F. STEFFENS.

STREET CAR.

APPLICATION FILED JUNE 1, 1915.

1,197,074.

Patented Sept. 5, 1916.

6 SHEETS—SHEET 1.

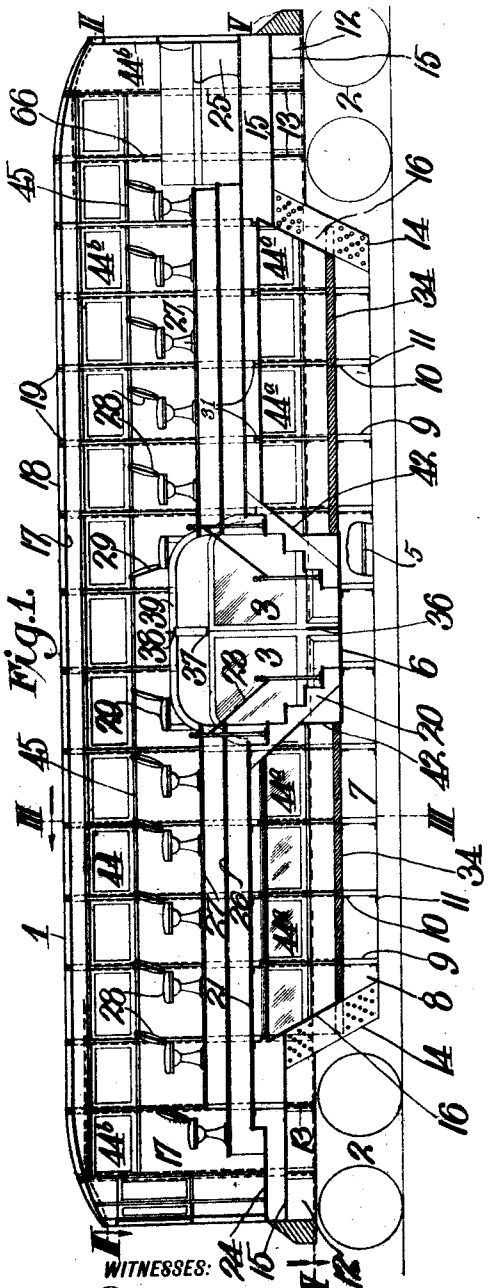


Fig. 1.

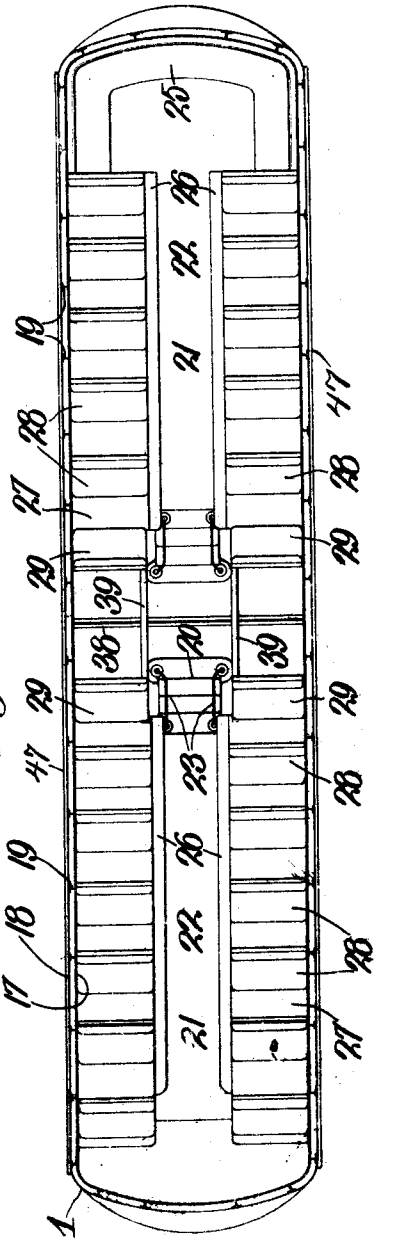


Fig. 2.

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6 SHEETS—SHEET 2.

Fig. 4.

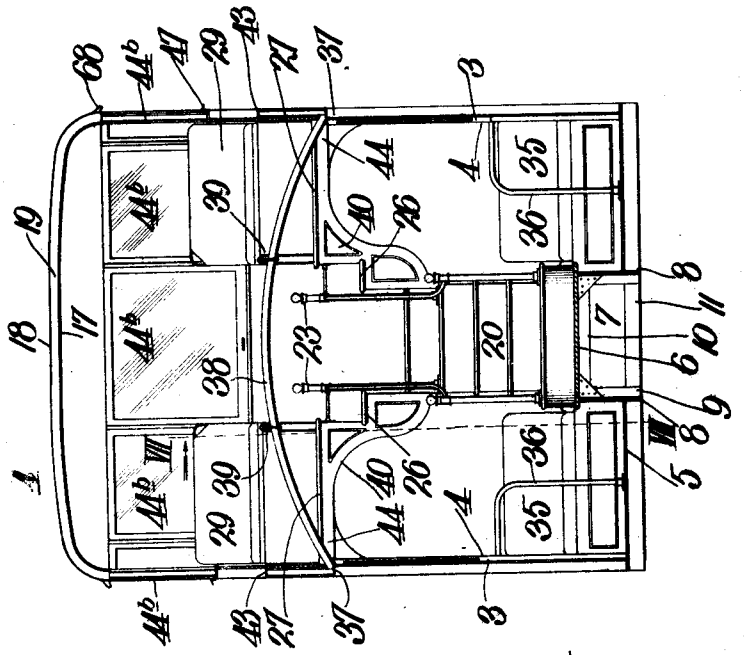
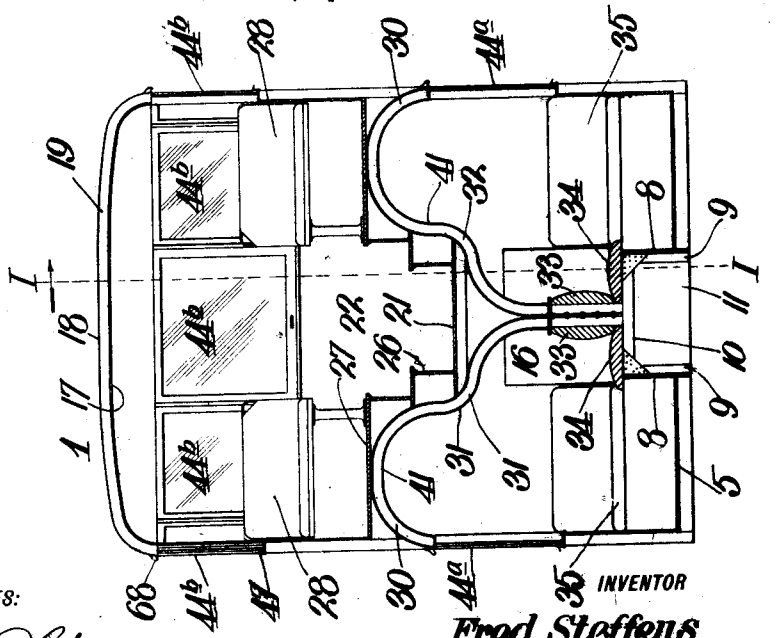


Fig. 3.



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Patented Sept. 5, 1916.

6 SHEETS—SHEET 3.

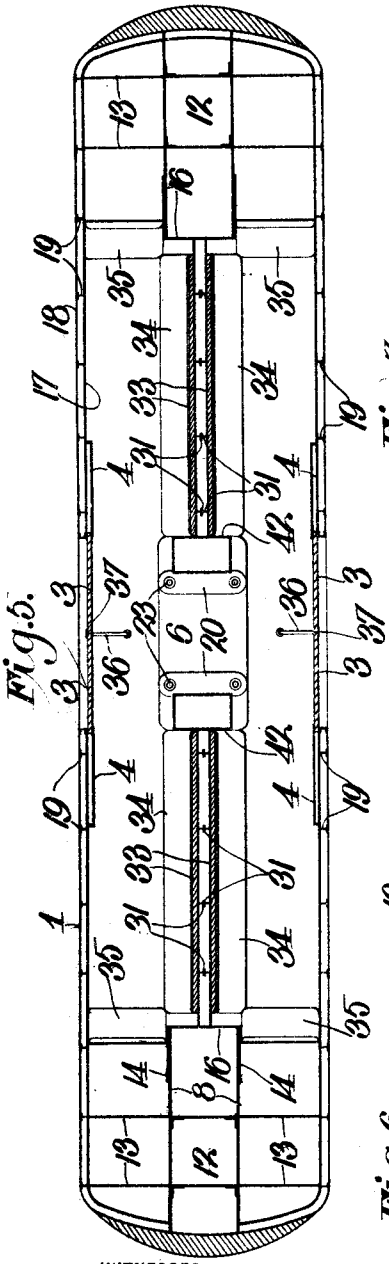


Fig. 5.

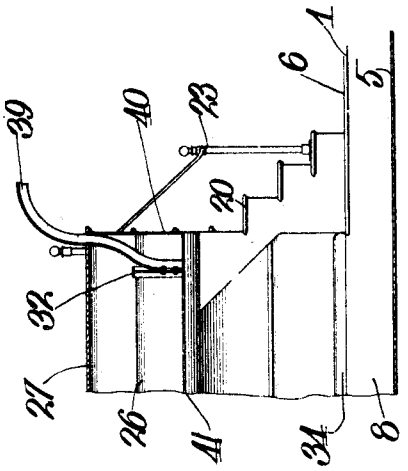


Fig. 7.

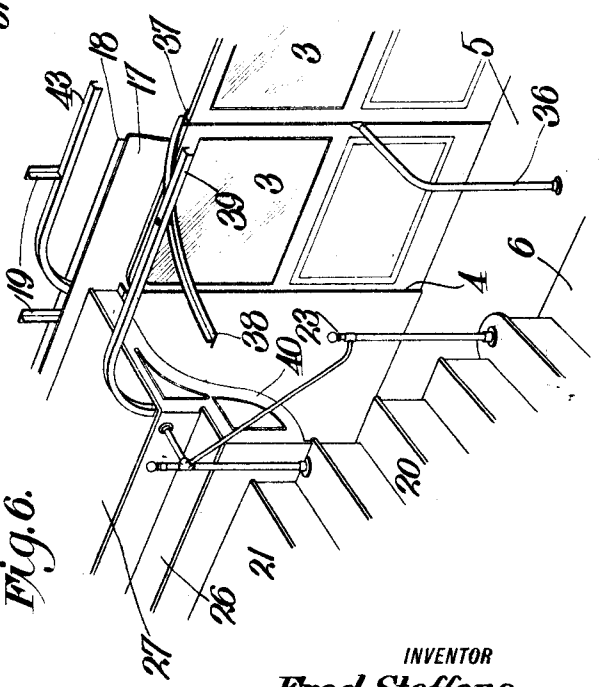


Fig. 6.

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Patented Sept. 5, 1916.

6 SHEETS—SHEET 4.

Fig. 8.

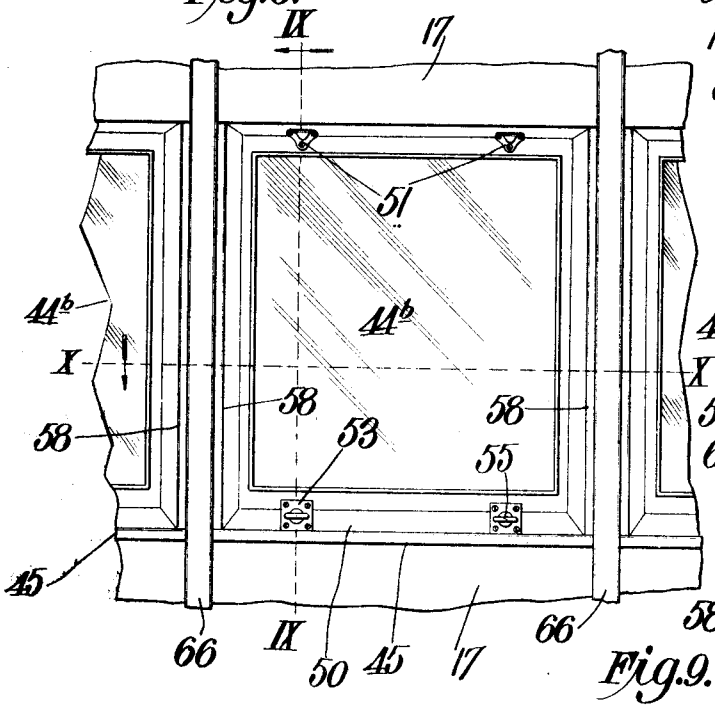


Fig. 9.

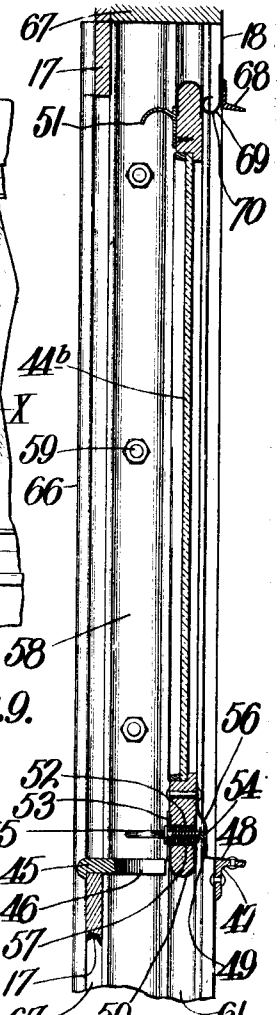
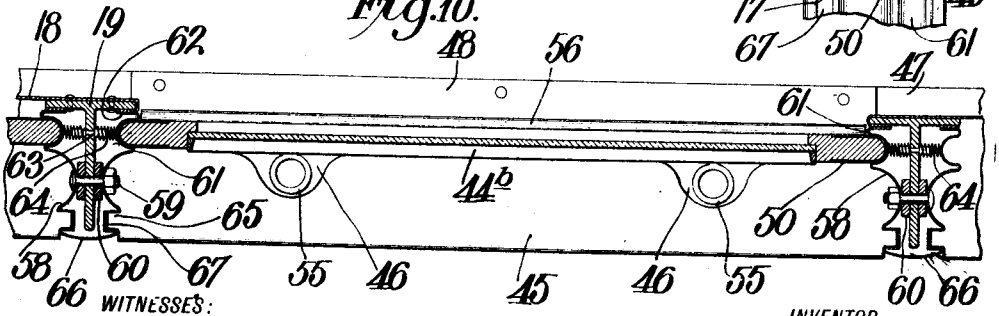


Fig. 10.



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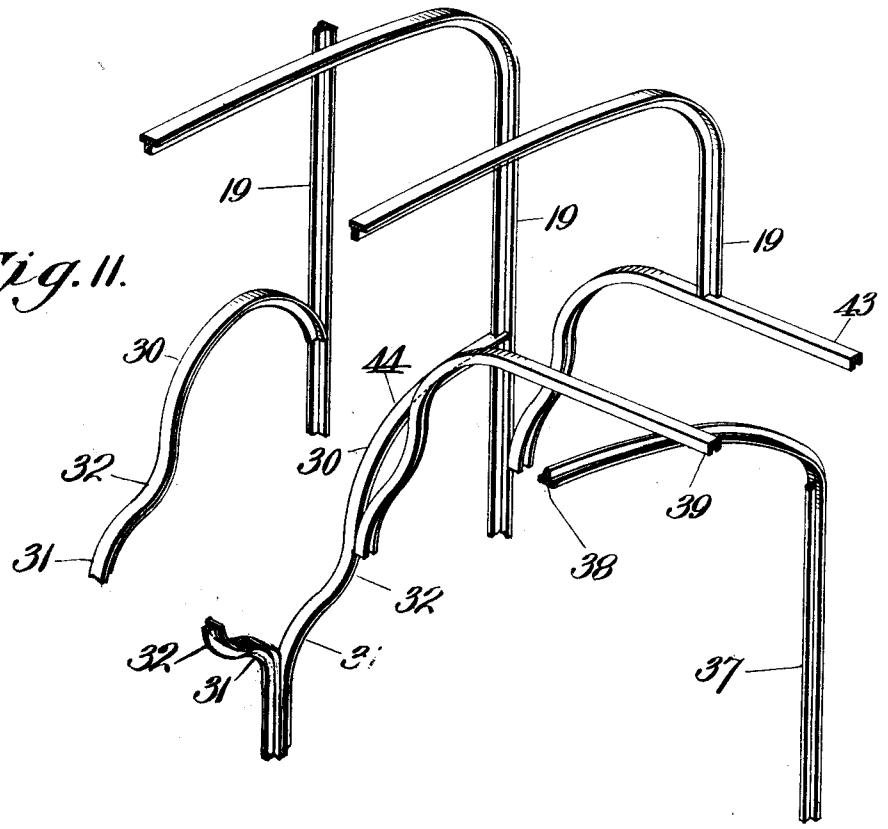
APPLICATION FILED JUNE 1, 1915.

1,197,074.

Patented Sept. 5, 1916.

6 SHEETS—SHEET 5.

Fig. 11.



Witness

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APPLICATION FILED JUNE 1, 1915.

1,197,074.

Patented Sept. 5, 1916.

6 SHEETS—SHEET 6.

Fig. 12.

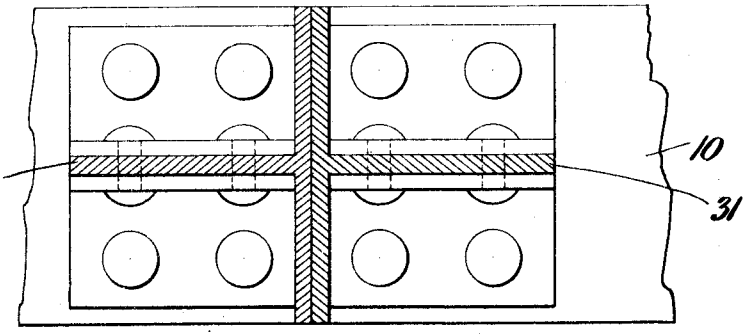


Fig. 13.

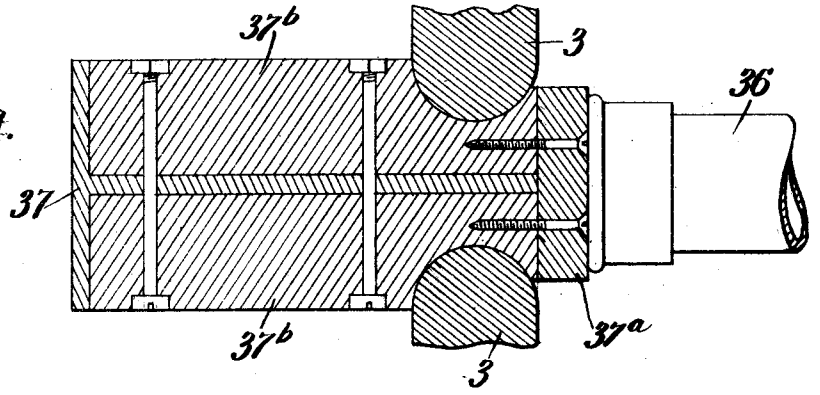
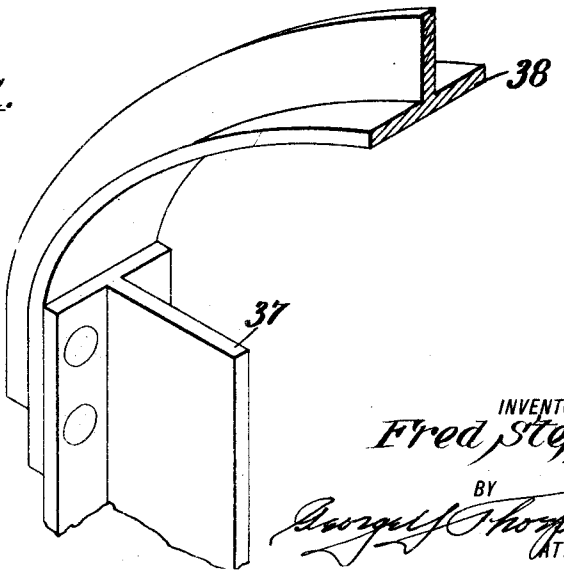


Fig. 14.



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UNITED STATES PATENT OFFICE.

FRED STEFFENS, OF ST. JOSEPH, MISSOURI.

STREET-CAR.

1,197,074. Specification of Letters Patent. Patented Sept. 5, 1916.

Application filed June 1, 1915. Serial No. 31,599.

To all whom it may concern:

Be it known that I, FRED STEFFENS, a citizen of the United States, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Street-Cars, of which the following is a specification.

This invention relates to street cars and the like, and its primary object is to produce a car of substantially the same size as but about twice the seating capacity of any single compartment car heretofore constructed.

More specifically the object is to produce a car having a central vestibule of full car width and low entrances thereto, an entrance level floor longitudinally divided at opposite sides of the vestibule to produce four entrance floor compartments accessible from the vestibule, a gallery at each end of the car, separated by the vestibule and of ample standing head room height above the outer portions or aisles of the entrance floor compartments and sitting head room height below the roof, and provided with dropped central portions or aisles of ample sitting head room height above the inner portions of the said entrance floor compartments and ample standing head room height below the roof of the car, the vestibule being provided with a flight of steps leading to each of said gallery aisles, the car also having a lower series of side windows to give light to and outlook from the lower compartments, and upper series of windows to give light to and outlook from the galleries.

Another object is to produce a car having a central longitudinal inverted channel structure or beam dividing the car into two longitudinally-extending compartments, having floors flanking the lower portions of the channel structure or beam, rows of longitudinally-extending outwardly-facing seats within said compartments and mounted upon said channel structure or beam, a central vestibule subdividing said compartments into four compartments communicating with the vestibule, and side entrances for the entrance and exit of passengers.

Another object is to produce a car of the type outlined of light, strong, rigid and ornamental construction and which possesses unusual hygienic properties through the provision of two series of windows at different elevations and all accessible to the passenger.

With these objects in view the invention consists in certain novel and peculiar features of construction and combinations of parts as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which:—

Figure 1, is a vertical longitudinal section of a car embodying my invention, taken on the line I—I of Figure 3. Fig. 2, is a horizontal section on the line II—II of Fig. 1, and discloses a plan of what I term the gallery floor of the car. Fig. 3, is an enlarged section on the line III—III of Fig. 1. Fig. 4, is a central vertical transverse section of the car. Fig. 5, is a horizontal section on the line V—V of Fig. 1, and discloses a plan of the entrance floor of the car. Fig. 6, is a fragmentary perspective view of the interior of the car to show the vestibule, a gallery, a gallery aisle and steps leading from the vestibule to the gallery aisle. Fig. 7, is a section on the line VII—VII of Fig. 4. Fig. 8, is a view illustrative of the window construction. Fig. 9, is an enlarged view taken on the line IX—IX of Fig. 8. Fig. 10, is an enlarged view taken on the line X—X of Fig. 8. Fig. 11, is a fragmentary perspective view showing the relation or connection between the arches of the car frame at and about midway the length of the same. Fig. 12, is an enlarged cross section showing one of the cross shaped posts shown on a smaller scale by Fig. 5 and produced by the inner legs of certain double arched cross braces of the car. Fig. 13, is a vertical section showing one of the vertical T-bars, the car doors adapted when closed to abut against said bar,—and the associated division rail, this figure showing certain wood strips in rigid relation to said bar to receive directly the impact of the doors and to afford a practical connection between said bar and the division rail. Fig. 14, is

a detail view showing the connection between one of the bars shown by Fig. 13, and the central arch for connecting said bar with a similar bar at the opposite side of the car.

Referring to the drawings where like reference characters identify corresponding parts, 1 indicates the car generally, the same corresponding substantially in length and width to standard cars now in use. The roof of the car is shown as of the turtle back type, and stands from six to eight inches higher than the conventional one compartment car of the same length and width.

Between the trucks 2, which are diagrammatically indicated because the construction thereof does not in any way affect the invention, the car floor is dropped down to within about twelve inches of the level of the rails. The car is of the low center entrance type, 3 indicating a pair of doors at each side for entrance and exit purposes. The doors of each pair are adapted in opening to slide from each other into pockets 4 formed along the inner surfaces of the side walls.

The entrance floor 5 of the car has a central raised channel beam or structure which extends for the full length of the car between and over the trucks and makes a step-up from the entrance floor of approximately ten inches. This step-up portion at the center or vestibule of the car has a short top plate 6. The beam or structure is inverted to form a downwardly-facing channel 7, and the sides of said channel consist of plates 8. This channel structure constitutes what may be termed the backbone of the car, as it performs the function of the customary side and center sills or beams of the conventional car. It is necessary to make the car of proper strength and rigidity, and hence at suitable intervals, vertical angle bars 9 are secured to the exterior faces of the plates 8, and are connected by transverse bars 10 and 11, certain of the bars 10 also underlying and engaging the top plate 6. Bars 11 extend clear across the car and support the floor 5 and connect the lower ends of bars 9. The parts from 6 to 11 inclusive constitute what may be termed a built-up channel, and it preferably is built up as shown, in the manner conventional with channels too large to be conveniently made from a single piece of metal.

To stiffen the end portion of the car over the trucks, the central channel structure described, is formed with raised end portions, shown most clearly in Figs. 1 and 5. The raised portions are identified by the reference characters 12 and are strengthened by transverse brace plates 13, and connected to the ends of the lower or main portion of the channel structure by downwardly converging plates 14. The top plates 15 of the raised portions of the channel structure constitute the floors of certain chambers hereinafter mentioned, and 16 are plates which connect the outer ends of the body of the channel with the inner ends of the plates 15, and form the outer or closed ends of the entrance floor compartments, hereinafter described.

The walls of the car comprise inner and outer shells 17 and 18. The former may be of metal, wood or any other desirable material and finish, but the outer shell is preferably of steel plates. The roof is likewise of double shell construction, and arranged between the shells of both walls and roof, at distances apart corresponding to the width of the side windows, hereinafter more particularly referred to, are inverted U-shaped T-irons or equivalent arched braces 19; all of these braces terminating at the extreme lower edge of the car body or sill of car, except the two occurring over the entrance compartment or vestibule, and the braces which occur at the ends of the car over the trucks, which last-named braces terminate at the lower edge of the car body over the trucks.

Flights of steps 20, lead upward from the ends of the top plate 6, constituting a raised central portion for the vestibule, to the aisle floors 21 of galleries 22, in opposite ends of the car, the steps being preferably equipped with guard rails or banisters 23.

The car shown is of the single end type, and the gallery floor 21 at the end of the car where the motorman will be stationed, is preferably dropped down a few inches as indicated at 24, to give the motorman ample headroom, the drop being provided because of the downwardly curved ends of the roof. At the other end of the car is a cross seat 25, which may be dispensed with and both ends of the aisle floors dropped if it is desired to produce a car of the double-end type. The spaces below the dropped portion and the floor where the seat 25 is located, may be utilized for holding tools and the like, the floor doors giving access to these spaces or receptacles, being omitted as forming no part of the invention.

Leading upward and outward from each of the aisle floors and extending from the steps 20, nearly to the ends of the car, are steps 26, and at the top of said steps are the floors 27 of the galleries for the support of the cross seats 28, all of which seats except the two innermost ones identified by the character 29, being of the reversible back type, in a car of the double-end construction. The said two innermost seats face toward their respective ends of the car because the floors 27 do not extend completely under them.

If it is desired to make a double-end car, the end seat 25, will be omitted and the gallery floors and steps extended for the accommodation of an additional seat 28 at

each side of the car, thus making the car identically the same as the front end of the car shown in Fig. 1.

The gallery floors, the aisle floors therefor, and the steps 26, are supported upon double-arched cross braces arranged in the same vertical planes as and secured at their outer ends in any suitable manner to braces 19, and at their inner ends to the channel structure or beam midway the width thereof. These cross braces guard against inward or outward collapse of the side walls of the car, and in conjunction with the arches or braces 19 and the channel structure or beam, constitute the main frame of the car.

The double-arched cross-braces above referred to consist of upper or outer arches 30 and lower or inner arches 31. The upper or outer arches 30 are sufficiently high to give ample head room for passengers standing on the aisle portions of floor 5 of the entrance floor compartment. The lower or inner arches 31 are sufficiently high to provide ample head room over the channel structure or beam, to accommodate passengers sitting on seats hereinafter referred to, which are secured upon said channel structure or beam.

Connecting the inner and outer arches are integral reverse bends 32, these bends being provided to accommodate the aisle floors 21 of the gallery 22. The inner ends of the arches 31 of opposite cross braces abut together at a suitable height above and extend down to the channel structure. The cross braces are preferably of T-iron or steel and secured rigidly together so as to constitute a central longitudinal series of strong cross-shaped posts (Figs. 3 and 5,) disposed at intervals along the car at opposite ends of the vestibule, and secured to opposite sides of said posts are the backs 33 of seats 34, which face outwardly so that the occupants thereof may rest their feet upon the floor 5. At the outer ends of the series of seats 34 are inwardly facing cross seats 35, to give additional seating capacity.

For customary reasons it is preferred that persons entering and persons leaving the car shall pass through separate door openings, and to aid the conductor, who preferably will stand at the entrance side of the vestibule, in keeping the incoming and outgoing traffic separated, division guard rails 36, are mounted upon the floors 5, their upper or outer ends being secured to vertical T-bars 37 by means of vertical strips 37^a to which the ends of said rails are adapted to be secured in any suitable manner, and filler strips 37^b against which the doors 3 abut when closed, and to properly support said bars 37 at their upper ends and thereby brace the car crosswise over the vestibule, they are connected by a transverse T or equivalent arch 38, the same being also braced by a pair of longitudinal arches 39, which extend through the inner corners of the gallery floors 27, and are fastened at their lower ends to the adjacent cross braces, as shown clearly in Fig. 7, Ornamental paneled brackets 40 give a finished effect to the inner ends of the gallery floors and steps, and the cross braces are hidden by gracefully curved walls 41, secured to the said braces in any suitable manner, see Fig. 3.

At the inner ends of the longitudinal seats 34 are obtuse angle shaped plates 42 which hide the steps from the view of the occupants of the entrance floor compartments; they merely constitute finished ends for said compartments.

It will be noted by reference to Figs. 5 and 6, that the pockets 4 lie in planes inward of the arms of arches 19, and that the pair of said arches which overlie the vestibule terminate above the door openings, the lower ends of said pair of arches being secured to longitudinal arches 43, preferably secured at their ends to adjacent arches 19, like arches 39 are secured to the double-arched cross braces 30—31. It is necessary for the accommodation of the doors, to straighten out to substantially horizontal position, the outer ends of the innermost pair of the cross braces 30—31, viz., that pair to which are secured the opposite ends of the longitudinal arches 39 (see Fig. 7). Fig. 4, shows one of the said pair of cross braces with its outer ends horizontal and lying in a plane above the pockets 4, in which the doors 3 slide. To identify this feature of the construction the outer ends of the said innermost pair of arches are numbered 44.

The car is provided with a lower series of windows 44^a for the lower or entrance compartments and an upper series of windows 44^b for the galleries and the motorman. Each window is adapted to open by sliding downward into the space between the outer wall of the adjacent side of the car and the adjacent inner wall thereof, which wall may be in the form of a panel. The windows, of course, do not fill such spaces and it is therefore desirable to provide a panel cap 45 to cover said spaces from the panel or inner wall of the windows, each cap being provided with suitable openings 46, for a purpose which is hereinafter explained. In the plane of the panel caps, an angle bar 47 is secured to the outer wall of each side of the car and extends for the full length of the same, and projecting inwardly from the angle bar for each window is a preferably resilient water cap 48 of sheet copper or its equivalent, the inner edge of the cap being formed with an upturned flange 49.

Each sash is provided around its edges with a U-shaped sheath 50 of sheet metal, preferably copper, and on its upper rail with a pair of lifting hooks 51. Its lower rail is provided with bushed or lined open-

ings 52 covered by plates 53, secured to the inner face of the sash. Extending slidingly through said plates are pins 54 terminating at their inner ends in eye handles 55. These pins are secured at their outer ends to spring plates 56 secured to the lower rail and adapted in normal position to overlap the outer side of the flange 49 of the cap 48. A coiled spring 57 fits in each bushing or lining and bears at one end against the plate 53 and at its opposite end against plate 56 for the purpose of holding the latter normally pressed outward.

To provide an ornamental non-corrosive guide within which the window sash shall operate and by which the same may be gripped with sufficient friction to secure it at any desired point of adjustment, I provide a pair of spring-copper plates 58 secured at suitable intervals by bolts 59 to braces 19, suitable fiber or equivalent washers 60 being mounted on the bolts between the plates 58 and said braces. Said plates are provided with vertical grooves 61 within which the side edges of the sash fits and at their free edges the plates are provided with flanges 62 which fit slidingly against the braces 19. The braces 19 are provided with pins 63 on which are mounted springs 64 to press the grooved portions of the plates 58 firmly against the sides of the sash. The plates 58 are also provided at their inner edges with curtain grooves 65, and such inner edges of the plates 58 of adjacent sashes are connected by cap or finishing strips 66, said strips being retained in position by angularly bent flanges 67 which fit in the grooves 65.

A short distance above each window is a cross piece or partition 67, to prevent air in the space between the double walls and roof of the car, from circulating downward into the interior of the car, the space just below such partition being adapted to receive a spring roller curtain or its equivalent, not shown, the ends of the curtain stick being adapted for sliding up and down in the grooves 65 of the plates 58 engaging the same window sash. Secured on the outer wall of the car for its full length across each window opening is an angle bar 68, and secured within each window opening to said angle bar 68, is a spring plate 69 terminating in a rounded eye or coil 70 bearing against the outer side of the window sash and preventing air from passing into the car over the sash when the same is in raised or closed position.

When it is desired to lower a sash, the operator presses upward to raise the sash until plate 56 clears the flange 49. The operator then hooks his fingers into the eyes 55 and pulls inward and presses downward upon them at the same time. In this action plate 56 is drawn inward beyond the flange 49 so that the sash is free to move downward, and in such downward movement the handles 55 pass through the openings 46 in the panel cap. The sash is closed by raising it until plate 56 clears flange 49, and is then lowered to cause plate 56 to again overlap the flange 49.

As the function of the various parts and compartments has been set forth in connection with the description of the car no recapitulation or additional explanation is essential other than to state that the doors may be opened and closed individually or any suitable mechanism may be employed to effect simultaneous operation of the doors, such mechanism being omitted as immaterial, and that fares may be collected as the passengers enter or later.

From the above description it will be apparent that I have produced a street car which embodies the features of advantage enumerated as desirable in the statement of the object of the invention, and which obviously may be modified in various particulars without departing from the principle of construction involved as recited in the appended claims.

I claim:—

1. A car having a side entrance vestibule, having a central raised portion extending longitudinally of the car, a gallery aisle, gallery floors at opposite sides of the aisle and in a higher plane than the floor of the aisle, and entrance floor compartments underlying the gallery floors and opening into the vestibule, and steps leading from the raised portion of the vestibule to the gallery floor aisle; the car having a series of side windows for the gallery floor compartments and a series of side windows for the entrance floor compartments.

2. A car having a side entrance vestibule having a central raised portion, a gallery aisle, gallery floors at opposite sides of the aisle and in a higher plane than the floor of the aisle, and entrance floor compartments underlying the gallery floors and opening into the vestibule, steps leading from the raised portion of the vestibule to the gallery floor aisle; the car having a series of side windows for the gallery floor compartments and a series of side windows for the entrance floor compartments, and outwardly facing seats underlying the gallery aisle for the entrance compartments.

3. A car having a side entrance vestibule having a central raised portion, a gallery aisle, gallery floors at opposite sides of the aisle and in a higher plane than the floor of the aisle, and entrance floor compartments underlying the gallery floors and opening into the vestibule, steps leading from the raised portion of the vestibule to the gallery floor aisle; the car having a series of side windows for the gallery floor

compartments and a series of side windows for the entrance floor compartments, outwardly facing seats underlying the gallery aisle for the entrance compartments, and seats mounted on the gallery floor.

4. A car having a side entrance vestibule, a gallery aisle, gallery floors at opposite sides of the aisle and in a higher plane than the floor of the aisle, and entrance floor compartments underlying the gallery floors and opening into the vestibule, steps leading from the vestibule to the gallery floor aisle; the car having a series of side windows for the gallery floor compartments and a series of side windows for the entrance floor compartments, and longitudinally-extending steps leading up from opposite sides of the floor of the gallery aisle to the gallery floors.

5. A car mounted upon trucks at its ends and provided with an entrance floor between the trucks, occupying a lower plane than the axes of the wheels of the trucks, and provided also with a side entrance vestibule and at opposite sides of the vestibule with gallery aisles centrally of the car and extending longitudinally from opposite sides of the vestibule, gallery floors at opposite sides of the gallery aisles and in a higher plane than the floor of the latter, entrance floor compartments underlying the gallery floors and opening into the vestibule, a central longitudinally-extending raised portion for the floor of the vestibule, steps leading upward from the raised portion of the vestibule floor to the adjacent end of each aisle floor, a series of side windows for each of the entrance floor compartments, and side windows for each of the galleries.

6. A car mounted upon trucks at its ends and provided with an entrance floor between the trucks, occupying a lower plane than the axes of the wheels of the trucks, and provided also with a side entrance vestibule and at opposite sides of the vestibule with gallery aisles centrally of the car and extending longitudinally from opposite sides of the vestibule, gallery floors at opposite sides of the gallery aisles and in a higher plane than the floor of the latter, entrance floor compartments underlying the gallery floors and opening into the vestibule, a central longitudinally-extending raised portion for the floor of the vestibule, steps leading upward from the raised portion of the vestibule floor to the adjacent end of each aisle floor, a series of side windows for each of the entrance floor compartments, side windows for each of the galleries, and outwardly-facing seats underlying the gallery aisles, for the entrance compartments.

7. A car mounted upon trucks at its ends and provided with an entrance floor between the trucks, occupying a lower plane than the axes of the wheels of the trucks, and provided also with a side entrance vestibule and at opposite sides of the vestibule with gallery aisles centrally of the car and extending longitudinally from opposite sides of the vestibule, gallery floors at opposite sides of the gallery aisles and in a higher plane than the floor of the latter, entrance floor compartments underlying the gallery floors and opening into the vestibule, a central longitudinally-extending raised portion for the floor of the vestibule, steps leading upward from the raised portion of the vestibule floor to the adjacent end of each aisle floor, a series of side windows for each of the entrance floor compartments, side windows for each of the galleries, outwardly-facing seats underlying the gallery aisles, for the entrance compartments, and seats mounted upon the gallery floors.

8. A car mounted upon trucks at its ends and provided with an entrance floor between the trucks, occupying a lower plane than the axes of the wheels of the trucks, and provided also with a side entrance vestibule and at opposite sides of the vestibule with gallery aisles centrally of the car and extending longitudinally from opposite sides of the vestibule, gallery floors at opposite sides of the gallery aisles and in a higher plane than the floor of the latter, entrance floor compartments underlying the gallery floors and opening into the vestibule, a central longitudinally-extending raised portion for the floor of the vestibule, steps leading upward from the raised portion of the vestibule floor to the adjacent end of each aisle floor, a series of side windows for each of the entrance floor compartments, side windows for each of the galleries, outwardly-facing seats underlying the gallery aisles, for the entrance compartments, and seats mounted upon the gallery floors, the innermost seats of the gallery floors overlying the vestibule and facing toward the outer ends of their respective galleries.

9. A car mounted upon trucks at its ends and provided with an entrance floor between the trucks, occupying a lower plane than the axes of the wheels of the trucks, and provided also with a side entrance vestibule and at opposite sides of the vestibule with gallery aisles centrally of the car and extending longitudinally from opposite sides of the vestibule, gallery floors at opposite sides of the gallery aisles and in a higher plane than the floor of the latter, entrance floor compartments underlying the gallery floors and opening into the vestibule, a central longitudinally-extending raised portion for the floor of the vestibule, steps leading upward from the raised portion of the vestibule floor to the adjacent end of each aisle floor, a series of side windows for each of the entrance floor compartment, side windows for each of the galleries, and outwardly-facing

seats for the entrance floor compartments, occupying a horizontal plane a suitable distance above the floors of the entrance compartments and located vertically under the floors of the gallery aisles.

10. A car mounted upon trucks at its ends and provided with an entrance floor between the trucks, occupying a lower plane than the axes of the wheels of the trucks, and provided also with a side entrance vestibule and at opposite sides of the vestibule with gallery aisles centrally of the car and extending longitudinally from opposite sides of the vestibule, gallery floors at opposite sides of the gallery aisles and in a higher plane than the floor of the latter, entrance floor compartments underlying the gallery floors and opening into the vestibule, a central longitudinally-extending raised portion for the floor of the vestibule, steps leading upward from the raised portion of the vestibule floor to the adjacent end of each aisle floor, a series of side windows for each of the entrance floor compartments, side windows for each of the galleries, outwardly-facing seats for the entrance floor compartments, occupying a horizontal plane a suitable distance above the floors of the entrance compartments and located vertically under the floors of the gallery aisles, and seats mounted upon the gallery floors.

11. A car mounted upon trucks at its ends and provided with an entrance floor between the trucks, occupying a lower plane than the axes of the wheels of the trucks, and provided also with a side entrance vestibule, side windows and entrance floor compartments opening into the vestibule, a central longitudinally-extending portion for and raised above the floors of the entrance floor compartments and the vestibule, comprising side plates near but at opposite sides of the longitudinal center line of the car, suitable braces for said side plates and in conjunction therewith forming a channel structure or beam, a top plate bridging the space between said braced side plates where the latter cross the vestibule, and longitudinally-extending outwardly-facing seats supported upon said channel structure within said floor compartments.

12. In a car provided with side entrances, a central vestibule, four entrance floor compartments opening at their inner ends into the vestibule, an end gallery over the said compartments at each side of the vestibule, provided with dropped central longitudinal aisles, flights of steps leading from the vestibule to the inner ends of the gallery aisles, longitudinal arches in the sides of the car and over the door openings, transverse roof arches connecting said longitudinal arches, uprights in the sides of the car centrally of the door openings thereof, a transverse arch connecting said uprights above the door openings, and longitudinal arches bridging the space between the galleries at opposite sides of the said aisles and secured to said last-named transverse arch, and a pair of side doors for each side entrance, abutting when closed, the said uprights.

13. A car provided with a central vestibule, side entrances to the vestibule, doors controlling said entrances and four compartments at the same floor level as the vestibule floor, a central longitudinal channel structure at the bottom of the car, forming raised inner portions for said compartments and a raised central portion for the vestibule, and longitudinal seats upon the raised inner portions of said compartments.

14. A car provided with a central vestibule, side entrances to the vestibule, doors controlling said entrances and four compartments at the same floor level as the vestibule floor, a central longitudinal channel structure at the bottom of the car, forming raised inner portions for said compartments and a raised central portion for the vestibule, longitudinal seats upon the raised inner portions of said compartments, galleries above the said compartments, provided with dropped central aisles, and pairs of cross-braces arranged in abutting relation at their inner sides and mounted at their inner ends on the channel along the longitudinal center thereof and secured at their outer ends to the sides of the car; said braces being formed with sets of arches supporting the gallery floors and lower sets of arches supporting the floors of the aisles.

15. A car provided with a central vestibule, side entrances to the vestibule, doors controlling said entrances and four compartments at the same floor level as the vestibule floor, a central longitudinal channel structure at the bottom of the car, forming raised inner portions for said compartments and a raised central portion for the vestibule, longitudinal seats upon the raised inner portions of said compartments, galleries above the said compartments, provided with dropped central aisles, and pairs of cross-braces arranged in abutting relation at their inner sides and mounted at their inner ends on the channel along the longitudinal center thereof and secured at their outer ends to the sides of the car; said braces being formed with sets of arches supporting the gallery floors and lower sets of arches supporting the floors of the aisles, flights of steps leading from the vestibule to said aisles, an arched brace across the vestibule above the doors, and longitudinal braces in the vestibule at opposite sides of the longitudinal center thereof and secured to the adjacent cross braces underlying the galleries.

16. In a low center car having opposite side entrances, a vestibule, four compartments on the same floor level as and com-

municating at their inner ends with the vestibule, galleries above said compartments, flights of steps leading from the vestibule to the galleries, a pair of doors controlling each entrance and adapted to slide away from or toward each other along the sides of the car within the latter, in their opening and closing movement, longitudinal arches over the doors and transverse roof arches over the vestibule and secured at their ends to said longitudinal arches.

17. A car having end trucks and a central channel structure or beam extending longitudinally between the trucks and provided with extensions extending over the trucks, a central vestibule, side entrance doors for the vestibule, floors extending from opposite sides of the channel structure to the sides of the car and at the entrance level of the vestibule floor, inverted U-shaped transverse arches for the roof and sides of the car, transverse arched braces between the sides of said U braces and the central portion of channel structure within the spaces between the vestibule and the raised end portions of the channel structure, and horizontal cross braces between the said raised portions of the channel structure and the sides of the car.

In testimony whereof, I affix my signature in the presence of two witnesses.

FRED STEFFENS.

Witnesses:
O. S. COLYER,
THEODORE RIESENNREY.