141 of the bar B clockwise thus moving the bar B to the position shown in solid lines in FIG. 9. The tension spring 205 is sufficiently resilient to avoid the bar B striking anyone in its closing path with sufficient force to cause injury. When the lower portion of the wheel frame 179 reaches its forward position, the lower extremity of the cam 171 will be pushed a sufficient distance forward to maintain the cam surface 175 partially disposed over the roller 165 thus providing a safety latch to prevent passengers in the seat S from moving the bar B forwardly to exit the car while it is in motion.

As the seats S are conveyed around the tracks 21 and 23, the contoured orienting rail 41 will guide the wheel assemblies 39 to maintain the respective seats S erect. Referring to FIG. 1, when the seats S are conveyed down the decline 26, the posts 25 are inclined upwardly and forwardly but the track 41 is contoured to tilt the seats backwardly on such posts to maintain them level. Such rearwardly tilting of the seats S is accomplished by having the rail 41 curve away from the adjacent support track 21 (FIG. 6) whereby the wheel assembly will be pivoted on its pivot pin 129 pushing the crank arm 123 (FIG. 14) inwardly and lowering the arm 119 to pull the rear end of the lever arm 115 downwardly to tilt the associated seat S backwardly. During ascent up the incline 27 the rail 41 will be curved inwardly away from the adjacent support track 21 thereby causing the crank 121 to be rotated to lift the rear end

of the lever arm 115 and tilting the associated seat S forwardly on the support post 25 to maintain it level.

Referring to FIG. 2, when the individual seats S approach a display D the seats S are pivoted sideways and face such display. Pivoting to the right as depicted in FIG. 2, is accomplished by means of the orienting rail 33 (FIG. 6) being curved toward the adjacent support track 23 thereby causing the gear portion 97 to be rotated counterclockwise rotating the swivel shaft 30 clockwise and pivoting the associated seat S to the right. Beyond the display D the seats S are pivoted to face forwardly to orient the passenger to view upcoming displays which may be disposed on the left side of the tracks 21 and 23. To pivot the seats S to the left the orienting rail 33 will curve away from the adjacent support track 23 to swivel the seat S accordingly.

From the foregoing it will be clear that the amusement ride system of present invention provides a seat which automatically rotates for convenient viewing of displays and tilts to maintain a level orientation. Further, a safety bar is provided which automatically locks into a passenger retaining position when the seat is not in the loading area thus preventing passengers from standing up in the seat or exiting the seat and endangering their persons.

Various modifications and changes may be made with regard to the foregoing detailed description without departing from the spirit of the invention or the scope of the following claims.

We claim:

1. An amusement ride system for conveying passengers by a display, said ride comprising:

a support track extending adjacent said scene and including an inclining portion and a declining portion;

first and second orienting rails extending longitudinally of said support track and contoured with respect thereto;

a truck mounted on said support track and including a joint rotatable about a horizontal axis extending transversely of said support track;

a seat mounted on said joint, said seat being pivotable relative to said truck to orient passengers seated therein for viewing said scene as said seat is passed thereby;

orienting means including a first follower coupled with said seat for following the contour of said first orienting rail to progressively pivot seat to face said display as said seat is moved thereby, said orienting means including a second follower coupled with said joint for following the contour of said second orienting rail and mechanically manipulating said joint to position said seat for positively maintaining said passengers seated erect while said seat is conveyed over inclining and declining portions of said support track; and

drive means for driving said truck on said support track.

2. An amusement ride system as set forth in claim 1 that includes: a hollow support shaft interposed between said truck and said seat; a swivel shaft projecting upwardly through said hollow support shaft and coupled with said seat and first follower to pivot said seat on said support shaft.

3. An amusement ride system as set forth in claim 1 that includes:

a second support track extending longitudinally of said first mentioned support track;

wherein said truck includes:

a pair of support wheels supported on top of said respective first and second support tracks; and

a first pair of horizontally spaced-apart guide wheels for engaging the sides of said first support track, a second pair of horizontally spaced-apart guide wheels for engaging said second support track and cooperating with said first pair of guide wheels to guide said support assembly on said first and second support tracks.

4. An amusement ride system as set forth in claim 1 that includes: a stabilizing rail extending longitudinally of said support track; and a third follower mounted on said seat for following along said stabilizing track to stabilize said seat.

5. An amusement ride system as set forth in claim 1 wherein said drive means includes: a skirt mounted on said truck and

extending longitudinally of said support track; a motor including a drive pulley for engaging said skirt to drive said skirt past said motor.

6. An amusement ride for automatically loading passengers from a loading area, said ride comprising:

a support track;

a truck mounted on said support track;

a seat supported on said truck;

an actuating rail disposed in said passenger-loading area;

a safety bar including a horizontal retaining portion and a connecting portion, said bar being pivotal from a retaining position with said retaining portion disposed over the lap of a passenger sitting in said seat to a release position with said portion pivoted forwardly from said retaining position to release passengers from said seat;

means for pivotally mounting said connecting portion to said chair;

a latching bracket mounted on said connecting portion and including a pivotal element on its projecting end;

a latch pivotally mounted, intermediate its ends, on said seat, one end of said latch forming a second pivotal element for cooperatively engaging said first pivotal element;

a safety bar actuating mechanism pivotally mounted on said chair, coupled with the extremity of said latch opposite said one end and including a follower for engaging said actuating rail to rotate said latch thereby pivoting said latching bracket to pivot said bar to its release position; and

drive means for driving said truck along said support track.

7. A personnel conveyance system as set forth in claim 6 that includes: biasing means for biasing said bar to its closed position.

8. An amusement ride system as set forth in claim 6 that includes: a lock for locking said safety bar in said retaining position.

9. An amusement ride system as set forth in claim 6 that includes: a lock pivotally mounted on one extremity to said seat and including a cam surface normally disposed in the path of said latching bracket to resist movement of said bar from said release position; a link connecting said lock with said actuating mechanism for moving said cam surface out of the path of said lever when said follower engages said rail.

10. An amusement ride system as set forth in claim 6 that includes: a lock for locking said safety bar in said release position and responsive to engagement of said follower with said rail to lock said bar in said release position and responsive to disengagement of said follower from said rail to unlock said bar from said release position.

11. An amusement ride system as set forth in claim 6 wherein:

said support track includes inclining and declining portions

and extends adjacent a display;

and wherein said system includes;

support means on said truck for mounting said seat for rotation to face said display as said seat is passed thereby, said support means including a joint pivotable about a

horizontal axis extending transversely of said track;

first and second orienting rails extending longitudinally of said support track and contoured relative thereto;

orienting means including a second follower for following said first orienting rail and coupled with said seat to rotate said seat to face said display as said seat is passed thereby and a third follower for following said second orienting rail and coupled with said joint to manipulate said joint and orient said seat to maintain passengers therein erect while said seat is moved up said inclining portions and down said declining portions.

12. An amusement ride system as set forth in claim 6 wherein said drive means includes: a skirt depending from said trucks and extending longitudinally of said support track; a drive motor mounted adjacent said support track and including a pulley for frictionally engaging said skirt to pull said truck past said motor.