No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, Jr.

RAILWAY CAR FRAME.

APPLICATION FILED FEB. 28, 1906.

9 SHEETS—SHEET 1.

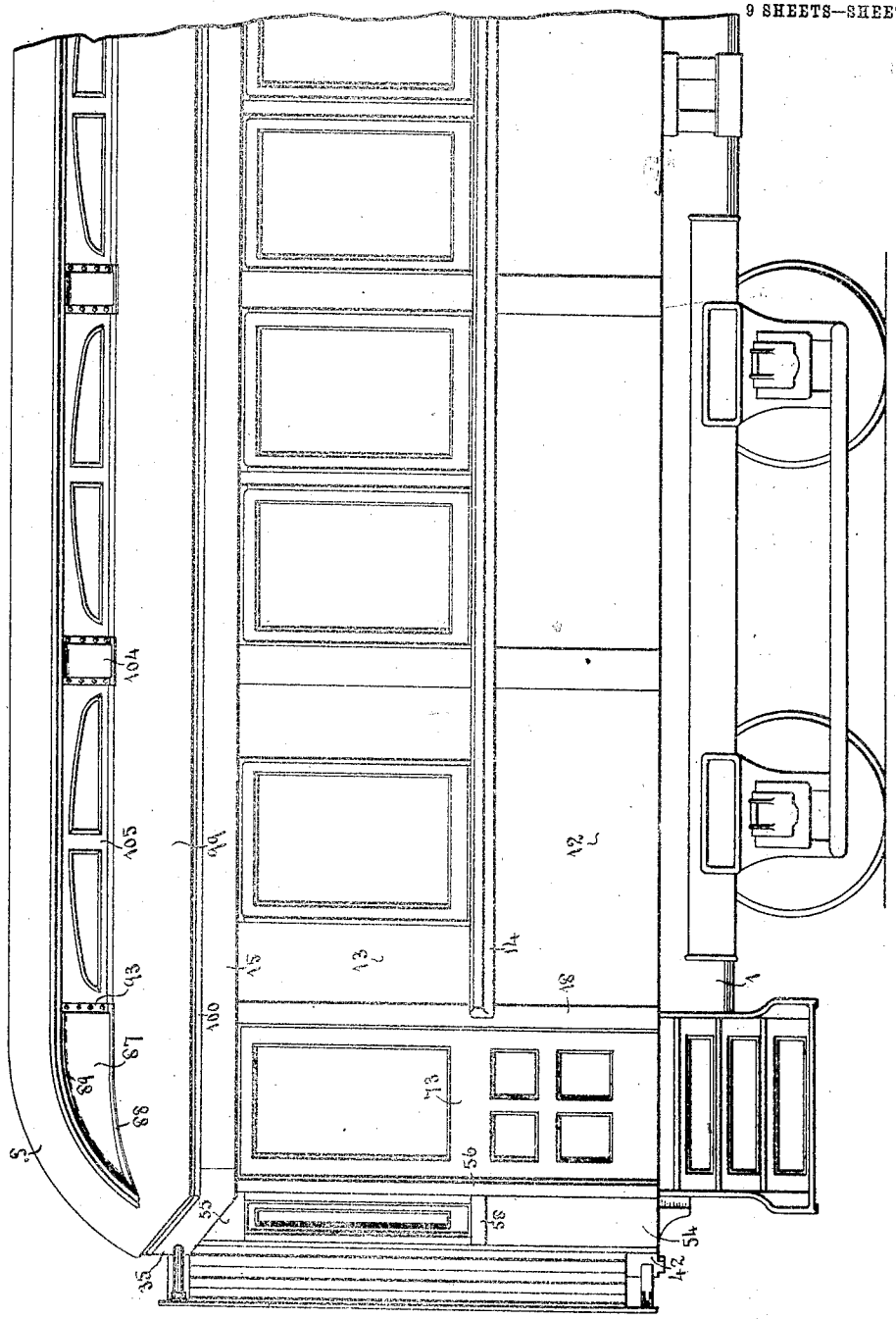


Fig. 1.

WITNESSES

J. H. O'Brien

L. V. Stoltzlen

INVENTOR

William F. Kiesel Jr.

BY Eugene Divers

ATTORNEY

No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, Jr.

RAILWAY CAR FRAME.

APPLICATION FILED FEB. 28, 1906.

9 SHEETS—SHEET 2.

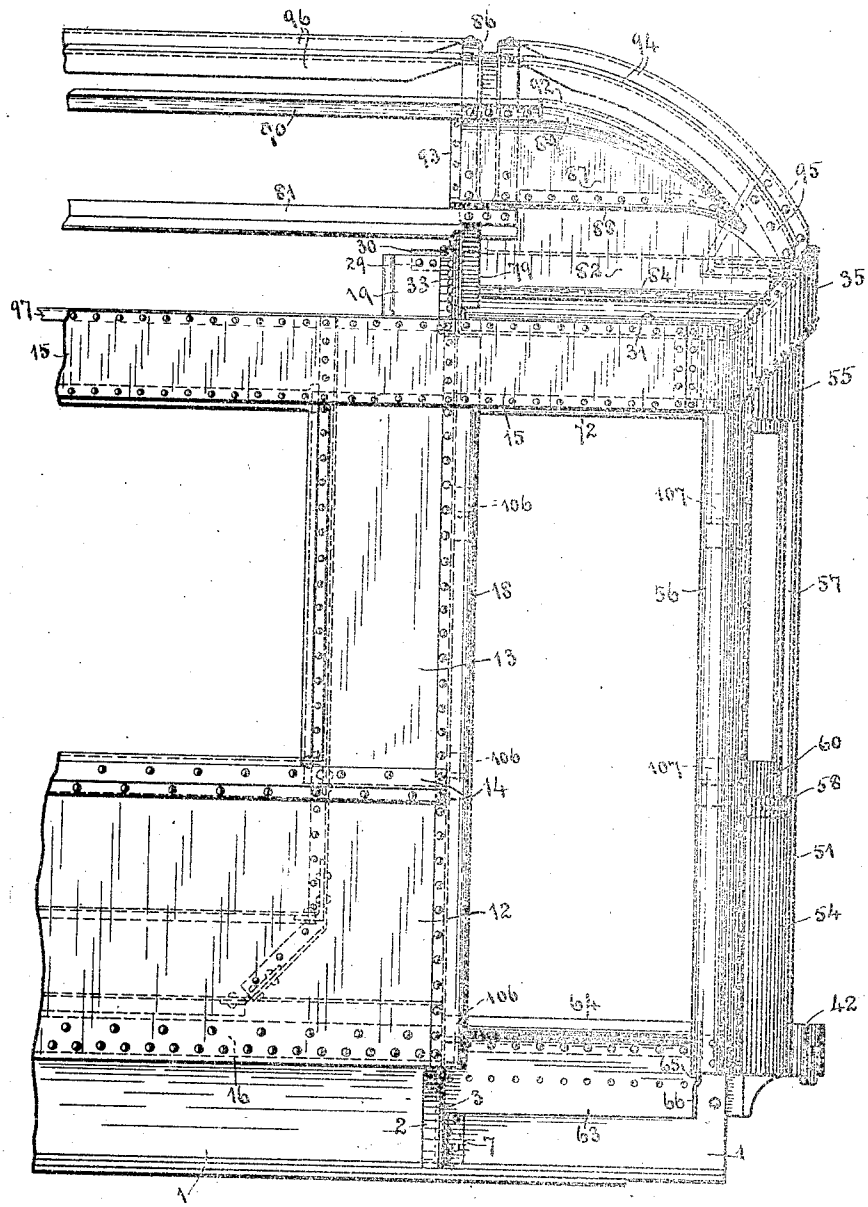


Fig. 2.

WITNESSES

J. H. O'Brien

L. V. Stoeltzlen

INVENTOR

William F. Kiesel Jr.

BY

Eugene Dixon

ATTORNEY

No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, Jr.

RAILWAY CAR FRAME.

APPLICATION FILED FEB. 26, 1906.

9 SHEETS—SHEET 3.

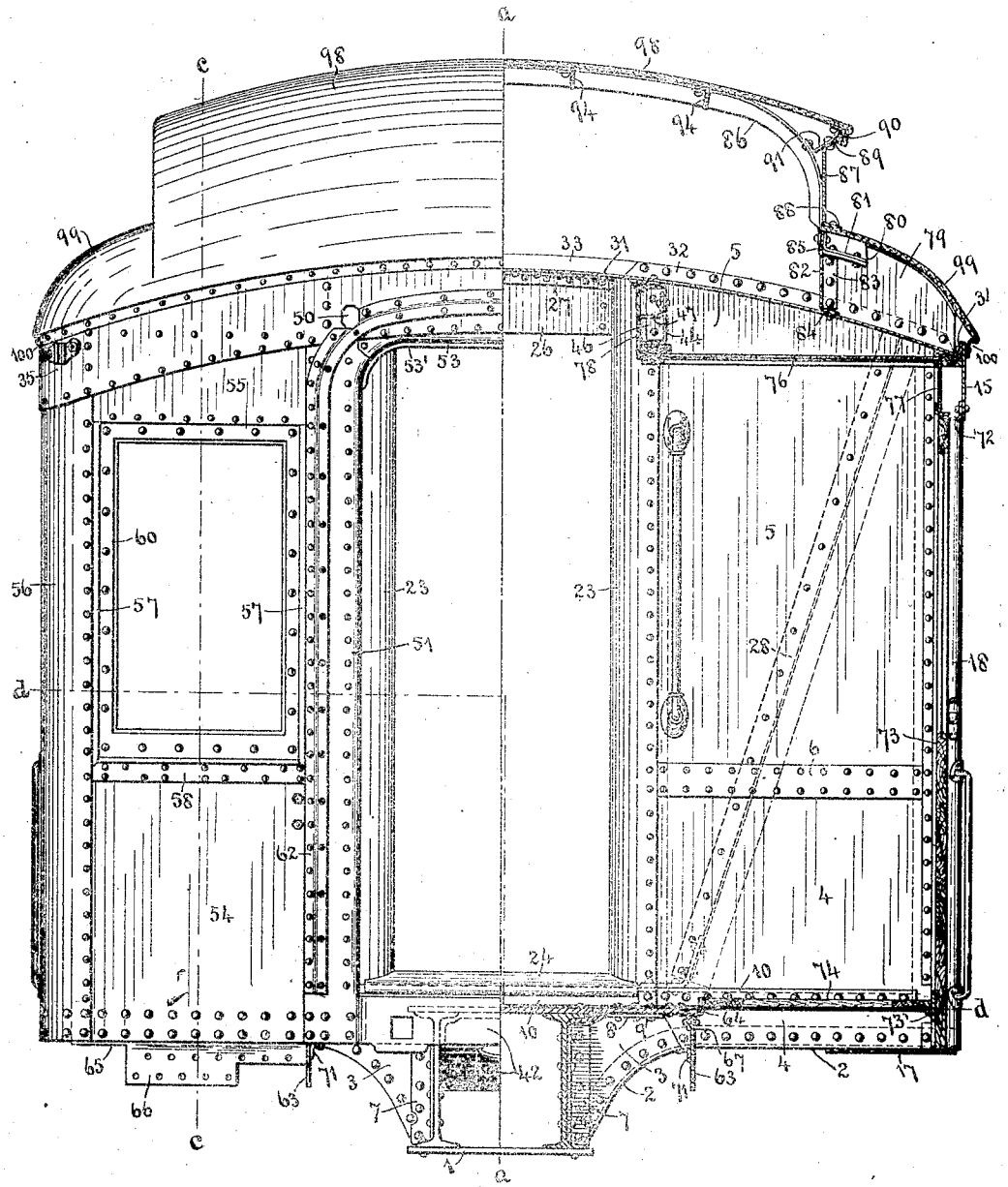


Fig. 3.

WITNESSES

J. H. O'Brien

L. V. Stoltzlin

INVENTOR

William F. Kiesel, Jr.

BY

Eugene Owen

ATTORNEY

No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, Jr.

RAILWAY CAR FRAME.

APPLICATION FILED FEB. 28, 1906.

9 SHEETS—SHEET 4.

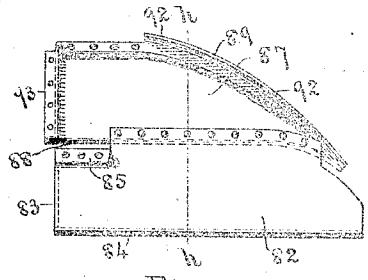


Fig. 14.

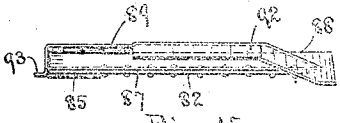


Fig. 15.

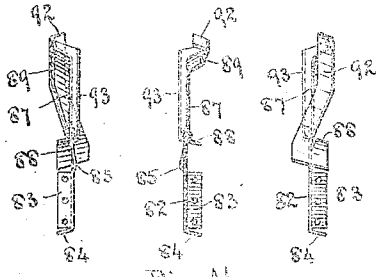


Fig. 16.



Fig. 17.

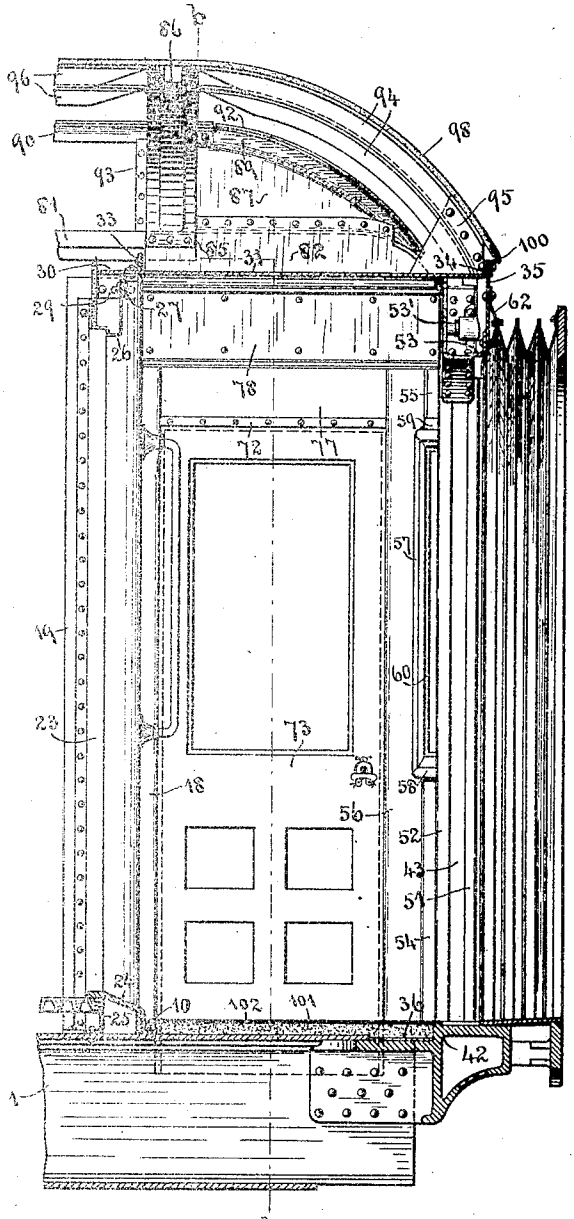


Fig. 4.

WITNESSES

J. H. Owen

L. W. Stoltzlen

INVENTOR

William F. Kiesel, Jr.

BY

Eugene Owen

ATTORNEY

No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, JR.

RAILWAY CAR FRAME

APPLICATION FILED FEB 26, 1906.

9 SHEETS—SHEET 5.

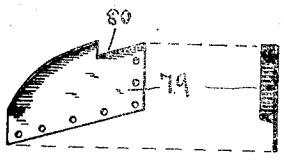


Fig. 18.

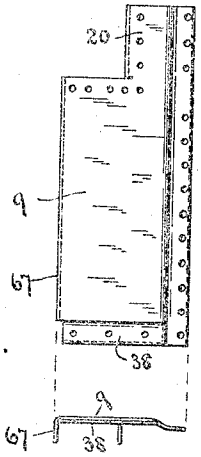


Fig. 19.

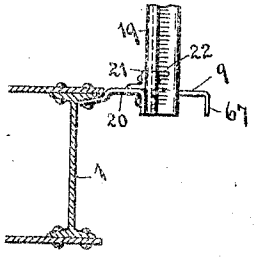


Fig. 20.

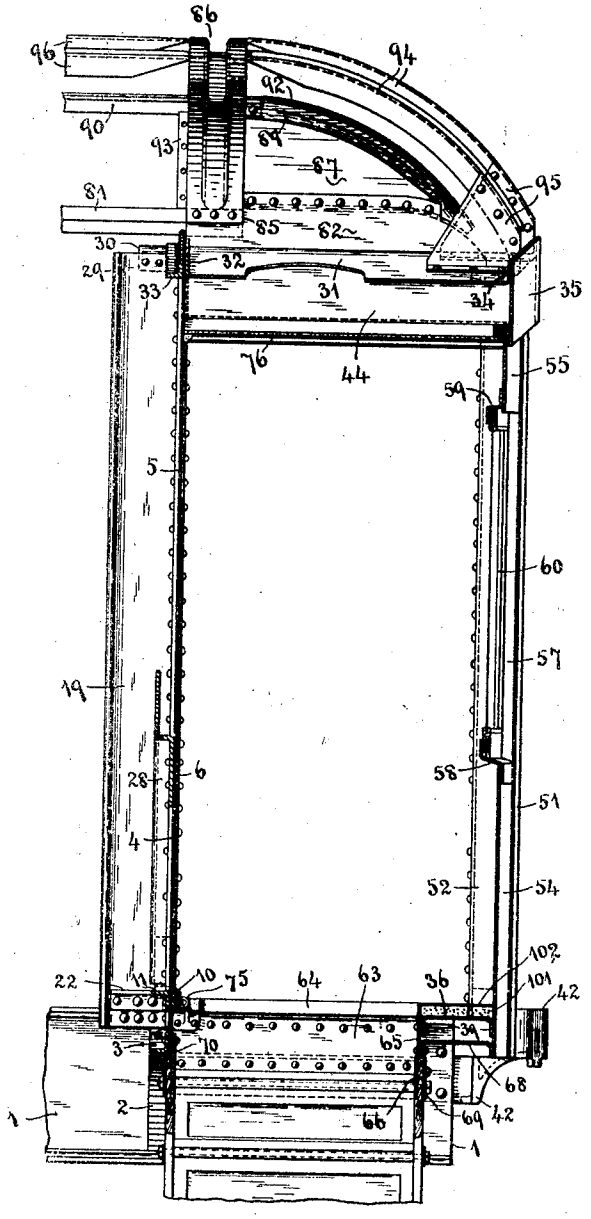


Fig. 5.

WITNESSES:

J. H. O'Brien

L. V. Stoltzlen

INVENTOR

William F. Kiesel Jr

BY

Eugene Owen

ATTORNEY

No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, JR.

RAILWAY CAR FRAME.

APPLICATION FILED FEB. 23, 1906.

9 SHEETS—SHEET 6.

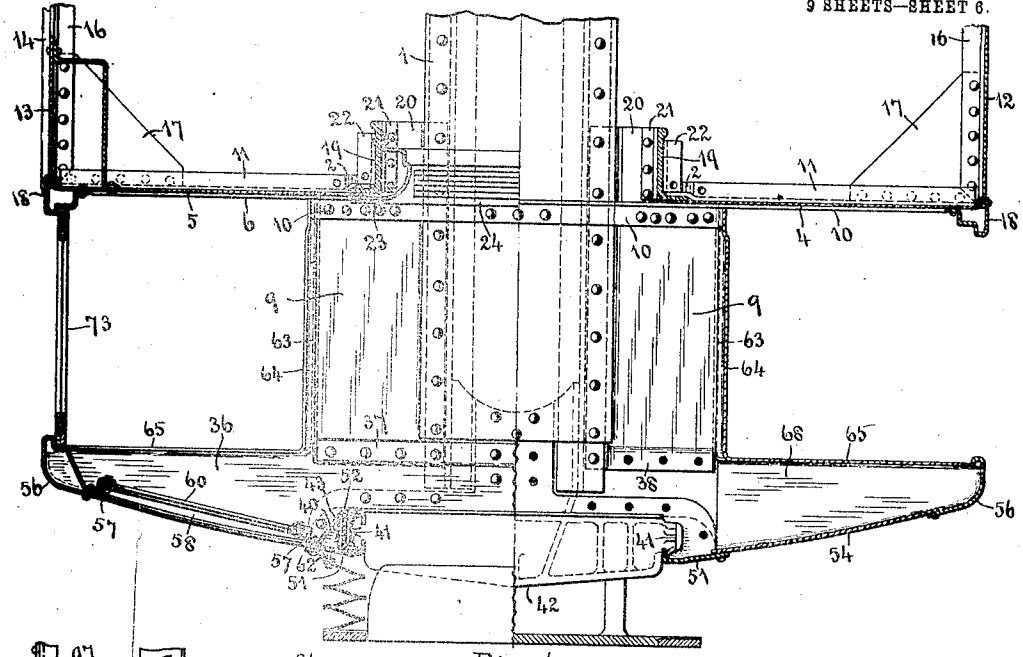


Fig. 6.

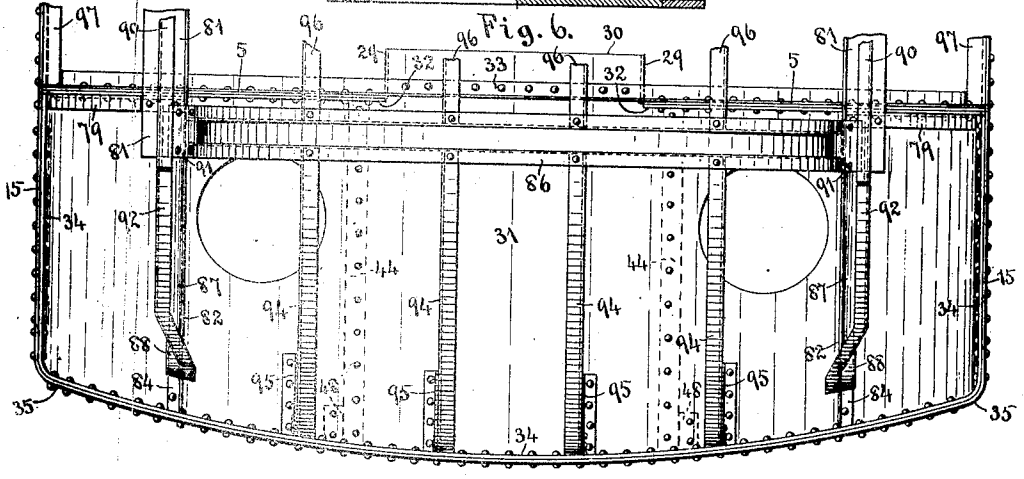


Fig. 7.

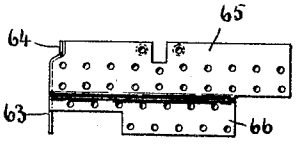


Fig. 22.

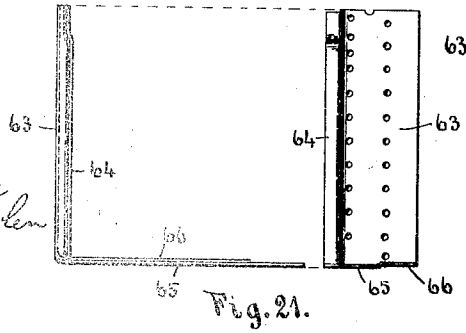


Fig. 21.

WITNESSES

J. F. O'Brien

L. V. Stoltzfus

INVENTOR

William F. Kiesel, Jr.

BY

Eugene Diven

ATTORNEY

No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, Jr.

RAILWAY CAR FRAME.

APPLICATION FILED FEB. 28, 1906.

9 SHEETS—SHEET 7.

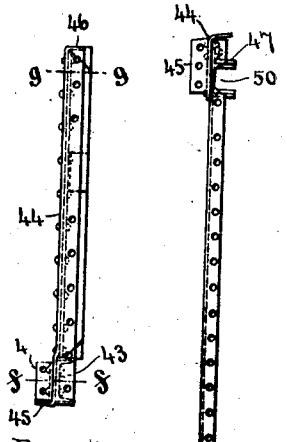


Fig. 11.

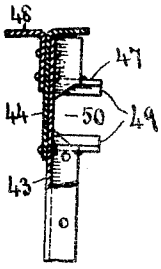


Fig. 12.

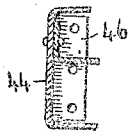


Fig. 13.

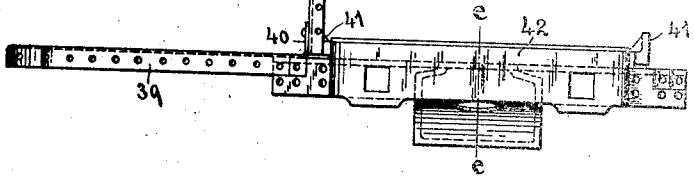


Fig. 8.

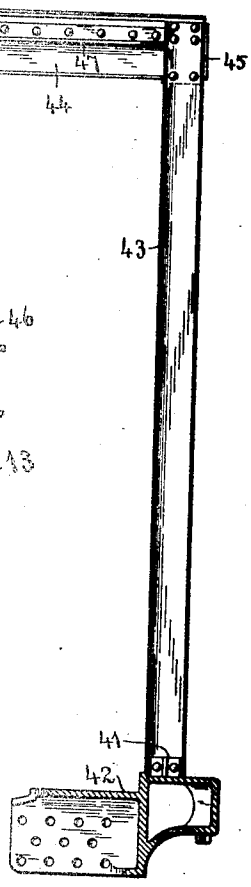


Fig. 9.

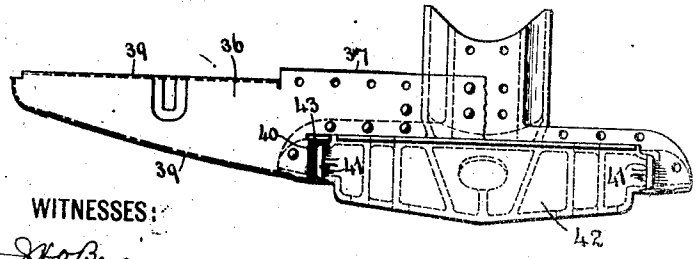


Fig. 10.

WITNESSES:

J. K. O'Brien

L. V. Stoeltzlen

INVENTOR

William F. Kiesel Jr.

BY

Eugene Driver

ATTORNEY

No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, Jr.

RAILWAY CAR FRAME.

APPLICATION FILED FEB. 28, 1906.

9 SHEETS—SHEET 8.

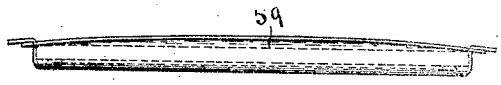


Fig.24.

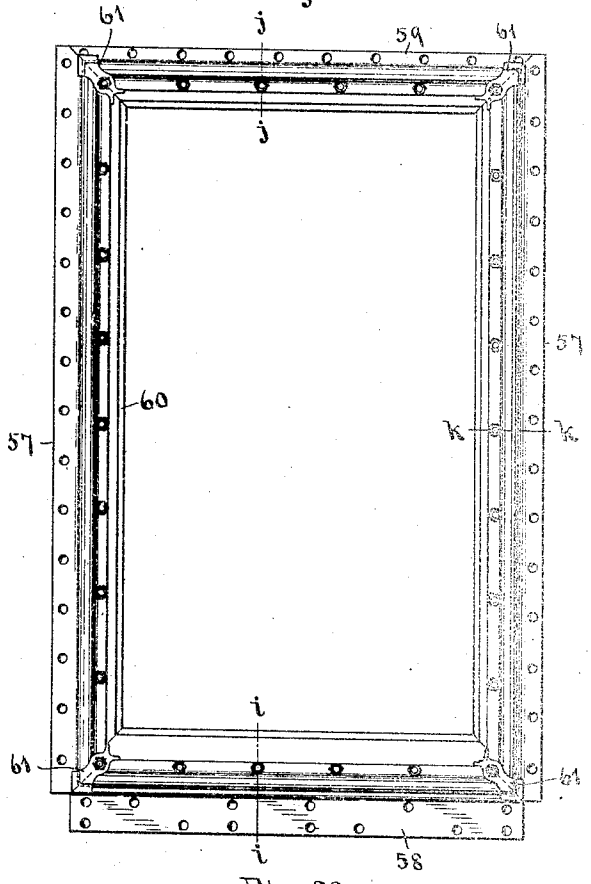


Fig.23.

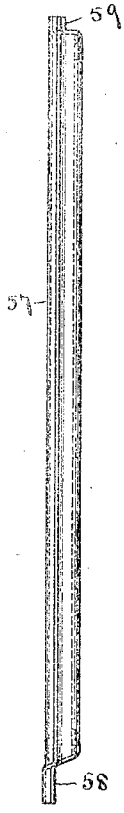


Fig.25.

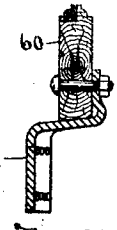


Fig.26.

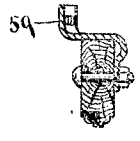


Fig.27.



Fig.28.

WITNESSES

J. H. O'Brien

L. V. Stoeltzlen

INVENTOR

William F. Kiesel Jr.

BY

Eugene Driver

ATTORNEY

No. 839,857. PATENTED JAN. 1, 1907.

W. F. KIESEL, Jr.

RAILWAY CAR FRAME.

APPLICATION FILED FEB. 28, 1906

9 SHEETS—SHEET 9.

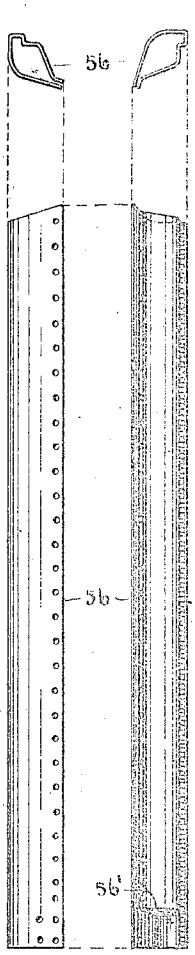


Fig. 29.



Fig. 30

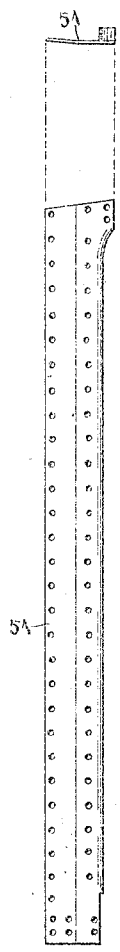


Fig. 31.

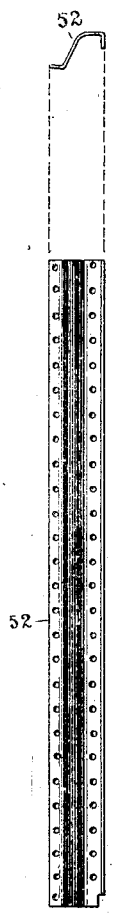


Fig. 32.

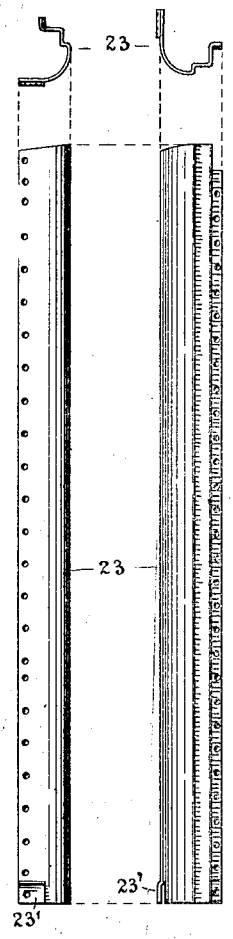


Fig. 33.

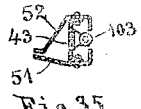


Fig. 35.

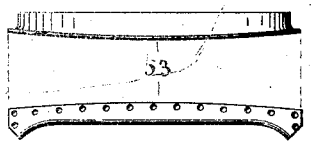


Fig. 34.

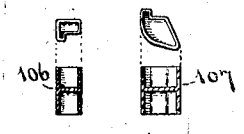


Fig. 36.

WITNESSES:

J. H. O'Brien

L. V. Stoltzlen

INVENTOR

William F. Kiesel, Jr.

BY

Eugene O'Brien

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM F. KIESEL, JR., OF ALTOONA, PENNSYLVANIA.

RAILWAY-CAR FRAME.

No. 838,857. Specification of Letters Patent. Patented Jan. 1, 1907.

Application filed February 28, 1906. Serial No. 303,405.

To all whom it may concern:

Be it known that I, WILLIAM F. KIESEL, Jr., a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Car Frames, of which the following is a specification.

This invention relates to improvements in steel railway-cars, and has to do more particularly with the platform and vestibule construction for passenger-cars, my object being to provide a light, strong, and well-braced framework and sheathing for the car end and vestibule, utilizing pressed-steel forms for the door-posts, corner-posts, &c., and a novel system of bracing whereby end shock and side racking will be resisted at all points.

Other features of novelty will be more fully described hereinafter and pointed out particularly in the claims.

I attain my object by constructing and arranging the parts of the car-body and vestibule substantially as illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of a portion of a car embodying my improvements; Fig. 2, a side elevation of a car end and vestibule, partly in skeleton form; Fig. 3, an end elevation showing one-half of the vestibule sectioned on the line *b b* in Fig. 4; Fig. 4, a vertical longitudinal section through the vestibule on line *a a* in Fig. 3; Fig. 5, a longitudinal section on line *c c* in Fig. 3; Fig. 6, a plan view in section on the line *d d* in Fig. 3; Fig. 7, a plan view of the vestibule-roof frame; Figs. 8 to 13, details showing the arrangement of the vestibule end sill and central door-posts, Fig. 9 being a section through the end casting on the line *e e* in Fig. 8 and Figs. 12 and 13 being sections on the lines *f f* and *g g*, respectively, in Fig. 11; Fig. 14, a detail showing an inside elevation of one of the upper-deck end side plates and its support; Fig. 15, a plan view thereof; Fig. 16, a rear elevation, a transverse section on the line *h h* in Fig. 14, and a front elevation thereof; Fig. 17, a detail showing a section of the extruded brass molding for the roof-eaves; Fig. 18, side and end elevations of the transverse end support for the lower-deck roof; Fig. 19, a plan and end view of one of the platform floor-plates; Fig. 20, a detail showing the rear end of one of said floor-plates, together with the manner of attaching the car-entrance-door posts thereto; Figs. 21 and 22, a plan view, side elevation, and end elevation of one of the top-step riser-plates; Figs. 23 to 28, details of the vestibule-window frame, Figs. 26, 27, and 28 being sections on lines *i i*, *j j*, and *k k*, respectively, in Fig. 23; Figs. 29 to 33, details showing in plan and elevation the vertical frame members of the several door and corner posts; Fig. 34, a plan and front elevation of the central vestibule-door lintel; Fig. 35, a detail showing a cross-section through one of the central vestibule-door posts, and Fig. 36 details showing the reinforcing-castings which are placed inside the corner-posts.

Like numerals designate like parts in the several views.

The car-body is supported upon a steel underframe similar in features of construction to that described in my Letters Patent No. 809,921, dated January 9, 1906, comprising a box-girder center sill which extends from end to end and out under the vestibule-platforms, the car-body being supported from the box-girder by cross-bearers suitably located intermediate the ends. Instead, however, of employing a separate end sill for the car-body, as described in said Letters Patent, I propose to support the end of the car from the center sill by means of curved angle-bars 2, which spring out from the base of the center sill at each side and are riveted to the bottom edges of the end sheathing-plates 4, which are carried down for the purpose below the platform floor-line. The triangular spaces between the curved portion of the angles 2 and the center sill are filled in by gusset-plates 3, the vertical edges of which are flanged and riveted to the sides of the center sill, tie-angles 7 being riveted to the gusset-plates and center sill at the side opposite the flanges. The upper edges of the gusset-plates are flanged at 8 and riveted to the under side of the platform floor-plates 9. Above the sheathing-plates 4 the end of the car is closed in by sheathing-plates 5, the top edges of which are riveted to the inside flanged edges 32 of the vestibule ceiling-sheet 31. Plates 4 and 5 are joined together by splice-plates 6, preferably on the line of the belt-rail. Passing transversely across both the floor-plates 9 and the cover-plate of the center sill is an angle-bar 10, the horizontal limb of which is cut away beyond the floor-

plates, the vertical limb being carried out at each side and riveted to the sheathing-plates 4. To further stiffen these plates and to provide a support for the car-floor, I provide the angle-bars 11, which are riveted on the inside of said plates opposite the bars 10. By this construction I make the car-body end sill an integral part of the end frame of the car and accomplish a saving in weight and material without detracting from the required strength.

The end sheathing-plates 4 and 5 are flanged at their outer vertical edges, said flanges being riveted directly to the side sheathing-plates 12 and 13 and to the top side plates 15, which latter run continuously through the length of the car and project out over the vestibule side doors, where they are along their top edges riveted to the flange 34 of the vestibule ceiling-sheet. The side plates 12 are riveted along their bottom edges to the angle-bar side sills 16, which also run continuously from end to end of the car, the ends of these side sills being joined to the end-sill angles 2 by triangular brace and tie plates 17. The corners of the car-body are completed by pressed-steel corner-posts 18, which also serve as jambs for the side doors of the vestibule. These corner-posts overlap the car sides opposite the side flanges on plates 4 and 5, so as to be riveted thereto, with the side plates 12 and 13 between, the inturned portions, which carry the side-door rabbets, being flanged and riveted directly to the plates 4 and 5.

The posts for the car-entrance door consist of bulb-angles 19, which rise from the inwardly-projecting portions 20 of the platform floor-plates 9, to which they are attached to the ceiling-sheet 31, said sheet being carried inward at 30 between the door-posts and provided at 29 with downturned flanges, to which the upper ends of the door-posts are riveted. The lower ends of the door-posts are riveted to downturned flanges on the portions 20 of floor-plates 9, the joint being further strengthened by angles 21. (See Fig. 20.) At 22 short angles are riveted in line with the angles 11 to support the car-floor. The door-frame is formed by pressed-steel jambs 23, which rise from the threshold-plate 24 to the ceiling-sheet 31, being connected at the top by a pressed-steel lintel 26, which latter is attached to the ceiling-sheet by means of the angle 27. The threshold-plate 24 is a casting supported on the inside by a transverse channel-bar 25 and at the outside resting upon the transverse angle 10, which it overlaps. The door-jambs 23 are carried down below the threshold and at their lower ends, at 23′, (see Fig. 33,) are cut and pressed outward to form lips which overlap the vertical limb of the angle 10, to which they are riveted. The end plates 4 and 5 are riveted in between the outward bend of these jambs and the flange of the bulb-angles 19. Diagonal Z-shaped braces 28 rise from the angles 11, near the door-posts, to the top of the car adjacent the upper ends of the corner-posts 18, said diagonal braces being riveted to the end plates 4 and 5 on the inside. An arched angle-bar 33 passes across from side to side back of the flanges 32 on the ceiling-sheet, the top edges of the end plates 5 being riveted in between this angle-bar and the flanges 32. The central portion of this arched angle passes over the inward projection 30 on the ceiling-sheet in line with the angle 27, rivets being passed through these angles and the ceiling-sheet to fasten all together. In this manner the end of the car is built up of light steel plates and pressed-steel frame members thoroughly braced, the peculiar form given to the combined posts and door-jambs enabling me to avoid the use of much metal.

The side plates 12 and 13 are joined together by the belt-rail 14, which passes continuously from one end of the car to the other beneath the windows, and the end thrust on the car sides is therefore met and resisted by three continuous longitudinal brace members—namely, the heavy angle-bar side sills 16, the top side plates 15, which are reinforced along their top edges by angles 97, and the intermediate belt-rail 14.

The vestibule ceiling-sheet 31 is formed from one plate of steel cut in the shape illustrated more fully in Fig. 7, being provided with the inward extension 30 over the entrance-door already referred to, having the downturned flanges 29 at the sides for attaching thereto the bulb-angle door-posts. At each side beyond this inward projection the sheet is flanged upwardly along its inward edges at 32, and the side and outer edges are also upwardly flanged at 34. An arched end plate 35 is bent around and riveted to the outside flange 34, the ends of said end plate being bent back and joined to the top side plates 15 by splice-plates, as shown in Fig. 2.

The platform and vestibule end sill are built up from the projecting end of the center sill. At each side floor-plates 9 are riveted to the under side of the flanges on the vertical members of the center sill and are pressed upward into line with the top cover-plate. Across the extreme end of the center sill is passed an end-sill cover-plate 36, formed from pressed steel slightly upset at each side of the center sill at 37 to overlap the depressed ends 38 on floor-plates 9, to which it is riveted, the inside and outside edges of this cover-plate being flanged downwardly at 39. The inside flanges 39 are riveted to outward projections 65 on the top-step riser-plates 63, said plates being riveted to the downturned flanges 67 on the platform floor-plates 9. The top cover-plate of the center sill is cut short of the end of the sill, and the end-sill cover-plate 36 passes across and is riveted to the

exposed ends of the vertical members thereof. Projecting from the end of the center sill is a steel end casting 42, upon which the cover-plate 36 also rests, said plate being cut in at the center to fit the vestibule-threshold formed on the end casting, as shown in Fig. 10. The outside flanges 39 of the cover-plate are riveted to the vestibule end sheathing-plates 54 on each side and also to the lower ends of the vestibule corner-posts 56 and to the arms of the end casting inside the jamb-plates 51. At each side below the cover-plate 36 is a brace or bottom cover-plate 68, also flanged downwardly and riveted between the side projections 65 of the riser-plates and the outside sheathing-plates 54 and corner-posts 56, thereby forming, in effect, a box-girder end sill strong, but yet light in construction.

Adjacent the sides of the threshold on the end casting the cover-plate 36 is provided with upturned flanges 40 in line with upwardly-projecting lugs 41, formed on the end casting, and channel-bar door-posts 43 have their lower ends fastened in between said flanges and lugs. (See Figs. 8 to 10.) These corner-posts 43 rise to the vestibule ceiling-sheet, where their upper ends are riveted to longitudinal channel-plates 44, which extend back and are riveted to the upper ends of the entrance-door posts by means of flanges 46, the outer ends of said channel-plates being flanged at 45 and riveted to the top end plate 35 and the top flanges of said channels being riveted to the under side of the ceiling-sheet. Narrow angles 48 are also provided opposite the ends of the door-posts 43 and riveted to the ceiling-sheet to further brace the upper end of the posts at this point. Along the inside of the channels 44 are riveted angles 47, said angles and the lower flanges of the channels forming supports for the upper buffer-stems, stops 49 being provided to receive the ends of the buffer-springs and said buffer-stems passing through holes provided therefor at 50 in the top end plate 35, the flanges of the door-posts being notched where they register with said holes.

The end casting is provided with guide-ways for the lower buffer-stems and is similar in construction to the end casting described in my Letters Patent above referred to. There are, however, some differences in the form of this end casting to adapt it to the all-steel construction herein described—notably the depression back of the threshold to receive the cover-plate 36 and the side lugs 41 to receive the door-posts 43.

The door-posts 43 are covered by outer and inner jamb lining-plates 51 and 52, (see Figs. 31 and 32,) which are brought together at their outside edges to embrace the vertical sides of the vestibule sheathing-plates 54 and 55 and the inside vertical members 57 of the vestibule-window frames. The door-case members are riveted to the flanges of the posts 43 and have their edges turned toward one another around said flanges, thereby forming pockets in which are located the rollers for the vestibule side curtains, one of the roller-supports being shown at 103 in Fig. 35.

The outside corners of the vestibule are formed by pressed-steel combination-posts and door-jambs 56, bent into the form illustrated more fully in Fig. 29, the inward limbs of these corner-posts being bent to form the rabbets for the vestibule side doors 73 and the inner and outer limbs being brought together so as to embrace and be riveted to the outside vertical sides of the sheathing-plates 54 and 55 and the outside members 57 of the window-frames. The outer limbs of these posts are brought down and riveted to the outer ends of the cover-plate 36 and the brace-plates 68, the inner limbs being cut short at 56′, (see Fig. 29,) so as to pass across the top of the cover-plate. The upper ends of these corner-posts rise to the ceiling-sheet and are riveted to the end top plate 35, and pressed-steel lintels 72 pass across to the posts 18 below the top side plate 15. The outside jamb-linings 51 of the central vestibule-door case are joined together by the pressed-steel lintel 53, the outside flange of which is riveted to the end plate 35, the inside of the lintel being finished by a molded piece 53′ of composite material.

The frames for the vestibule-window sashes 60 are composed of pressed-steel plates of a particular form, as shown more fully in Figs. 23 to 28, inclusive, of which Fig. 23 represents an inside view of a complete sash-frame. The sides or jambs 57 of the frames, of which Fig. 28 is a cross-sectional view, are bolted to the inside of the window-sash and bent outward to engage the sides of the sash, being then flanged, so as to be inserted and riveted between the limbs of the corner-posts 56 and between the central door-case members 51 and 52. The sill of the sash-frame, of which Fig. 26 is a sectional view, is pressed out beyond the bottom of the sash, so as to overlap the sheathing-plate 54, the downturned flange of this sill-piece being curved to conform with the shape of the vestibule end and riveted to the upper edge of the plate 54 on the outside. The top frame member 59, of which Fig. 27 is a cross-section, has its upturned flange also curved to conform with the shape of the vestibule end, but is not carried to the outside, being riveted to the sheathing-plate 55 on the inside. In other words, the upper sheathing-plate is made to overlap the sash-frame and the window-sill is made to overlap the lower sheathing-plate, thereby making the joints weatherproof. The members of the sash-frame are brought together with mitered joints closed by corner-pieces 61, which are shaped to conform with the bends of the frame mem-

bers and secured in place by the corner-bolts, which pass through the window-sash and frame members. The window-sash is bolted permanently in place in the manner shown in the drawings. The end of the vestibule is therefore built up entirely from steel plates and frame members, producing a light but strong and weatherproof construction of neat appearance. The vestibule-diaphragm is attached to the central-door casing by means of a pressed-metal strip 62, riveted in with the casing members 51 and passing around over the top end plate 35, to which it is also riveted, the vestibule-diaphragm having its edges bolted to this attaching-strip.

The top-step riser-plates 63 (shown in Figs. 21 and 22) are pressed outward along the upper edge at 64, where they project above the floor-plates 9 to form the nosings for the platform-landings. They are braced at a point below the platform floor-plates by longitudinal angles 71. At 65 the riser-plates are bent outwardly, as already described, to complete the platform end sill, this end sill portion of the plates being extended downward at 66 to form a hanger for the car-steps. The upper end of one side of the car-steps is fastened between this hanger 66 and an outside hanger-plate 69, which is riveted in between the riser-arm 65 and the end-sill brace-plate 68. The other side of the steps is hung from a plate 70, similar in form to hanger 66, riveted in with the angle 2 where it joins the sheathing-plate 4. (See Fig. 5.) The platform-floor consists of a plastic filling 101, overlaid with a top covering 102 of rubber or other suitable material, the top of the floor being on a level with the top of the riser-plate nosings 64, said flooring also covering the end-sill cover-plate 36 to the level of the top of the riser-arms 65.

The top members of the side-door casings consist of the pressed-steel lintels 72, bent to conform with the shape of the jamb members 18 and 56, the outer edge of the lintel being flanged upwardly and riveted to the inside bottom edge of the top side plates 15. The vestibule-doors 73 fit the rabbets formed in these casing members and are provided at the bottom with ledges 73′ to support the trap-doors 74, which are hinged between the door-jambs 18 and the top-step riser-plates 63, one of the hinge-sockets being shown at 75 in Fig. 5, the trap-doors resting when thrown down, in line with the vestibule-flooring in the usual manner.

Above the lintels 72, which on the inside are flanged upwardly, are panels 77, of wood or composite board, to fill in the space between the lintels and the ceiling-sheet 31, wooden cleats being secured to said sheet to receive said panels, and from these panels horizontal ceiling-panels 76, of the same material, pass inward to cleats beneath the buffer-stem supports 44, said supports being closed in by vertical panels 78. These panels are secured in place by wooden cleats fastened to the metal parts of the framework and are finished off by suitable moldings. The ceiling for the central part of the vestibule is formed by the ceiling-sheet 31.

The vestibule-roof is supported by a framework built up from the ceiling-sheet, the lower-deck roofs 99 being supported by end deck-supporting plates 79, riveted to the flanges 32 of the ceiling-sheet and having their upper edges curved and flanged to receive the roofing, which will preferably be formed of composite board covered by a suitable weatherproof coat. At 80 these deck-roof supports 79 are notched and flanged to receive the ends of longitudinal angle-bars 81, which run from one end of the car to the other, said angles having a broad horizontal limb and constituting the principal brace members for the car-roof. Longitudinal deck-supporting plates 82 extend out to the outer edge of the ceiling-sheet from the inner ends of the plates 79, being riveted thereto by flanges 83, said longitudinal deck-plates being provided along their bottom edges with flanges 84, by which they are riveted to the ceiling-sheet. At 85 the plates 82 are notched and pressed inwardly at an incline to receive the vertical limbs of the angles 81. To the top edge of the plates 82 are riveted the upper-deck end side plates 87, the lower edges of which are flanged outwardly at 88 and bent to overlap the lower-deck roofs 99 to render the joints weatherproof. The upper portions of these side plates 87 are pressed outwardly at 89 and have secured to them the ends of the upper-roof angles 90, the top edges of the overhang 89 being flanged inwardly at 92 from the point where the angles 90 are attached and curved to conform with the shape of the upper-deck roof where it bends down to unite with the lower deck at the end of the car, these inturned flanges 92 serving as a continuation of the horizontal limbs of the angles 90 to receive and support the outer edges of the upper-deck roof. At the inner ends the side plates 87 are pressed inwardly and provided with flanges 93, inside of which the upper-deck sashes 105 are secured, the other end of said sashes being secured to similarly-formed side plates 104, attached to the next upper-deck carlines. (See Fig. 1.)

The upper-deck roof 98 is supported by a carline 86 of U-shaped cross-section, similar to that described in my Letters Patent No. 809,920, dated January 9, 1906, the ends of said carline being riveted in with the ends of the angles 81 where they are secured to the longitudinal plates 82 at the points 85. Attached to the outer flange of the carline 86 are angles 94, four in number in the present instance, which curve down to the outer edge of the ceiling-sheet, to which they are at-

tached by the supporting-plates 95. Similar angles run longitudinally from points in line with these vestibule-angles from the carline 86 to the next carline, and so on through the length of the car, thereby providing a continuous series of longitudinal braces and supports for the upper-deck roof. At 91 the upper-deck side plates 87 are secured to the carlines by tie-plates to thoroughly brace them at these points. The eaves of the lower-deck roof are finished off by an extruded brass molding-strip 100, (see Fig. 17,) which extends completely around the car from end to end, being riveted to the upper edge of the top side plates 15 and to the top end plates 35. This molding-strip is so formed as to overlap the outside edge of the roofing-sheet, thereby forming a strong edge not easily damaged and serving to hold the roof-sheet in place, especially where the latter is made of composite board or like material. The molding forms a strong edging for the eaves and gives a pleasing finish. The longitudinal end deck-supports and upper-deck side plates 82 and 87, as will be seen from an inspection of Figs. 14 to 16, are of peculiar formation to adapt them for the purpose which they are to serve. They are formed from steel plates cut and pressed into the desired shapes.

As so constructed the vestibule and car end are light as to material and yet strong and thoroughly braced to resist all strains and end shocks. For the sheathing I propose to use plates one-eighth inch in thickness, while the pressed-metal combination door jambs and posts, sash-frames, ceiling-sheet, deck-roof supports, &c., will be formed either from one-eighth-inch or three-sixteenths-inch stock, the platform-plates 9 and end sill cover-plate 36 being cut from three-eighths-inch plates. The corner-posts 18 and 56 are reinforced by spacing-castings 106 and 107, respectively, placed inside the posts at points about two feet apart. These castings prevent the posts from collapsing when struck and also provide thicker metal in which to fasten the screws for locks, hinges, &c. All superfluous metal is therefore dispensed with without in the least sacrificing strength and rigidity. The body of the car will follow the same system of design and will be found more fully described in a companion application.

Having thus described and particularly pointed out the several features of my improved vestibule construction, what I claim as my invention, and desire to secure by Letters Patent, is—

1. A car-body end sill comprising end sheathing-plates extended below the floor-line, bottom chords riveted to said plates, and a center sill from the sides of which said chords are projected.

2. A car-body end sill comprising end sheathing-plates extended below the floor-line, bottom chords riveted to said plates, a center sill from the base of which said chords spring upward into line with the bottom of said plates, and gusset-plates riveted to the sides of the center sill and to said chords in the spaces between the sheathing-plates and center sill.

3. A car-body end sill comprising end sheathing-plates extended below the floor-line, bottom chords riveted to said plates, a center sill from the sides of which said chords project, and an upper chord passing across above the center sill and riveted to the sheathing-plates.

4. The combination with an underframe having side sills and a center sill, of a car-body end sill comprising end sheathing-plates extended downward at each side of the center sill into line with the side sills, bottom chords projecting from the sides of the center sill and riveted to the bottom of said plates, and brace-plates joining the outer ends of said chords to the ends of the side sills.

5. The combination with an underframe having angle-bar side sills and a center sill, of a car-body end sill comprising end sheathing-plates extended downward at each side of the center sill into line with the side sills, angle-bar bottom chords projecting from the sides of the center sill and riveted to the bottom of said plates, said chords and side sills having their horizontal limbs in the same plane where they meet, and triangular brace-plates riveted to said limbs in the meeting angles.

6. The combination, with a box-girder center sill having outwardly-flanged side members, of a car-body end sill comprising end sheathing-plates extended downward at each side of the center sill, angle-bar bottom chords bent upward from the bottom flanges of said side members and riveted to the bottom ends of said plates, platform floor-plates riveted to the center sill at each side, gusset-plates riveted in the angles between the sides of the center sill, floor-plates and bottom chords, and an angle-bar passing transversely across the end of the car above the center sill, the horizontal limb of said bar being riveted to the top cover-plate of the center sill and to the floor-plates and cut away beyond the floor-plates, and the vertical limb being riveted to the sheathing-plates.

7. A center sill projecting beyond the end of a car-body, in combination with platform floor-plates projecting from each side thereof, said plates being supported from the center sill by transverse supports projecting therefrom, inward extensions on the floor-plates, and door-posts for the car-entrance supported thereby.

8. A center sill projecting beyond the end of a car-body, in combination with platform

floor-plates projecting from each side thereof, and a platform end-sill cover-plate passing across the end of the center sill and riveted to the ends of the floor-plates.

9. A vestibule-platform comprising a center sill projecting beyond the end of a car-body, platform floor-plates fastened at each side thereof at the top, a platform end-sill cover-plate passing across the end of the center sill and riveted to the ends of the floor-plates, and top-step riser-plates riveted to the floor-plates and bent outward along the end-sill cover-plate, to which they are also riveted.

10. A vestibule-platform comprising a center sill projecting beyond the end of a car-body, platform floor-plates fastened at each side thereof at the top, a platform end-sill cover-plate passing across the end of the center sill and riveted to the ends of the floor-plates, an end casting projecting from the end of the center sill, to which the cover-plate is also riveted, said end casting having formed thereon a threshold for the central door, posts rising from each side of said threshold and secured to the end casting, corner-posts rising from the ends of the cover-plate, sheathing-plates between the door-posts and corner-posts having their lower ends riveted to the cover-plate, transverse plates riveted to the cover-plate at the inside between the floor-plates and corner-posts, and brace-plates riveted in between said transverse plates and the sheathing-plates below the cover-plate.

11. In a vestibule-platform, a center sill projecting beyond the end of a car-body, an end casting projecting from the end thereof and having formed thereon a threshold for the central door, a platform end-sill cover-plate passing across the end casting and fitted around the threshold, upwardly-projecting lugs on the end casting at each side of the threshold, upturned flanges on the cover-plate opposite said lugs, and door-posts secured between said lugs and flanges.

12. The platform end-sill cover-plate 36 cut in at the center to fit the central door-threshold, flanged downwardly along its outer and inner edges at 39 and upwardly at the sides of the threshold-opening at 40, and adapted to overlap the platform floor-plates at 37.

13. The end casting 42 adapted to be fastened to the end of a center sill and having laterally-projecting arms bearing a central door-threshold, and attaching-lugs for the door-posts projecting upward from the sides of the threshold.

14. The platform cover-plates depressed at one side where they are attached to the center sill, downwardly flanged on the opposite side to receive the top step riser-plates, depressed at the center and above the end-sill cover-plate passes across, and having the inward-flanged extensions 20 to support the entrance-door posts.

15. The gusset-plate 3 flanged on two sides and cut on the third side to fit the bend in the bottom chord 2.

16. The combination, with the center sill and platform floor-plates, of bulb-angle door-posts rising from the floor-plates at each side of the center sill, pressed-steel door-jambs riveted to the webs of said angles and bent around to overlap their flanges, and end sheathing-plates riveted in between said flanges and jambs.

17. The combination, with the center sill and platform floor-plates, of rolled-bar door-posts rising from the floor-plates at each side of the center sill, a platform ceiling-sheet having an inward projection to which said posts are riveted at their upper ends, pressed-steel door-jambs riveted to said door-posts and rising to the ceiling-sheet, and a pressed-steel lintel riveted to the ceiling-sheet between the jambs, said jambs and lintel being bent to form the rabbets for the entrance-door.

18. A car end comprising end sheathing-plates flanged along their outer edges, side sheathing-plates riveted to said flanges, and pressed-steel corner-posts riveted in with the end and side plates and bent around against the end plates to which they are again riveted.

19. A car end comprising entrance door posts of rolled bars flanged at the outer side, pressed-steel door-jambs riveted to the webs of the posts and bent outward to overlap the flanges, end sheathing-plates riveted in between the jambs and post-flanges and provided with flanges on their outside edges, pressed-steel corner-posts riveted to the face of said plates and bent around to overlap their flanges, and side sheathing-plates riveted in between the end-plate flanges and corner-posts.

20. A car-vestibule comprising a platform and platform end sill, top side plates projecting from the car-body, a top end plate spliced to the side plates, a ceiling-sheet flanged around its edges and riveted to said side and end plates, pressed-steel corner-posts at the corners of the car-body, pressed-steel posts rising from the ends of the platform end sill to the corners of the ceiling-sheet and riveted to the top end plate, and pressed-steel lintels riveted to the top side plates between the posts, said posts and lintels being bent to form rabbets for the side doors.

21. A car-vestibule comprising a platform and platform end sill supported upon a projecting center sill, top side plates projecting from the car-body, an arched top end plate spliced to the ends of said side plates, an arched ceiling-sheet flanged around its edges and riveted to said side and end plates, entrance-door posts rising from the platform at

each side of the center sill and fastened at the top to an inward projection from the ceiling-sheet, an arched angle passing across said projection and riveted to flanges on the ceiling-sheet at each side thereof, sheathing-plates having their upper edges riveted in between said angle and ceiling-sheet flanges, pressed-steel door-jambs and corner-posts overlapping the inner and outer edges of said sheathing-plates, pressed-steel posts rising from the ends of the platform end sill to the corners of the ceiling-sheet, central vestibule-door posts rising from the end sill to the ceiling-sheet, pressed-steel jamb-plates riveted to said posts, and vestibule sheathing-plates and sash-frame riveted in between said jamb-plates and the platform corner-posts.

22. The central vestibule-door frame comprising channel-bar posts and pressed-steel jamb-plates, said plates being brought together at the outside of the frame to receive between them the inner edges of the vestibule-sheathing, and being flanged toward one another at the inside of the frame to form with the channel-bars side pockets for the purpose set forth.

23. The platform end-sill corner-posts pressed from a single plate of steel and comprising two limbs bent back upon one another to receive between them the outer edges of the vestibule-sheathing, the outside limb being bent to form the vestibule-corners and the inside limb being bent to form a rabbet for the vestibule side door.

24. The entrance-door-jamb plates flanged at the inside and pressed out to form the rabbets for the door, the outside being bent around to lap the outside sheathing.

25. The entrance-door jambs formed from pressed-steel plates having their outside bends cut and pressed outward at the bottom to overlap a transverse frame member.

26. The entrance-door frame comprising pressed-steel jamb-plates riveted to rolled-bar door-posts, a pressed-steel lintel carried upward at the outside and riveted to the platform ceiling-sheet, said jambs and lintel being bent to form rabbets for the door.

27. The entrance-door frame comprising bulb-angle door-posts set with their flanged sides outward, pressed-steel jamb-plates flanged at the inside and riveted to the webs of said posts, said plates being bent around at the outside to overlap the post-flanges, and a pressed-steel lintel joining the jamb-plates at the top.

28. In an entrance-door frame comprising pressed-steel rabbeted jamb-plates, the combination therewith of a channel-bar passing across between the rabbets at the foot of the jambs, and a threshold-plate fitted to said jambs at the sides and resting on said channel, the outer edge of said threshold-plate being turned down to overlap a transverse frame member.

29. The central-vestibule-door-jamb casing-plates 51 and 52 substantially as herein described.

30. The combination, with the central-vestibule-door-jamb casing-plates 51, of a pressed-steel lintel 53 adapted to be riveted to the upper ends of said plates and inside the vestibule-top end plate.

31. The combination, with a box-girder center sill projecting beyond a car-body and having outwardly-flanged side members, of platform floor-plates riveted to the under side of the top flanges of said members and pressed inward into alinement with the top cover-plate of the center sill.

32. The combination, with a center sill projecting beyond a car-body, of platform floor-plates attached to each side thereof, and top-step riser-plates riveted to flanges at the sides of said plates.

33. The combination, with a center sill projecting beyond a car-body, of platform floor-plates attached to each side thereof, a platform end-sill cover-plate passing across the ends of said sill and floor-plates and riveted thereto, and top-step riser-plates riveted to the sides of the floor-plates and bent outward along the inner sides of the cover-plate to which they are also riveted.

34. The combination, with the platform floor-plates, of top-step riser-plates riveted to the sides thereof, said plates being carried above the floor-plates and pressed outward to form nosings for the platform-landings.

35. The top-step riser-plates pressed outward at the top to form nosings and bent outward at the outer ends to form the inside members of a platform end sill.

36. The top-step riser-plates bent outward at the outer ends to form part of the platform end sill and provided with downward extensions, or hangers, to support the sides of the platform-steps.

37. The vestibule sash-frame comprising angled jamb members embracing the sides of the window-sash, said members being outwardly flanged to register with the vestibule-sheathing, a similarly-angled sill member having a downturned flange adapted to overlap the sheathing on the outside, and a similarly-angled lintel member upwardly flanged to fit the sheathing on the inside.

38. The vestibule sash-frame comprising metal jamb, sill and lintel members bolted to the inside of the sash, pressed outward to embrace the rim of the sash and then outwardly flanged for attachment to the vestibule-sheathing, said members being united by miter-joints, and corner-pieces covering said joints.

39. A car-vestibule comprising a center sill projecting from the car-body, platform floor-plates and a platform end sill carried by the center sill, rolled-steel entrance-door posts supported by the floor-plates, rolled-steel

central vestibule-door posts supported by the end sill, longitudinal channel-plates extending between said posts at the top, a curved ceiling-sheet passing over said longitudinal channels, top side plates projecting from the car-body and an end top plate riveted around the sides and end of said ceiling-sheet, an inward extension from said sheet to which the upper ends of the entrance-door posts are attached, and a curved angle-bar passing across said extension and riveted to flanges on the ceiling-sheet at each side thereof.

40. A vestibule roof-frame comprising transverse lower-deck-end supports rising from the car end at each side, longitudinal deck-end supports extending outward from the inward ends of the transverse supports and supported by the underframe, and longitudinal deck-angles extending from the junction of said supports through the length of the car to similar supports at the other end thereof.

41. A vestibule roof-frame comprising a ceiling-sheet supported from below, transverse lower-deck-end-supporting plates rising from said sheet at each side and having depressed flanged portions at their inward ends, longitudinal deck-angles extending through the car-body and having the ends of their longitudinal limbs secured to said depressed flanges, and longitudinal deck-end-supporting plates joined to the inward ends of said transverse plates and having the vertical limbs of the deck-angles secured thereto, said longitudinal plates resting upon the ceiling-sheet.

42. A vestibule roof-frame comprising a ceiling-sheet supported from below, transverse and longitudinal deck-end-supporting plates resting thereon at each side, longitudinal deck-angles having their ends secured to said plates at their points of intersection, and an upper-deck carline having its ends riveted in with the ends of said angles.

43. A vestibule roof-frame comprising transverse and longitudinal deck-end-supporting plates at each side joined together at their inward ends, and longitudinal deck-angles and an upper-deck carline having their ends attached thereto at the points of juncture.

44. A vestibule roof-frame comprising transverse and longitudinal deck-end-supporting plates at each side joined together at their inward ends, longitudinal deck-angles and an upper-deck carline having their ends attached thereto at the points of juncture, deck-end side plates rising from the longitudinal supporting-plates, and longitudinal upper-deck angles having their ends attached to said side plates.

45. A vestibule roof-frame comprising an arched ceiling-sheet supported from below, transverse deck-end-supporting plates riveted to transverse flanges at each side of said sheet at the inward end, longitudinal deck-end-supporting plates flanged at the inward and bottom sides and riveted to said sheet and to the inward ends of the transverse plates, longitudinal deck-angles and an upper-deck carline having their ends riveted to the transverse and longitudinal plates at their points of juncture, deck-end side plates rising from the longitudinal plates, and intermediate deck-end-supporting angle-bars attached at one end to the carline and at the other end to supporting-plates rising from the ceiling-sheet.

46. The transverse deck-end-supporting plates having their upper edges curved and flanged, the inward upper ends being cut down and flanged for the purpose set forth.

47. The longitudinal deck-end-supporting plates 82 cut and flanged substantially as herein shown and described.

48. The deck-end side plates curved and pressed outward at the top, then inward to form a top flange, said flange being cut away at the inward end of the plate, an outturned flange along the bottom edge of the plate uniting with the upper flange at the outward end, and the inward end of the plate being pressed in to form a vertical side having a flanged projection.

49. The combination, with the side and end top plates, of an eave-molding riveted in with said plates at the top, and overlapping the edge of the lower-deck roofing.

50. The combination, with a deck-roofing, of a metal eave-molding secured to the framework below the roofing and projecting above the roof, said projecting portion being bent inward to overlap the roof along its outer edge for the purpose set forth.

51. In a car-frame, the combination, with hollow posts for doorways and corners formed from light steel plates pressed into the shapes required and riveted to the frame members substantially as herein described, of spacing-castings fitting the inside contour of the posts and inserted therein at intervals to reinforce the posts where hand-rails, hinges and other fittings are to be attached.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM F. KIESEL, Jr.

Witnesses:
J. F. Meck,
J. C. Strum.