F. HEDLEY & J. S. DOYLE.

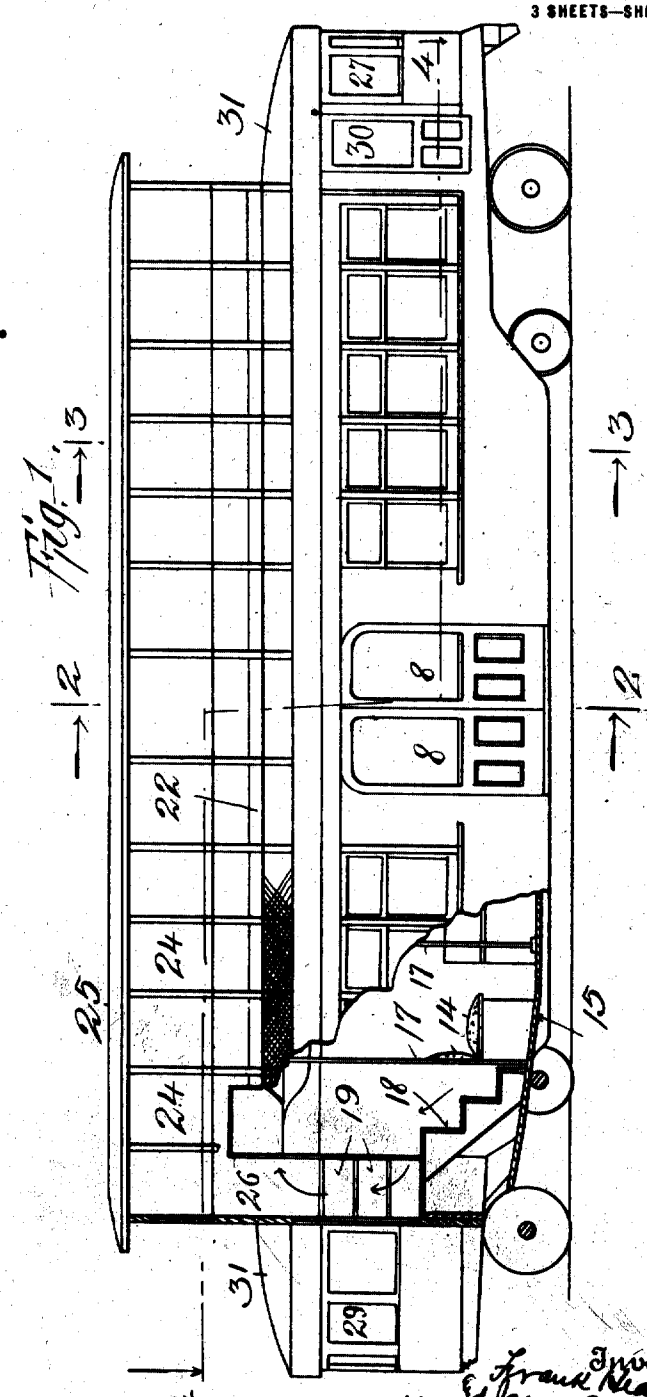
DOUBLE DECK CAR.

APPLICATION FILED JUNE 28, 1912.

1,217,174.

Patented Feb. 27, 1917.

3 SHEETS—SHEET 1.



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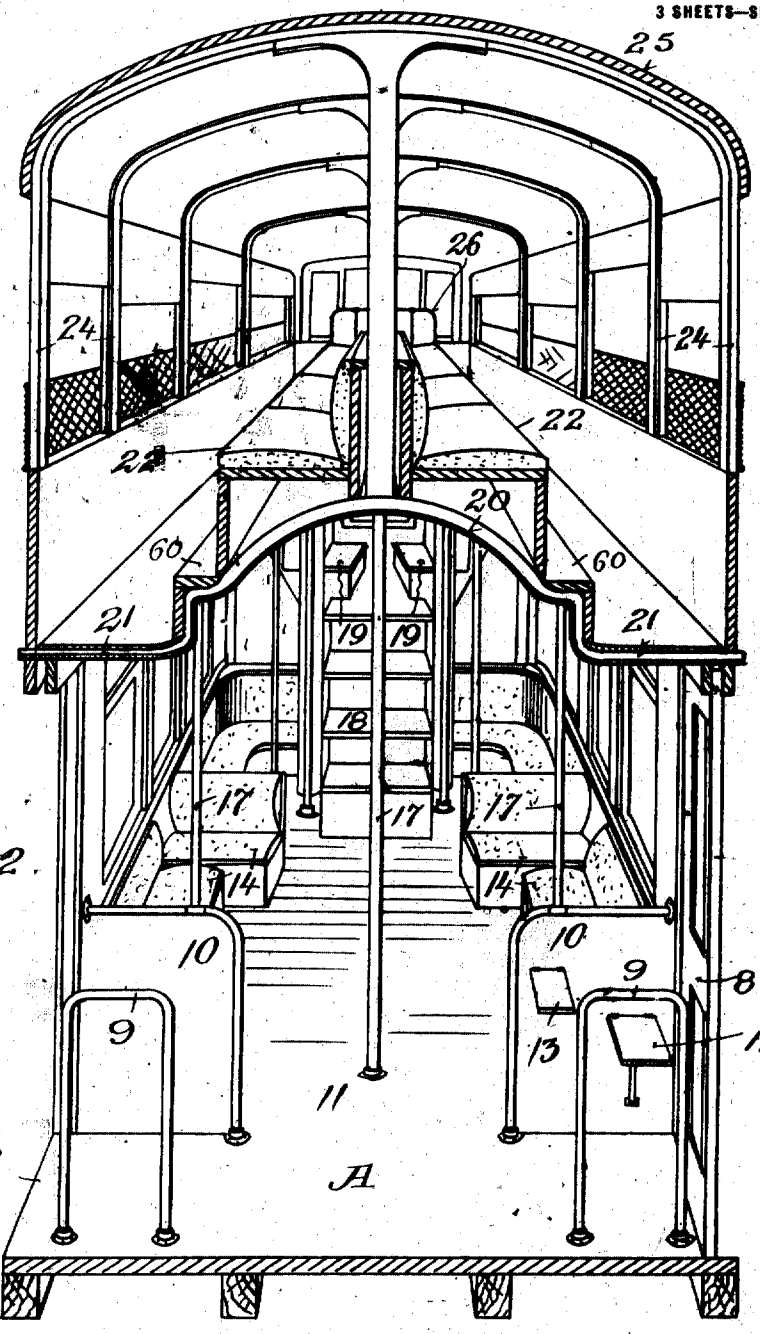


Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 4.

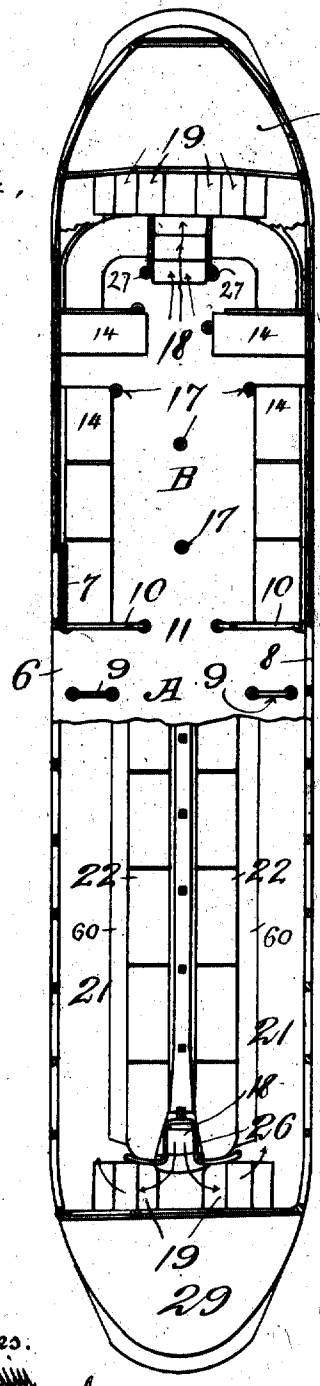
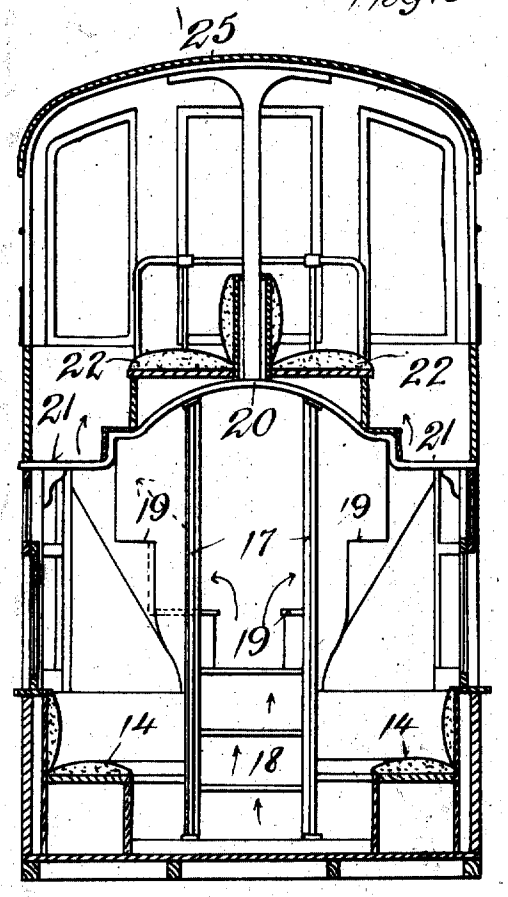


Fig. 3



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DOUBLE-DECK CAR.

1,217,174. Specification of Letters Patent. Patented Feb. 27, 1917.

Application filed June 28, 1912. Serial No. 706,320.

To all whom it may concern:

Be it known that we, FRANK HEDLEY and JAMES S. DOYLE, citizens of the United States, and residing, respectively, at Yonkers and Mount Vernon, in the county of Westchester, State of New York, have made a certain new and useful Invention in Double-Deck Cars, of which the following is a specification.

This invention relates to double-deck cars for handling passenger traffic.

The object of the invention is to provide means for increasing the facilities for handling passenger traffic in crowded streets of cities and the like, to increase the carrying capacity of passenger cars and to secure rapid transit as well as entrance and exit of passengers to and from street cars.

A further object of the invention is to provide a double deck car which offers the minimum amount of time and effort of passengers in ascending to or descending from the upper deck of the car.

A further object of the invention is to provide for the rapid and easy collection of fares from entering passengers, and to reduce the time scheduled of street car operation, while at the same time increasing the carrying capacity of the car.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claims.

Referring to the accompanying drawings, and to the various views and reference signs appearing thereon:

Figure 1 is a view in side elevation parts broken out and parts in central vertical section, showing a double-deck car embodying the principles of our invention.

Fig. 2 is a view in transverse section on the line 2, 2, Fig. 1, looking in the direction of the arrows.

Fig. 3 is a view in vertical transverse section on the line 3, 3, Fig. 1, looking in the direction of the arrows.

Fig. 4 is a horizontal sectional plane view on the planes indicated by the line 4, 4, Fig. 1, showing a portion of the plan of the upper as well as a portion of the plan of the lower deck of the car.

The same reference numeral is employed to designate the same part wherever it occurs throughout the several views.

The great problem of street car traffic, particularly in congested districts of cities, is to secure rapid transit with ease and comfort to the passengers carried, while insuring the collection of a fare from every passenger carried.

With the present type of street car structures, the limit of rapid transit has been attained. Any increase in the number of cars on the street increases correspondingly the street surface occupied, with the result that instead of securing rapid transit, the time schedules are decreased, and rapid transit is not secured.

The addition of trailers to the present type and construction of cars to afford carrying capacity for additional passengers, results also in a failure to attain rapid transit for the reason that each additional trailer or car added increases the street surface occupied which is not only objectionable but also particularly at street crossings interferes with traffic, causes delay by reason of the period of time consumed at the street crossings and required to effect the crossing, thereby blocking vehicles passing along intersecting streets.

It is among the special objects and purposes of our present invention to provide a construction and type of street car which increases the passenger carrying capacity without materially increasing the size or weight of the car, or the operating expense for the car, and to this end we propose to employ a double-deck car designed and intended to carry passengers on both decks thereof. In the type of double deck cars heretofore employed, the customary entry way for passengers boarding the car as well as exit ways for passengers desiring to leave the car, and to and from both decks of the car is located either at the front or the rear end of the car or sometimes at both ends, with the result that great congestion takes place by reason of the fact that all passengers leaving the car must leave before entering passengers are permitted to or can enter the car, the result is a congestion and delay of the schedule which it is exceedingly desirable to avoid. In carrying out our invention we propose to employ a double deck car having a floor on the lower deck at a

low level, that is, at a small height above the street level, so as to enable passengers when entering or leaving the car to step directly from the street surface into the car or from the car on to the street without employing steps for the purpose. We also propose to employ a center side entrance into the car at the lower deck of the car, and at a point intermediate the length of the car, and of sufficient extent and area to enable passengers to enter and leave the car through the side doorways thereof, at the same time and without interfering with each other, so that passengers may enter the car and the side doors closed, if desired, or if necessary, before the fares of all the entering passengers are collected to the end that the fares may be collected during the time the car is proceeding on its journey and before the next stopping point is reached. We also propose, in accordance with our invention, to provide a construction and arrangement of car, and of the lower deck thereof which provides a wide concourse at each end of the car or at opposite sides of the center entrance to the car, through which concourse passengers may distribute themselves and either remain on the lower deck, which is designed to be equipped and provided with convenient seats or to continue to the upper deck. We also propose to provide stairways leading from the lower deck to upper deck at each end of the car, so that passengers after passing the conductor or ticket seller at the entry point to the lower deck from the street, may proceed to the end, or to either end, of the car and then up the stairway to the upper deck. We also propose to construct the roof of the lower deck so as to form the floor of the upper deck section of the car and in such relation as to form archways over the concourse longitudinally through the lower deck of the car, which arch portion forms or constitutes the seating part of the upper deck of the car. On each side of the central arch portion of the roof of the lower deck, we provide lower horizontal sections directly over the seats of the lower deck and which constitute the floor or walking space for passengers on the upper deck. By utilizing a low level floor for the lower deck of the car so that passengers may step directly from the street level into the car body without employing side steps, and by gradually elevating or inclining the floor level of the lower deck of the car, so that the low level floor extends over the end trucks of the car without any interior steps, we are enabled to secure a minimum of height of the floor of the upper deck of the car, thereby minimizing the height to which passengers must climb while ascending to or descending from the upper deck, through the stairways at each end of the car.

vention will be more fully hereinafter described in the coöperative relation and arrangement thereof.

Referring particularly to the embodiments of our invention, as disclosed in the accompanying drawings, reference numeral 6, designates the entry-way located in the side and intermediate the ends of the car. In practice we propose to employ an entry way in each side of the car, and preferably arranged opposite each other, and each controlled by any suitable or convenient arrangement of doors.

We have indicated the entry way 6, as being open and controlled by doors shown in their open position 7, the doorway on the opposite side of the car being shown as closed by the door indicated at 8. It is obvious that any suitable or convenient type of door may be employed, that is either folding, sliding, or other suitable form adapted for the purpose, and, if desired, any suitable or convenient door operating or controlling mechanism may be employed for operating the doors.

Located approximately at the mid point of the width of the side doorway opening is a railing 9, arranged to extend transversely partially across the car body and dividing the entry-way into separate passages, while at the same time affording a convenient hand grip or rail for the use of passengers while entering or leaving the car. At each side of each doorway is located a railing 10, which is arranged also to extend transversely partially across the car body, and which, if desired, may be in the form of a panel, the passenger entry and exit spaces being provided between the center transverse railing 9, and the side panels 10. The side panels 10, extending toward each other from opposite sides of the car provide a passageway, indicated at 11, therebetween for passengers to pass into or toward the ends of the car after having paid their fare on entering, or through which passengers desiring to leave the car may pass. If desired, in order to accommodate the conductor, we propose to employ a hinge seat 12, upon one or another of the side panels 10, which may be folded down against the side of the panel when not required for use, or raised to position to form a seat for the conductor. We also propose to employ a shelf or bracket 13, hinged to one or another of the side panels 10, which is to be raised into position for use or swung down along the side of the panel when not required for use. With this arrangement a conductor is seated upon a seat 12, on one side of the car, with the table or platform 13, swung up into position to form a desk over which change may be made for entering passengers. Ordinarily the seat 12, and the desk or table 13, when in position

posite the doorway through which the passengers enter. As soon as all the passengers desiring to enter the car at any particular stop, or corner, attain the interior of the entry-way, the door controlling the doorway 6 is moved to closed position whether all of the passengers who have entered have paid their fares or not. The fares of those passengers occupying the space indicated generally by reference letter A, which for convenience may be called the vestibule of the car, may then be collected while the car is proceeding on its way and the passengers after paying their fares, distribute themselves to either end of the car, as they may desire, passing through the passage-ways 11, between the side panels 10. The area of the vestibule space A, is sufficient to accommodate a large number of passengers so that passengers may be taken on board the car, the doors closed and the car started on its trip, without unnecessary delay incident to the collection of fares. After the passengers pay their fares and pass through the passages 11, toward one end or the other of the car, they enter the concourses indicated generally by reference letter B, and which extend longitudinally of the car, toward the ends from the central vestibule space A. These concourses have seats arranged at the sides thereof, as indicated at 14. The floor level of the lower deck constituting the floor of the vestibule A, and the concourses B, is gradually inclined upwardly from the vestibule space A toward each end of the car, as indicated at 15, Fig. 1, and this floor level at the vestibule space A is preferably at a height above the street level, such as to permit a passenger to step from the street into the car and from the car on to the street level. The low frame or level of the floor of the lower deck is extended over the end trucks of the car, as shown. This brings the level of the lower deck floor to a very low point and correspondingly lowers the height of the upper deck floor.

If desired the concourses B, extending lengthwise of the car toward each end thereof, may be provided at convenient points with vertical posts 16, which not only afford means for supporting the roof of the lower deck and the floor of the upper deck but also afford convenient hand grips for passengers. At each end of the car and at the extreme ends of the concourses B, we propose to employ a stairway indicated at 18. These stairways lead to the upper deck of the car. In practice we propose to employ a single section or portion of stairway, the lower portion for instance, which terminates in passageways or continuations of the stairways indicated at 19, which lead off from the central or lower portion to opposite sides of the upper deck of the car. The roof of the lower deck is preferably arched as indicated at 20, Figs. 2 and 3, the arched portion extending longitudinally of the car and directly over the concourses B. At each edge of the arched portion 20, are horizontal extensions or side portions indicated at 21, these longitudinally extending side portions 21 are directly above the seats 14, of the lower deck and are sufficiently high above the seats as not to interfere with the heads, hats or the like of the passengers seated on the seats 14 of the lower deck. The arched portions 20, of the roof of the lower deck are located directly over the concourses B and sufficiently high to permit passengers to easily and readily occupy or traverse longitudinally the concourses B, without interference with their heads or hats.

The arched portions 20 of the roof of the lower deck we propose to utilize for the accommodation of longitudinally extending seats 22 for the upper deck and a foot ledge 60 is arranged to extend along side of each seat 22 in front of the same to accommodate the feet of passengers occupying the seats without interfering with passengers standing on the flooring 21. In this way the seats 22, extend longitudinally of and centrally with reference to the transverse section of the upper deck of the car. The passengers seated on the seats 22, of the upper deck face outwardly toward the sides of the car and are thereby afforded a convenient place of observation. The horizontal side portions or extensions 21, constitute the floor or foot space for the upper deck for the accommodation of standing passengers, or for permitting passengers to traverse the same to reach a vacant seat after arriving at the upper deck through the stairway passages 18 and 19. If desired the sides of the upper deck indicated at 24 may, for winter car use be inclosed by glass panels, window frames or the like, so as to inclose the upper deck, thereby increasing the comfort of the passengers carried thereby, and in like manner said sides may be opened when the car is used as a summer car. The upper deck may or may not have a roof thereover. We have shown a roof, however, as indicated at 25.

If desired the stairways may be equipped with a hand rail as indicated at 26. This hand rail may include vertically extending posts 27, see Fig. 4.

At one or both ends of the car, and outside the seating space thereof, we propose to provide a cab, indicated at 29. Ordinarily the floor of the cab portion 29, is on a level above the truck wheels. This level indicates the ordinary level of the ordinary street car floor. Obviously this level is above the level of the floor 15, of the lower deck of the low level car body. The cabs 29 are designed for the use of the motorman so that whether the car proceeds in one direction or the

other, a motorman's cab is provided at the front end of the car. Ingress to and egress from the motorman's cab 29, may be had through a doorway in the side of the cab, as indicated at 30, see Fig. 1. It will be observed that the level of the floor of the cab 29 is comparatively close to the level of the floor portion 21 of the upper deck. In order to afford ample head room for the motorman in the cab 29, the arched portion 20 of the roof of the lower deck is extended as indicated at 31 over to form the roof of the cab portion 29. Ordinarily the floor level 21, of the upper deck is approximately breast high to a person standing on the floor of cab portion 29. This indicates the exceedingly low height attained by the particular construction and arrangement of a car as above set forth.

From the foregoing description it will be seen that we provide a construction of car which avoids delays in the schedule of operation and permits the attainment of rapid transit and provides for the convenience and comfortable handling of large crowds without very materially increasing the cost of construction, maintenance or operation of the car. Instead of passengers loading and unloading at one end of the car directly from and to the street, they are loaded and unloaded at a point intermediate the car ends. The lower deck is utilized for loading and unloading the passengers and the arrangement is such that the conductor no longer remains a conductor in the ordinary sense but becomes ticket seller or cashier. It will also be seen that the longitudinally extending concourses in the central part of the lower portion of the car are utilized for the entrance accommodation and distribution of passengers as well as for the discharge of passengers from the upper deck preparatory to their exit from the car. The time of loading and unloading passengers is very greatly decreased and without discomfort to passengers because of the enlarged area or space in the vestibule portion A for their accommodation while entering or preparing to leave the car. One ticket agent or cashier at the point indicated for the fare prepayment station in the vestible A, is thus enabled to handle a very much larger number of passengers than in the ordinary styles of cars. The ticket seller or cashier is fixed at one point and the entering passengers file by him to pay their fares and distribute themselves to either end of the lower deck, remaining, if desired, on lower deck, or proceeding to the upper deck of the car by way of the stairways 18, 19. The time ordinarily consumed by passengers ascending the stairways is materially decreased because they ascend to, or descend from, the upper deck while the car is in motion and furthermore the height of the second deck is reduced to a minimum and hence the delay of the schedule in order to permit passengers to ascend or descend the stairway is avoided. It will be observed that we do not provide any signaling arrangement for the upper deck of the car so that passengers occupying the upper deck and desiring to leave must descend to the lower deck before the signal is given to stop the car. This enables the rapid transit schedule of the car to be maintained since there is no loss of time between the giving of a signal to stop the car and the exit of passengers, since the passengers desiring to leave the car congregate on the lower deck of the car, or in the concourse B thereof, or in or adjacent the vestibule A, from which they exit from the car as soon as the door is open. It will also be seen that access to and from the upper deck is gained at each end of the car, thus also materially increasing the facility of passengers reaching the upper deck or descending therefrom.

Having now set forth the object and nature of our invention, and a construction embodying the principles thereof, what we claim as new and useful and of our own invention, and desire to secure by Letters Patent of the United States is:—

1. A car having an upper and a lower deck, the lower deck portion having a side entry way and a centrally disposed concourse extending longitudinally of the car, and a stairway located at the end of the concourse and having branches delivering to opposite sides of the upper deck.

2. A car having an upper and a lower deck, the lower deck having a center side entrance and a stepless concourse extending longitudinally of the car therefrom, said entrance having a floor level within a single stepping distance from the street level, and a stairway located at the end of the concourse and leading to the upper deck, said stairway having branches delivering to opposite sides of the upper deck.

3. A car having an upper and a lower deck, transversely extending barriers in the lower deck portion forming an entryway, means to form a side door for the entryway, a conductor's station opposite said side door, and a stairway leading from the interior of the lower deck portion to the upper deck.

4. A car having an upper and a lower deck transversely extending barriers in the lower deck portion forming an entry way, said entryway having a floor level within a single stepping distance from the street level, and a dividing stairway leading from the interior of the lower deck portion to the upper deck on both sides thereof.

5. A car having an upper and a lower deck, the roof of the lower deck being transversely arched for a portion of its width

to form a seat space for the upper deck, and having a portion extending horizontally from the lower edge of the arched portion to form a foot space flooring for the upper deck and a step interposed between the foot space flooring and said seat space.

6. A car having an upper and a lower deck, the roof of the lower deck being transversely arched at the longitudinal central portion thereof and a horizontal portion extending laterally from each side edge of the arched portion, said arched portion forming a seat space for the upper deck and the horizontal portions forming the floor space for the upper deck and a longitudinally extending foot rest step located above said floor space and between the same and the seat space.

In testimony whereof we have hereunto set our hands in the presence of the subscribing witnesses on this 22nd day of June, A. D. 1912.

FRANK HEDLEY.
JAMES S. DOYLE.

Witnesses:
G. A. McGRATH,
W. A. DARBY.