

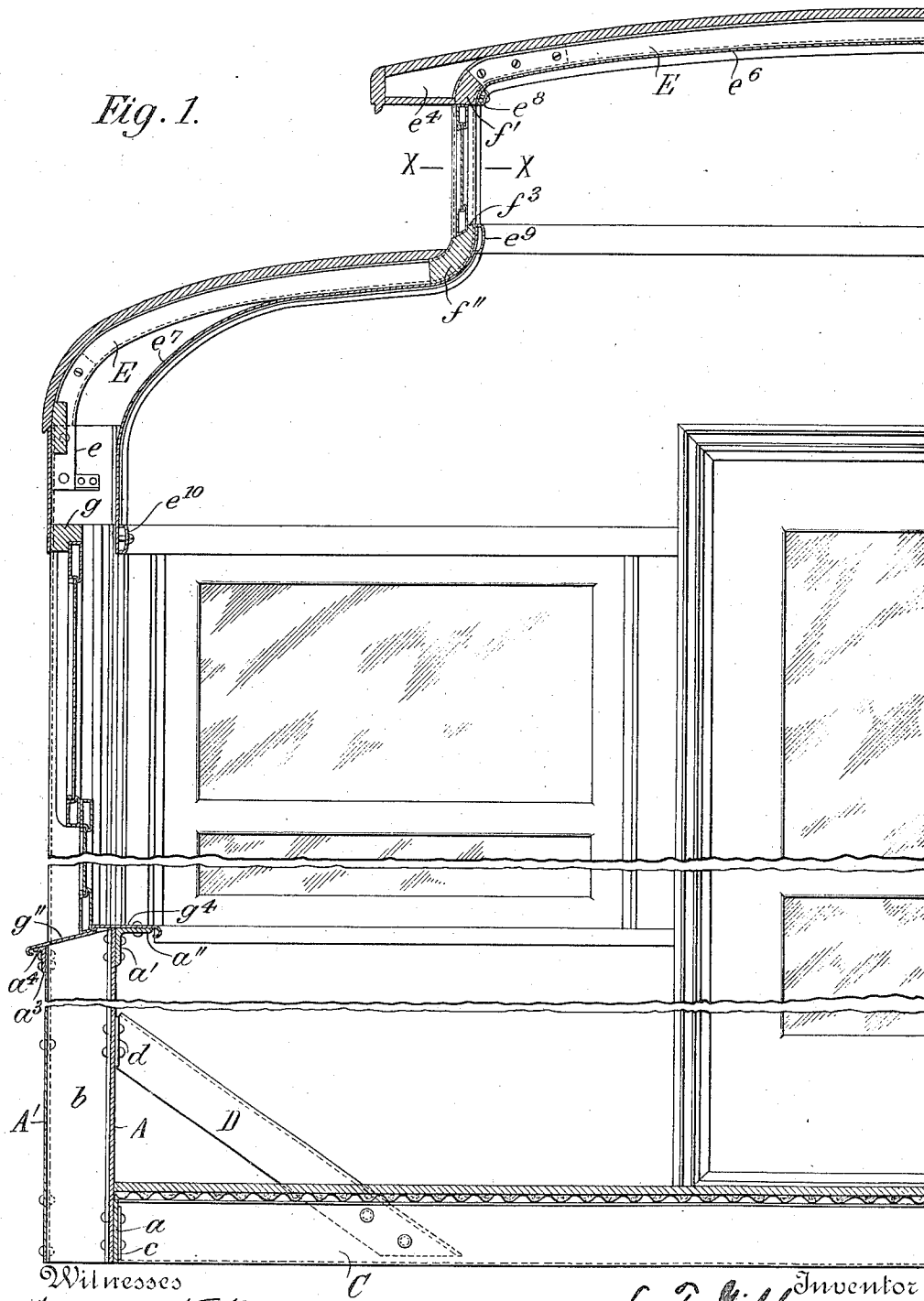
1,031,060.

L. T. GIBBS.
PASSENGER CAR.
APPLICATION FILED SEPT. 29, 1905.

Patented July 2, 1912.

7 SHEETS—SHEET 1.

Fig. 1.



Witnesses

Russell Hutter
J. L. Dunham

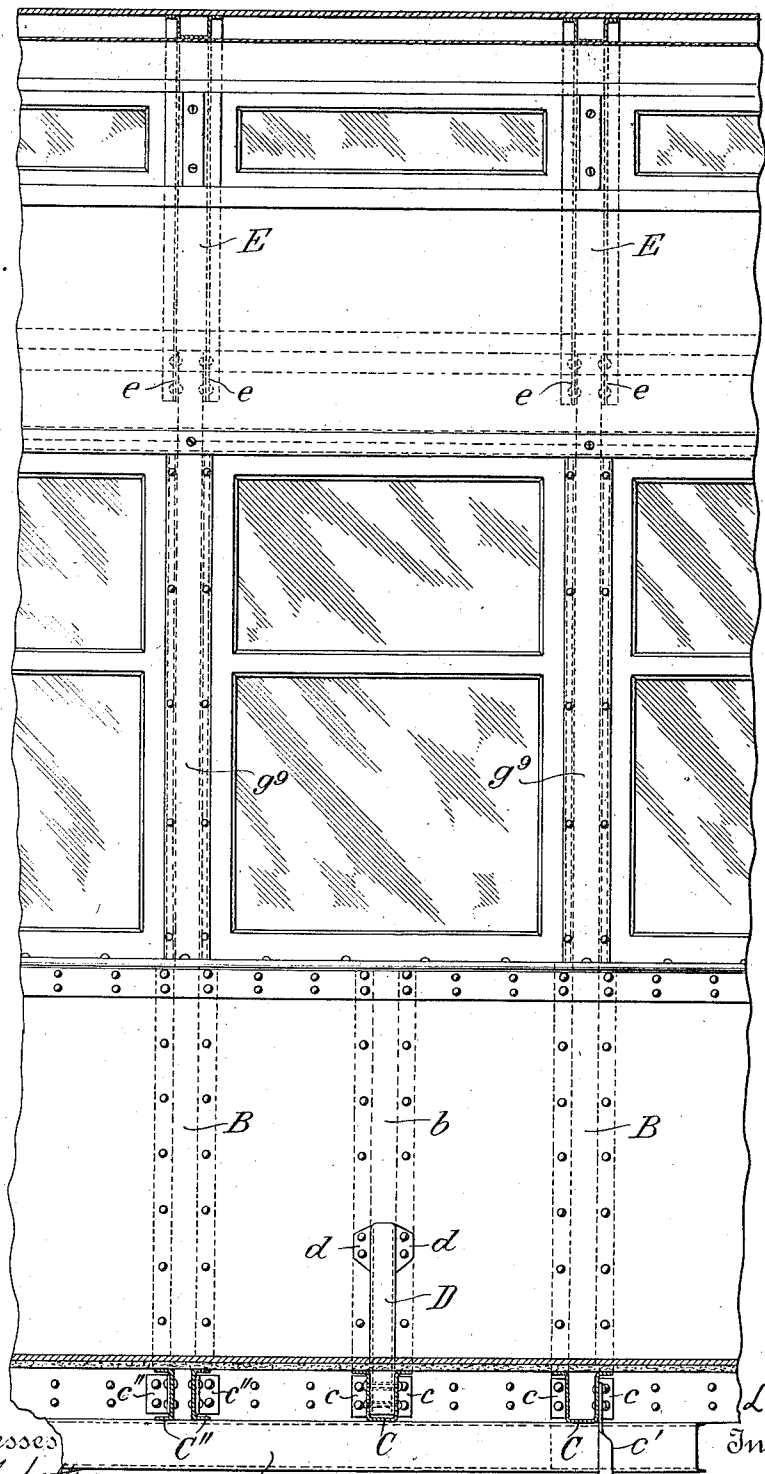
L. T. Gibbs, Inventor
By his Attorneys
Kerr, Page & Cooper

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7 SHEETS—SHEET 2.

Fig. 2.



Witnesses
Raphael Heller
A. A. Dunham

By his Attorneys
Kerr, Page & Cooper

L. T. Gibbs
Inventor

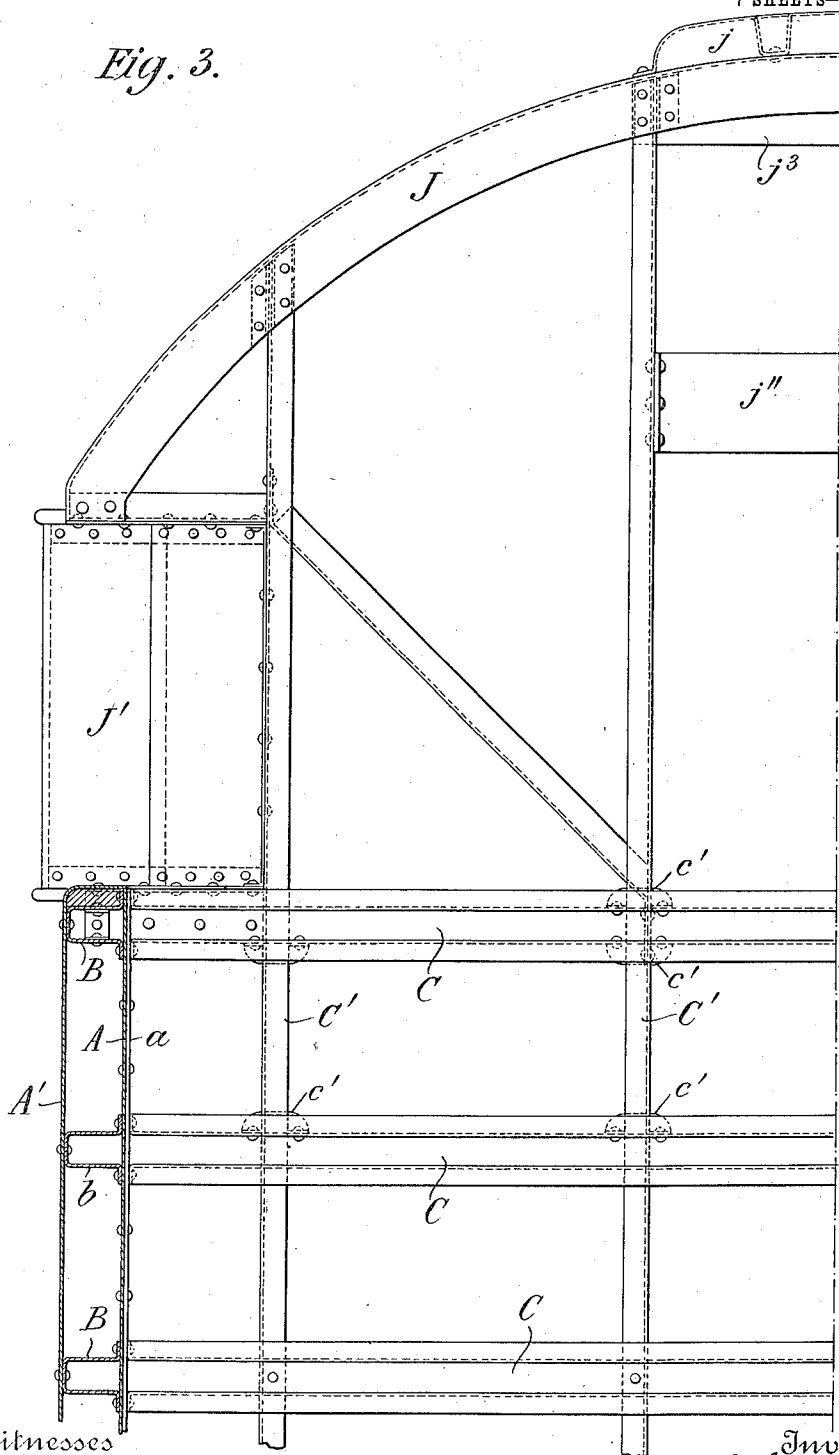
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7 SHEETS—SHEET 3.

Fig. 3.



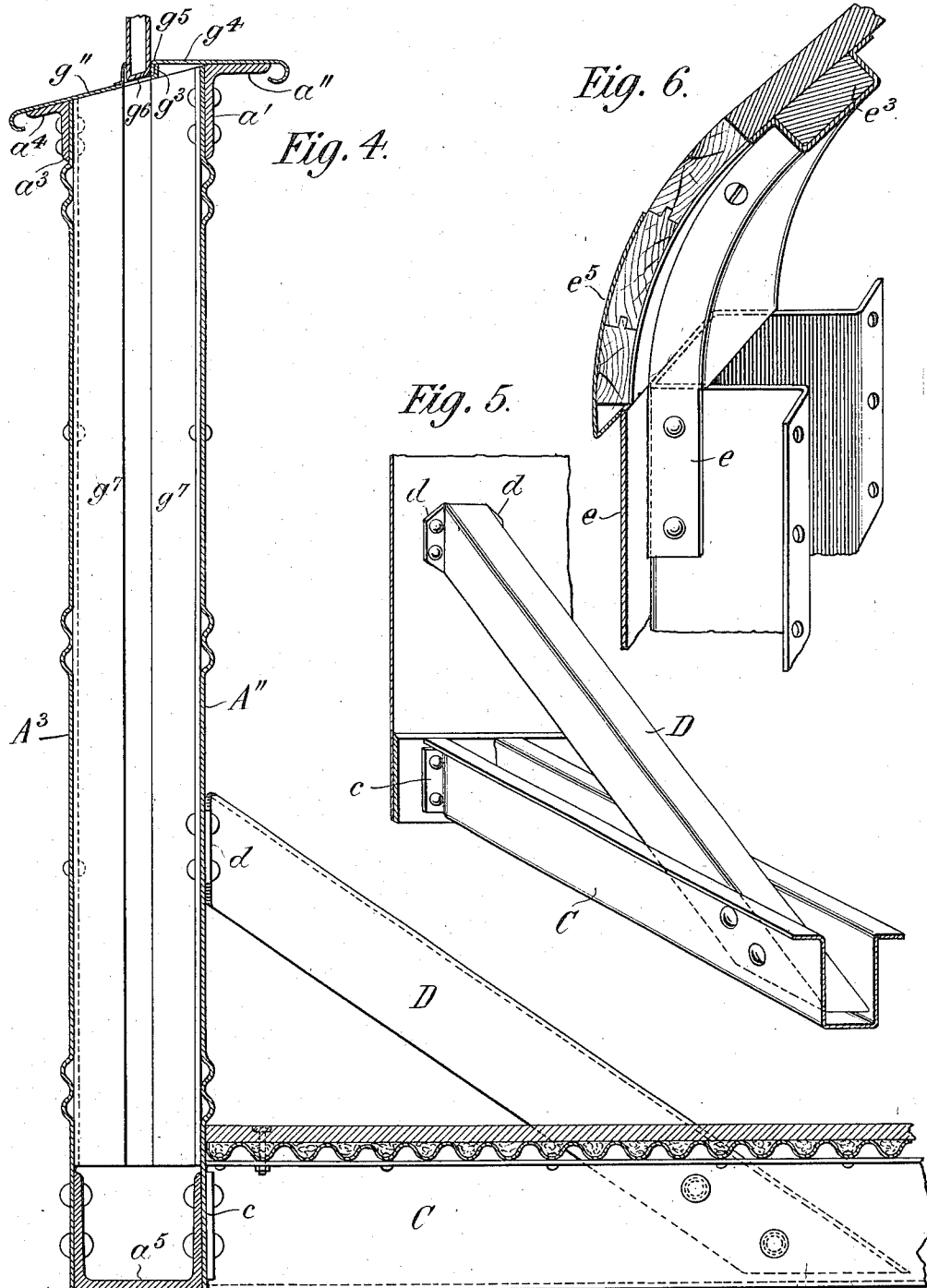
Witnesses
Raphaël Ketter
A. S. Dunham

Inventor
L. T. Gibbs
By his Attorneys
Kerr, Page & Cooper

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7 SHEETS—SHEET 4.



Witnesses
Kaphaël Ketter
A. S. Dunham

Inventor
L. T. Gibbs
By his Attorneys
Kerr, Page & Cooper

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Fig. 9.



Fig. 8.

L. J. Gibbs Inventor
By his Attorneys
Kerr, Page & Cooper

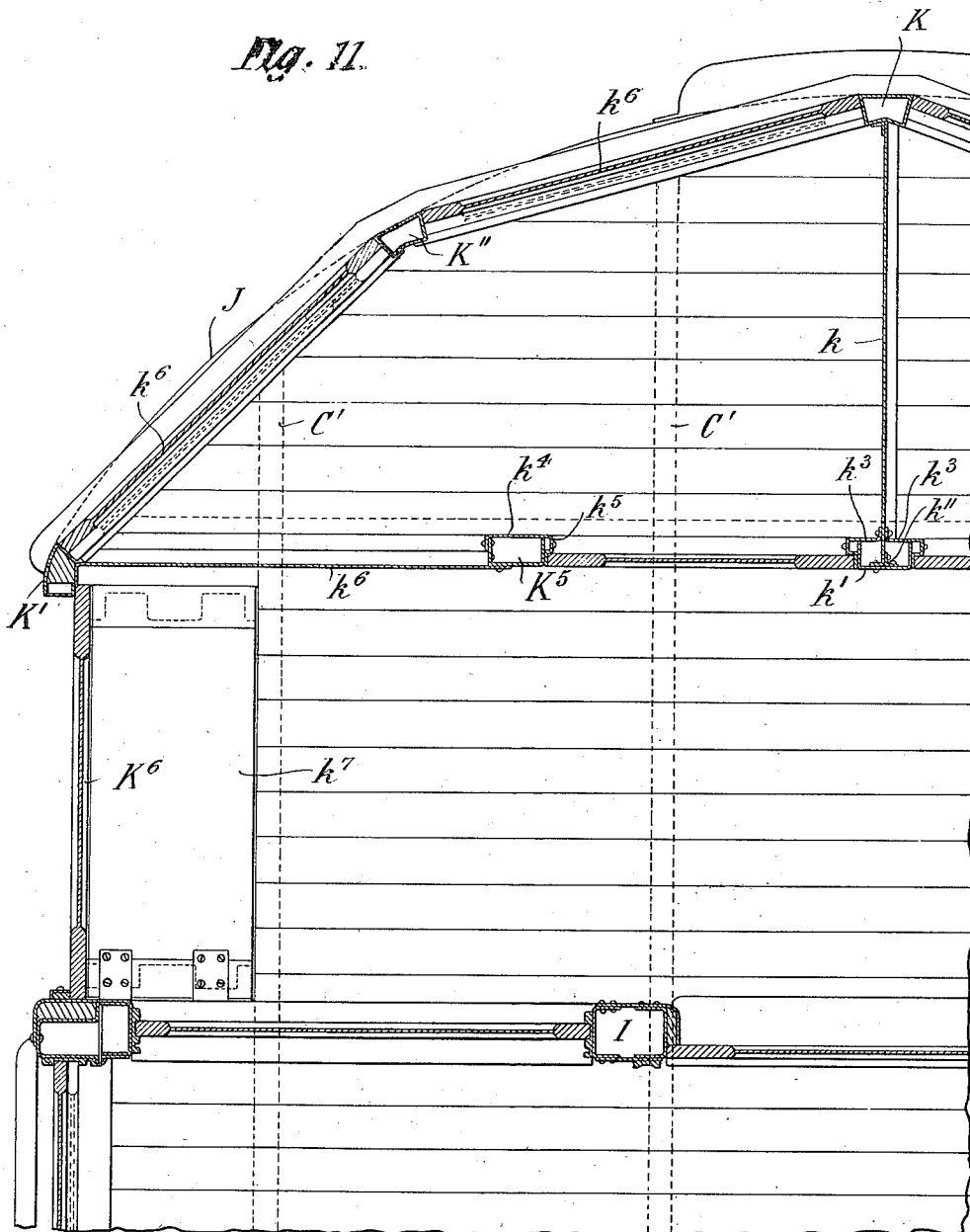
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7 SHEETS—SHEET 6.



Witnesses
Raphaël Vetter
A S Dunham

L. J. Gibbs Inventor
By his Attorneys
Kerr, Page & Cooper

L. T. GIBBS.
PASSENGER CAR.

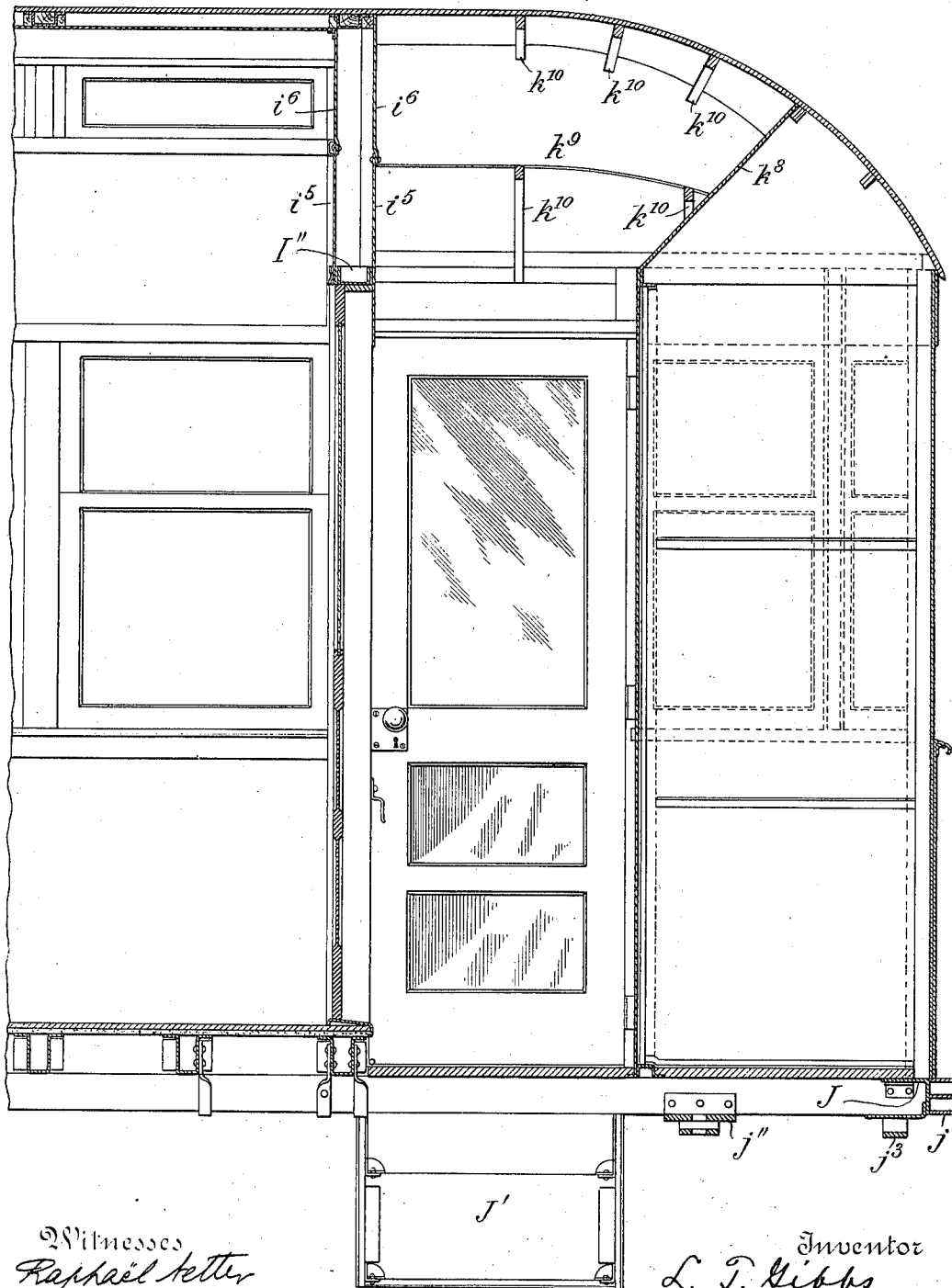
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7 SHEETS—SHEET 7.

Fig. 12.



Witnesses
Raphael Ketter
S. S. Dunham

Inventor
L. T. Gibbs
By his Attorneys
Kerr, Page & Cooper

UNITED STATES PATENT OFFICE.

LUCIUS T. GIBBS, OF HEMPSTEAD, NEW YORK, ASSIGNOR TO AMERICAN CAR & FOUNDRY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF NEW JERSEY.

PASSENGER-CAR.

1,031,060.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed September 29, 1905. Serial No. 280,584.

To all whom it may concern:

Be it known that I, LUCIUS T. GIBBS, a citizen of the United States, residing at Hempstead, in the county of Nassau and State of New York, have invented certain new and useful Improvements in Passenger-Cars, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

My invention relates to steel-frame passenger cars, and has for its chief object to provide a construction which is simple yet utilizing the elements thereof to such advantage as to give greater strength and rigidity without undue weight.

A further object is to provide a construction in which common commercial shapes may be employed for the most part at least, thereby avoiding the greater cost incident to the use of specially rolled shapes.

To these and other ends the invention consists in the novel features of construction, arrangements of parts, and combinations of elements hereinafter described and more fully set forth in the claims.

In the annexed drawings I have shown the preferred embodiment of the invention.

Figure 1 is a vertical transverse section, showing the construction of the car frame, and other features. Fig. 2 is a vertical longitudinal section of a portion of the car. Fig. 3 is a plan view of the floor frame at one end of the car, but showing the side truss in horizontal section. Fig. 4 is a detail sectional view showing a modification of the side truss, also a portion of the floor. Fig. 5 is a detail perspective view showing the method of connecting the side truss, the transverse floor beams, and the diagonal braces or compression members. Fig. 6 is a detail perspective view showing the method of connecting the roof posts and roof carlines. Fig. 7 is a detail sectional view showing the construction of the upper deck. Fig. 8 is a section on line VIII.—VIII., Fig. 7. Fig. 9 is a detail horizontal section at one corner of the car, showing the side window construction. Fig. 10 is a section on line X.—X., Fig. 1. Fig. 11 is a horizontal section at one corner of the car, taken above the window sills, showing the construction and arrangement of the vestibule. Fig. 12 is a vertical longitudinal section of the same end of the car.

Heretofore car bodies have been designed

having a plate girder arranged to constitute a part of the outside sheathing or finish of the car with the vertical body posts inside of the girder. This construction is unsatisfactory, for the reason that in case of a side swipe, or any considerable injury to the girder, it is practically impossible to remove the dents or bends from the heavy girder plate in such manner as to render the exterior surface again presentable, and furthermore resurfacing or straightening a twisted or dented girder requires the removal of the girder from the car. The outside girder construction is further objectionable because of the fact the exposed riveting gives to the car a crude and unfinished appearance, when the rivet heads are left in full, and when the rivet heads are counter-sunk there is a tendency on the part of the varnish to pull away from the counter-sunk rivet heads thus showing each rivet head almost as plainly as though it were left in full, and furthermore the counter-sinking of rivet heads greatly diminish their holding effect. A still further objection to using a girder plate for the outside finish of a car is that when a supporting girder plate of this character is riveted up the varnished side usually has a wavy appearance thus detracting from its looks.

The construction which is more fully hereinafter described, is designed to overcome all of the objections of the outside girder and at the same time to preserve the body posts uncut and furnish a continuous girder. The body posts in the construction hereinafter specified, extend uncut and continuous from the floor to the roof structure, thus serving to stiffen the girder plate against buckling, and are arranged to carry at their outer sides a finished sheathing. In this type of construction the girders are protected by the body posts and the sheathing, and if the side of the car be accidentally injured, any desired portion of the sheathing may be easily and quickly renewed by replacing only that particular part which was injured, thus entirely restoring the general appearance of the car. If the girder which is on the inside should be buckled, dented or injured in any manner that requires straightening, any incidental dents or marring during the straightening operation are inconsequential, for the reason that the girder is on the inside of the car where its continuous length

cannot be easily observed and where it becomes very easy to cover up the marred or bent portion.

The principal elements of my car are the side girders or trusses, one of which is shown in transverse section in Fig. 1.

A is a plate girder extending from one end of the car to the other, preferably in the form of a single plate, but it may be composed of several pieces arranged end to end in the usual manner. At the lower edge is a tension member a in the form of a narrow plate, and at the upper edge is an angle iron a' constituting a compression member. The flange a'' of the angle iron, projecting from the plate girder, forms a shelf on which rests the inner window-sill plate, as hereinafter described. The plate A may constitute the inner sheathing of the car below the windows. On the outside of the plate A are secured the roof posts B, and the short or "cripple" posts b , Figs. 2 and 3. Each of these posts is a channel iron with lateral outwardly turned flanges abutting against and riveted to the plate A, as clearly shown in the figures just mentioned. The roof posts are spaced far enough apart to leave the desired spaces between them for the windows, and the cripple posts are located midway of the roof posts, below the windows. On the other faces of the posts is riveted the outer plate A' , preferably of thinner material than the inner plate A, and forming the outer sheathing of the car. At the upper edge of the outer plate is an angle iron a^3 having its flange a^4 turned outward to provide a support for the outer window-sill plate, as hereinafter described, and also to furnish a belt-rail below the windows. A side frame thus constructed possesses great rigidity and strength, being practically a box girder, and is also extremely light in proportion to its strength. It will be noted that the bottom of the truss is open, thus making every part of its interior accessible for painting either by means of a spray or a long-handled brush. Another form of side truss is shown the detail sectional view, Fig. 4. In this case lower member consists of a channel iron a^5 , the flanges of which extend upwardly between and are riveted to the inner and outer plates A'' , and A^3 , respectively. These plates are corrugated longitudinally, at top, bottom, and center, as shown, to produce greater stiffness. In respect to its other features the truss shown in Fig. 3 is similar to that first described.

Extending across the car from post to post are the floor beams C, Figs. 1 to 5 inclusive. These beams are preferably laterally flanged channel irons of the same cross-sectional size as the side posts, and are arranged with the flanges uppermost, as shown in Figs. 2, 3 and 5. For the purpose of securing the

floor or cross beams to the lower chord of the side trusses the laterally extending flanges of the said beams are cut away for a short distance at each end of the same and the vertical webs are bent outwardly to form ears, as c , Fig. 5. In the construction shown in Fig. 1, in which the side posts extend down to the lower edge of the tension member a , the rivets extend through the material flanges of the posts, as will be seen in Figs. 3 and 9, thus connecting the longitudinal members, the vertical members, and the transverse members together at common points, producing an extremely strong and rigid frame. In the side truss shown in Fig. 4, in which the side posts do not extend into the channel iron a^5 the cross beams are of course not riveted directly to the side posts, but only to the inner plate A and the adjacent flange of the lower chord a^5 . At suitable intervals diagonal or compression members D are provided. These are channel irons, arranged with their parallel webs or flanges extending downwardly, and are of a size to fit into the space between the webs of the cross beams, to which they are riveted, as shown in Fig. 5. The webs or flanges of the compression members are cut away at an angle to permit the lower ends of the members to extend close to or in contact with the bottoms of the floor beams. At the upper ends of diagonals their webs are bent outwardly to form the ears d , which are secured by rivets to the inner plate A and the lateral flanges of the contiguous side posts B or b . This arrangement of the various elements, and their connection at common points, produce a frame which is extremely strong and rigid and consequently possessing great resistance to distortion.

Longitudinal members may be employed in the floor frame if desired, as the channel irons C', Figs. 2, 3 and 12, arranged with their webs vertical, and supported by rivets extending through the bottoms of the cross beams and by hangers c' riveted to the vertical webs of the cross beams. It has been found, however, that the longitudinal corrugations of the floor sheet, hereinafter described, provides all the longitudinal stiffness needed in the floor, and I therefore prefer to omit the longitudinal members C'.

Instead of using channel irons like C to form the cross beams, they may consist of channel irons without lateral flanges, as C'', Fig. 2, arranged back to back but spaced apart a short distance. They may be secured to the side trusses by means of angle brackets, as c'' .

On top of the cross-beams, riveted to the outwardly extending flanges thereof, is a longitudinally corrugated sheet of metal, C³, the grooves of which may be filled with a suitable composition for the purpose of

insulating the interior of the car from heat, sound, and electricity. On the corrugated sheet may be laid a wood flooring C^4 , secured thereto by small bolts as shown in Fig. 4, at c^3 , the bolts extending also through the flanges of the floor beams wherever possible. As just explained, the corrugation of the floor sheet provides the necessary stiffness longitudinally for the floor, and hence, in general, no longitudinal members are needed in the floor frame.

The roof frame is composed of one-piece carlines, bent to the proper shape to form the usual upper deck, as shown at E, Figs. 1, 6 and 7. Each carline consists of a laterally flanged channel iron of the same kind as the side posts B, but slightly wider between the webs, so that the latter webs can straddle the ends of the posts as clearly shown in Fig. 6, the bottom of the carline iron being cut out to permit such connection. The legs e thus formed on the carlines are riveted to the side webs of the posts B. The joint thus formed is simple, yet extremely strong. I prefer also to cut away the lateral flanges at the ends of the carlines, as shown in Fig. 6, so that the letter board e' can lie flush with the remaining portions of the said lateral flanges. At such points as are readily accessible the strips constituting the main roof-sheathing E' are bolted directly to the carline flanges, as at e'' , Fig. 7, but at the lower edges of the roof, which are rendered somewhat less accessible by the proximity of the ends of the roof posts, wood fillers e^3 , Fig. 6, are used, of proper size and shape to fit the space between the vertical webs of the carlines. At these points the roof strips are nailed or screwed to the fillers. To produce the desired overhang on the upper deck the carlines carry extension pieces, of wood, indicated by e^4 , Figs. 1 and 7, at the points at which the carlines are bent downward. To these extension pieces roof strips are screwed or nailed, as for example at Fig. 7. Immediately above the letter board the roof may be provided with a protective sheathing, as e^5 , of metal or other suitable material, and the same may of course extend over the entire roof if desired, but it is not necessary to illustrate so simple and obvious a modification. The interior sheathing may be formed by a sheet of metal or other material, e^6 , secured to the underside of the car lines on the upper deck, and by a sheathing e^7 extending from the upper deck below the ventilator windows to a point above the side windows, on the roof posts. Finishing strips e^8 , e^9 , e^{10} , may be provided to cover the edges of the inner roof sheathings.

The upper deck or ventilator windows, F, are located between the carlines, and to provide suitable forms therefor, wood fillers f are employed, secured in the angles of the

carlines, as shown in Fig. 10, the upper and lower members of the frame being formed of horizontal strips f' , f'' respectively, extending from carline to carline, as indicated in Figs. 1 and 7. In the form shown, the sashes are intended to swing outwardly upon pivots at the top of the frame, and the lower member is therefore provided with a stop f^3 to limit the inward swing of the sashes. The sashes themselves may be made of sheet metal, as shown.

A considerable advantage flows from the roof construction described, in the fact that the entire roof may, if desired, be built separately from the car body and then dropped down upon the body. The carlines telescope over the roof posts and are then riveted thereto and also to the letter board. The body and roof may thus be built simultaneously, thus effecting a very desirable economy of time in the construction of the complete car, as will be readily understood.

The side windows G are located between the roof posts B, and above the cripple posts b . The upper members of the frames consist of horizontal wooden strips g , Fig. 1, secured to the roof posts in any suitable way. The side stops g' , Fig. 9, are preferably of pressed metal, secured directly to the sides of the roof posts. The outer window sills, see Figs. 1, 3 and 9, are formed by a plate g'' , preferably extending the length of the car, or in shorter sections, as desired. At the proper points openings or deep notches are cut in its inner edge to receive the roof posts, and the inner edge itself is turned up to form a flange g^3 . The inner sills are formed by a similar plate, g^4 , with its edge turned down to form the flange g^5 which engages the corresponding flange on the other, as shown in Fig. 4. In the construction shown in Fig. 1 the lower sash rests on the outer sill plate, while in the construction shown in Fig. 3 the lower sash is intended to drop into the space between the inner and outer truss plate A'' and A^3 , the cripple posts in that case being of course omitted, and the outer sill plate slotted, as at g^6 , to permit the sash to pass through the same. Guides for the sash may also be provided for the sash, as for example plates g^7 secured in any convenient manner to the side posts. It is of course evident that either plan may be used with either side truss, the necessary modifications being made as above indicated. The upper sash is preferably stationary as appears in Fig. 1, and abuts against the upper frame member g , resting in a rabbet formed therein. The outer and inner sills are riveted to the angle iron flanges a'' , a^4 , respectively, as shown in Figs. 1 and 9. In order to admit the window sashes the lateral flanges of the roof posts are cut away for the desired dis-

tance, as indicated at g^8 . The open space between the parallel webs of the side posts may be closed in any suitable manner, as by metal plates g^9 , Fig. 2.

5 The roof post at each corner of the car has a filling member H, for example of wood, secured to it and covered by the outer sheathing, which is bent inwardly for that purpose, as shown in Fig. 9. The end doors, 10 leading into the interior of the car, are located between hollow rectangular posts rising from the floor, one of which is shown at I, Fig. 9. To form stops for the doors, blocks, as i , are secured to the door posts, 15 and may be covered with sheathing i' . The end windows are framed between the end roof posts and the door posts, as seen in Figs. 9 and 11. The channel iron I' , arranged against the side wall of the car, carries one set of stops, i'' , while the other set 20 i^3 , is secured to the door post I. The sills for the end windows may be constructed in the same manner as those for the side windows, or single flat plates may be used, as i^4 , 25 Fig. 9. Below each end window is a plate i'' , forming a continuation of the inner sheathing A, and a similar plate, not shown, may be provided for the outer side.

30 The end platforms are provided for by extending the longitudinal floor members C' , C' , as shown in Fig. 3, where such members are used, or cantaliver beams may be employed instead, as will be readily understood. The middle members are longer than 35 the outer ones to accommodate a curved end member J, at the apex of which is secured a buffer j . The steps J' , are in each case supported between the end of the side walls and the adjacent end of the end member J, 40 as clearly shown in Figs. 3 and 12. From the ends of the steps to the points where the longitudinal members cross the end cross beams C extend diagonal braces, as j' , and if desired a plate j'' may be provided across 45 the middle members C' , C' to which a draw bar may be connected, in which case a support, as j^3 , for the draw bar, may be provided at the end of the platform, secured to the same longitudinal members.

50 The preferred vestibule construction is shown in Figs. 11 and 12. At the center of the end member J is a hollow post K, and midway between it and the posts K' at the steps are similar posts K'' . Extending in- 55 wardly from the center post K is a flanged metal plate k . The inner flange is secured to a vertical channel iron k' , constituting a door post, an angle iron k'' being secured to both members to strengthen the joint. Riv- 60 eted to the plate are metal parts k^3 , extending over the edges of the channel iron k' and forming stops for doors K^3 and K^4 . The other posts for these doors are formed by channel irons, one of which is shown at 65 K^5 , the space between the flanges thereof

being covered by a metal plate k^4 , extend- ing over the side of the post and forming a stop k^5 . Between the posts K^5 and K' are plates k^6 , only one of which is shown in Fig. 11. Between the posts K, K' , K'' are the vestibule windows. These are located as 70 far out as the posts will permit, the upper sashes k^6 being flush with the outer faces of the posts, to make the end of the car as smooth as possible, thereby reducing the re- 75 sistance offered by the air.

The arrangement above described secures an economical utilization of the platform space. One of the compartments thus 80 formed may be used as a toilet room and the other as a motorman's or engineer's cage. It is obvious that the other vestibule may be similarly divided or may be used as a single room for baggage.

85 The transverse passage of the vestibule is provided with end doors, one of which is shown at K^6 , Fig. 11, and when the door is closed the space occupied by the steps may be covered by a hinged plate k^7 in the usual way. 90

The roof of the vestibule is formed by continuing the outer roof sheathing down to the upper ends of the vestibule posts, K, K' , K'' , as shown in Fig. 12, and the two vesti- 95 bule compartments, are ceiled by a plate k^8 which may be formed by continuing the sheathings k^9 . The upper members of the end doors are formed by transverse channel irons, one of which is shown at I'' , Fig. 12, 100 secured to the upper ends of the door posts I, and above these upper members are plates i^5 riveted at their upper edges to plates i^6 which extend to the car roof and are se- 105 cured to the end car lines. Extending from the joint between the outer plates i^5 and i^6 over to the ceiling k^8 of the vestibule compartments is a ceiling k^9 for the vestibule passage. The roof of the vestibule and the ceiling k^9 may be supported by suitable car- 110 lines k^{10} .

What I claim is:

1. In a railway passenger car frame, the combination with side trusses; of cross beams for the floor of the car, consisting of 115 laterally flanged channel irons, arranged with their side webs extending upwardly, the ends of the webs being bent at right angles thereto to form ears for connection with the bottoms of the side trusses, as set forth.

2. In a railway passenger car frame, the 120 combination with side trusses; of cross beams for the floor of the car consisting of laterally flanged channel irons, arranged with their side webs extending upwardly, and secured to the bottoms of the side 125 trusses; and diagonal braces consisting of channel irons arranged with their side webs extending downwardly, the upper ends of the side webs being bent at right angles thereto to form ears for connection with the 130

side trusses and the lower ends of the diagonal members extending between and secured to the side webs of the cross beams, as set forth.

3. In a railway passenger car frame, the combination with side trusses, each comprising a longitudinal plate girder having upper and lower chords secured thereto, a plurality of vertical posts secured to the plate girder, and an outer plate secured to the said posts; of cross beams for the floor of the car, secured to the bottoms of the side trusses; as set forth.

4. In a railway passenger car frame, the combination with side trusses, each comprising a longitudinal plate girder having upper and lower chords, vertical posts secured to the plate girder on its outer side, and an outer plate secured to the vertical posts; of cross beams for the floor of the car, consisting of channel irons having the ends of their side webs bent at an angle thereto and secured to the bottoms of the side trusses, as set forth.

5. In a railway passenger car frame, the combination with side trusses, each comprising a longitudinal plate girder, having upper and lower chords, vertical posts consisting of laterally flanged channel irons having their flanges secured to the plate girder, and an outer plate secured to the vertical posts; of cross beams for the floor of the car, consisting of channel irons having the ends of their side webs bent at an angle thereto for connection with the side trusses, the said cross beams being located at the points where the vertical posts are secured to the plate girder and the bent ends of the side webs being secured by rivets extending through the lateral flanges of the vertical posts; as set forth.

6. In a railway passenger car frame, the combination with side trusses, each comprising a longitudinal plate girder having upper and lower chords, vertical posts consisting of laterally flanged channel irons, secured by their flanges to the outer side of the plate girder, and an outer plate secured to the vertical posts, of cross beams for the floor of the car, consisting of channel irons having the ends of their side webs bent at an angle thereto for connection with the side trusses, said cross beams being located at the points where the vertical posts are secured to the plate girders and the bent ends of the side webs thereof being secured by rivets extending through the lateral flanges of the vertical posts; and diagonal members consisting of channel irons having the upper ends of their side webs bent at an angle thereto and secured to the plate girder by rivets extending through the lateral flanges of the vertical posts, said diagonal members being secured at their lower ends to the side webs of the cross beams; as set forth.

7. In a railway passenger car, the combination with side trusses; of cross beams for the floor of the car, secured to the bottoms of the side trusses, consisting of laterally flanged channel irons arranged with their lateral flanges upward; a corrugated metal sheet supported by the said flanges; and a floor tread on the corrugated sheet, as set forth.

8. In a railway passenger car, the combination with side trusses; of cross beams for the floor of the car, secured to the bottoms of the side trusses, consisting of laterally flanged channel irons, arranged with their lateral flanges upward; a metal sheet, having corrugations extending longitudinally thereof; supported by the said flanges; and a floor tread on the said corrugated sheet; as set forth.

9. In a railway passenger car, the combination with side trusses; of cross beams for the floor of the car, secured to the bottoms of the side trusses, consisting of laterally flanged channel irons arranged with their lateral flanges upward; diagonal members secured to the side trusses and extending between and secured to the side webs of the cross beams; and a corrugated metal sheet supported by the lateral flanges of the cross beams; as set forth.

10. In a railway passenger car, a side wall frame comprising, in combination, a longitudinal plate girder, roof posts consisting of laterally flanged channel irons having their flanges secured to the plate girder on the outer side of the same, and an outer plate secured to the outer faces of the roof posts, as set forth.

11. In a railway passenger car, a side wall frame comprising, in combination, a longitudinal plate girder having upper and lower chords, the upper chord having an inwardly extending flange, vertical posts for the roof of the car, consisting of laterally flanged channel irons, the said flanges being secured on the outer side of the plate girder, and an outer plate secured to the outer faces of the roof posts and having an upper chord with an outwardly extending flange, as set forth.

12. In a side wall construction for railway passenger cars, the combination with a longitudinal plate girder having an upper chord with an inwardly extending flange, roof posts secured to the outer side of the plate girder, and an outer plate secured to the outer faces of the posts and having an upper chord with an outwardly extending flange; of an outer sill plate secured to the said outwardly extending flange and extending between the roof posts, with an upwardly extending flange at its inner edge; and an inner sill plate secured to the said inwardly extending flange, said inner sill plate extending outwardly between the roof

posts and having a downwardly turned flange on its edge engaging the upwardly turned flange on the outer sill plate; as set forth.

5 13. In a railway passenger car, the combination with a roof post, of a roof carline secured thereto at the upper end thereof, consisting of a laterally flanged channel iron, having its side webs extended to fit over
10 the upper ends of the roof posts, as set forth.

14. In a railway passenger car, the combination with a roof post consisting of a channel iron, of a roof carline consisting of
15 a channel iron having the ends of its webs extended and fitting the side webs of the roof post, as set forth.

15. In passenger car construction, the combination with a plurality of continuous
20 vertical body posts, of a continuous girder beneath the windows on the inside of the body posts having a continuous intumed flange portion at its upper edge.

16. In passenger car construction, the combination with a plurality of continuous
25 vertical body posts, of a continuous girder beneath the windows on the inside of the body posts having a continuous intumed flange portion at its upper edge and sheathing
30 on the outside of the body posts.

17. In passenger car construction, the combination of a girder plate having a continuous intumed reinforcing portion at its upper edge and located beneath the car
35 windows, continuous body posts secured along the outer side of the girder and extended to the upper portion of the side of the car and sheathing secured outside the body posts.

40 18. The combination in passenger car construction, of a side girder extending the length of the car beneath the windows thereof and comprising a plate with a flange at its lower edge and a continuous intumed
45 flange at its upper edge, vertical body posts rigidly secured to the outer face of the girder at intervals, and sheathing outside the body posts.

19. In passenger car construction, the combination with a continuous flanged
50 girder located beneath the car windows, the upper flange of which projects toward the center of the car and is continuous, of a plurality of continuous vertical body posts
55 spaced along the outer side of the girder and secured rigidly thereto at their lower ends and sheathing outside the body posts.

20. In passenger car construction, the combination with a continuous flanged
60 girder located beneath the car windows, the upper flange of which projects toward the center of the car and is continuous, of a plurality of continuous vertical body posts extending from the lower side of the girder
65 to the upper portion of the side of the car

and rigidly secured to the outer side of such girder and sheathing outside the body posts.

21. A passenger car wall comprising in combination, a plurality of continuous body
70 posts extending from the lower side of the wall to the upper side thereof, a girder plate extending the length of the car beneath the windows and rigidly secured to the inner
75 sides of the lower portions of the body posts, a continuous flange member secured along the upper inner edge of the girder plate, and sheathing outside the body posts.

22. In a car construction, the combination with a plurality of vertical body posts, of a continuous double plate girder comprising
80 supporting plates respectively on the inner and outer sides of said posts, said girder comprising compression flanges and window sill plates connected with said flanges
85 said sill plates being notched to receive said posts.

23. In a car construction, the combination with a plurality of vertical body posts, of a continuous girder beneath the windows on
90 the inside of the body posts, said girder having a continuous compression member and a cross bearer provided with continuous flanges extending entirely across the car.

24. In a passenger car construction, the combination with a plurality of body posts,
95 of continuous girders beneath the windows on the inside of the body posts at opposite sides of the car, tension members and compression members forming parts of said girders and continuous cross bearers extend-
100 ing entirely across said car and connected with said girders.

25. In a passenger car construction, the combination with a plurality of body posts,
105 of continuous girders beneath the windows on the inside of the body posts at opposite sides of the car, tension members and compression members forming parts of said girders and continuous cross bearers having
110 upper flanges extending entirely across said car and connected with said girders.

26. In a passenger car construction, the combination with a plurality of body posts,
115 of continuous girders beneath the windows on the inside of the body posts at opposite sides of the car, tension members and compression members forming parts of said girders and cross bearers having a continuous member forming a portion thereof extend-
120 ing entirely across the car and being connected with said girders.

27. In a car construction, the combination with a plurality of body posts and double
125 plate girders comprising web plates and compression members at the upper edges of said webs notched for said body posts substantially as described, said members being carried by said web plates.

28. In passenger car construction, the combination with a plurality of continuous
130

vertical body posts, of a continuous girder beneath the windows on the inside of the body posts having a continuous inturned flange portion at its upper edge and uninterrupted cross bearers extending entirely across the car and connected with said girder.

29. In a passenger car construction, the combination with a plurality of continuous vertical body posts, of a continuous girder beneath the windows on the inside of the body posts having a continuous inturned flange portion at its upper edge in combination with cross girders having continuous upper flanges and a corrugated floor sheet supported by said cross girders.

30. In a passenger car construction, the combination comprising continuous body posts; inner plate girders connected therewith, said plate girders having compression members and tension members, an outer sheathing connected with said posts, and notched window sills.

31. In a passenger car construction, the combination comprising body posts, cross bearers, an inner plate girder connected to each end of said cross bearers, notched members forming window sills riveted to said inner plate girders and an outer sheathing secured to said body posts.

32. In a passenger car construction, the combination comprising body posts, inner plate girders connected with said body posts, said girders comprising web plates with connected compression members and tension members, cross bearers connected with said tension members and an outer sheathing connected with said body posts.

33. In a passenger car construction, the combination comprising body posts, inner plate girders connected with said body posts, said girders comprising web plates with connected compression members and tension members, cross bearers connected with said body posts and an outer sheathing connected with said body posts.

34. In a railway car, a side supporting member comprising parallel connected plate girders each of which is composed of a supporting web plate, with a flanged member along its upper portion, means for connecting said flanges, a stiffening member connected with the lower portion of the outer plate and body posts extending upwardly from said stiffening member between said parallel girders.

35. In a railway car, a side supporting member comprising parallel connected plate girders each of which is composed of a supporting web plate, with a flanged member along its upper portion, means for connecting said flanges, a stiffening member connected with the lower portion of the outer plate and body posts extending upwardly from said stiffening member between said

parallel girders, said posts being connected positively with said outer plate.

36. In a railway car, a side supporting member comprising parallel plate girders each of which comprises a web plate, a top flange and a bottom flanged member, and body posts extending upwardly between said web plates and connected positively with one of said plates.

37. In passenger car construction, the combination of a plurality of continuous vertical body posts, and of a continuous girder having a continuous upper flange beneath the windows on the inside of said body posts.

38. In passenger car construction, the combination of a plurality of continuous vertical body posts, of a continuous girder having a continuous upper flange beneath the windows on the inside of said body posts, and sheathing on the outside of the body posts.

39. In passenger car construction, the combination of a plurality of vertical body posts, said body posts being formed of laterally flanged channel irons arranged with their flanges inward, continuous plate girders secured to the inner flanges of said posts and continuous carlines attached to said body posts and adapted to stiffen the body posts by laterally bracing the same, said continuous carlines consisting of laterally flanged channel irons having their flanges arranged outwardly.

40. In passenger car construction, the combination of a plurality of vertical body posts consisting of laterally flanged channel irons arranged with their lateral flanges inward, a plate girder secured to said flanges, and continuous carlines attached to the upper portion of said body posts and adapted to stiffen said body posts by laterally bracing the same, said continuous carlines consisting of laterally flanged channel irons arranged with their lateral flanges outward.

41. In a railway passenger car, the combination of supporting members including side plate girders, roof carlines extending across the car and bent to the form of the upper deck of the roof in such manner as to laterally brace said supporting members, each carline consisting of a laterally flanged channel bar arranged with its flanges outward, and means for attaching said carlines to said supporting members.

42. In a railway passenger car, the combination of vertical supporting members including side plate girders, roof carlines extending between said vertical supporting members in such manner as to laterally brace said supporting members, each carline consisting of a laterally flanged channel bar arranged with its flanges outward, and means for attaching said carlines to said supporting members.

43. In a railway passenger car, the combination with vertical body posts, of side girders on the inner sides of said posts, said girders comprising web plates provided
5 with compression members and tension members, cross beams for the floor of the car, and means for attaching the ends of said cross beams to said girders.

44. In a railway passenger car, the combination of a plurality of vertical body posts comprising channel irons, a continuous girder beneath the windows and secured to the inner sides of said posts, said girder being provided with a compression member
10 and a tension member, a continuous letter board above the windows, carlines extending across the car and attached to said body

posts in such manner as to laterally brace the same, and a curved lower deck roof overhanging said letter board.

45. In a passenger car, the combination with roof posts at the side of the car, of roof carlines extending across the car from the tops of the roof posts, each carline consisting of a laterally flanged channel iron arranged with its flanges outward, and bent to form the upper deck of the roof, and a roof secured to said lateral flanges of the carlines, as set forth.

LUCIUS T. GIBBS.

Witnesses:

S. S. DUNHAM,

THOMAS J. BYRNES.