

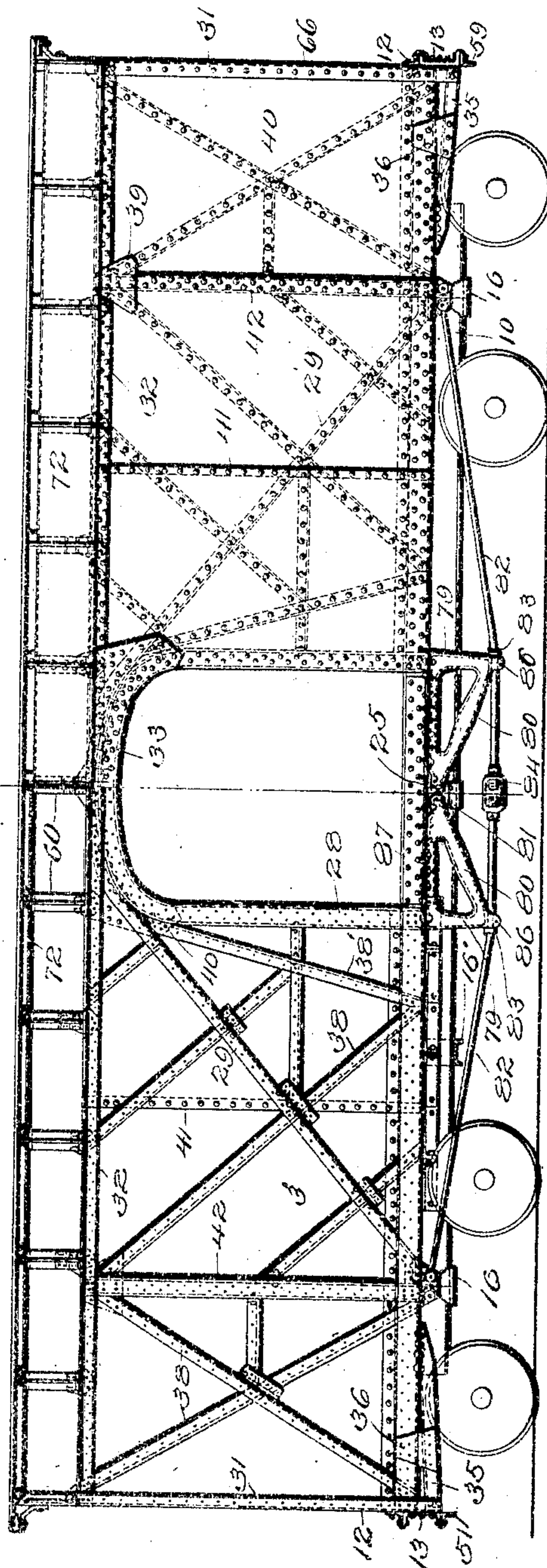
No. 837,841.

PATENTED DEC. 4, 1906.

F. JERDONE, JR.  
CAR STRUCTURE.

APPLICATION FILED JULY 25, 1906.

4 SHEETS—SHEET 1.



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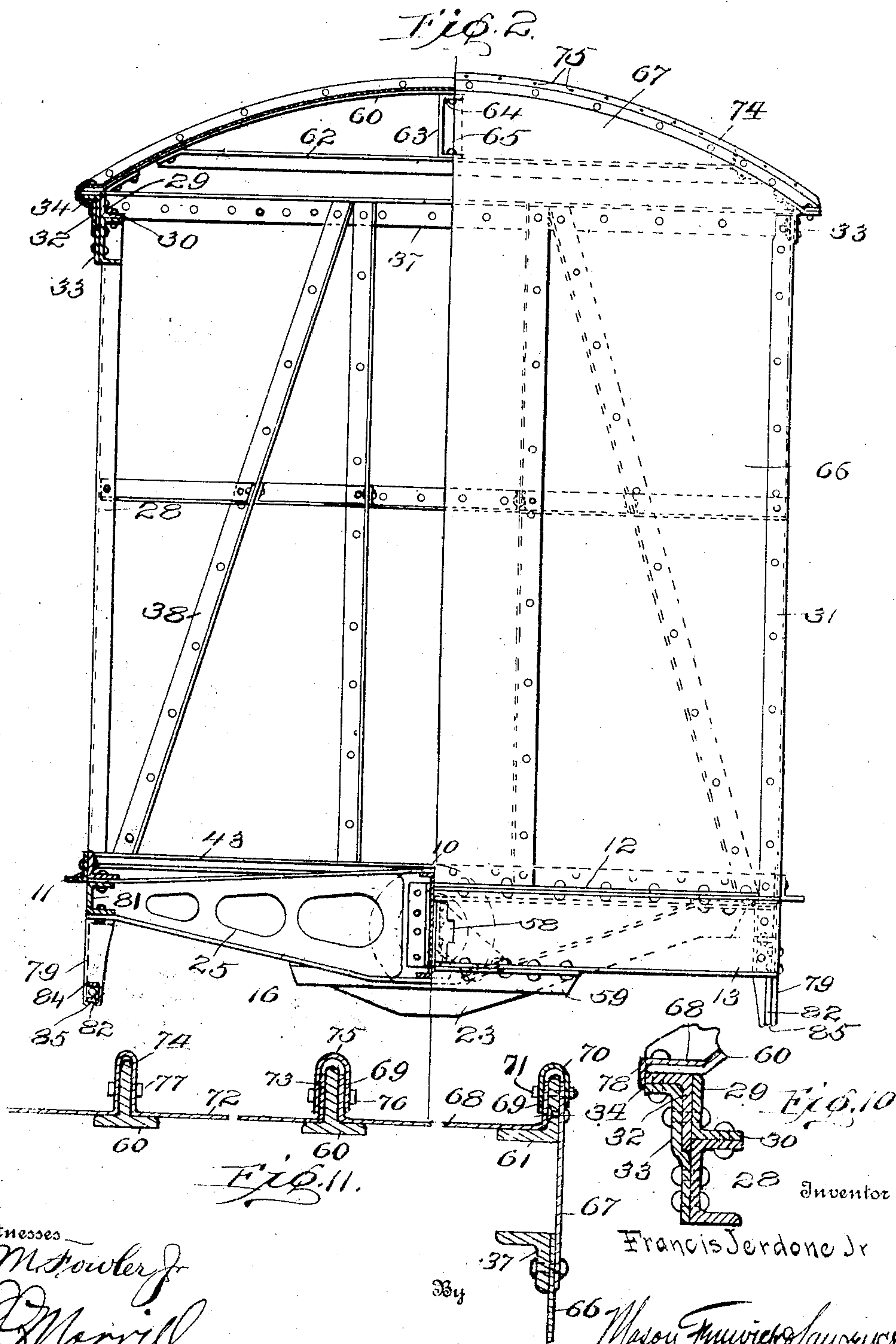
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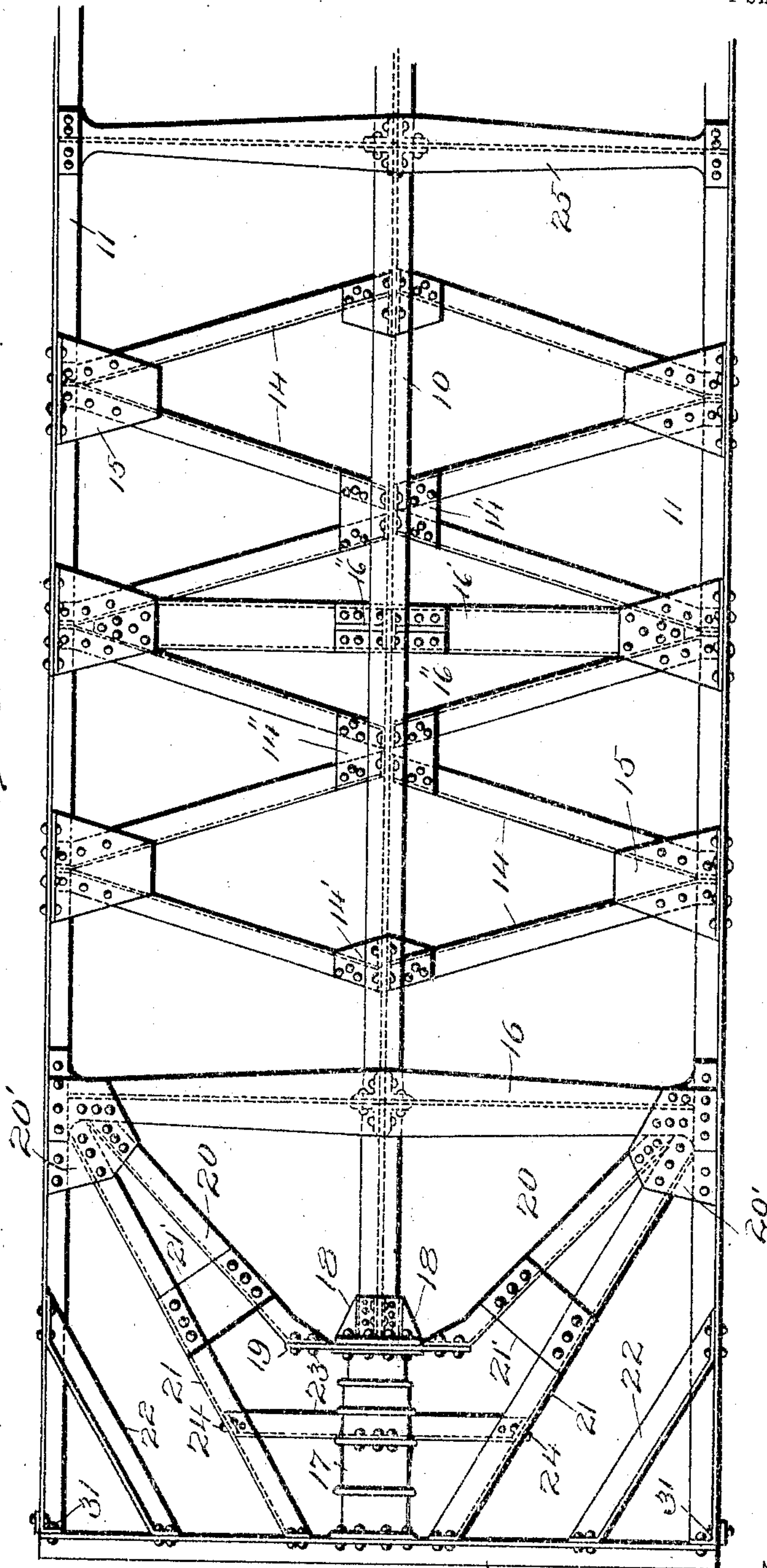
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4 SHEETS—SHEET 3.

Fig. 3.



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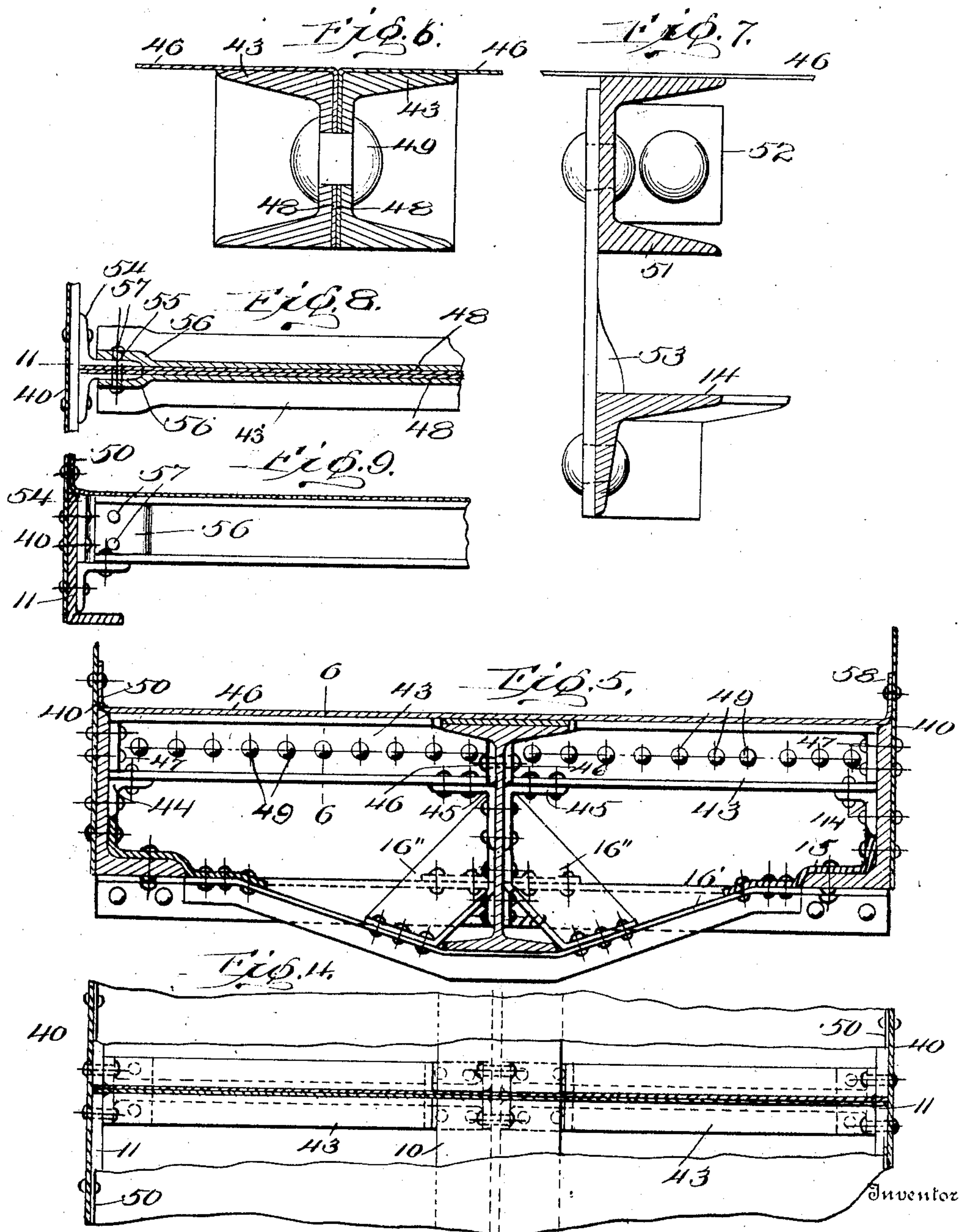
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# UNITED STATES PATENT OFFICE.

FRANCIS JERDONE, JR., OF CHICAGO, ILLINOIS.

## CAR STRUCTURE.

No. 837,841.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed July 25, 1906. Serial No. 327,753.

*To all whom it may concern:*

Be it known that I, FRANCIS JERDONE, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car Structures; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to car structures, and has for an object to provide a car structure composed principally of metal parts embodying new and improved features of strength, economy, and rigidity.

A further object of the invention is to provide in a car structure a doorway of large dimensions and so arranged and reinforced as to give ample and sufficient strength for carrying at its center when necessary the greater part of the full capacity of the loaded car.

A further object of the invention is to provide in a car structure improved means for supporting the central portions of the structures by means of truss-rods, associated body-bolsters, needle-beams, truss-rod stands or queen-posts, and other parts of improved form.

A further object of the invention is to provide in a car structure improved means for applying and using a metal floor to be free from the obstruction of rivet or bolt heads on its inside loading-surface.

A further object of the invention is to provide a car structure embodying a single center supporting-beam and with improved means for applying a draft-rigging to the beam and with improved means of bracing and stiffening said beam and of joining or connecting said beam to side-sill beams.

A further object of the invention is to provide in a car structure improved means of applying the roof in order that the same will brace and strengthen the sides of car and that the metal sheets will be free from vertical rivets or bolts to prevent the possibility of leakage.

A further object of the invention is to provide in a car structure improved means for transmitting the central load of the car to the bolsters through truss-rods and arched queen-posts at the side center of the car.

With these and other objects in view the invention comprises certain other novel constructions, combinations, and arrangements

of parts, as will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a view of the improved car in side elevation, showing one-half in full and one-half in dotted lines the positions of the several members composing the car structure. Fig. 2 is a view of the improved car, one-half being in end elevation and one-half being in vertical section taken upon the center line of the car. Fig. 3 is a top plan view of the center beam and side sills, together with the braces and the means for adjustment to and connection with the bolsters and transverse beam beneath the center of the car. Fig. 4 is a top plan view of one of the transverse beams for supporting the metal floor, the said floor being broken away to show the beam in full lines. Fig. 5 is a view in elevation of one of the transverse beams for supporting the metal floor, the said floor and the frame of the car being shown in section. Fig. 6 is a transverse sectional view of the supporting-beam shown in Fig. 5 and taken on line 6 6. Fig. 7 is a transverse sectional view showing a beam arranged for supporting the center of one of the plates forming the floor of the car and the plate for supporting the beam from the frame-braces of the car. Fig. 8 is a longitudinal sectional view showing a modified form of transverse beam for supporting the metal floor. Fig. 9 is a view in side elevation of the modified form of beam shown at Fig. 8. Fig. 10 is a detail sectional view at the transverse center of car and showing in section the arched door-frame, arched truss-member, side plate at eaves of car, and gusset for connecting and tying the several parts together and also shows the end of one of the carlines and the method of turning down the roof-sheets at eaves of car. Fig. 11 is a detail sectional view showing the carlines and the manner of attaching the roof-plate thereto.

Like characters of reference designate corresponding parts throughout the several views.

The car structure forming the subject-matter of this application comprises a center beam 10 of any approved form, but preferably, as here shown, comprising a single I-beam extending longitudinally of and throughout the greater portion of the length of the car, but stopping short of the ends, as shown particularly in Figs. 1 and 3.

Associated with the center I-beam 10 of the car are the side sills 11, extending longi-



tudinally of the car and parallel with the central beam 10 and defining the limits of the structure. The side sills 11 are connected and joined at their opposite ends by means of end sills 12, preferably composed of angle-iron, as are the side sills, and beneath which are disposed heavier sills 13, preferably composed of channel-iron. The side sills and the center beam are rigidly secured together and braced by means of diagonally-disposed braces 14, rigidly riveted or otherwise permanently secured to the center I-beam and to gussets 15, which are rigidly secured to the vertical and horizontal flanges of the side sills 11. The side sills 11 are also supported upon the bolsters 16, which said bolsters are rigidly connected at right angles to the I-beam 10, such bolster and the manner of connecting to the beam forming the subject-matter of a copending application bearing Serial No. 327,755, filed July 25, 1906, and forming no part of the present invention.

The side sills 11 and the center-sill I-beam 10 are rigidly secured together and braced by means of obliquely-disposed braces 14, the first two braces inside of the bolster 16 connecting to the center I-beam 10 through their vertical flanges after same have been set at an angle to the main body of the brace, the said angling to form a foot of the brace and the foot of each of the two braces to be rigidly riveted together through the vertical web of center-sill I-beam 10, and the said inner ends of these braces are further secured to a suitable gusset-plate 14', as shown, by being rigidly riveted, and the said gusset-plates are turned up and rigidly riveted to the vertical web of the center-sill I-beam 10, the two said braces 14 running obliquely away from the body-bolster 16 and from the center I-beam 10 and connecting at the said side sill by said means each with one other brace 14 of the same kind, as shown, particularly in Fig. 3, and these two connecting-braces 14 run back to the center-sill I-beam 10, but oppositely inclined to the first braces, and the last-said braces meet two other diagonal braces, as shown, which diagonal braces in turn run diagonally back to the said side sill and meet two other diagonal braces, and so on throughout the distance between the two bolsters or between bolster and center needle-beam.

Where two of the braces meet at the side sill their vertical flanges are angled at right angles to the side sill, and these vertical flanges become adjacent and are rigidly riveted together in the manner shown, while the horizontal flanges are rigidly riveted to and through the bottom flange of side sill 11 and through suitable gusset-plate 15, resting on the top side of bottom flange of side sill, which gusset-plates 15 turn up and are riveted to the vertical flange of side sill 11, and said gusset-plate 15 also projects horizon-

tally beyond the bottom flange of side sill and is rigidly riveted to the top flanges of the two ingoing diagonal braces, all as shown.

When two of the ingoing diagonal braces 14 meet at the center-sill I-beam 10, two other like braces 14 meet on the opposite side of center-sill I-beam 10, and all four have their vertical flanges angled to form feet, the foot of one brace to oppose and brace the foot of the corresponding opposite brace, and the two feet of the two corresponding braces are riveted against and through the vertical web of center-sill I-beam 10, and the two other corresponding braces are also adjacent and are riveted to the vertical web of center-sill I-beam. Furthermore, the four braces running together, two on each side of center-sill I-beam and connecting to the center-sill I-beam, are also jointly and rigidly secured to each other and to the vertical web of center-sill I-beam by means of suitable gusset-plates 14'', each lying horizontally on the top flanges of the ends of the two diagonal braces and rigidly secured to same, and said gussets 14'' also being flanged upward on the vertical web of the center-sill I-beam, and said upward-flanged portions rigidly riveted together through the vertical web of center-sill I-beam. The side sill 11 and center sill 10, diagonal connecting-braces 14, which are joined together or connected by suitable gussets 14'' and 15, will at suitable intervals, as shown, have connected to said gusset 15 at side sill of car a continuous and depressed member 16', preferably channel-iron or T shape, extending from said side gusset 15 to said side gusset 15 on opposite side of car, and said continuous and depressed member 16 passing immediately under the bottom flange of center-sill beam 10 and bearing against said flange with its own flanges downward and being connected at its outer end to the said side gussets 15 and at its center to the vertical web of center-sill I-beam by means of two brackets 16'' of suitable material, and preferably of T shape and said brackets to be riveted through their vertical flanges and through the vertical web of center-sill I-beam and to branch off from said I-beam at a point immediately below the said rivets and to have their lower extremities or flanges meet and be rigidly secured to the said depressed support 16' and at points equidistant from center I-beam and rigidly riveted to the depressed support to form a brace and support for the center-sill I-beam and to assist the center-sill I-beam to support and carry the load superimposed on the center-sill I-beam and to assist in transmitting a portion of this load to the side sills of car through the center-sill I-beam 10 and depressed support 16'.

At its ends the I-beam 10 is continued by means of a barrel 17, forming a part of a draft-rigging, which said draft-rigging, including



said barrel, forms the subject-matter of a copending application bearing Serial No. 327,754, filed July 25, 1906, and forming no part of the present invention, except in so far as it is desirable to conform the car structure of the present invention for association with the said draft-rigging. For such an association the ends of the I-beam 10 are provided with tapered brackets 18, (shown more fully in said copending application,) with the plate 19 disposed between the end of the I-beam and the adjacent end of the barrel 17. To the ends of the plate 19 extended beyond the barrel 17 are secured braces 20, extending in inversely-inclined relation to the ends of the bolsters 16, to which are they secured by gussets 20. Other inclined braces, as 21 and 22, are also employed for the purpose of stiffening the structure, and a supporting-beam 23 is preferably connected to the brace-beams 22, as by the rivets 24, and curved downwardly beneath and to support the barrel 17 of the draft-rigging. The braces 20 and 21 are preferably connected and stiffened by a gusset 21', riveted to and spanning the interval between the said braces.

Beneath the center of the car is disposed a transverse needle-beam 25, being wider in the middle and with its ends tapered and formed with a vertically-disposed web and flanges extending upon opposite sides of the web and at right angles thereto, forming at the outer ends substantially a T, as shown in Fig. 1.

At the center of the car is erected a door-frame 28, arched at its upper end and with its lower ends rigidly secured to the sills 11, the said door-frame 28 being integral and preferably formed of channel-iron, as shown in section particularly in Figs. 2 and 10.

A truss-bar 29 is secured at its opposite ends to the sills 11 adjacent the bolster 16 and extends in a substantially straight line to adjacent the curvature of the upper portion of the door-frame 28 and is then arched at its middle point to pass over the said door-frame and be secured rigidly by its flange to the upper flange of the channel-iron door-frame. The truss-bar 29 is preferably composed of angle-iron, with the horizontal flange at its lower side so disposed that the said lower flange (shown at 30 in Figs. 2 and 10) corresponds substantially with and is rigidly secured to the upper flange of the channel-iron door-frame 28.

At the corners of the sills formed by the side sills 11 and end sills 12 are erected corner-posts 31, forming the corners of the car structure, and upon the said corner-posts is secured the ends of the plate 32, which extending longitudinally of the car at the eaves has its vertical flange riveted or otherwise rigidly secured to the vertical flange of the truss-bar 29, as more particularly shown in Figs. 2 and 10. For further strengthening

the connected portions represented by the door-frame 28, the truss-bar 29, and the plate 31 a gusset 33 is riveted or otherwise rigidly secured adjacent the top of the door-frame and is provided with a curved cut-out portion conforming substantially to the curvature of the interior opening of the said door-frame and with its upper edge extending upwardly and flanged outwardly, as at 34, and rigidly secured to the plate 32.

The corner-posts 31 are made rigid by having their lower ends extend downwardly beyond the sills 11 and said extended ends engaged by braces 35, which extend in an inclined position and are secured to the sills 11 through their horizontal flanges. The braces 35 are further strengthened by gussets 36' to prevent buckling. The side plates 32 are connected at their ends by a transversely-disposed end plate 37 with its flange turned inwardly and the structure made rigid by means of a plurality of inclined braces 38, secured at their lower ends to the sills 11 and 12 and at their upper ends to the side and end plates and to gusset 33 and to other gussets 39, secured to the plates 32. A brace 38<sup>a</sup> is also secured at the juncture of the truss-bar and door-frame and extends obliquely downwardly and is secured to the side sill, whereby the structure formed by the door-frame and truss-bar is strengthened and the sill supported and made more rigid.

The sides and ends of the car are composed of metal sheets, as 40, rigidly riveted to the corner-posts 31 and to the door-frame 28, and the intervening seams, as at 41, riveted each to the other and to the frame-posts 42, disposed vertically above the bolster 16. The side sheets 40 are riveted securely to all of the transverse braces 38 and to the several vertical posts, whereby the plates are prevented from buckling under the action of expansion or load.

Extending transversely of the structure at properly-spaced intervals are channel-iron beams 43, supported upon brackets, as 44, secured to the sills 11, and other brackets, as 45, secured to the central I-beam 10. The beams 43 are riveted or otherwise secured to the I-beam 10 by turning a portion of the web, as 46, and to the sills 11 by turning the end of the flange, as 47, at right angles to the beam, the remaining portion of the beam being cut away to correspond in length to the interval between the sills 11 and I-beam 10. At those places where the sheets 46 of the floor join the said beams 43 are used in pairs, as shown particularly in Figs. 4 and 6, and with the edges 48 of the floor material bent downwardly and clamped between the channel-irons 43, as by the rivets 49, inserted through the said channel-irons and through the clamped edges of the plate. The edges of the plates 46 at the side of the car are turned upwardly at 50 and riveted through



the plates 40. For supporting the plates 48 intermediate the double bars 43 a single bar 51 is employed with its web turned, as at 52, for engagement with the sills 11, and as the  
 5 said beam 51 is single it is preferably supported by means of the plate 53 or other similar bracing means rigidly secured at its upper end to said beam and at its lower end to  
 10 any convenient brace 14 and given the necessary twist to compensate for the obliquity of the brace 14.

As shown in Fig. 8, the channel-iron beams 43' may be connected with the sills 11 by employing a short piece of T-iron 54, having its  
 15 web portion 55 extending outwardly from the sill 11 and with the beams 43' curved at their extremities, as at 56, to embrace the web 55 of the T-iron and secured thereto in any approved manner, as by the rivets 57.

20 To permit the use of a draw-bar in connection with the structure shown, the channel-iron beam 13 at the end of the car is provided with an opening 58, proportioned to permit the insertion of a yoke of a coupler of the  
 25 usual form. To strengthen the beam 13, an angle-iron 59 is rigidly secured to the under side of the said beam and, spanning the opening 58, is rigidly secured to the lower flange of the said beam 13.

30 The roof of the car structure is formed by a plurality of T-beams or carlines 60, forming an arch or segment of a circle and connected at their extremities to the plates 32 by means of gussets 60' or otherwise. The supporting-  
 35 beams or carlines at the ends of the car are preferably constructed of angle-iron, as shown at 61, curved to correspond with the T-beams 60 and similarly secured at their  
 40 ends. The T-beams or carlines 60 are preferably so spaced that the sheets of the material forming the roof of the car cover an interval equal to the space between two of said  
 45 carlines and with sufficient material to form the connections with the said carlines hereinafter described. The carlines are tied by means of angle-iron braces 62, extending  
 50 transversely of the car, and with a short brace, as 63, disposed centrally of the carlines with its upper end turned, as at 64, and secured to  
 55 the said carlines and lower ends turned, as at 65, and connected to the tie 62. The sheets of material 66, forming the outer surface of the ends of the car, extend upwardly to the  
 60 transverse plate 37, and a plate 67 is secured to the end carline 61 and extends downwardly and overlaps the upper edge of the  
 65 plates 66, as shown particularly in Figs. 2 and 11. A plate of material 68 is provided at its longitudinal edges with upturned  
 60 flanges 69, proportioned to fit between the carline 61 and the adjacent carline 60, and a cap 70 is disposed over the upturned flange 69 and the upper curved edge of the plate 67  
 and is secured to said edges and through the  
 65 carline 61, as by the bolt 71, the plate 67 be-

ing secured by a rivet countersunk in the carline 61. A second plate 72 is provided at its longitudinal edges with upturned flanges 73 and at its longitudinal center with an upwardly-extending curved portion 74, proportioned to fit over the carline 60, disposed to  
 70 receive the same, with the upturned edge 73 disposed opposite the edge 69 and with the cap 75 disposed over the upturned edges 69 and 73 and secured by rivets or bolts 76.  
 75 The curved portion 74 is also secured to the carline 60, as by bolts or rivets 77, whereby the plates 68 and 72 are easily removed from the roof structure. The outer edges forming the ends of the plates, as 68 and 72, are  
 80 curved downwardly, as at 78, over the plate 32, as shown in detail in Fig. 10.

For supporting the center of the car, brackets or queen-posts are secured beneath  
 85 the sills 11, with upright portions 79 beneath the side posts of the door-frame 28 and with inclined portions 80 extending and secured to the center needle-beam 25 by means of reduced portions, as 81, being inserted and secured between the upper and lower flanges of  
 90 the said needle-beam. A truss-rod 82 is secured to the bolster 16 and, extending beneath the queen-posts 79, is provided with collars or nuts 83, bearing against the outer surfaces of the posts and with the turn-  
 95 buckle 84 for exerting strain upon the said truss-rod. As the truss-rod 82 is tightened by means of the turnbuckle 84, the upright portions 79 of the queen-posts are lifted and are also forced toward each other, so that the  
 100 ends of the inclined portions 80, connected with the center needle-beam 25, are also raised to support the said beam and the central portions of the car. The queen-posts are provided at their lower ends with recesses  
 105 85 to receive and accommodate the truss-rods 82, which said rods are retained therein by means of bolts or pins 86 and with horizontal portions 87, extending longitudinally  
 110 of the car beneath the door-openings and terminating in the reduced ends 81, secured to the needle-beam, as above described, and with the inclined portions 80 forming a supporting-arch for the center of the car structure.  
 115

What I claim is—

1. In a car structure, side sills, a door-frame rigidly secured to a side sill and comprising an integral structure embodying an  
 120 arched top and vertical side posts, and a truss-bar rigidly secured at its opposite ends to the sill and curved over and rigidly secured to the arched portion of the door-frame.

2. In a car structure, side sills, a door-  
 125 frame secured to the sills and comprising vertical side posts and an integral upper curved portion, a plate secured at the upper portion of the door-frame, and a gusset rigidly connecting the door-frame and plate.  
 130



3. In a car structure, side sills, bolsters supporting said side sills, a door-frame disposed centrally between the bolsters and comprising side posts, and an integral arched top portion and braces extending from the bolsters and secured to the upper arched portion of the door-frame.

4. In a car structure, side sills, a draft-rigging disposed intermediate the sills, and braces connecting the sills, and the draft-rigging intermediate its ends and forming an arch.

5. In a car structure, a single central supporting-beam, side sills spaced upon opposite sides of the central beam, means connecting the side sills and central beam rigidly together, and an arched door-frame rigidly secured centrally of the side sills.

6. In a car structure, a door-frame comprising spaced side posts, bolsters disposed beneath the car structure adjacent the opposite ends, and a truss-bar rigidly secured to the structure adjacent the bolsters and extending to and arched over the door-frame.

7. In a car structure, a door-frame disposed centrally of the longitudinal side of the structure, bolsters secured rigidly beneath and adjacent the opposite ends of the structure, truss-bars rigidly secured to the structure adjacent the bolsters, and inclined reversely upward toward the middle of the car and extending to and arched over the door-frame.

8. In a car structure, side sills, an end sill connecting the side sill, a draft-rigging secured to the end sill and disposed intermediate the side sills, and braces connecting the side sills and a draft-rigging intermediate its ends and forming an arch.

9. In a car structure, side sills, an end sill connecting the side sills, a bolster connecting and rigidly secured at opposite ends to the side sills, a draft-rigging secured to the end sill, and braces connecting the side sill and draft-rigging and forming an arch from the ends of the bolster to the draft-rigging intermediate its ends.

10. In a car structure, a sill, a door-frame rigidly secured to the sill and comprising spaced door-posts defining a door-opening at the center of the sill, bolsters disposed beneath the sill adjacent its opposite ends, a truss-bar rigidly secured to the sill adjacent the bolsters and extending at an inclination to and arched over the door-frame, a corner-post rigidly secured to the extremity of the sill and extending above and below the sill, and a brace secured to the lower extended end of the corner-post and extending toward the middle of the car and rigidly secured to the sill.

11. In a car structure, side sills, an end sill, inclined braces extending from the side sills adjacent the center of and connected with the end sill, a draft-rigging disposed be-

tween the braces, and means carried by the braces and arranged to support the draft-rigging.

12. In a car structure, a single center beam, a bolster comprising a central web surrounded by a flanged portion disposed at right angles to the central web and with a central opening formed in the web and proportioned to receive and accommodate the central beam, and with the beam and bolster disposed perpendicularly to each other, and angle-braces rigidly secured to the beam and bolster within the angles formed at their juncture.

13. In a car structure, a single central beam, sills in parallelism with and spaced from the central beam, and upon opposite sides thereof, a bolster provided with a central opening proportioned to receive and accommodate the central beam, means rigidly securing the spaced sills and the opposite extremities of the bolster, and angle-braces rigidly secured to the bolster and central beam, and disposed within the angles formed at their juncture.

14. In a car structure, side sills, an end sill, a bolster disposed transversely of the structure and rigidly connected at opposite ends to the side sills, inclined braces extending from adjacent the bolster to and rigidly connected with the end sill adjacent its middle and forming an arch, a draft-rigging connected to the end sill and disposed between the arched braces and other inclined braces extending from adjacent the bolster to and connected with the draft-rigging intermediate its ends and forming an arch.

15. In a car structure, a single central beam, side sills spaced upon opposite sides of the beam, means rigidly bracing the side sills and central beam relative to each other, a draft-rigging secured to the end of the central beam and extending to the end of the structure, and means passing beneath and to support the draft-rigging carried by the sill-bracing means.

16. In a car structure, a single central beam extending longitudinally of the car, side sills spaced upon opposite sides of the central beam, braces rigidly secured to the central beam and extending obliquely to and rigidly secured upon the side sills, a draft-rigging rigidly secured to the end of the central beam and extending to the end of the structure, and a supporting-brace disposed beneath the draft-rigging and with its opposite ends rigidly secured to the oblique braces.

17. In a car structure, spaced side sills, obliquely-disposed braces rigidly secured to the side sills, a draft-rigging disposed between the side sills and extending to the end of the structure, a supporting-brace rigidly secured to the oblique braces and passing beneath the draft-rigging, posts rigidly secured to the



extremity of the side sills and extending both above and below the sills, and braces secured to the lower extended ends of the corner-posts and extending in an inclined position toward the center of the structure and rigidly secured to the sills.

18. In a car structure, spaced side sills, braces rigidly secured to the side sills and extending obliquely relative thereto, door-frames comprising spaced side posts secured to the sills and defining registering door-openings centrally of the sills, truss-bars rigidly secured to the side sills adjacent their opposite ends and extending to and arched over the door-frame, corner-posts rigidly secured to the extremities of the sills and extending above and below the sills, braces secured to the lower extended ends of the corner-posts and extending toward the center of the car and rigidly secured to the side sills, and a plate rigidly secured to the upper extremities of the corner-posts, and extending longitudinally of the car, and rigidly secured at its central point, to the door-frame, and truss-bar.

19. In a car structure, spaced side sills, door-frames rigidly secured to the side sills and comprising spaced side posts, and integral-arched top portions defining registering door-openings upon opposite sides of the structure, truss-bars rigidly secured to the sills adjacent their opposite ends and extending to and arched over the arched door-frame, and with the arched portions of the truss-bar and door-frame rigidly secured together, corner-posts erected at the extremities of the side sills, and plates rigidly secured to the upper extremities of the corner-posts and extending longitudinally of the structure and rigidly secured at their middle points to the arched door-frame and arched truss-bar.

20. In a car structure, spaced side sills, a needle-beam extending transversely between and rigidly secured to the side sills at the longitudinal middle, queen-posts rigidly secured to the side sills upon opposite sides of the needle-beam, and with inclined brace portions extending toward each other, and secured to the needle-beam, and a truss-rod rigidly connected with the sill and extending beneath the queen-posts.

21. In a car structure, spaced side sills, bolsters extending transversely between and rigidly secured to the side sills adjacent their ends, a needle-beam extending transversely between the side sills at their longitudinal middles and rigidly secured to said sills, queen-posts disposed beneath the side sills upon opposite sides of the queen-posts and having brace portions extending in reversely-inclined position to and secured upon the needle-beam, and a truss-rod rigidly secured at its opposite ends to the bolsters, and extending beneath the queen-posts.

22. In a car structure, a side sill, a door-frame erected upon the side sill and comprising spaced door-posts defining a central door-opening, queen-posts rigidly secured to the said sill beneath the door-posts, and provided with brace portions reversely inclined toward each other, and truss-rods rigidly connected with the side sills adjacent their opposite ends and extending beneath the queen-posts.

23. In a car structure, spaced side sills, bolsters rigidly secured beneath the side sills adjacent their opposite ends and extending transversely relative thereto, a door-frame erected upon the side sill and comprising integral-spaced door-posts arched at the top and defining a door-opening, centrally of the sills, a truss-bar rigidly secured to the sills adjacent the bolsters, and extending to and arched over the door-frame, a needle-beam disposed transversely of the sills and centrally of the door-openings, queen-posts rigidly secured to the side sills beneath the door-posts and provided with brace portions reversely inclined extending to and secured upon the needle-beam, and a truss-rod rigidly secured at its opposite ends to the bolster and extending beneath the queen-posts.

24. In a car structure, a side sill, spaced queen-posts secured to the side sill and having brace portions extending in reversely-inclined positions and secured to the center of the sill, truss-rods rigidly secured to the side sill adjacent their opposite ends and extending beneath the queen-posts, means carried by the truss-rod for engaging the opposite outer faces of the queen-posts, and means carried by the truss-rod between the queen-posts for exerting tension upon the rod and posts.

25. In a car structure, spaced side sills, bolsters secured to and extending transversely of the sills adjacent their opposite ends, a door-frame erected upon the side sill and comprising integral side posts, and a top arched portion defining a door-opening centrally of the sill, a truss-bar rigidly secured to the sills adjacent the bolsters and extending to and arched over the arched portion of the door-frame, a needle-beam extending transversely of the car and centrally of the door-openings, queen-posts rigidly secured to the side sills beneath the spaced door-posts, and provided with brace portions reversely inclined extending and secured to the needle-beam, a truss-rod rigidly secured at its opposite ends to the bolsters and extending beneath the queen-posts, means carried by the truss-rod for engaging and bearing against the outer opposite faces of the queen-posts, and means carried by the truss-rod between the queen-posts for exerting tension upon the truss-rod and the queen-posts.

26. In a car structure, spaced side plates, spaced arched carlines secured at their oppo-



site ends to the said plates, and having up-  
standing flanges, a roof-plate having its edges  
turned at right angles to the plate and  
curved to conform to the curvature of the  
5 carlines, and with a curved portion formed  
along its longitudinal middle proportioned to  
cover one carline, a cap covering one up-  
standing edge of the roof-plate, and a flange  
of one carline, removable means for securing  
10 the cap upon the carlines, and removable  
means for securing the intermediate curved  
portions of the roof-plate upon the interme-  
diate carlines.

27. In a car structure, spaced side lines,  
15 and a single center beam, transverse beams  
rigidly secured at their opposite ends to the  
center beam and the side sills, and arranged  
in pairs, floor-plates disposed upon the trans-  
verse sills and having their opposite edges  
20 turned downward between the pairs of sills,  
and means for clamping the downwardly-  
turned edges of the floor-plates between the  
sills.

28. In a car structure, a center beam, and  
25 side sills spaced upon opposite sides of the  
center beam, transverse sills disposed be-  
tween the center beam and the side sills, and  
having portions at each end turned at right  
angles and secured rigidly to the said center  
30 beam and sill, the said transverse beams be-  
ing arranged in pairs, a floor-plate disposed  
upon the transverse sills and having its  
edges turned at right angles to the plate and  
disposed between the pairs of transverse  
35 sills and with edges adjacent the sides of the  
structure turned upwardly, and means for  
clamping the downwardly-turned floor edges  
adjacent the transverse sills.

29. In a car structure, side sills, an end  
40 sill, a bolster disposed transversely of the  
structure and rigidly connected at opposite  
ends to the side sill, inclined braces extend-  
ing from adjacent the bolster to and rigidly  
connected with the end sill adjacent its  
45 middle and forming an arch, a draft-rigging  
disposed between the braces, and means  
carried by the braces and extending beneath  
and to support the draft-rigging.

30. In a car structure, side sills, an end  
50 sill, a bolster disposed transversely of the  
structure and rigidly connected at opposite  
ends to the side sills, inclined braces extend-  
ing from adjacent the bolster to and rigidly  
connected with the end sill adjacent its  
55 middle, and forming an arch, a draft-rigging  
disposed between the braces, means carried  
by the braces extending beneath and to sup-  
port the draft-rigging, and inclined braces  
extending from adjacent the ends of the bol-  
60 ster to and rigidly connected with the draft-  
rigging and forming an arch.

31. In a car structure, side sills, an end  
sill, a bolster disposed transversely of the  
structure and rigidly connected at opposite  
65 ends to the side sills, inclined braces extend-

ing from adjacent the bolster to and rigidly  
connected with the end sill adjacent its  
middle, and forming an arch, a draft-rigging  
disposed between the braces, means carried  
by the braces and extending beneath and to 70  
support the draft-rigging, inclined braces  
extending adjacent the end of the bolster to  
and rigidly connected with the draft-rigging  
and forming an arch, and gussets joining the  
two sets of inclined braces intermediate 75  
their ends.

32. In a car structure, queen-posts form-  
ing an arch beneath the center of the car.

33. In a car structure, a side sill, queen-  
posts disposed beneath the center of the side 80  
sill and provided with members forming an  
arch.

34. In a car structure, a side sill, queen-  
posts disposed beneath the sill and forming  
an arch, and a truss-rod having its opposite 85  
ends connected with the sill and disposed  
beneath the queen-posts.

35. In a car structure, a side sill, spaced  
queen-posts disposed beneath the middle of  
the sill and provided with inclined portions 90  
extending toward each other and forming an  
arch, and means for supporting and exerting  
tension upon the queen-posts.

36. In a car structure, a side sill, spaced  
queen-posts disposed beneath the middle of 95  
the sill and having portions extending along  
and secured to the sill, and with inclined  
portions extending toward each other and  
forming an arch, and means disposed be-  
neath and to support the queen-posts. 100

37. In a car structure, a side sill, a side  
plate, an arched door-frame erected between  
the sill and plate and rigidly secured to each,  
a truss-bar arched over the top of the door-  
frame and having its opposite ends rigidly 105  
connected with the sills, and braces extend-  
ing between the plate and the truss-bar in-  
termediate the door-frame and its ends.

38. In a car structure, a side sill, a side  
plate, an arched door-frame erected between 110  
the sill and plate a truss-bar arched over the  
top of the door-frame and with its opposite  
ends rigidly secured to the sill and a brace  
extending from the plate to the truss-bar in-  
termediate the door-frame and one end, and 115  
disposed substantially at right angles to the  
truss-bar.

39. In a car structure, a side sill, a side  
plate, an arched door-frame, erected between  
the sill and plate, a truss-bar arched over the 120  
door-frame and rigidly secured at its oppo-  
site ends to the sill, a brace extending from  
the plate to the truss-bar intermediate the  
door-frame and one end, and disposed sub-  
stantially at right angles to the truss-bar, 125  
and a brace extending from the sill to the  
truss-bar, and disposed substantially at  
right angles to the truss-bar.

40. In a car structure, a side sill, a side  
plate, an arched door-frame erected between 130



the sill and plate, a truss-bar arched over the door-frame and having its opposite ends rigidly secured to the sill, and braces rigidly secured to the sill and inclined toward and  
5 extending to the juncture of the door-frame and truss-bar.

41. In a car structure, a side sill, a side plate, a door-frame erected between the sill and plate, a truss-bar arched above and rigidly secured to the door-frame and plate,  
10 and with its opposite ends rigidly secured to the sill, and brace-bars rigidly secured to the sill between the door-frame and the ends of the truss-bar and extending in an inclined  
15 position to and rigidly secured at the junctures of the truss-bar and door-frame.

42. In a car structure, a side sill, a side plate, an arched door-frame erected between the sill and plate and rigidly connected with  
20 each, a truss-bar arched above and rigidly secured to the door-frame and having its opposite ends rigidly secured to the sill, and a plurality of braces extending from the plate to and substantially at right angles with the  
25 truss-bar.

43. In a car structure, a side sill, a side plate, an arched door-frame erected between the side plate and the side sill and rigidly secured to each, a truss-bar arched  
30 above and rigidly secured to the door-frame and with its opposite ends secured to the sill, and a plurality of braces extending from the sill to and at right angles with the truss-bar.

44. In a car structure, a side sill, a side plate, a door-frame erected between the sill and plate, a truss-bar arched above the door-frame and rigidly secured thereto and with its opposite ends rigidly secured to the sill, a  
35 plurality of braces extending from the plate to and at right angles with the truss-bar, and  
40 other braces extending from the sill to and at right angles with the truss-bar.

45. In a car structure, a side sill, a side plate, a door-frame erected between the sill and plate, a truss-bar arched above the door-frame and rigidly secured thereto and to the plate, and with its opposite ends secured to the sill, reversely-inclined braces secured to the sill between the door-frame and the ends  
45 of the truss-bar, and extending to and secured at the junctures of the truss-bar and door-frame.  
50

46. In a car structure, a side sill, a side plate, a door-frame erected between the sill and plate, and rigidly secured to each, a truss-bar arched above the door-frame and rigidly secured thereto and to the plate, and with its opposite ends rigidly secured to the sill, reversely-inclined braces secured to the sill between the door-frame and the ends of the truss-bar and extending to and secured at the junctures of the truss-bar and door-frame, and a brace extending from the plate to the truss-bar and disposed substantially at right angles to the truss-bar.

47. In a car structure, a side sill, a side plate, a door-frame erected between the sill and the plate, and rigidly secured to each, a truss-bar arched above the door-frame and rigidly secured thereto, and to the plate and with its opposite ends rigidly secured to the sill, reversely-inclined braces rigidly secured to the sill between the door-frame and the ends of the truss-bar, and extending to and rigidly secured at the junctures of the truss-bar and door-frame, braces extending from the plate to the truss-bar and rigidly secured at right angles thereto, and other braces extending from the sill to the truss-bar and rigidly secured at right angles thereto.

48. In a car structure, spaced bolsters, a side sill carried upon the bolsters, a side plate spaced above the side sill, a door-frame erected between the sill and the plate and intermediate the bolsters, a truss-bar arched above the door-frame and rigidly secured thereto and to the plate, and with its ends secured rigidly to the side sills adjacent the bolsters, reversely-inclined braces extending from the side sill intermediate the door-frame and bolsters to and secured at the junctures of the door-frame and truss-bar, braces extending from the plate to and rigidly secured at right angles to the truss-bar, and other braces extending from the sill and rigidly secured at right angles to the truss-bar.

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

FRANCIS JERDONE, JR.

Witnesses:

BEATRICE FITZGERALD,  
H. W. STEVENSON.