

April 28, 1953

J. F. CLARY

2,636,452

DOUBLE-DECK RAILWAY PASSENGER CAR

Original Filed July 29, 1947

4 Sheets-Sheet 1

FIG. 6

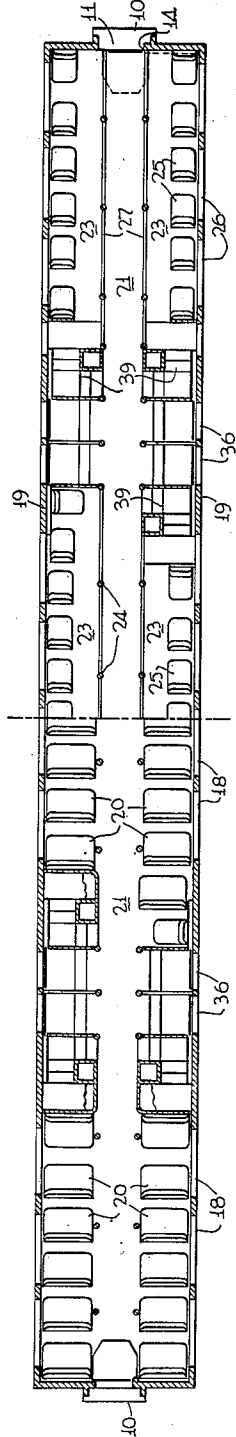
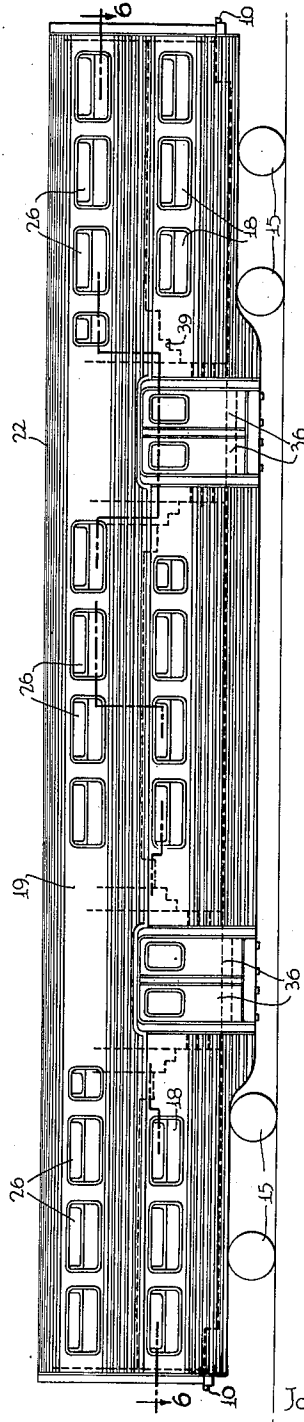


FIG. 5



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4 Sheets-Sheet 2

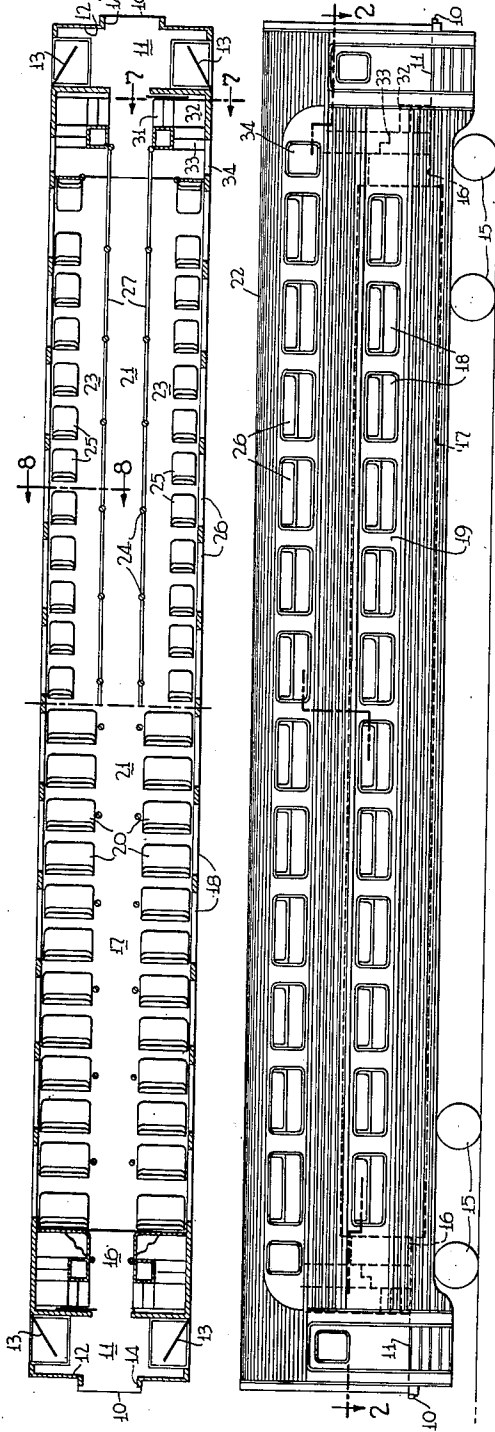


FIG. 2

FIG. 1

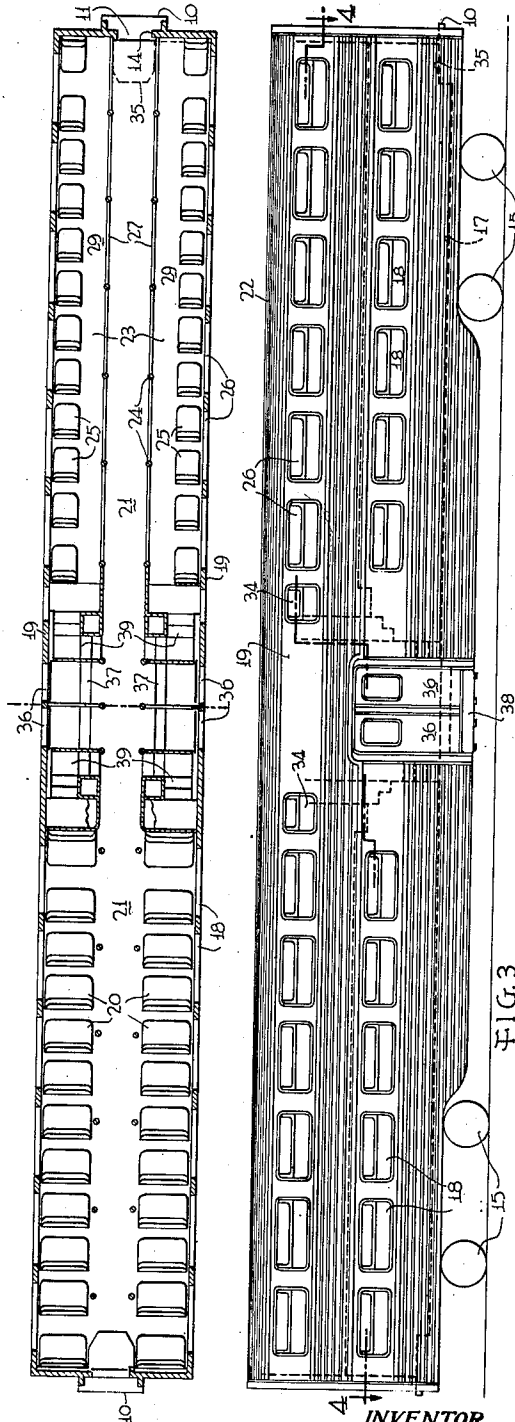


FIG. 4

FIG. 3

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4 Sheets-Sheet 3

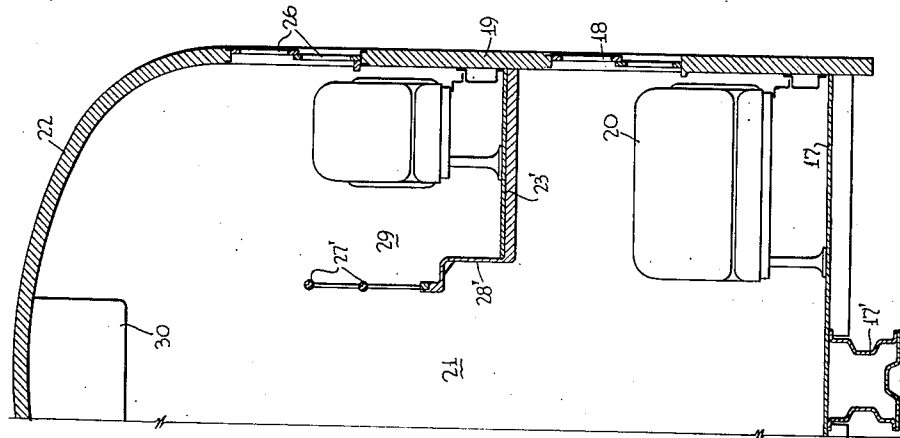
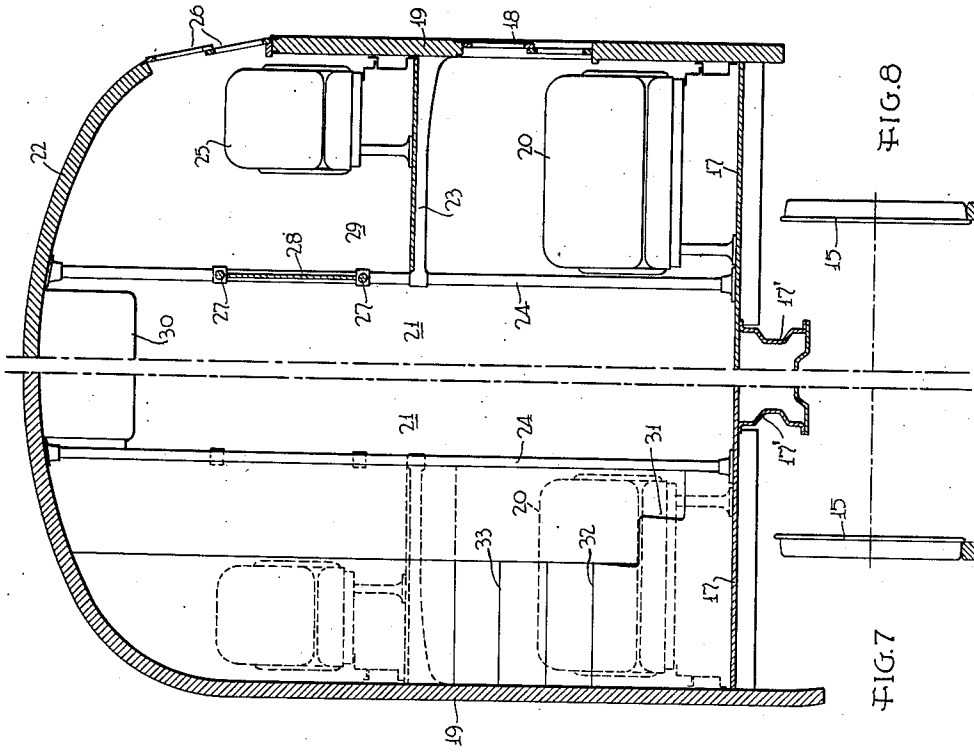


FIG. 9

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DOUBLE-DECK RAILWAY PASSENGER CAR

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4 Sheets-Sheet 4

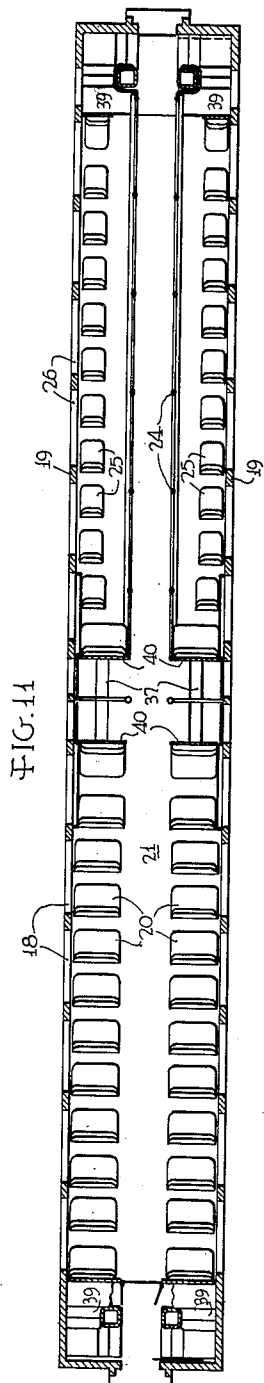


FIG. 11

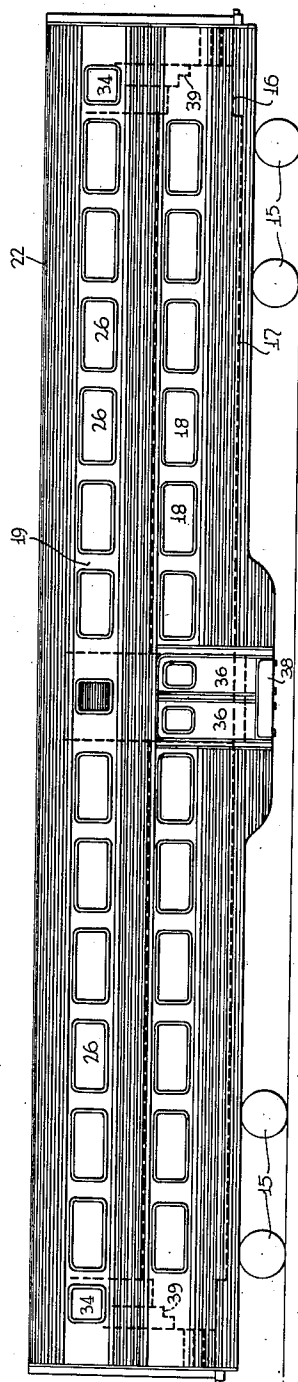


FIG. 10

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# UNITED STATES PATENT OFFICE

2,636,452

## DOUBLE-DECK RAILWAY PASSENGER CAR

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Continuation of application Serial No. 764,289, July 29, 1947. This application March 26, 1951, Serial No. 217,663

14 Claims. (Cl. 105—340)

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This is a continuation of the inventor's original, now abandoned, application "Railway Passenger Car," Serial No. 764,289, filed July 29, 1947.

The invention relates to a double-deck railway passenger car and particularly to a large-capacity such car adapted for suburban service.

Double-deck cars have heretofore been proposed in which seating accommodations for passengers are arranged upon upper and lower floors in the region between trucks, but at the ends of the cars over the trucks but a single floor for seating purposes was provided. This arrangement, while securing a greater seating capacity than the ordinary single-deck car, still did not achieve the maximum of seating capacity so desirable in suburban service.

In suburban service, it is also necessary that the usual crew be able to collect fares rapidly, and the entrances to the car and the stairways in the car to pass from one deck to the other must be arranged to handle the large capacity crowds with dispatch.

To achieve an unusually favorable ratio of passenger capacity to car weight and to provide for ease in collecting the fares and in handling the incoming and outgoing passengers at stations with a minimum of confusion, the invention provides a railway car having all or several of the following characteristics:

A main floor extends between and over the major portions of the lengths of the trucks which support the car at its opposite ends, and is arranged at a normal height or somewhat lower than the normal height of the usual buffers at the ends of the car. In the case where the main floor is lower than normal height, the ends thereof, for a short distance inwardly, are raised slightly just enough to clear the normal-height buffer and draft gear usually provided to enable the car to be coupled to normal-height cars. Suitable doorways and doors, adjoined by transverse passageways or vestibules, are provided in the car sides for reaching the main floor from the ground or the station platforms. Seats, preferably in double rows, are arranged on the main floor substantially from end wall to end wall in the spaces between the side walls and the center aisle, except for the locations of the doors, the transverse passageways or vestibules, and the stairways referred to later on.

The roof of the car is preferably raised above normal height to a height of from 14' 6" to 15' 10", or thereabouts, above the rails or as much as allowed by the clearance lines of the railway

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on which the cars are to be used or to provide adequate head room.

Above the main floor and spaced a sufficient height thereabove, say 5', to allow the passengers on the lower main floor to reach their seats without much stooping, a raised gallery, balcony or upper floor is arranged on one side, but preferably such floors are provided on both sides of the car; the latter floors project inwardly from each side of the car to about the center aisle and preferably terminate there, so that the center aisle extends upwardly beyond the upper floors and may be open substantially to the roof from the main floor. Each of the gallery floors is provided with individual access stairways leading between it and the main floor and being arranged at the sides of the center aisle. Each of these galleries also extends substantially the length of the car, except as limited by the space occupied by the stairways and transverse passageways, and each is provided along its inner margin with a parapet, such as a guard railing, of suitable height. A continuous panel extends upwardly from adjacent the inner margin of each gallery floor to a height shielding the lower portion of the gallery adjacent the center aisle from the gaze of persons seated or standing on the main floor.

A single row of seats is arranged along one margin of each gallery floor, preferably along the side wall margin. The seats face preferably in the direction of travel. A double seat may be provided on each gallery or balcony section at the end thereof remote from the stairway giving access to such section. Between these seats and the other margin of said floor is provided a longitudinal passageway of suitable width for the transit of passengers to and from the seats on the gallery floor and the stairways. The height of this passageway for the smaller height cars of 14' 8" may necessitate slight stooping of tall persons, but for the greater height cars of 15' 10" or over, full standing room height for the tallest persons is made possible.

A lower line and an upper line of windows are provided in each side wall of the car. The lower line is arranged between the lower and upper floor substantially throughout the length of the main floor except for the locations of the doors, transverse passageways or vestibules, and stairways; and the upper line of windows is arranged above the upper floors.

With the new arrangement and construction, it is possible to seat 148 passengers in a railway car of standard length and to provide for their

comfortable travel to and from their seats. By reason of the open central aisle, the collection of fares by the crew is facilitated, since a member of the crew can pass through the aisle and collect fares from the passengers on both sides and on the upper and lower floors in one passage through the aisle by reaching through openings in the gallery railings.

These and other objects and advantages and the manner in which they are attained will become more fully apparent from the following detailed description when read in connection with the drawing forming a part of this specification.

In the drawing:

Figure 1 is a diagrammatic side elevation of a railway car embodying a first form of the invention;

Figure 2 is a sectional plan view of the same car, the section being taken substantially along line 2—2 of Figure 1;

Figures 3 and 4 are views similar to Figures 1 and 2, respectively, embodying a second form of the invention;

Figures 5 and 6 are also views similar to Figures 1 and 2, respectively, embodying a third form of the invention, Figure 6 being a planar section on line 6—6 of Figure 5;

Figures 7 and 8 are diagrammatic transverse vertical sections on a larger scale through opposite halves of the car per Figures 1 and 2, the planes of section being indicated by lines 7—7 and 8—8, respectively, of Figure 2;

Figure 9 is a sectional view similar to Figure 8 through a car with the roof up to a height which allows full standing height for very tall persons on the upper gallery floors, this view showing a modified gallery arrangement; and

Figures 10 and 11 are views similar to Figures 1 and 2, showing a further modification combining features of the forms shown in Figures 1, 2, and 3, 4.

In the form shown in Figures 1, 2, 7, and 8, the invention is shown applied to a railway car having the buffers 10 and an end platform or vestibule floor 11 at normal height to enable the car to be coupled to other cars of like or of different construction, as may be desired. The vestibule walls 12 and side entrance doors 13 are arranged as usual at the ends of the car and have the usual steps and trap doors so they can be entered at ground, or at platform, level. The usual end door openings 14 for communication with adjacent cars are also provided. Usual trucks, as indicated diagrammatically by the wheels 15, support the car near its ends.

According to this form of the invention, the main floor of the car is extended for a short distance inwardly at platform level, as indicated at 16, Figure 1, to provide clearance for the usual buffer and draft gear, but inwardly of those raised end portions, which extend over but end a short distance beyond the adjacent truck, the main floor is dropped down one step for substantially the length of the car, as indicated at 17. The low main floor portion 17 is established at the lowest line which will permit a center sill, as 17' (Figures 7, 8), to extend in a straight line across the trucks to the car ends. It will be understood, however, that the invention is equally applicable, with but slight sacrifice of head room, to a car in which the main floor extends from end to end at the same level, or to one in which the main floor is dropped down only on opposite sides of the aisle.

A row of windows 18 is provided in each side

wall 19 of the car, extending through the length of this main lowered floor portion 17, the windows being spaced apart and of a width and at a height to permit passengers seated on the main floor to have a good view of the outside.

Along each side wall 19 of the car is arranged a row of double seats 20, these seats extending the length of the main floor portion 17 and extending inwardly from the respective side walls to the center aisle 21 running the length of the car.

The roof 22 of the car is preferably raised to the full height permitted by the clearance lines of the railroad upon which the cars are used so as to obtain the desired head room. This height may vary from about 14' 8" to 15' 10" or thereabouts above the rails.

Gallery floors 23, arranged above the lower or main floor seats 20 at each side of the car, are secured along their outer edges to the adjacent side walls 19 and supported along their inner aisle-flanking margins, as shown in Figure 8, by any suitable means, such as stanchions 24, extending from the main floor portion 17 to the roof.

These gallery, balcony or upper floors 23 are vertically spaced from the lower or main floor portion 17 a distance, say 5', which is ample to afford comfortable clearance for the heads of the passengers seated on the lower floor. This height also permits entering and leaving the seats without much stooping to avoid the gallery floors. The gallery floors 23 extend substantially the length of the main floor portion 17 and each carries a single row of seats 25 extending along the adjacent side wall. A second row of windows 26 is disposed in each side wall in proper relation to the seats on the respective gallery floors 23.

Where the over-all height of the car is restricted by the railroad's clearance lines, as shown in Figure 8, this row of windows is disposed in an inclined position where the side wall 19 merges into the rounded roof 22, affording the gallery passengers a view upwardly as well as laterally.

The inner side of each gallery floor is flanked by vertically spaced guard rails 27 extending between stanchions 24 and the space between these rails is closed by panels 28 hiding the lower portion of the gallery passageway from the gaze of persons on the lower or main floor. The lower rail 27 is close to the gallery floor but spaced slightly therefrom to permit ease of cleaning of the floor.

The space between the row of seats 25 and the guard rails 27 provides on each gallery a longitudinal passageway 29 to allow the passengers to reach their seats from each end of the gallery. The center aisle 21 extends vertically substantially the full height from main floor 17 to roof 22, except for an air conditioning duct 30 extending along the roof over the aisle. With this arrangement, the passengers on the gallery and on the lower floor are accessible to the crew member passing along the aisle for the collection of fares, and he need pass through the car only once to collect all fares.

For the restricted over-all height of the cars to about 14' 8", as in Figures 7 and 8, the height of the gallery passageways may be about 5' 6" and the taller passengers would have to stoop slightly in walking along the galleries because of the limited head room. However, where the clearance lines permit, the height of the car may be such, say 15' 10", as shown in Figure 9, pro-

viding ample head clearance in the gallery passageways for even very tall persons. In this Figure 9, a somewhat more simplified arrangement of the upper row of windows 26 is made possible; the vertical side walls 19 extend above the gallery floors a sufficient distance to allow the windows to be placed in the vertical portions thereof.

Also, in this modified gallery arrangement of Figure 9, the continuous closing panel 28' at the inner margin of the gallery floor 23' is rigidly secured to this margin of the floor, which floor is of somewhat less width than the gallery floor in the forms shown in Figures 7 and 8. The panel 28' extends upwardly and is then offset inwardly to widen the top of the gallery passageway for accommodating the wide torso region of the bodies of the passengers. The height of the panel is such as to effectively screen from the gaze of persons on the lower or main floor the lower or leg region of the gallery passengers. By narrowing the width of the gallery floor, the lower floor seats are rendered more accessible. The parapet or railing, at least the part formed by closing panel 28', may also serve with the adjacent margin of the floor as a longitudinally extending beam supporting the gallery floor without the use of vertical stanchions or, at least, the number of such stanchions may be greatly reduced. The guard railing 27', in this form of the invention, may be secured to the upper offset margin of the panel 28'.

Access to the galleries (in the form shown in Figures 1, 2, 7, and 8) is had through stairways at each end of each gallery. Each such stairway may consist of a series of steps 31 leading from the aisle 21 to an intermediate platform 32 adjacent the car side wall, and a second series of steps 33 leading from this platform longitudinally to the gallery floor level. The space under certain of these steps may be utilized for toilet rooms or storage space, as desired. Windows, as 34, may be provided in line with the upper row of windows 36 in the region of the stairways.

By extending both the lower portion of the main floor and the gallery floors substantially from end to end of the car, except as limited by the necessary stairways and vestibules, a maximum seating capacity of 144 passengers may be attained, and the arrangement is such as to facilitate the loading and unloading of passengers and the collection of fares. Moreover, the passengers are seated in comfort, the open aisle giving a sense of roominess, and the numerous windows affording ample light and view to the outside.

In the form of the invention shown in Figures 3 and 4, only a short central portion of the main floor 17 is shown raised, as indicated by lines 35, to the platform level to accommodate the usual buffer, and the seats 20, 25 on the main and gallery floors 17, 23 are extended clear to the end of the car. In this modification, wide central double doors 36 are provided in both sides 19 of the car, these doors sliding to open position and communicating through a transverse passageway including a series of steps 37 and a movable step 38 with the central aisle 21. Alongside the central doors are arranged stairways 39 similar to the stairways 31, 32, 33 of the first described form, leading to the respective gallery floors 23. In other respects, this form is similar to the form of Figures 1 and 2.

and similar reference numerals are used to designate corresponding parts.

While in Figures 1 and 2 there is one continuous gallery on each side of the car, the gallery in Figures 3 and 4 is divided into four sections, each of which is accessible by one of the stairways 39. The sections of the galleries as well as the rows of seats 20 on the main floor extend to the end walls of the car but are spaced from each other by the transverse passageways connecting the doors 36 with the center aisle 21 and by the stairways 39.

The form shown in Figures 5 and 6 is similar to the form of Figures 3 and 4, except that greater ease of loading and unloading is provided for at some sacrifice of passenger capacity. In this form, two spaced, wide, double entrance doors 36 are provided in each side of the car, these doors being spaced in the neighborhood of one-third of the length of the car. This divides the gallery floor 23 into six sections and a stairway 39 is provided at one end of each section for access thereto from the main floor. These stairways are similar to the stairways in the form per Figures 1, 2, and 7 and are arranged two on opposite sides of one side door 36 and one at one side of the other side door 36 in each side of the car, see Figure 6.

For utilizing all available space, a transversely-facing seat may be arranged at the end remote from the stairway of individual gallery sections. Such transverse seat would at other locations most likely obstruct the passageway 29. A transverse seat may similarly be used with other forms of the invention having a gallery section accessible from one end closed by a wall or the like at the other end.

The form shown in Figures 10 and 11 is generally similar to the form shown in Figures 3 and 4 except that the stairways 39 to the galleries, instead of being arranged adjacent the center doors 36, are arranged adjacent the ends of the car as in Figures 1 and 2, and except that vertical panels 40 extending inwardly from the car side walls to the aisle and vertically from the floor to the roof, are arranged on opposite sides of the center doorways and define the ends of the gallery sections. By placing double seats 41 on the galleries against these panels, the seating capacity of the car can be increased to 148. Similarly, the seating capacity of the other forms, other than the form shown in Figures 1 and 2, could be increased by replacing the single seat shown at the closed end of the galleries by a double seat extending the width of the associated gallery. The arrangement shown in Figures 10 and 11 will sometimes be preferred to the arrangement shown in the other figures because it should speed up the loading and unloading of the passengers and at the same time provide the maximum of seating capacity.

It will be understood, of course, that in all the forms the main lower floor may be at the normal car floor level instead of having a small rise at the ends to accommodate a usual buffer. In such event, there would be slightly less head room on the galleries if the clearance lines on the railroads did not permit of raising the roof to the required extent. This would not detract materially from the desirability of this arrangement for suburban or interurban service.

It will be understood also that the galleries are accessible to the conductor, standing on the main floor, by reaching through the open spaces

provided in the parapets or railings of the galleries.

While the invention has been herein shown and described in several embodiments, it will be understood that further changes and modifications may be made by those skilled in the art without departing from the invention. For instance, the invention is not necessarily restricted to a car having a balcony or gallery on each side but may also be carried out with a gallery on one side only. Another example of a possible modification is such upward extent of the center aisle as to afford full head room for even the tallest person without, however, extending the aisle practically to the roof.

What is claimed is:

1. In a railway passenger car, a car body having a main lower floor, a roof and side walls interconnecting the floor and roof, said main floor extending substantially from end to end of the car, a center aisle on said lower floor, double rows of seats on said main floor at the opposite sides of said aisle; upper gallery floors extending along each side of the car inwardly from the adjacent side wall and terminating at said aisle; a row of seats on each gallery floor disposed along one margin thereof, and a passageway between said seats and the opposite margin of the respective gallery floor; a parapet along the inner margin of each gallery floor; and individual stairways leading from said lower floor to the respective gallery floors and arranged on opposite sides of said aisle.

2. In a railway passenger car, a car body of more than normal height substantially throughout its length and having a main lower floor, a roof and side walls interconnecting said main floor and roof, said main floor extending substantially from end to end of the car at one level, upper and lower rows of windows in the car side walls, rows of double seats arranged on said main floor adjacent the respective side walls, and a center aisle between said rows extending substantially from said main floor to said roof; gallery floors arranged along both sides of the car vertically between the upper and lower windows and extending inwardly from the respective side walls to said aisle, a row of seats arranged on each gallery floor along one margin thereof leaving a longitudinal passageway on each gallery floor between the associated row of seats and the opposite margin of said gallery floor; and stairways leading from the lower main floor to each gallery floor, the gallery floors extending substantially the full length of the car except for the space taken up by said stairways and by transverse passageways and entrance openings.

3. In a railway passenger car, a car body of more than normal height throughout its length and having a main floor, a roof and side walls interconnecting said floor and roof, said main floor extending substantially from end to end of the car body, upper and lower rows of windows in the car side walls, seating accommodations arranged on the main floor adjacent the respective side walls and between said walls and a central aisle extending substantially from the main floor to the roof; gallery floors arranged along both sides of the car vertically between the upper and lower rows of windows and extending inwardly from the respective side walls to the aisle, seating accommodations arranged on each gallery floor along one margin thereof but leaving a longitudinal passageway on each

gallery floor between the associated seating accommodations and the other margin of said gallery floor; stairways leading from said lower main floor to said gallery floors; and side doors in the end portions of the car side walls; the gallery floors extending substantially the full length of the car except for the space taken up by said stairways and side doors, said stairways being arranged at each end of the car adjacent said side doors.

4. In a railway passenger car, a car body of more than normal height throughout its length and having a main floor, a roof and side walls interconnecting said floor and roof, said main floor extending substantially from end to end of the car body, upper and lower rows of windows in the car side walls, seating accommodations arranged on the main floor adjacent the respective side walls and between said walls and a longitudinal aisle extending substantially from the main floor to the roof between said seating accommodations; gallery floors arranged along both sides of the car vertically between the upper and lower rows of windows and extending inwardly from the respective side walls to the aisle, seating accommodations arranged on each gallery floor along one margin thereof leaving a longitudinal passageway on each gallery floor between the respective seating accommodations and the other margin of said gallery floor, wide central doorways in the car sides; and stairways leading from said lower main floor to said gallery floors, said stairways being located adjacent to, and on opposite sides of, said central doorways; the gallery floors extending substantially the full length of the car except for the space taken up by said doorways and stairways.

5. In a railway passenger car, a car body of more than normal height throughout its length and having a truck support near each of its ends, said body comprising a main floor, a roof and side walls interconnecting said floor and said roof, upper and lower rows of windows in the car side walls, rows of lengthwise facing double seats arranged on said main floor adjacent the respective side walls and between said side walls and a central aisle; gallery floors arranged along both sides of the car vertically between the upper and lower rows of windows at a height less than standing height above said main floor, said gallery floors extending inwardly from the respective side walls to the aisle, a row of seats arranged on each gallery floor along one margin thereof leaving a longitudinal passageway on each gallery floor between the associated rows of seats and the other margin of said gallery floor; stairways leading from said main floor to said gallery floors, and a pair of wide doorways in each car side wall longitudinally disposed, one inside and adjacent each said truck support, said stairways being disposed adjacent to, and on opposite sides of one of said doorways and adjacent to, and on one side of the other of said doorways; said gallery floors extending substantially the full length of the car except for the space taken up by said doorways and stairways.

6. In a railway passenger car, a car body of more than normal height throughout its length and having a main floor, a roof and side walls interconnecting said floor and roof, said main floor extending substantially from end to end of the car body, upper and lower rows of windows in the car side walls, seating accommodations arranged on the main floor adjacent the respective side walls and between said walls and a longitu-

dinal aisle extending substantially from said main floor to the roof, gallery floors arranged along both sides of the car vertically between the upper and lower rows of windows and extending inwardly from the respective side walls to the aisle, at least one row of seats arranged on each gallery floor along one margin thereof leaving a longitudinal passageway on each gallery floor between the associated seats and the other margin of said gallery floor, stairways leading from said lower main floor to said gallery floors and being located adjacent the opposite ends of the car, the gallery floors extending substantially the full length of the car except for the space taken up by said stairways and by entrance openings in the side walls.

7. In a railway passenger car, a car body having a main floor, a roof and side walls interconnecting the floor and roof, a longitudinal aisle on said main floor, a gallery floor accessible to passengers along at least one side of said aisle, and a closing panel rising from about the margin of said gallery floor adjoining said aisle to at least a height shielding the space for some distance above said gallery floor from the gaze of persons standing or seated on the main floor.

8. In a railway passenger car, a car body having a main floor, a roof and side walls interconnecting the floor and roof, said main floor extending substantially from end to end of the car; a gallery floor accessible to passengers extending along at least one side wall and partway across said body; seating accommodations on said gallery floor disposed along one margin thereof, a passageway between said seating accommodations and the opposite margin of said gallery floor, and a gaze-shielding panel rising from the inner margin of said gallery floor to a height some distance above the floor, said panel being offset inwardly in its upper regions to provide ample width for the wide torso region and to effectively shield the lower leg region of the gallery-occupying passengers from the gaze of persons on the main floor.

9. In a railway passenger car, a main floor, a roof and side walls interconnecting the floor and roof, said main floor extending substantially from end to end of the car, a longitudinal aisle extending upwardly from said main floor, rows of seats on said main floor at the opposite sides of said aisle; a gallery floor extending along each side of the car inwardly from the adjacent side wall toward said aisle accessible from said main floor, at least one row of seats on each gallery floor disposed along one margin thereof, a passageway between said seats and the opposite margin of the gallery floor, and a parapet along the inner margin of said gallery floor provided with openings so as to permit ticket control and sale, for persons on said gallery floor, by a conductor passing along the aisle.

10. In a railway passenger car, a main lower floor, a roof and side walls, an upper floor extending substantially from end to end of the car and from one side wall partway across the width of the car, a stairway leading from said lower floor to the upper floor, and seating accommodations for passengers arranged along the side walls of the car on both said floors, and a longitudinal passageway on said upper floor between the inner margin thereof and the seating accommodations thereon.

11. In a railway passenger car, a main floor, a roof and side walls, said main floor extending substantially from end to end of the car body, seating accommodations arranged on the main floor adjacent the respective side walls and between said walls and a longitudinal middle aisle, doorways in the car sides, gallery floors arranged along both sides of the car and extending inwardly from the respective side walls to the aisle, seats arranged on each gallery floor along one margin thereof leaving a longitudinal passageway on each gallery floor between the associated seats and the other margin of said gallery floor, said gallery floors presenting individual sections separated from each other at the doorways, stairways leading from said lower main floor to each section of said gallery floors, said stairways being located adjacent to said doorways.

12. In a railway passenger car, a main floor, a roof, end walls and side walls interconnecting said floor and roof, said main floor extending substantially from end to end of the car body, a gallery floor accessible to passengers being arranged along at least one side of the car and partway across the width thereof, a parapet along the inner margin of said gallery floor, said gallery floor being supported at its outer margin by the respective side wall and at its ends by vertical structures such as the end walls, said parapet along the inner margin of said gallery floor being formed at least in part as a longitudinal load-supporting beam.

13. In a railway passenger car, a car body having a main floor, a roof and side walls interconnecting the floor and roof, said main floor extending substantially from end to end of the car, a gallery floor extending along at least one side wall of said body and partway across its width and being accessible from said main floor, and a closing panel rising from the inner margin of said gallery floor to a height shielding the space for some distance above said gallery floor from the gaze of persons on the main floor, said panel being formed as a longitudinal beam for supporting the inner margin of said gallery floor.

14. In a railway passenger car, a car body having a main lower floor, a roof and side walls interconnecting the floor and roof, said main floor extending substantially from end to end of the car, a longitudinal center aisle on said lower floor, plural rows of seats on said main floor at the opposite sides of said aisle; upper gallery floors extending along each side of the car inwardly from the adjacent side wall and terminating at said aisle; rows of seats on said gallery floors disposed along one margin of the respective gallery floor, and a passageway between said seats and the opposite margin of the respective gallery floor; a parapet along the inner margin of each gallery floor; and individual stairways leading from said lower floor to the respective gallery floors and arranged on opposite sides of said aisle.

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