





Jan. 10, 1939.

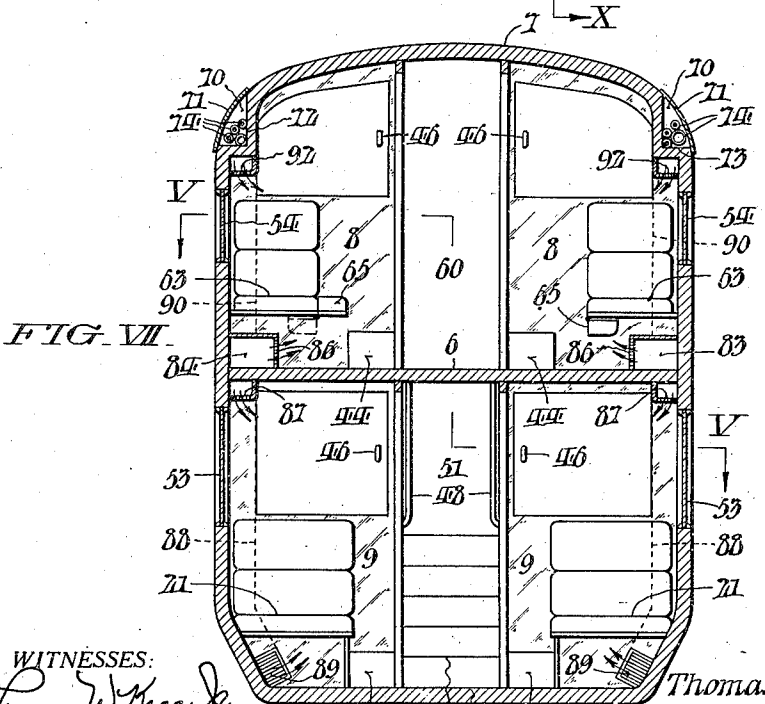
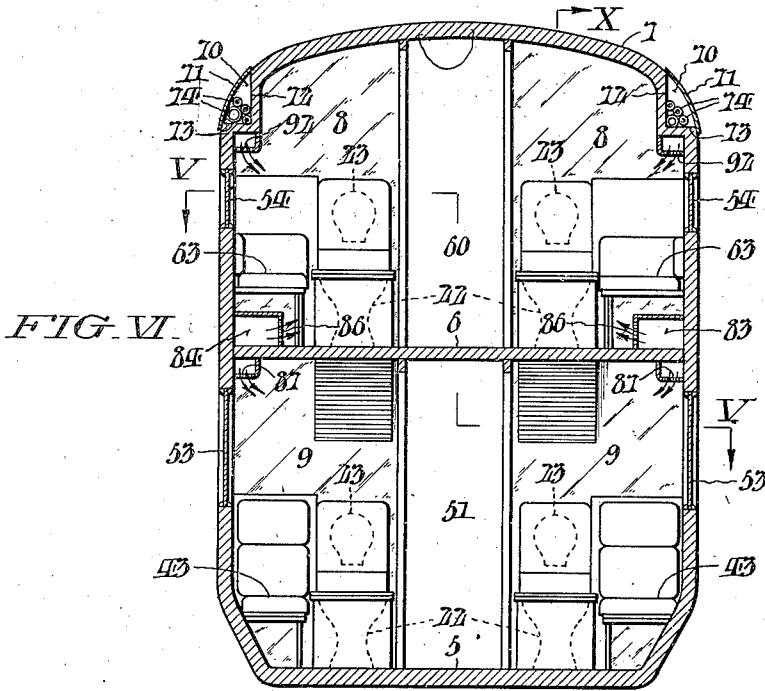
T. W. DEMAREST

2,143,827

DOUBLE DECK SLEEPING CAR

Filed June 4, 1937

5 Sheets-Sheet 3



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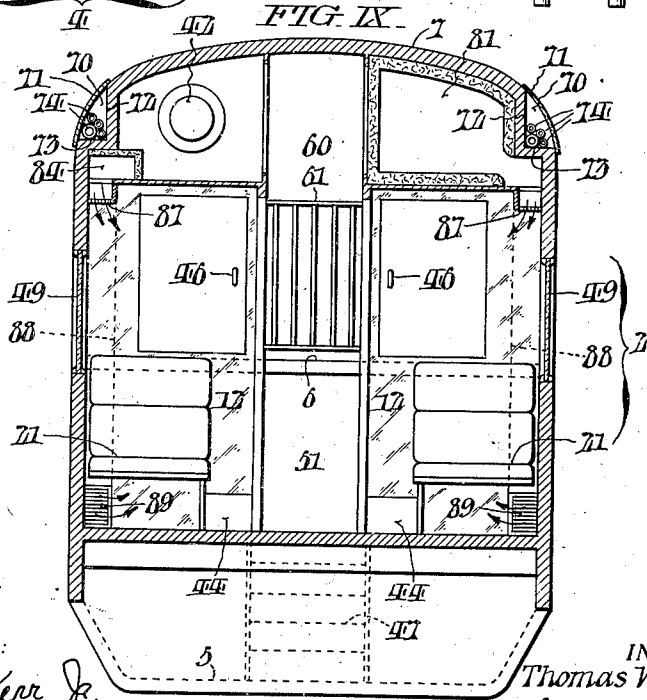
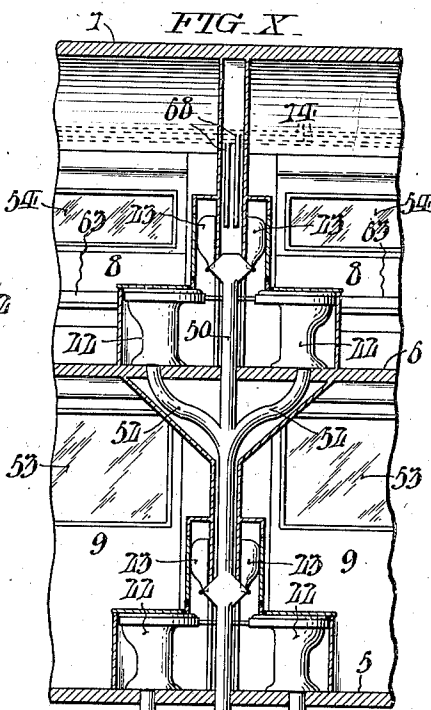
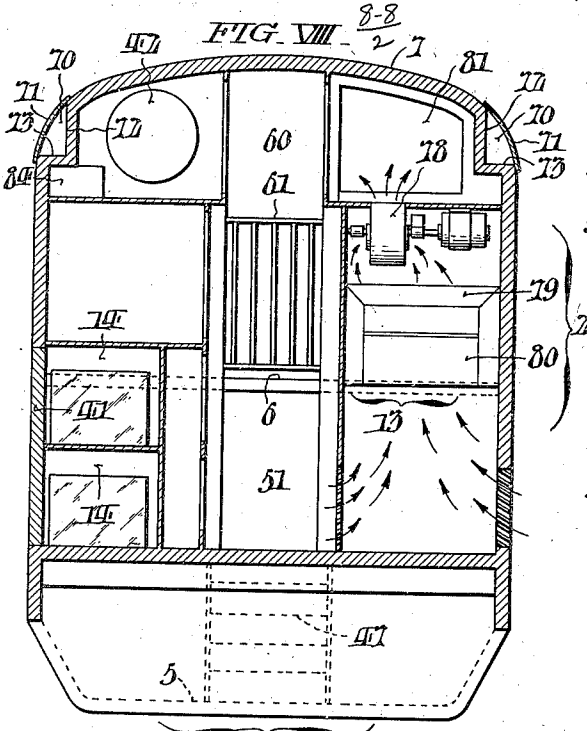
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DOUBLE DECK SLEEPING CAR

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5 Sheets-Sheet 4



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FIG. VI

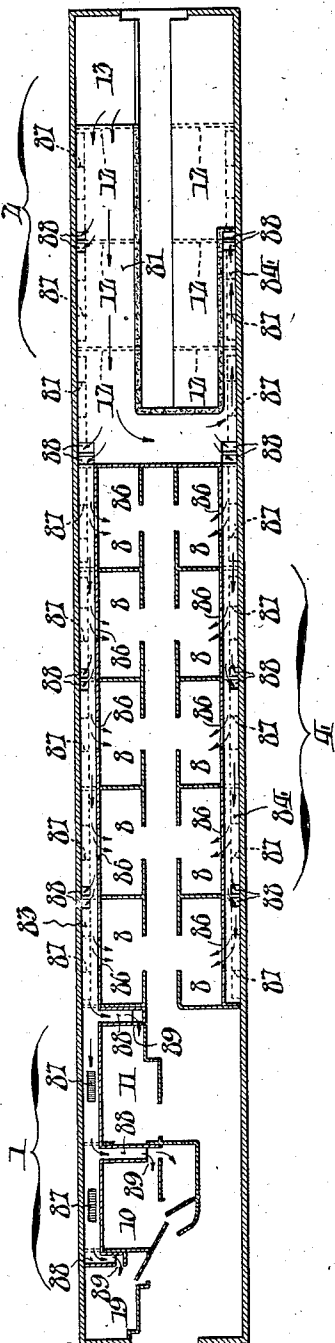
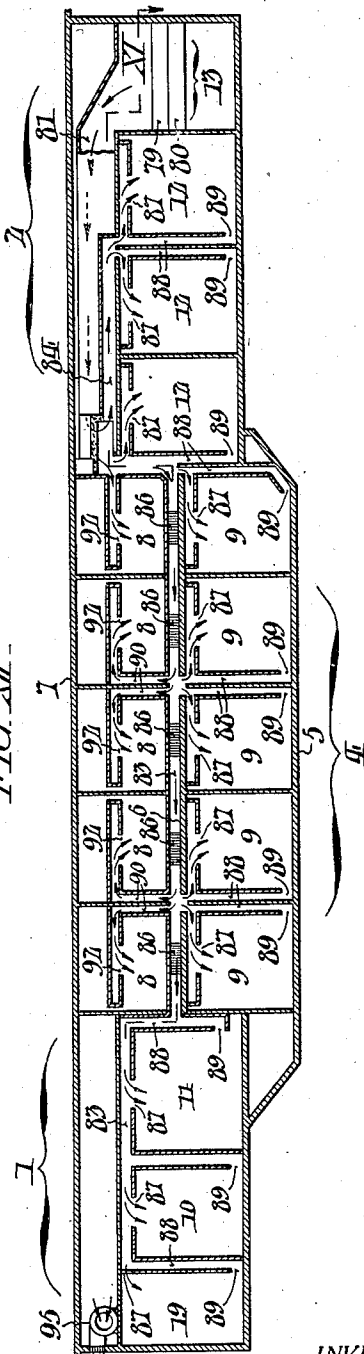


FIG. VII



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# UNITED STATES PATENT OFFICE

2,143,827

## DOUBLE DECK SLEEPING CAR

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Application June 4, 1937, Serial No. 146,340

14 Claims. (Cl. 104—340)

My invention relates generally to double deck railway cars and more specifically to double deck sleeping cars.

There have been in the past a number of proposals for getting away from the cramped upper berth which is now in use in railway sleeping cars. But none of these proposals has been sufficiently practical to eliminate the unpopular upper berth which is still in general use on the railways of the country. There is only a limited space on railway cars available for division into separate sleeping compartments and the problem is largely a matter of arrangement within the limits set by the clearance diagrams. A well section between trucks is a step forward but the practical solution requires further re-arrangement to take full advantage of the added space from the central well section. Another difficulty which is related to internal arrangement is the ventilation and air-conditioning requirements. When the usual clerestory form is abandoned to give further space at the top of the car, the ventilation system must be re-designed to take care of the absence of the usual ventilating openings of the clerestory.

My invention is directly concerned with the internal arrangement of a double deck sleeping car, having a central well section to provide, in a practical manner, upper and lower sleeping compartments which will be equally desirable. I have designed the compartment layout to take full advantage of the limited space available giving equal consideration to both upper and lower compartments. I have devised a compartment having great practical advantage over what is now shown in the art by working together a number of features which, in combination, provide a compartment much superior to either the present upper or lower berth, each compartment being equipped with individual toilet and lavatory facilities.

Therefore, the principal object of my invention is the provision of a well-lighted, well-ventilated sleeping compartment in a double deck railway car which has sufficient head room and does not cramp the occupant. A further object is to provide upper and lower compartments which are of equal desirability. A further object is to provide a practical way of eliminating the unpopular upper berth. Still further advantages will become apparent from the following detailed description of a preferred embodiment of my invention, reference being had to the accompanying drawings.

Fig. I of the drawings is a side elevation of a railway car embodying my invention.

Fig. II is a longitudinal sectional view of a railway car, taken as indicated by the arrows II—II in Figs. III and IV.

Fig. III is a horizontal plan sectional view of the upper deck of the car, taken as indicated by the arrows III—III in Fig. II.

Fig. IV is a view similar to Fig. III showing the lower deck of the car, taken as indicated by the arrows IV—IV in Fig. II.

Fig. V is a fragmentary staggered plan section, drawn to a larger scale and taken as indicated by the arrows V—V in Figs. VI and VII.

Fig. VI is a transverse vertical sectional view of the car, taken as indicated by the arrows VI—VI in Fig. II.

Fig. VII is a view similar to Fig. VI viewed from the opposite direction as indicated by the arrows VII—VII in Fig. II.

Fig. VIII is a view similar to Fig. VI taken as indicated by the arrows VIII—VIII in Fig. II.

Fig. IX is a view similar to Fig. VI taken as indicated by the arrows IX—IX in Fig. II.

Fig. X is a longitudinal section taken as indicated by the arrows X—X in Fig. VI.

Fig. XI is a diagrammatic plan section of the ducts for conveying the cool and heated air to the various parts of the car.

Fig. XII is a diagrammatic longitudinal sectional view of the ducts enclosed in a railway car.

Fig. XIII is a local plan section of that portion of the car enclosed in the dotted rectangle.

For the purpose of a detailed description, the car shown in Fig. I may be resolved analytically into the following component parts: end sections 1 and 2 over trucks 3, a central well section 4 between the trucks 3, a lower deck 5 at the bottom of the well section 4, an upper deck 6 midway between the lower deck 5 and roof 7 of the car, upper compartments 8, lower compartments 9 and end compartments 10, 11 and 12.

The end sections 1 and 2 are complementary in that section 1 is designed as the access end, while section 2 is designed primarily for compartment space and space for air conditioning equipment 13 and a battery locker 14 with only a narrow communicating passageway 16. End section 1 is therefore equipped with side doors 17 which are omitted in end section 2. A passageway 18 is provided in end section 1 and in the illustrated example two end compartments 10 and 11 are provided. A general or public lavatory 19 is fitted into a corner of the car adjacent the compartment 10 without impairing the size of the passageway 18.

Opposite the lavatory 19 is a small luggage locker 20. The size and arrangement of compartments 10 and 11 provide sufficient space for the passageway 18 as shown. The space available permits compartment 10 to be much larger than the other compartments and hence this compartment 10 is fitted to be a sort of deluxe compartment. A sliding partition 15 is provided between compartments 10 and 11 as indicated in the drawings, which permits the conversion of separate compartments 10 and 11 into a single large compartment or drawing room. This partition 15 is in two sections and slides into a pocket located in the lavatory wall of compartment 10 as shown in detail in Fig. XIII. The compartment 10 is equipped with a transverse seat 21 convertible into a bed and a toilet 22 and lavatory facilities enclosed in a separate compartment in the main compartment 10. A folding basin 23 is provided over the toilet 22. This basin 23 is of the type that discharges its contents on being folded up into a waste pipe as shown more clearly in Fig. X. While the type of folding basin shown in the drawings is very handy, obviously other types may be used satisfactorily in accordance with my invention. The lavatory 19 is equipped with a toilet 22 and a basin 24. Swinging doors are provided, as shown, for the compartment 10, lavatory 19, luggage locker 20 and to the passageway 18 for communication to vestibule 25. A watercooler 30 and porter's seat 31 are fitted into the passageway 18 without interfering with its width requirements. Compartment 11 is not so spacious as compartment 10 because of the space requirements of stairways 32 and 33 to the lower and upper decks 5 and 6 respectively. Compartment 11 is equipped with seats 21 and toilet 22 and basin 23. The upper part of end section 1 is utilized for water supply tanks 34 and linen lockers 35.

End section 2 has a central passageway 16 with compartments 12 opening off to each side. Space is provided at the end of the car for air conditioning equipment 13 and a battery locker 14 which has doors 41 for access from outside the car. Space over compartments 12 is utilized for air reservoirs 42 for powerbrake system and also for water pressure system and for air conditioning ducts which will be described below. Each compartment 12 is provided with a seat 21, a narrower seat 43, a toilet 22, a folding basin 23 and a shoe box 44 which is accessible from the passageway 16 through a door provided for that purpose.

The transversely positioned seat 21 and its mate 43 face each other and may be converted into a bed. In order to provide toilet and lavatory facilities, seat 43 is narrower than seat 21. This arrangement permits the use of a "kidney mattress", in which case the toilet 22 is accessible without mattress interference when the bed is made up, or an ordinary mattress may be used, in which case the end of the mattress must be lifted for access to the toilet 22. The details of the seats 21 and 43 are omitted for clarity because their construction and operation are well known to the art. A mattress 45 is housed in a mattress locker 46 formed in the end wall of the compartment 12 opposite the toilet 22.

Each compartment 12 has a sliding door as indicated in the drawings, which avoids obstruction of passageway 16 by opened doors. Passageway 16 leads down to lower deck 5 by means of stairway 47 which is provided with hand rails 48, as are stairways 32 and 33. Windows 49 all on the same level are provided for the compartments 10, 11 and 12.

The lower deck 5 extends down into the well section 4 between the trucks 3 and is accessible from the two end sections 1 and 2 by means of stairways 32 and 47. The compartments 9 on the lower deck 5 are arranged in two rows separated by a central passageway 51 in substantially the same way as compartments 12 described above including the arrangement of seats and toilet, and this description need not be repeated. Compartments 9 are lighted by windows 53. There is, however, one slight difference: viz., the space for a common waste pipe 50 from the upper deck 6. The folding basins 23 in compartments 9 are attached to this common waste pipe 50 which is housed between the walls of adjacent compartments 9. When the basin 23 is swung up, the water contained in it flows into the common waste pipe 50 and the basin 23 is then ready for use when swung down again.

The upper deck 6 is reached by the stairway 33 at the access end of the car only. The stairway 33 leads to a central passageway 60 which runs the length of the upper deck 6. At the end of the passageway 60 from the stairway 33, a gate 61 is provided to prevent passengers from falling. This passageway 60 is thus open at both ends in case of emergency and to aid ventilation. A balustrade 62 is provided at the side of the passageway 60 where the stairway 33 connects with the passageway 60. The two stairways 32 and 33 are placed side by side and the upper deck 6 is cut away sufficiently to provide ample head room for the stairway 32. It is this cut-away portion which requires the balustrade 62 on the upper passageway 60.

The compartments 8, lighted by windows 54, are arranged on each side of the passageway 60 and are provided with sliding doors as shown. Instead of transversely positioned seats, these compartments 8 are provided with a longitudinally extending seat 63 adjacent to the side of the car. A hinged section 65 is attached to this seat 63 at the end away from a toilet 22. When not in use, section 65 is hinged back under seat 63 as shown in Fig. VII. By swinging this section 65 up, a bed is provided to receive the "kidney mattress" 45 which is wider at one end, or a mattress of ordinary form. This mattress 45 is housed in a mattress locker 46 in an end wall of the compartment away from the toilet 22. These compartments 8 are also equipped with shoe boxes 44 accessible from without the compartment 8, toilets 22 and folding wash basins 23. A common waste pipe 50 serves two adjacent compartments 8 and the toilets 22 and basins 23 are positioned accordingly. Branch waste pipes 52 serve to connect the two toilets 22 to the common waste pipe 50. The hot and cold water supply for each compartment comes from pipes 68 (see Fig. X) which are connected to main supply pipes in the conduit 70, the pipes 68 being positioned between the end walls of adjacent compartments 8.

This conduit 70 also carries electrical wiring, brake, signal, water and steam pipes (comprehensively designated as 74) which are ordinarily run under a car. In this case, the well section 4 interferes with brake transmission lines and it was necessary to find another way of taking care of these lines. The conduit 70 has a removable cover 71 making access to the conduit 70 from the outside an easy matter. This cover 71 is outwardly curved to provide interior space and conform to the contour of the car. The inside portion of the conduit 70 is formed by vertical

and horizontal surfaces 72 and 73 to keep the wires and pipes 74 firmly in place as originally arranged.

Of great practical importance in the success of a car of this type, is the ventilation and air conditioning. In the old upper and lower berth arrangement, the car was to a considerable extent open throughout and ventilation of the car as a whole was possible. In my invention, the small separate compartments must be positively ventilated and conditioned individually. This I have worked out practically by using main ducts for both cooled and heated air and separate distribution ducts for cooled and for the heated air. Each compartment therefore has a separate louvre for cooled and for heated air, the former being placed in the upper part of the compartment and the latter in the lower part. Thus the cooled air sinks down and the heated air rises, insuring good distribution throughout.

The air conditioning unit 13 is placed in end section 2 at the end of the car. A blower 76, heating unit 79 and cooling unit 80 of any well-known type may be installed as in Fig. VIII.

In the air conditioning system a discharge duct 81 leads from the air conditioning unit 13 over the compartments 12 in end section 2, to the well section 4, where the discharge duct 81 branches into main ducts 83 and 84 running down each side of the well section 4. Main duct 83 extends into end section 1 to supply compartments 10, 11 and lavatory 19; main duct 84 extends into end section 2 to supply compartments 12. These main ducts 83 and 84 run along the upper side of upper deck 6 in the well section 4 and where they are extended into end sections 1 and 2, these ducts 83 and 84 are positioned over the compartments in the end sections 1 and 2. The ducts 83 and 84 have a louvre 86 for each compartment 8 for the discharge of heated air. In the end sections 1 and 2, and in compartments 9 on the lower deck 5 ducts 83 and 84 discharge into the upper portions of the compartments through louvres 87 in each compartment, louvres 87 being for the discharge of cooled air. For the sake of clarity the details of the louvres have been omitted in the drawings but they may be of any type which opens and closes. For the distribution of heated air into the compartments in end sections 1 and 2 and on lower deck 5, additional distribution ducts 88 are provided leading to the lower parts of those compartments, discharging through louvres 89. Similar distribution ducts 90 lead the air from main ducts 83 and 84 to the upper part of compartments 8 on upper deck 6 where cool air is discharged through louvres 92. These distribution ducts 88 and 90 are conveniently positioned in the mattress lockers 46, thus providing large duct areas without projecting the ducts 88 and 90 into the compartments. Similarly the main ducts 83 and 84 are positioned underneath the longitudinal seats 63 in the upper compartments 8. A conventional exhaust blower 95 is shown in Fig. XII for discharging a portion of the vitiated air but any other efficient form of exhaust means may be conveniently adopted in the practice of my invention. The exhaust blower 95 is desirably positioned above the ceiling in end section 1 and it functions to withdraw air from the passageways of the car and from the individual compartments. As indicated in Fig. VIII, part of the air in the car is re-circulated returning through the passageways to the space beneath the cooling unit 80.

The operation of this air conditioning system

causes heated air to be distributed at the bottom of all of the compartments of the car and cooled air to be distributed at the tops of the compartments. When heated air is being distributed, louvres 87 and 92 are all closed and the heated air is discharged from opened louvres 86 and 89. When cooled air is being distributed, louvres 86 and 89 are closed and louvres 87 and 92 are opened. In this way an efficient distribution of the air conditioning is effected and each individual compartment in the car is ventilated. Thus my invention provides a practical way of eliminating the upper and lower berth arrangement now in use in sleeping cars and makes all compartments of equal desirability, with the exception of one large compartment which is the most roomy in the car.

While I have described the above embodiment of my invention in some detail, it will be obvious to those skilled in the art that various changes and modifications can be made without departing from the spirit of the invention as hereinafter claimed.

Having thus described my invention, I claim:

1. In a double deck railway car, a compartment having a seat which has capacity for formation into a bed of varying width, and a toilet positioned at the narrower end of said bed, said toilet being of a height substantially equal to the height of said bed.
2. In a double deck railway car, a compartment having oppositely disposed seats, one of said seats being narrower than the other, and a toilet positioned adjacent the narrower seat, said seats having capacity for arrangement into a bed having a greater width at the end thereof away from the toilet, permitting unrestricted access to the toilet, said toilet being of a height substantially equal to the height of said bed.
3. In a double deck railway car, a compartment having a seat which has capacity for formation into a bed of varying width, a toilet positioned at the narrower end of said bed, said toilet being of a height substantially equal to the height of said bed, and a mattress substantially fitting said bed housed in a locker within said compartment.
4. In a double deck railway car, a compartment having oppositely disposed seats, one of said seats being narrower than the other, a toilet positioned adjacent the narrower seat, said toilet being substantially of the same height as said seats, said seats having capacity for arrangement into a bed having a greater width at one end than at the other end, and a mattress substantially fitting said bed, said mattress being housed in a locker when not in use.
5. The invention of claim 2, characterized further by the fact that a mattress substantially fitting said bed is housed in a locker at the end of the compartment away from said toilet, and that the pipes and equipment associated with said toilet are housed in a space behind the wall adjacent said toilet.
6. In a double deck railway car, a compartment having a seat of a length proper for a bed, means for laterally extending a portion of said seat to provide a bed of greater width at one end, and a toilet positioned at the narrower end of said bed, said toilet being of a height substantially equal to the height of said bed.
7. In a double deck railway car, a compartment having a seat of a length proper for a bed, hinged means for laterally extending a portion of said seat to provide a bed of greater width



at one end, a toilet positioned at the narrower end of said bed, said toilet being of a height substantially equal to the height of said bed, and a mattress substantially fitting said bed and housed in a locker when not in use.

8. In a compartment on the upper deck of a two deck railway car, a seat of a length proper for a bed, hinged means for laterally extending a portion of said seat to provide a bed of greater width at one end, a toilet positioned at the narrower end of said bed, said toilet being of a height substantially equal to the height of said bed, a mattress locker formed in an end wall of said compartment, a mattress substantially fitting said bed and housed in said locker when not in use, and a longitudinal conduit at the upper outside corner of said compartment for brake pipes, wiring and the like, said conduit having a removable outside cover and being accessible from the outside of said car.

9. The invention of claim 8 characterized by the further fact that said conduit is formed by vertical and horizontal walls joined by said removable cover which is outwardly curved.

10. In a double deck railway car, a compartment, a seat in said compartment having capacity for formation into a bed, a toilet positioned at one end of said compartment, said toilet being substantially of the same height as said seat, said bed being narrowed at the end near said toilet, and a folding basin over said toilet.

11. The invention of claim 10 characterized further by the fact that said basin is of the hinged type and discharges into the same waste pipe with said toilet when the basin is folded up after use.

12. In a double deck railway car, a plurality of upper and lower sleeping compartments having beds and toilets therein, said beds being narrower at one end and said toilets being positioned adjacent said narrowed ends of said beds, a common waste pipe extending between adjacent upper compartments and between corresponding adjacent lower compartments, said toilets in said upper compartments being connected to said common waste pipe, and wash basins in each compartment discharging into said common waste pipe.

13. In a double deck railway car, a plurality of upper and lower sleeping compartments arranged in two rows with an intervening passageway, said car extending downward between the trucks at each end thereof to provide a well section, a bed in each said sleeping compartment having a narrowed end, a toilet substantially of the same height as said bed and positioned adjacent said narrowed end, an upper deck extending the length of said well section, windows above and below said upper deck opening into said upper and lower compartments, said upper and lower compartments being of substantially equal height, a sliding door for each of said compartments and side entrance doors to said car at only one end thereof.

14. The invention of claim 13 characterized further by the fact that the roof of said car is rounded out and the usual clerestory eliminated and the lower portion of said well section is inclined inward in accordance with the clearance diagram for said car.

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