June 9, 1942. J. LEDWINKA ET AL 2,285,933

DOUBLE DECK RAIL CAR

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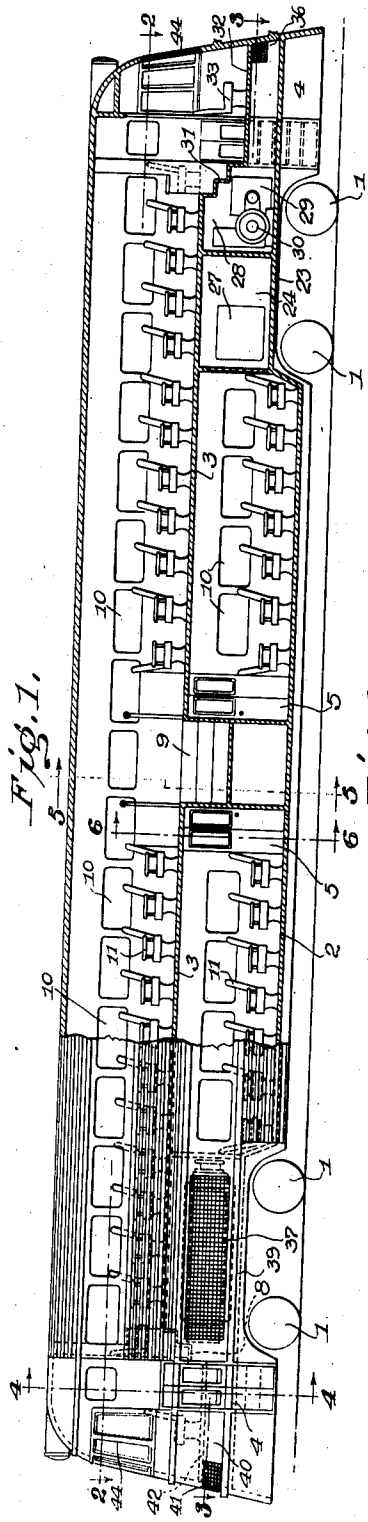

Fig. 1.

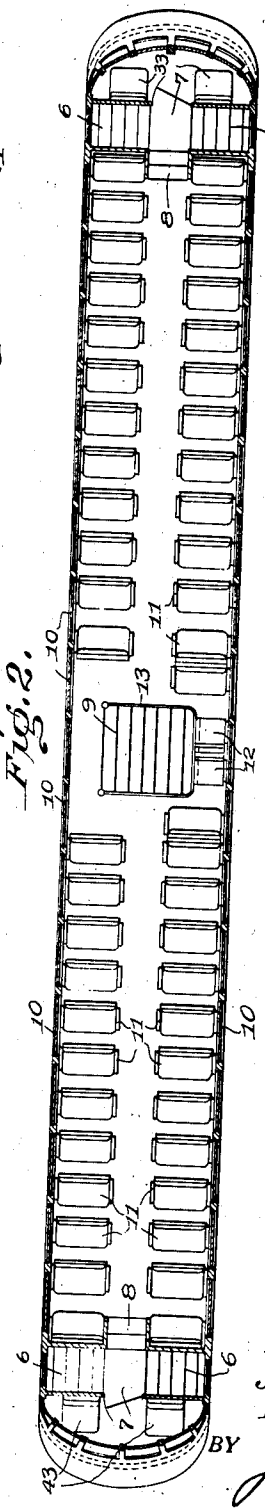

Fig. 2.

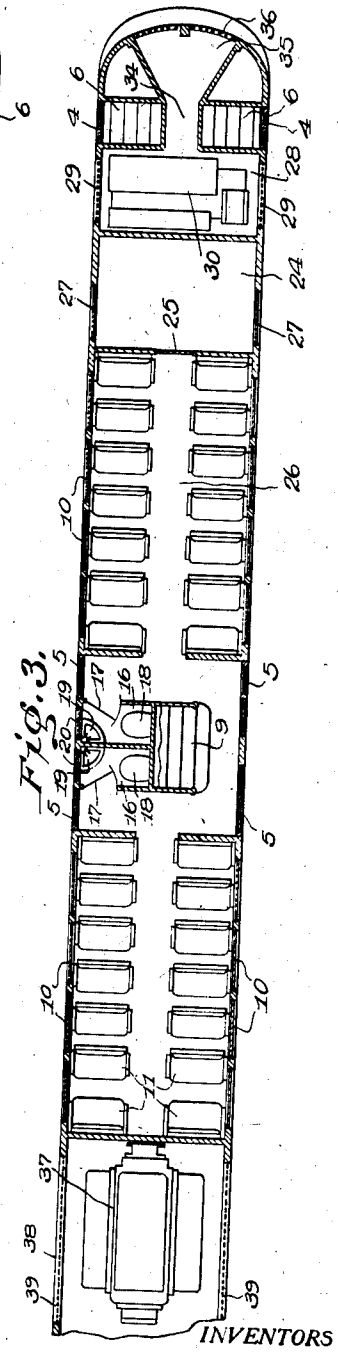

Fig. 3.

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Fig. 4.

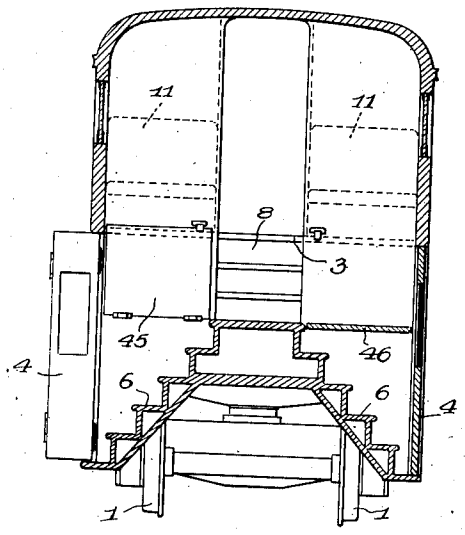


Fig. 5.

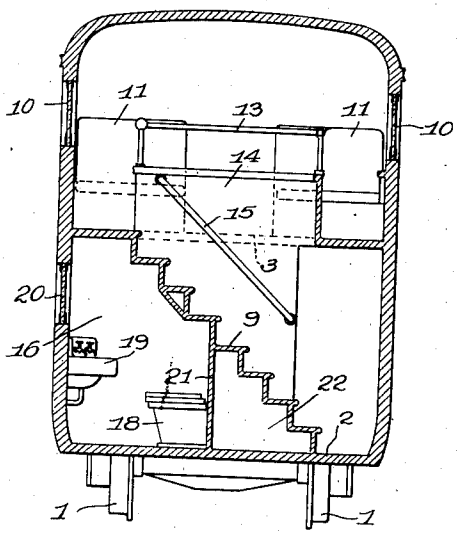
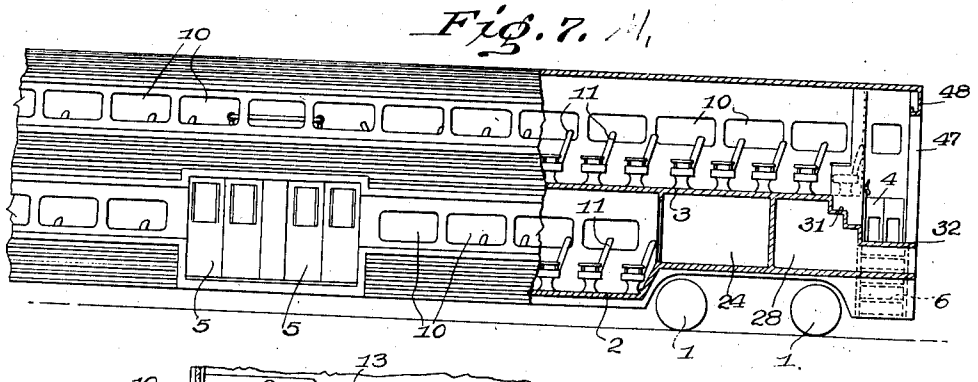


Fig. 7.



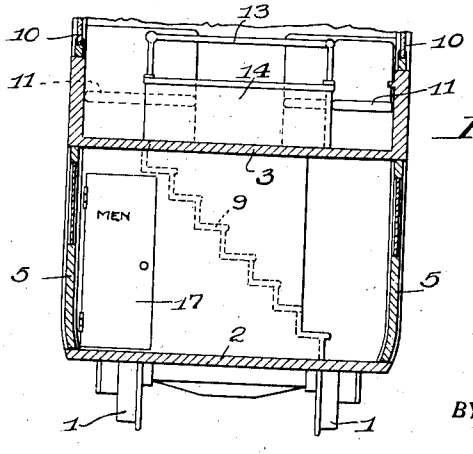


Fig. 6.

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DOUBLE DECK RAIL CAR

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Application June 5, 1940, Serial No. 338,887

10 Claims. (Cl. 105—340)

The present invention relates to railway cars.

Specifically, it concerns a novel arrangement of seats, compartments, machinery, etc., in a vehicle of the double-deck type, whereby an increased number of passengers may be accommodated in comfort and wherein the available space is utilized to good advantage.

The invention includes in part providing an upper deck extending substantially throughout the entire length of the car at one uniform level, together with a lower deck occupying the portion of the car between the inner ends of the wheel trucks, said lower deck having its floor at a level considerably below the level of the tops of the wheels.

Entrances may be provided at a convenient level at the center and at each end of the car, and stairways within the vehicle provide means for giving access to any part thereof.

Other features and advantages of the invention will be clear from the present specification and the drawings accompanying the same and forming a part thereof, wherein one preferred form of the invention is disclosed, together with a slightly modified embodiment thereof.

In said drawings:

Fig. 1 is a diagrammatic side elevation, partly broken away and in central longitudinal section, of a railway car embodying the invention;

Fig. 2 is a diagrammatic sectional plan view thereof, the section being made on the horizontal plane indicated by the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary diagrammatic sectional plan view of the same, one end being broken away and the section being made on the horizontal plane indicated by the line 3—3 of Fig. 1;

Fig. 4 is a diagrammatic cross sectional elevation on an enlarged scale, made on the plane indicated by the line 4—4 of Fig. 1;

Fig. 5 is a similar section made on the plane indicated by the line 5—5 of Fig. 1;

Fig. 6 is a similar section made on the plane indicated by the line 6—6 of Fig. 1 and partly broken away; and

Fig. 7 is a diagrammatic fragmentary side elevation, partly in central longitudinal section, of a slightly modified form of car.

In all the figures, similar elements are indicated by the same reference characters.

Referring first to the form illustrated in Figs. 1 to 6, it will be noted that the car is mounted on the wheels 1 and has two decks therein, namely a lower deck 2 occupying the central portion of the car between the innermost wheels, and an upper deck 3 extending substantially throughout the entire length of the car. Doors 4 are provided at each end of the car, as shown, and additional doors 5 are located in the central portion of the car so as to provide a relatively large area for receiving and discharging passengers at stops.

Stairways 6 are located adjacent the doors 4 to give access to the upper deck 3. These stairs lead to an intermediate platform 7 from which other stairs 8, at right angles to the stairs 6, lead to the upper deck 3. At the center of the car the doors 5 give direct access to the deck 2 at the level thereof, and in addition provide access to the upper deck 3 by means of the stairway 9 which connects the two levels.

Suitable windows 10 are provided at a convenient level above each deck, and a suitable number of seats is located wherever space is available for the same, on each deck. For example, in Fig. 2 two groups, each comprising twelve double seats 11, are arranged along one side of the car and two groups of thirteen double seats each are arranged along the other side, these seats occupying most of the available space on the upper deck. Over the low end of the stairway 9 two single seats 12 may be provided on the upper deck in addition to the said double seats.

A suitable protection such as a railing 13 may surround the stair well, as indicated in Figs. 2, 5 and 6. There may be a solid panel below said railing, as indicated at 14, if desired, to afford further protection, and a suitable hand rail 15 may be arranged as shown in Fig. 5.

The space underneath the central stairway 9 may be used for any desired purpose, for example, for toilets as indicated in Figs. 3, 5 and 6, each toilet 16 being equipped with a suitable door 17 and window 20, and provided with a seat 18 and wash stand 19. A partition 21, here forming a continuation of the riser of the fifth step, may be placed as shown in Fig. 5 to constitute one of the walls of the toilet, thus leaving a space 22 under the first four steps which may be used for any purpose, such as for the storage of supplies, or for housing some of the equipment of the car.

Referring now to the right hand end of Fig. 1, it will be seen that there is an additional floor 23 located at a level slightly above that of the wheel trucks and that a compartment 24 is provided thereon and extends entirely across the car, as shown in Fig. 3. This compartment affords storage space for luggage or the like and may have a door 25 opening into the center aisle 26 of the lower deck. Such compartment may if desired have a large window 27, at each end thereof, as indicated in Figs. 1 and 3.

Immediately in front of the compartment 24 is a further compartment 28, likewise extending across the car and having suitable preferably removable louvres or grilles such as 29 at its ends to give access to its interior and provide ventilation, the compartment 28 serving to house cer-

tain equipment of the car, here shown as air conditioning means 30, although it will be understood that other equipment may be housed therein if desired.

A stairway 31 leading from the upper deck to a further floor 32, somewhat above the floor 23, forms at the same time a portion of the enclosing wall of compartment 28. On the floor or platform 32 may be located additional seats 33 for any desired use, either to accommodate passengers or train crew, as may be expedient.

An air passage 34 having a tapered end portion 35, opening at the end of the car and covered by a suitable grille 36 or the like, provides a protected opening for air to serve the apparatus 30 in the compartment 28. It is clear that the direction of air flow through the screens 29 and 36 will depend upon the direction of motion of the car, and that for instance in the example illustrated, the air will enter at 29 and leave at 36.

Motive power for the car may be provided by the power plant 37, which may consist of an electric motor or a Diesel engine, according to need. In order to economize space, when a Diesel engine is used, said engine may advantageously be of the horizontal cylinder type. The compartment 38 for housing said power plant may be located on the floor 39 at one end of the car and at a level slightly above that of the top of the corresponding wheel truck. This compartment preferably extends entirely across the car and has large side openings for cooling air, covered by suitable screens or grilles 39.

An air intake passage 40 communicates with the compartment 38 and opens at the front of the car, with a suitable screen 41 protecting its said opening. It will be noted that this passage 40 is defined between the floor 39 and a second floor 42 a short distance above the other floor, and that the bottom of the stairway 8 also forms a part of the wall or ceiling of said passage 40 and chamber 38.

Seats for the use of the operator of the vehicle may be located on the floor 42, as shown at 43 for example. Suitable windows 44 will be provided at the ends of the car, and it is of course obvious that the mechanical and electrical features of the car may be arranged in the customary way to make it possible to operate the car from either end.

Referring now to Fig. 4, trap doors 45 and 46 have been shown above the stairways 6. The trap door 45 is shown in the open position, in which position it is possible for patrons to enter through the opened doorway controlled by the door 4 and pass up or down the corresponding stairway 6 and the connecting stairway 8, while passage to the other stairway 6, whose door 4 is closed, is barred by the closed trap door 46. In this way confusion of the passengers is prevented, as they can use only the stairway on the open side of the car. Of course where there is a loading platform at both sides of the car, both trap doors and both doors 4 may be opened simultaneously, to afford greater speed of loading and unloading.

The car described hereinabove is primarily suited for operation as a single unit. When it is desired to entrain two or more cars, it will be preferable to embody a slight modification in the design, which may then be constructed as illustrated in Fig. 7.

It will be seen that here the car has a flat vertical rear end wall 48 having an opening 47 therein, which will aline with a similar opening in the adjacent car entrained therewith, thus making it possible for passengers and crew to pass from one car to another. Obviously the remaining end of the car shown in Fig. 7 may be either like the one illustrated at 48, or like one of the ends of the car shown in Fig. 1, depending upon whether the car is to be placed at an end of a train or between two other cars thereof. In other respects the car shown in Fig. 7 may be substantially identical with the form described in the preceding figures.

The operation of the invention will be understood from the structures described, and may be briefly summarized as follows:

The car is driven by the power plant 37, under the control of an operator at one end of the car and access to all the seats may be had by means of the central doors 5 and the end doors 4, in combination with the stairways and aisles.

By proper manipulation of the trap doors 45 and 46 the passengers may be guided automatically to the correct doors at stations. The seats on the lower deck may be used for some particular purpose, for example, smoking may be permitted on the lower deck and prohibited elsewhere in the car, if it is thought desirable. The toilets are located centrally in the car and are readily accessible. The spaces over the trucks, where only a single deck of adequate height for the accommodation of passengers can be placed, provides sufficient room for compartments of lower height for housing the power plant, air conditioning mechanism, and the like, and for the storage of luggage or supplies.

It will thus be seen that the present car has many advantages over the conventional single deck car at present in general use, namely it has increased seating capacity, provides a separate section of the car which may be used to accommodate smokers, and has ample room for the necessary machinery and equipment, while at the same time maintaining a pleasing appearance and providing ample facilities for rapid loading and unloading.

While a preferred form of the invention has been disclosed herein, together with a slightly modified form thereof, it should be understood clearly that the precise structures illustrated and described are highly diagrammatic and are given solely in an illustrative sense, as distinguished from a restrictive one. Numerous alterations, additions and omissions may be made therein without departing from the invention, which is defined solely in the following claims.

We claim:

1. A railway car having a wheel truck near each end thereof, said car having therein an elevated floor extending substantially the length of the car and a depressed floor, said elevated floor having a fixed walkway throughout its length the major portions of which constitute elements of a center aisle, said depressed floor being substantially below the level of the tops of the wheels and extending throughout the distance between the trucks, an intermediate floor in each end of the car at a level only slightly above the tops of the wheels and extending substantially throughout the length of the corresponding wheel truck, said car having an entrance at each end, means leading from said entrance to the elevated floor, a stairway within the car, providing access between the elevated and depressed floors, and a central entrance providing direct access to the depressed floor.

2. A railway car having a wheel truck near

each end thereof, said car having therein an elevated floor and a depressed floor, said depressed floor being substantially below the level of the tops of the wheels and extending throughout the distance between the trucks, an intermediate floor in each end of the car at a level only slightly above the tops of the wheels and extending substantially throughout the length of the corresponding wheel truck, a service mechanism compartment structure between the elevated floor and each intermediate floor, said car having an entrance at each end, means leading from said entrance to the elevated floor, a plurality of seats mounted on said upper floor and extending along the sides of the car thereby forming center aisles, a fixed central stairway within the car, providing access between the elevated and depressed floors, and a central entrance providing direct access to said fixed stairway and to the depressed floor.

3. A railway car having a wheel truck near each end thereof, said car having therein an elevated floor and a depressed floor, said depressed floor being substantially below the level of the tops of the wheels and extending throughout the distance between the trucks, an intermediate floor in each end of the car at a level only slightly above the tops of the wheels and extending substantially throughout the length of the corresponding wheel truck, there being a compartment formed between the elevated floor and each intermediate floor, means providing an air passage at each end of the car, leading to such compartment, said car having an entrance at each end, stairs leading from said entrance to the elevated floor, a plurality of seats mounted on said upper floor and extending along the sides of the car, a stairway within the car, providing access between the elevated and depressed floors, and a central entrance providing direct access to the depressed floor.

4. A railway car having a wheel truck near each end thereof, said car having therein an upper floor and a lower floor, said lower floor being substantially below the level of the tops of the wheels and extending throughout the distance between the trucks, said car having an entrance at each side at each end, a plurality of stairways and landings intermediate certain of the stairways leading from said entrances to the said upper floor, means for increasing the areas of said landings and preventing access to selected of said stairways accordingly as said entrances are to be utilized, a plurality of seats mounted on each floor and extending along the sides of the car, a stairway within the car, providing access between the upper and lower floors, and a central entrance providing direct access to the lower floor, the first-named stairs comprising flights at right angles to one another, with an interposed landing.

5. A railway car having a wheel truck near each end thereof, said car having therein an upper floor and a lower floor, said lower floor being substantially below the level of the tops of the wheels and extending throughout the distance between the trucks, said car having an entrance at each side at each end, means including stairways leading from said entrances to the said upper floor, means for preventing access to selected of said stairways accordingly as said entrances are to be utilized, a plurality of seats mounted on each floor and extending along the sides of the car, a substantially centrally located stairway within the car, providing access between the upper and lower floors, and a central entrance at each side of the car, providing direct access to the lower floor, and to the said last-named stairway.

6. A rail car comprising a pair of wheel trucks, a body including an upper floor, a lower floor between and below the level of said trucks, an intermediate floor over each truck, compartment means between said upper floor and each of said intermediate floors, a motor adjacent a car end housed in said compartment means, and air-passageway means communicating between the exterior of said end of the car body and each of said compartment means and between the outside of a side of said car body and said compartment means.

7. A rail car comprising a pair of wheel trucks, a body including an upper floor, a lower floor between and below the level of said trucks, an intermediate floor over each truck, compartment means between said upper floor and said intermediate floors, and structure providing flooring at a level between the levels of said upper and intermediate floors and including air-passageway means opening to the adjacent end of the car and communicating at its inner end with said compartment means, the compartment means having a passageway to the outside atmosphere through a side wall thereof.

8. In a double-deck rail car, an upper deck, extending substantially from end to end of the car, of full standing room height and affording a passenger accommodating space, a lower deck also of full standing room height extending between the wheels of spaced trucks supporting the car, intermediate decks at opposite ends of the car extending over the trucks, of less than full standing room height and serving as equipment compartments, doorways at the sides of the car adjacent at least one end thereof, stairways leading transversely from said doorways to a platform intermediate in height between the upper and intermediate deck and a further stairway leading from said platform to the upper deck.

9. In a double-deck rail car, an upper deck extending substantially from end to end of the car, of full standing room height and affording a passenger accommodating space, a lower deck extending between the wheels of spaced trucks supporting the car and also of full standing room height, and intermediate decks at opposite ends of the car extending over the trucks, of less than standing room height and serving as equipment compartments, and a stairway at each of the ends of the car leading to said upper deck and another stairway intermediate the ends extending between the upper and lower decks.

10. In a double-deck rail car, an upper deck extending substantially from end to end of the car, of full standing room height and affording a passenger accommodating space, a lower deck also of full standing room height extending between the wheels of spaced trucks supporting the car, intermediate decks extending over the trucks at the opposite ends of the car, of less than full standing room height and serving as equipment housing compartments, a doorway at each of the opposite ends of the car, and a stairway leading at least from the level of the bottom of said doorways to a platform at a level between the intermediate and upper decks, and a further stairway leading from said platform to the upper deck.

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