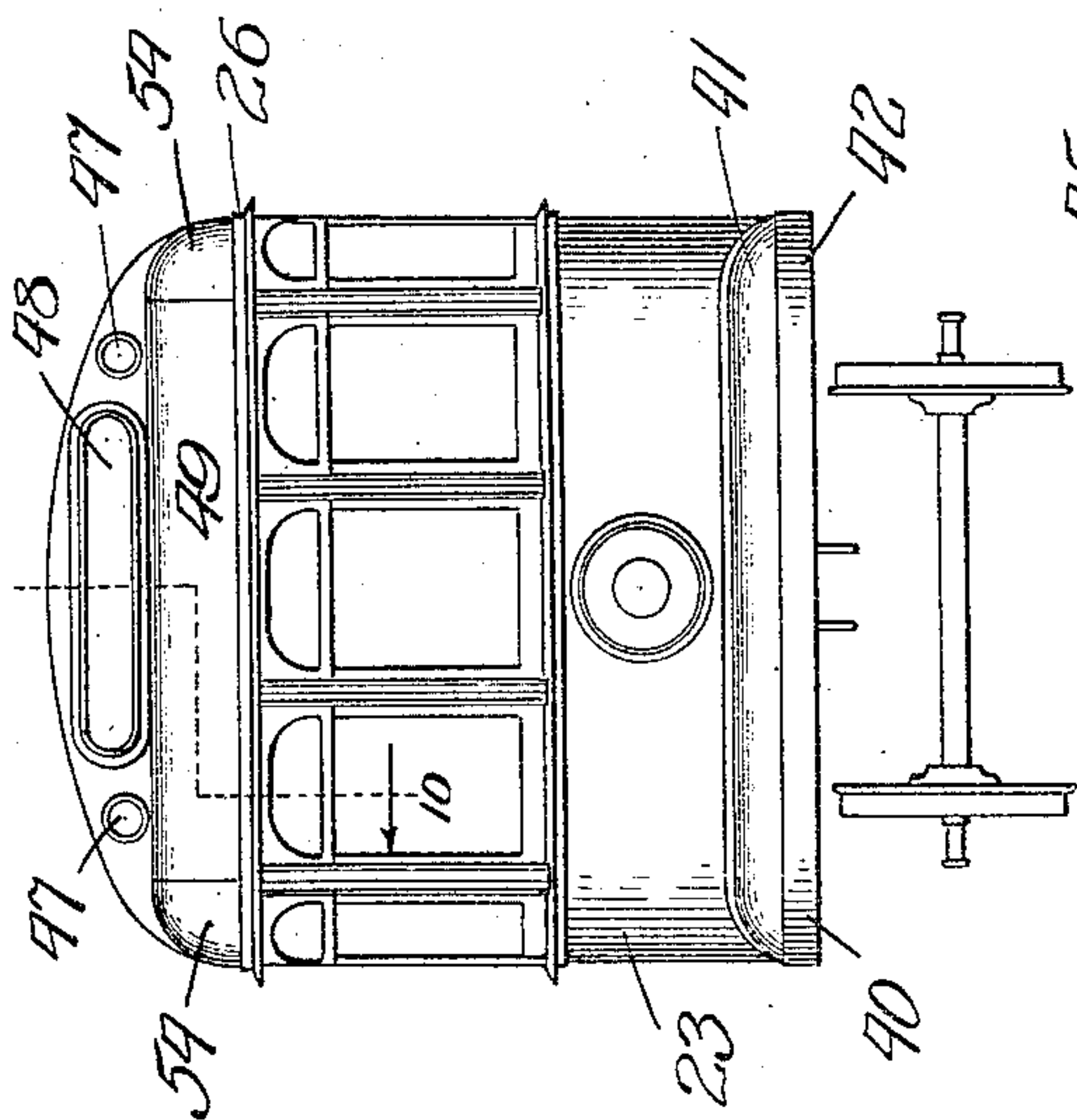


STEEL CAR.

Patented Dec. 14, 1909.

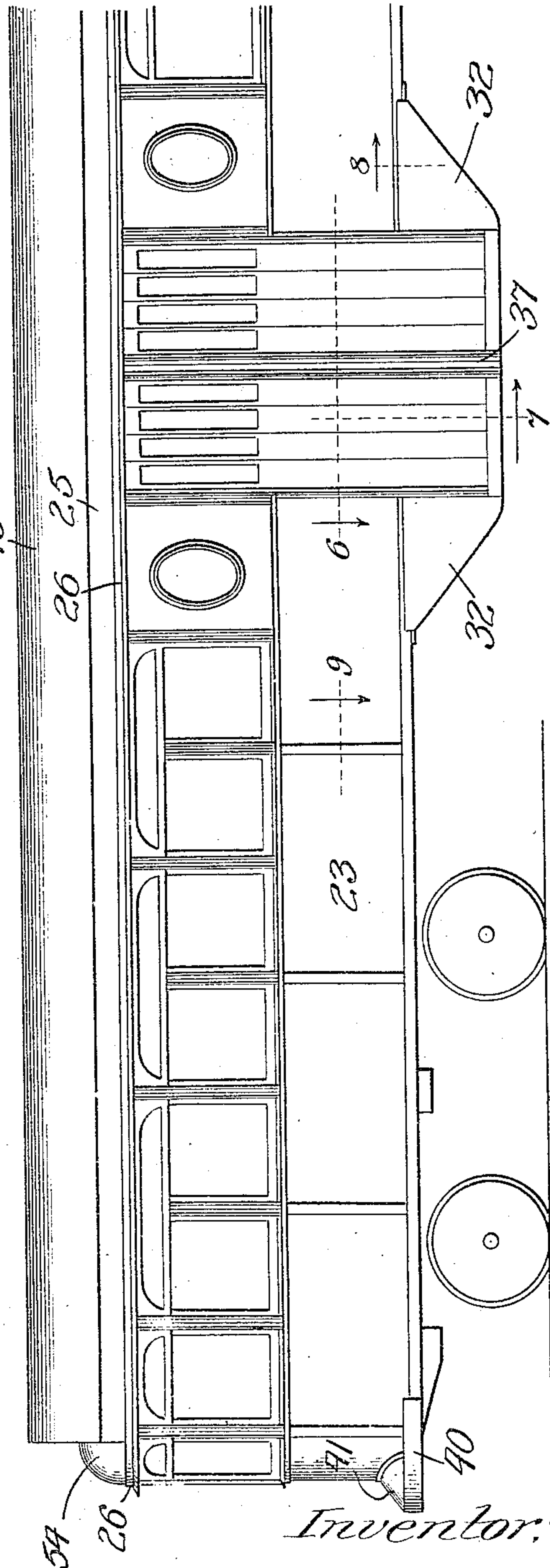
5 SHEETS—SHEET 1.

943,213.



1624

Fig. 2.



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54-26-  
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STEEL CAR.

APPLICATION FILED JULY 7, 1909.

Patented Dec. 14, 1909.

5 SHEETS—SHEET 2.

943,213.

Fig. 3.

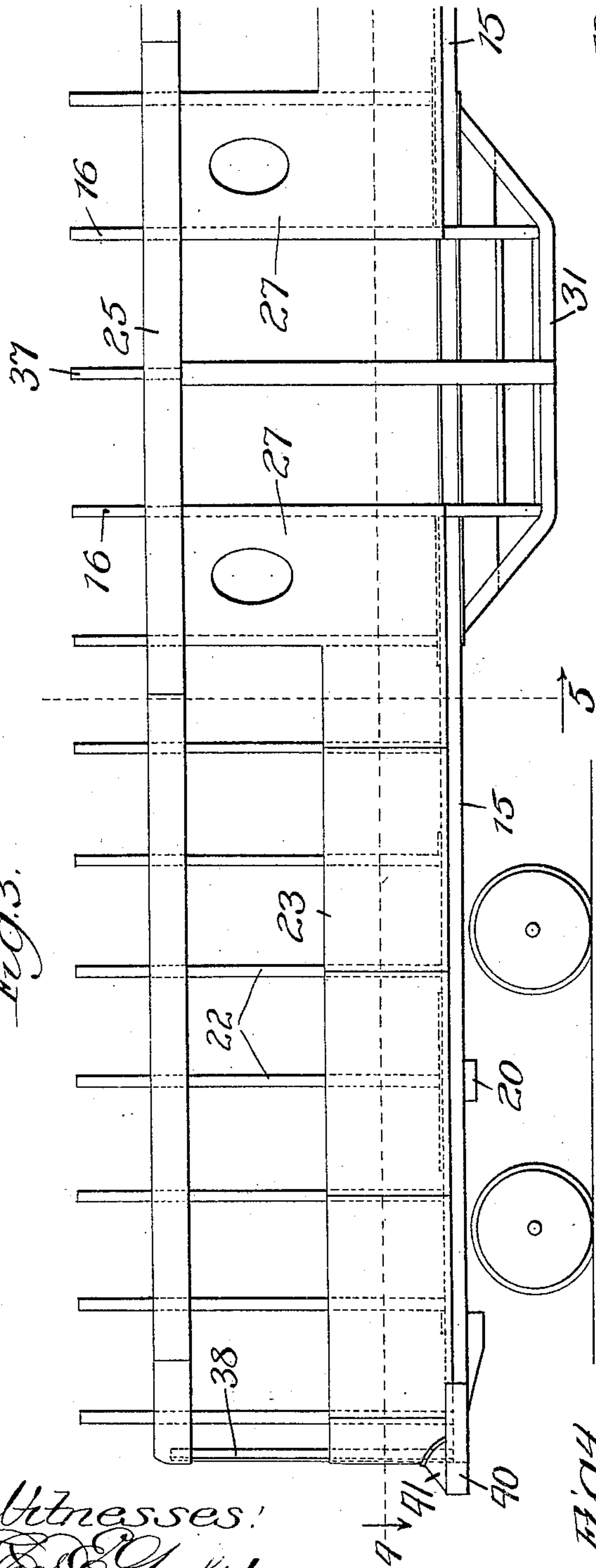
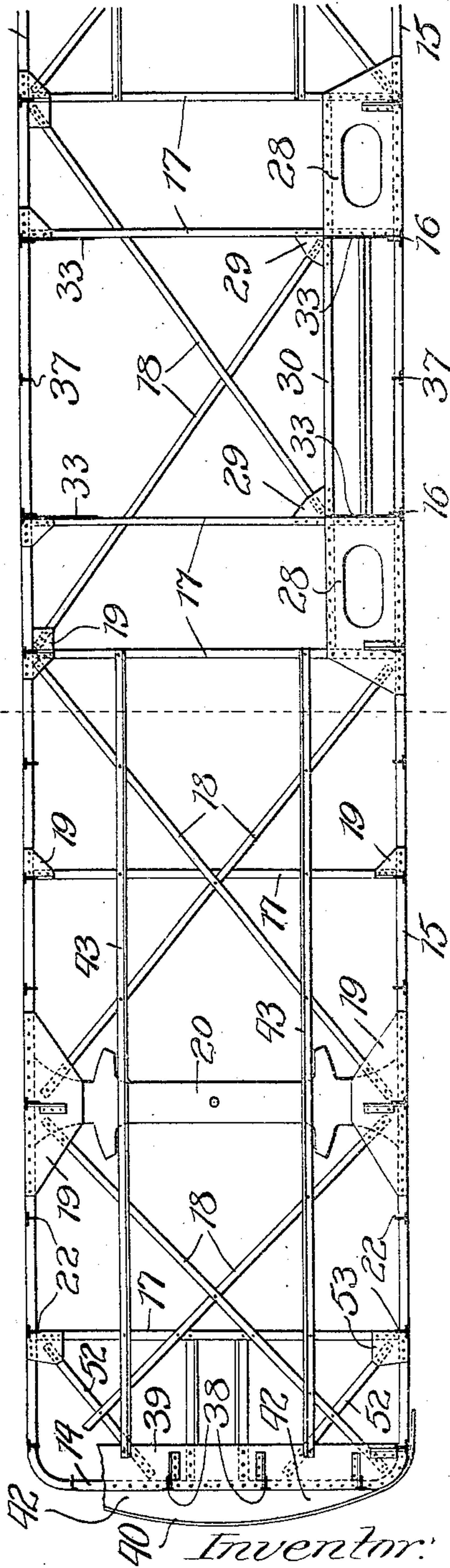


Fig. 4.



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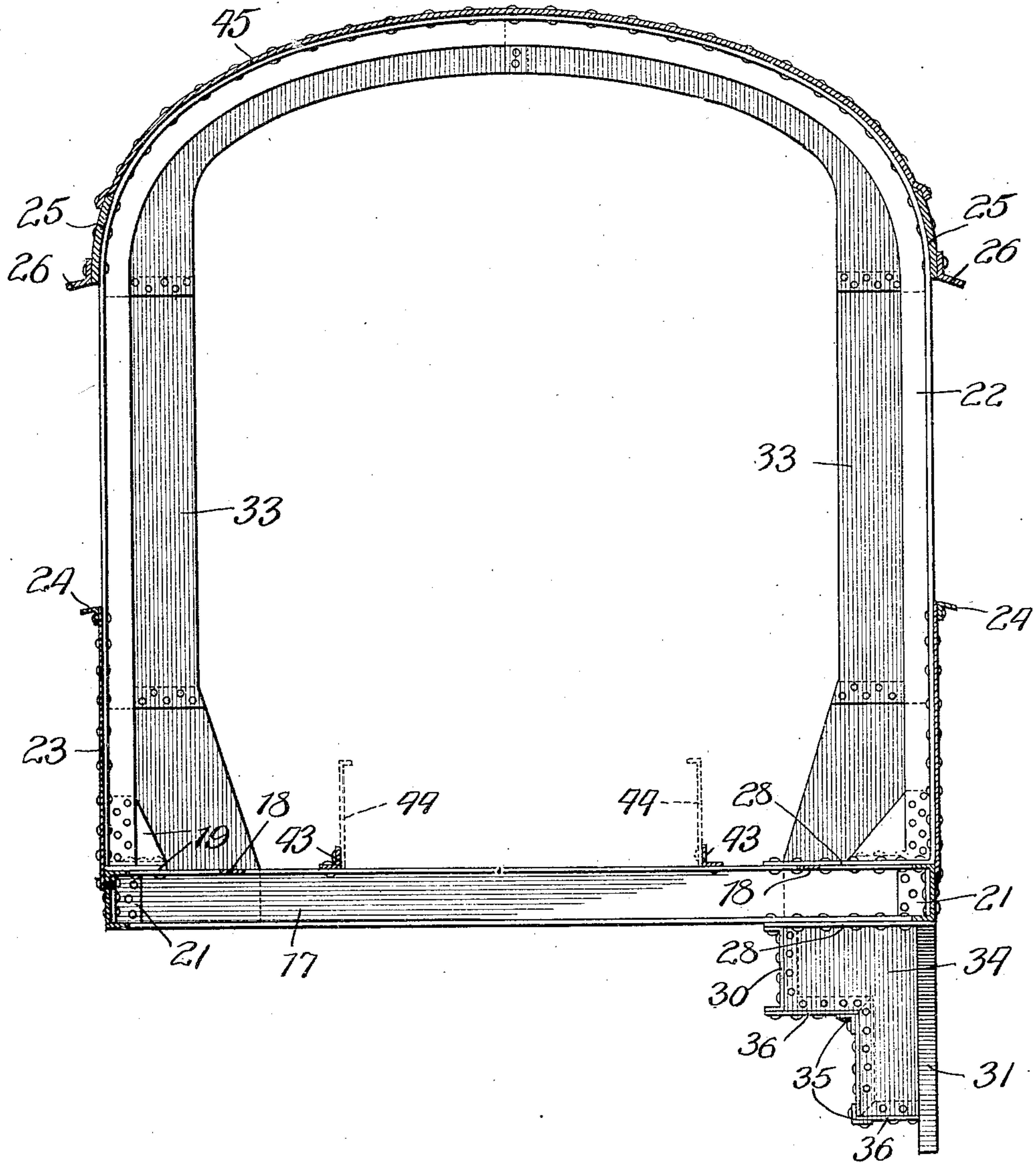
APPLICATION FILED JULY 7, 1909.

Patented Dec. 14, 1909.

5 SHEETS—SHEET 3.

943,213.

Fig. 5.



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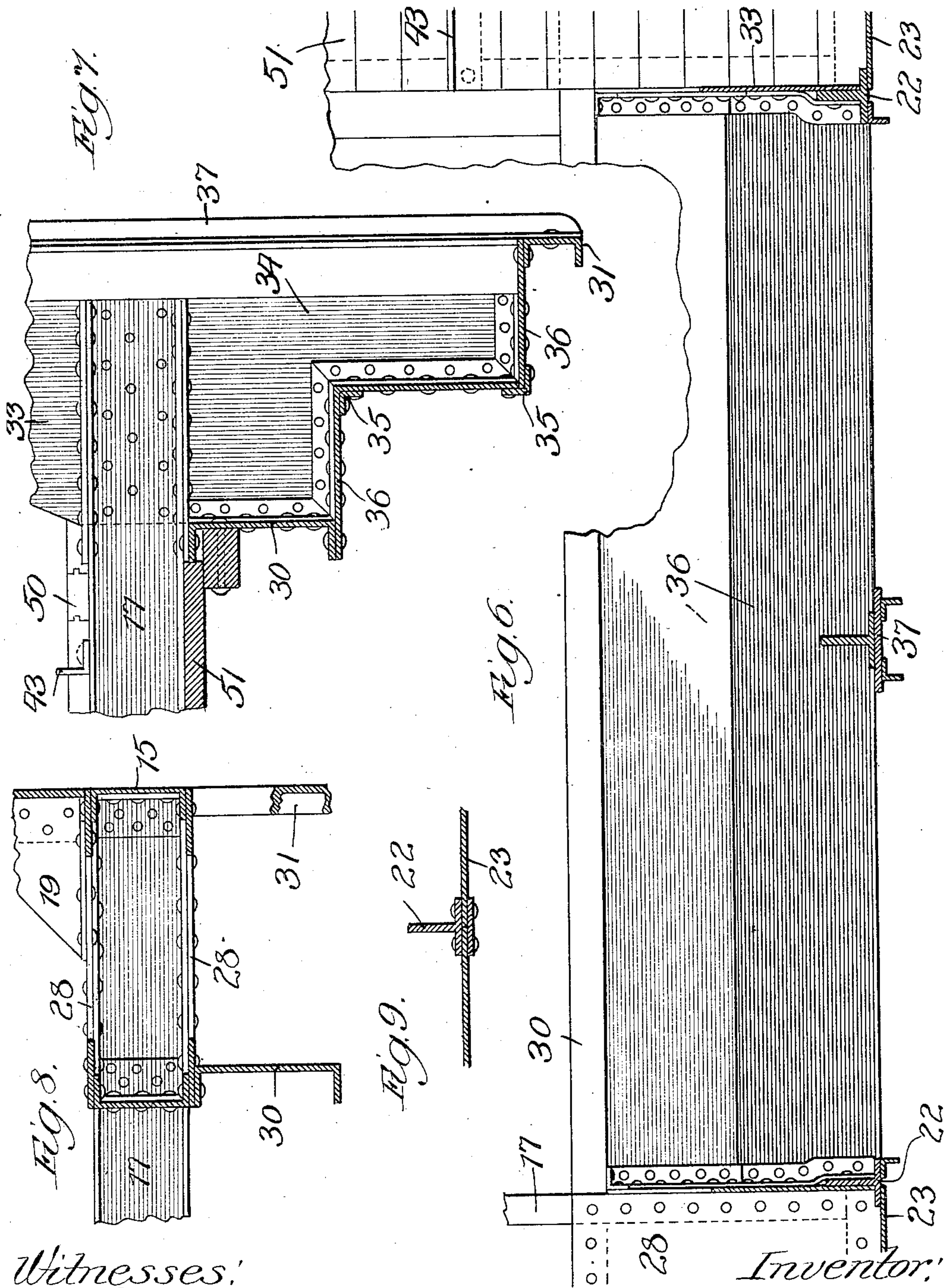
STEEL CAR.

APPLICATION FILED JULY 7, 1909.

Patented Dec. 14, 1909.

5 SHEETS—SHEET 4.

943,213.



Witnesses:

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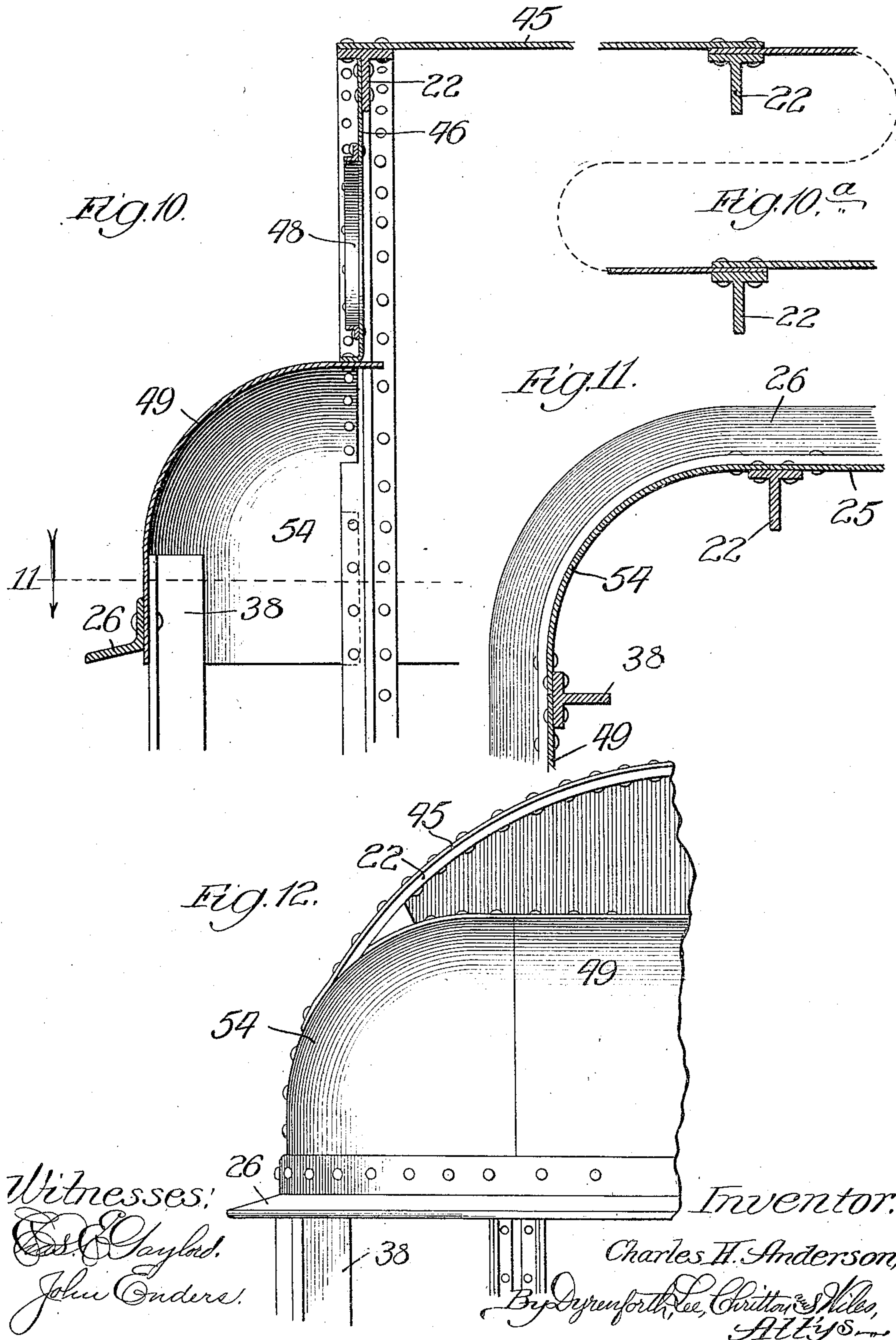
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# UNITED STATES PATENT OFFICE.

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STEEL CAR.

943,213.

Specification of Letters Patent.

Patented Dec. 14, 1909.

Application filed July 7, 1909. Serial No. 506,375.

*To all whom it may concern:*

Be it known that I, CHARLES H. ANDERSON, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a new and useful Improvement in Steel Cars, of which the following is a specification.

My object is to provide certain improvements in steel-cars generally, and more especially in railway passenger-coaches, with a view to rendering them particularly light, durable and attractive in appearance and at the same time to materially reduce their cost of construction.

In the accompanying drawings which illustrate my improvements applied to a car having a door in one side and designed, more especially, for interurban and city electric railways—Figure 1 is an end elevation of the car; Fig. 2 a broken elevation of one side; Fig. 3, a broken elevation of the framing at one side; Fig. 4, a plan section taken on line 4, in Fig. 3, and with the side truss-plates removed; Fig. 5, an enlarged transverse section taken on line 5 in Figs. 3 and 4; Fig. 6, an enlarged broken plan section taken on line 6 in Fig. 2, with the doors omitted; Figs. 7, 8 and 9, enlarged broken sections taken on lines 7, 8 and 9 in Fig. 2; Fig. 10, an enlarged broken section taken on irregular line 10 in Fig. 1; Fig. 10<sup>a</sup>, a continuation of Fig. 10, and illustrating therewith the roof construction; Fig. 11, a broken plan section taken on line 11 in Fig. 10; and Fig. 12 a broken end elevation of an upper corner-portion of the car.

The underframing of the car has a practically continuous channel-beam forming the sill-section 13, extending the full length of one side, sill-sections 14, across opposite ends, and sill-sections 15, on the other side of the car, terminating at the bowed, or arched, T-bars or uprights 16, 16 at opposite sides of the door-opening. The channel-beam forming the sill-sections 13, 14, 15, can be of one continuous length or in sections preferably butt-joined, and held together by tie-plates. The side sill-sections are secured together intermediate of the ends by channel-beam cross-sills 17, spaced apart as indicated in Fig. 4; and are further strengthened by diagonal straps or bars 18 secured at their ends to suitable gusset-plates 19, which are riveted to the sills. Secured against the under edges of the side sills are

the bolsters 20. The beams 17 abut against the side sills, and are further secured thereto by the corner-plates 21, as indicated in Fig. 5.

The upper framing of the car is formed with a series of similarly arched, or bowed, T-bar carlines 22, all alike, and spaced equidistant apart between the uprights 16 and ends of the car. Alternate T-bars 22 are anchored to the sills by means of the gusset-plates 19, which are of angle form, with upward-extending flanges as indicated in Fig. 5. Extending around the car and terminating at the uprights 16 is a lower truss-plate 23 riveted along its lower edge to the side sills and end sills and provided along its upper edge with an angle-bar 24 forming a projecting sill at the base of the window-openings. Extending around the car above the window-openings is an upper truss-plate 25 provided at its lower edge with an angle-bar 26 forming a water-shed. At opposite sides of the door-opening are upright plates 27 forming practically a continuation of the truss-plates 23 and joined at their upper edge-portions to the upper truss-plate 25.

At opposite sides of the doorway, at the upper and lower sides of the sills 17 are horizontal strengthening plates 28, to the inner corners of which the central diagonal bars 18 are secured through gusset-plates 29 as shown.

The plate 25 and angle-bar 26 form the top or compression chord of the truss construction, as well as the door lintel, a lower or tension chord being formed by a short longitudinally extending channel-beam 30 fastened against the undersides of the lower plates 28, and also forming a step-riser. Extending across and below the door-opening is a depressed channel-bar 31 secured at opposite ends against the under sides of the sills 15 and strengthened by means of covering plates 32. The T-bars, or uprights, 16 are anchored to the upper plates 28, and fastened against them are bulk-heads 33 formed of plate-sections, as illustrated most plainly in Fig. 5. At opposite sides of the door-opening, the bulk-head plate-sections extend below the sills and form stay-cheeks 34, to which are secured the angle-iron stay-braces 35 holding the steps 36. The lower step rests at its outer edge upon the bar 31. A T-bar 37 intermediate the bars 16 separates the opening into two doorways and is of the



same shape as the other arched T-bars but extends downward to the bar 31, operating as a stay therefor.

The framing described, forms a very strong and durable construction, particularly light in weight. The entire height of the side of the car at the doorway is used as the depth of the truss and the unit-stresses on the material are, by this construction, reduced to the minimum where the greatest strength is required. The end-framing of the car is formed with upright T-bars 38, secured at their lower ends to horizontal reinforcing plates 39, which are in turn secured to the sills, the T-bars being secured at their upper ends to the angle-bar 26. At each end of the car is a projecting bowed buffer-plate 40, fastened against the truss-plate 23 and side-sills, extending to which is a hood 41. The space between the buffer-plate 40 and end sill 14 is filled with a wooden block 42. Extending from the plates 39 over the cross-sills, as indicated in Fig. 4, are angle-iron straps 43 which form anchors for the inner sides of the seat-supporting plates 44, shown in Fig. 5.

The deck or roof-plates 45 are fastened to the T-bars 22, 16, 37, as indicated most plainly in Figs. 10, 10<sup>a</sup>. Each plate 45 extends at its edge across the flat surface of the T-bar and is riveted in place by two rows of staggered rivets, which serve to hold the edges of the plates closely and firmly against the T-bars throughout their extent. The joint thus made is so close and water tight that no filler, such as is commonly used beneath roof-plates of cars, need be employed.

Each end of the car is formed with an upper vertical plate 46, in which openings 47, 47 are provided for signal lights and an opening 48 for a destination sign. The plate 46 at its upper edge fits into a bowed T-bar 22, and at its lower edge is flanged to fit over a projecting circular end roof-plate 49, to which it is secured as indicated in Fig. 10. The circular or hood-shaped plate 49 at its lower edge is secured to the upper ends of the T-bars 38, and fits within the water-shed 26. The opposite edges of the plate 49 are joined to circular dished plates 54 which close the sides of the car-end hood thus formed.

In constructing my improved car, I have endeavored to dispense, as far as possible, with superfluous material which adds to the expense and weight of the car. I have accomplished this by causing the covering plates 23, 25 and other exposed parts of the car to enter largely into the staying and strengthening portions thereof. The construction of the ends described is particularly simple and inexpensive and gives the advantage of openings for the lights and a place for a destination sign in the actual framework of the car.

From opposite sides of the doorway to the ends of the car, the flooring 50 rests upon the upper surfaces of the cross-sills 17. At the doorway is a depressed floor 51 extending across the car on about the level of the under sides of the cross-sills 17 and top of the beam 30. This brings the lower of the two steps 36 to within short stepping distance from the ground, which is a material advantage in loading and unloading passengers. The doors which are of sectional form, not claimed in the present application, are mounted between the uprights or T-bars 16, 37, and when closed extend practically flush with the outer side of the car and outer edge of the lower step.

The plates 39 at opposite ends of the car are in pairs, one above and one below the end sill. Extending from points near the centers of the plates 39 are diagonal channel-bars or thrust-braces 52 reaching to the sides of the car where they are fastened by means of the gusset-plates 53 to the cross and side-sills. By means of this construction end-thrust against the car is carried through the braces or channel-bars 52 to the side sills. End-thrust against the sills 15 is carried through the plates 28 to the beam or chord 30, their connection with the latter and cross-sills 17 preventing any twisting movement under either compressing or tension strains.

The frame-work of the upper structure, formed, as described, largely of interchangeable parts, leaves relatively little room for wood trimmings, which may be easily applied at comparatively low expense and contribute to the attractiveness in appearance desired.

Although I have shown and described the plate 25 as thicker than and separate from the roof or deck plate 45, these plates may be integral. That is to say, the plate 45 may extend to and under the angle-bar 26 and thereby take the place of the separate truss-plate 25 shown. These and other modifications in details of construction may be made without departing from the spirit of my invention as defined by the claims.

What I claim as new and desire to secure by Letters Patent is—

1. In a steel-car having a door-opening in the side, an underframing formed with an outer sill and a lower truss-plate both extending around the ends of the car and cut away at the door-opening, cross-sills, an upper truss-plate extending around the car and forming an upper chord above the door-opening, vertical truss-plates connecting the said upper and lower truss-plates at opposite sides of the doorway, steps in the doorway, horizontal plates secured to the sills at opposite sides of the doorway, and a lower chord connecting said horizontal plates at the back of the steps.



2. In a steel-car having a door-opening in the side, an underframing formed with an outer sill and a lower truss-plate both extending around the ends of the car and cut away at the door-opening, cross-sills, a series of arched T-bars forming the door-framing, an upper truss-plate extending around the car and forming an upper chord above the door-opening, vertical truss-plates connecting said upper and lower truss-plates at opposite sides of the doorway, steps in the doorway, horizontal plates secured to the sills at opposite sides of the doorway, and a lower chord connecting said horizontal plates at the back of the steps.

3. In a steel-car having a door-opening in the side, an underframing formed with an outer sill and a lower truss-plate both extending around the ends of the car and cut away at the door-opening, cross-sills, a series of arched T-bars forming the upper frame, bulk-head plates secured to the T-bars at opposite sides of the door-opening, an upper truss-plate extending around the car and forming an upper chord above the door-opening, vertical truss-plates connecting the

said upper and lower truss-plates at opposite sides of the doorway, steps in the doorway, horizontal plates secured to the sills at opposite sides of the doorway, and a lower chord connecting said horizontal plates at the back of the steps.

4. In a steel-car having a door opening in the side, an underframing formed with an outer sill and a lower truss-plate both extending around the ends of the car and cut away at the door-opening, cross-sills, a series of diagonal braces extending between opposite sides of the underframing, an upper truss-plate extending around the car and forming an upper chord above the door-opening, vertical truss-plates connecting the said upper and lower truss-plates at opposite sides of the doorway, steps in the doorway, horizontal plates secured to the sills at opposite sides of the doorway, and a lower chord connecting said horizontal plates at the back of the steps.

CHARLES H. ANDERSON.

In presence of—

MORRIS B. SACHS,  
R. E. BANKS.