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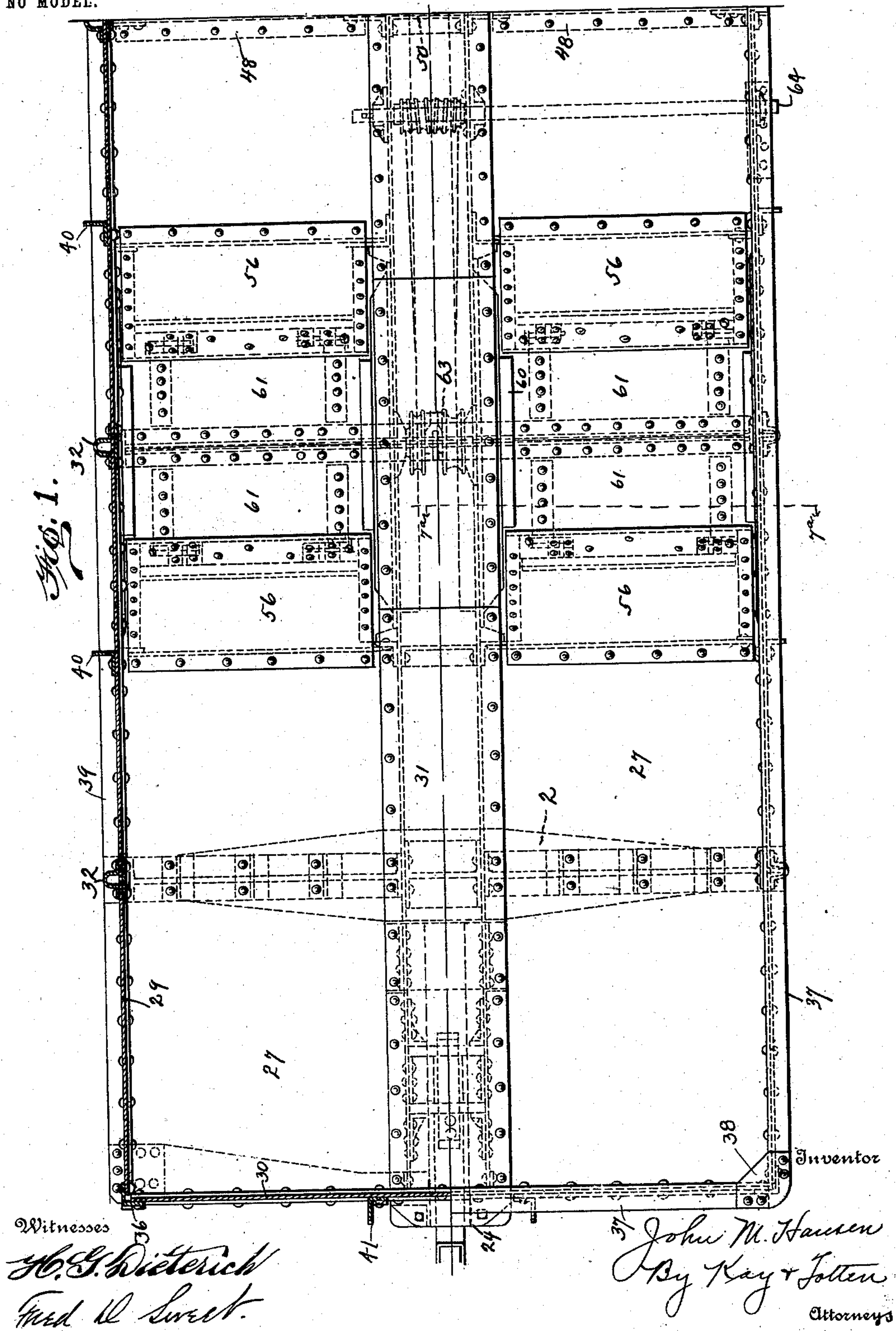
PATENTED NOV. 10, 1903.

J. M. HANSEN.
GONDOLA CAR.

APPLICATION FILED MAY 9, 1902.

NO MODEL.

6 SHEETS—SHEET 1.



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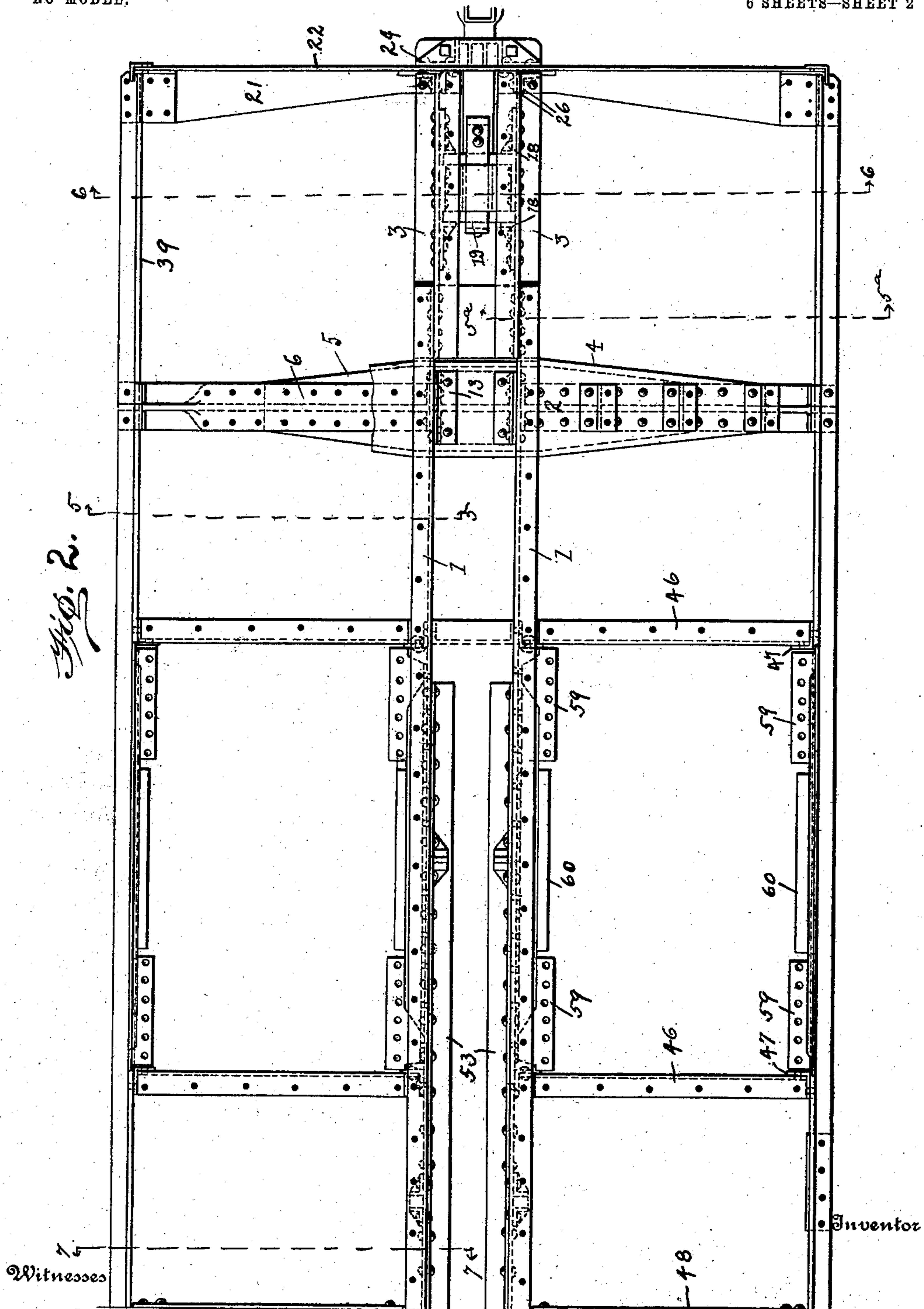
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6 SHEETS—SHEET 2



Witnesses

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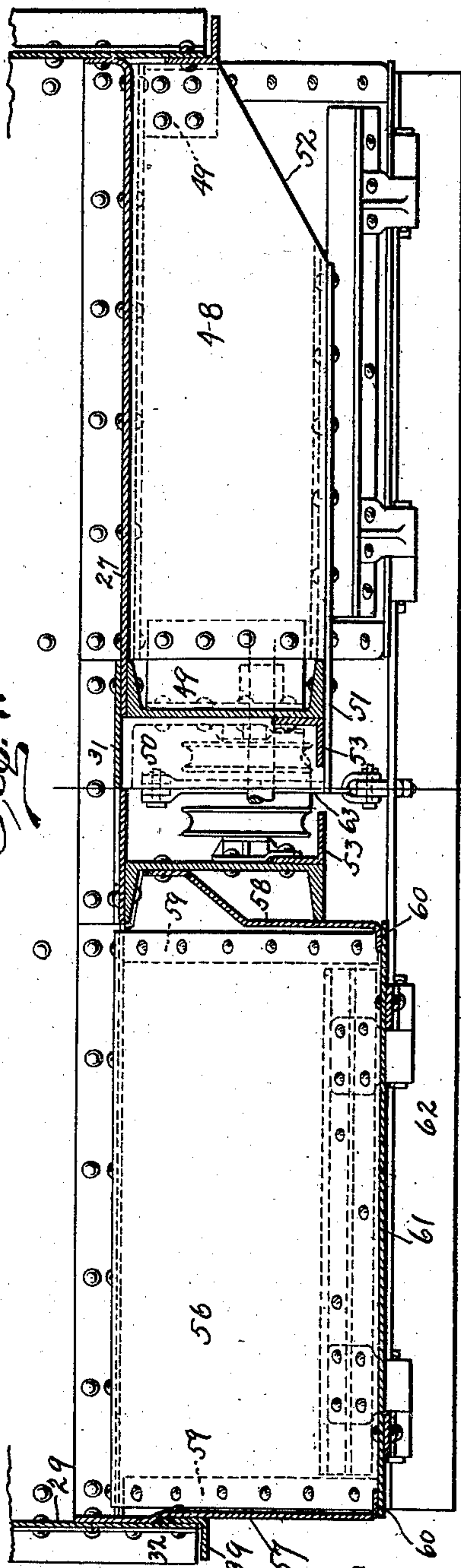
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6 SHEETS—SHEET 3.



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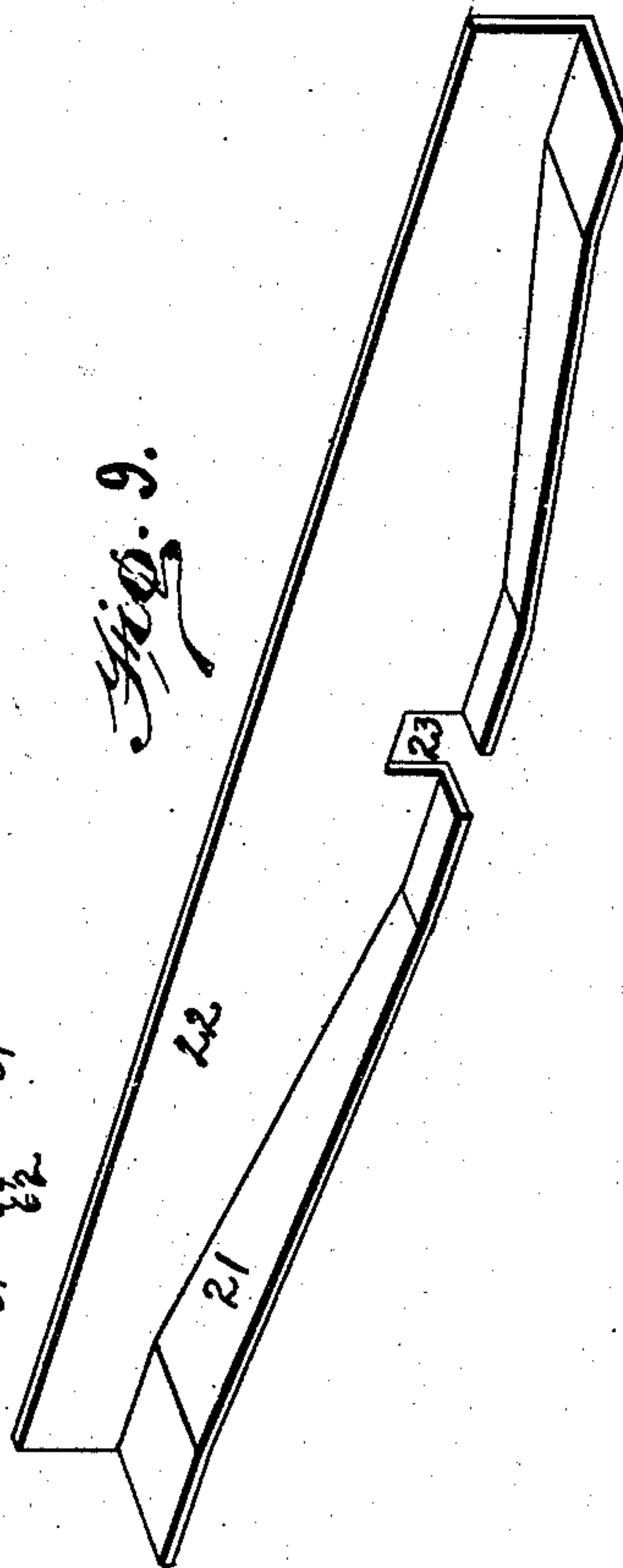
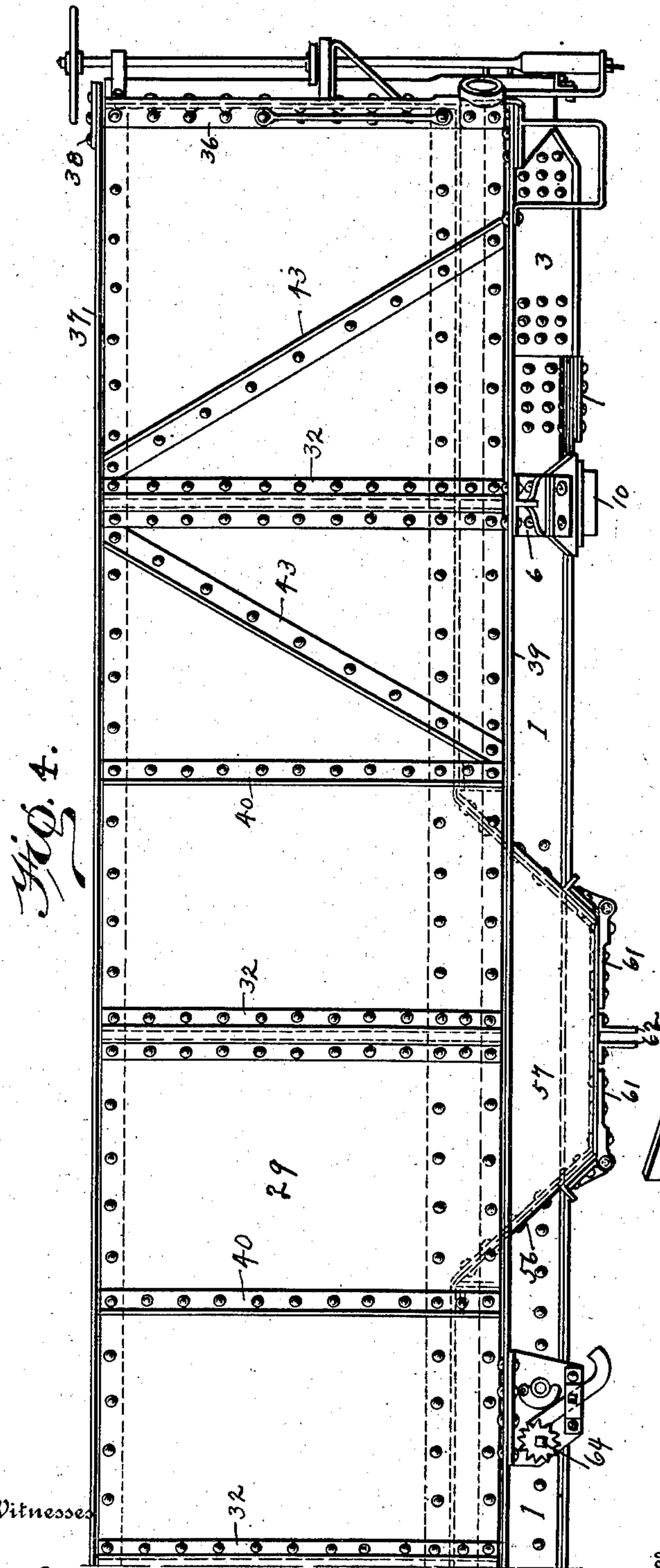
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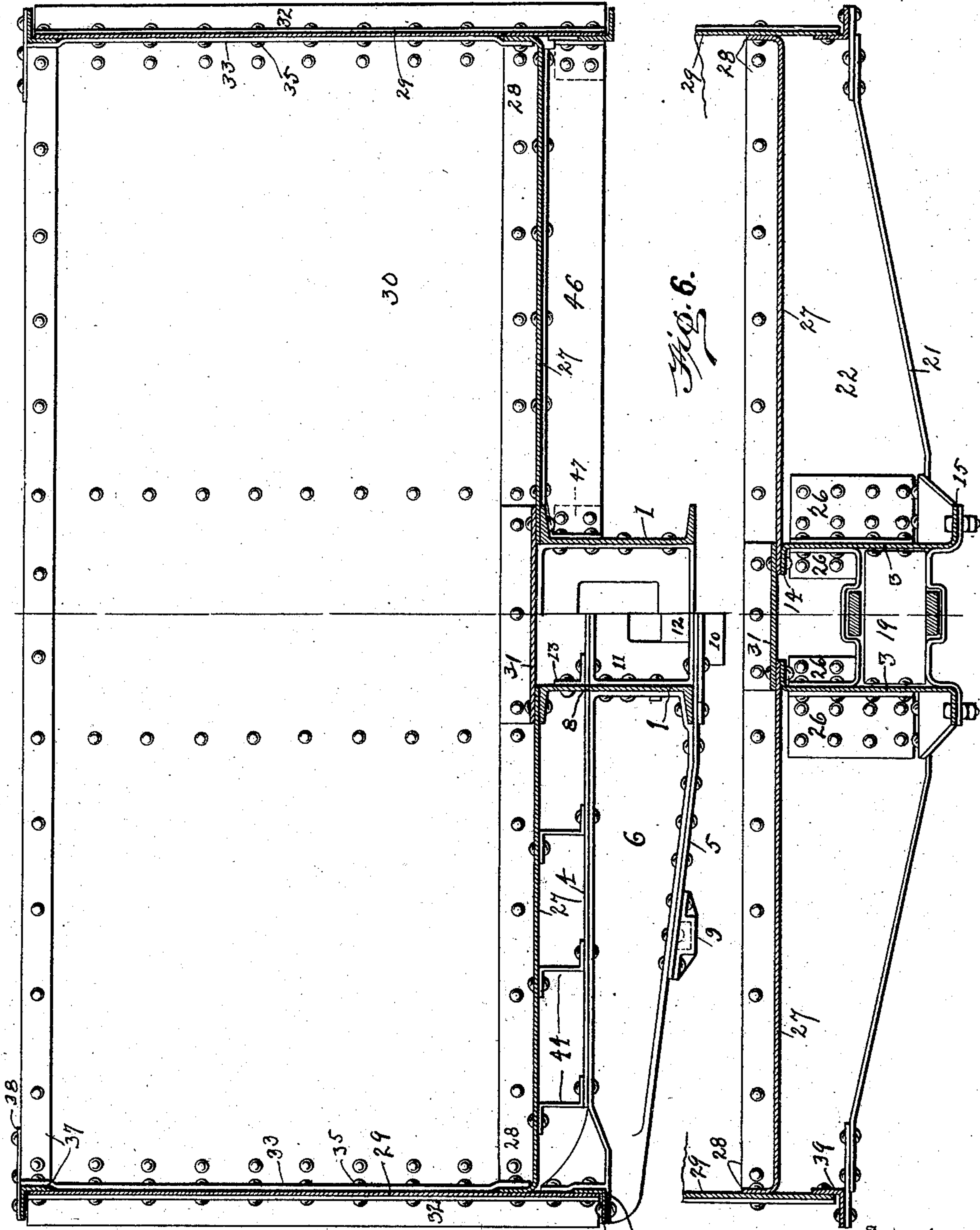
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6 SHEETS—SHEET 5.



Witnesses

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Fig. 5.

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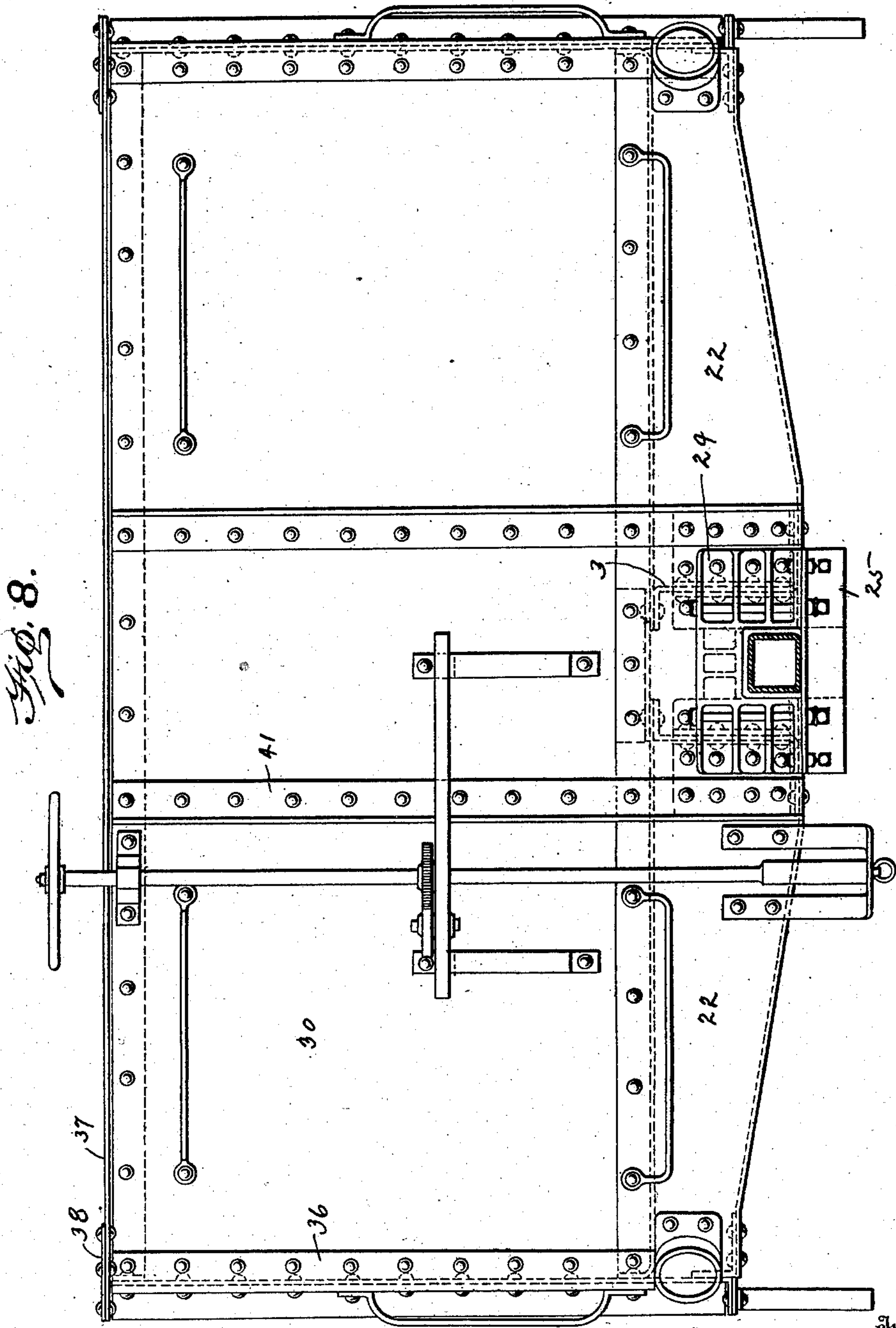
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NO MODEL.

6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

JOHN M. HANSEN, OF PITTSBURG, PENNSYLVANIA.

GONDOLA CAR.

SPECIFICATION forming part of Letters Patent No. 743,497, dated November 10, 1903.

Application filed May 9, 1902. Serial No. 106,580. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. HANSEN, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gondola Cars; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to metallic railway-cars, and more especially to that type known as "gondola" cars; but it is applicable to all metal cars having flat bottoms, whether unbroken or provided with doors or hoppers. I have illustrated the invention in connection with a flat-bottom gondola car provided with twin hoppers.

The invention consists in improving cars of this character in the details of construction, which will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view of one half of the car, the upper portion of the figure showing the side and end of the car in section. Fig. 2 is a plan view of the underframe, the floor-plates being removed. Fig. 3 is a longitudinal vertical section of one half of the car, the portion to the right of the line $x x$ being taken on a plane at one side of the center sills, while the portion to the left of said line is taken on the central longitudinal plane of the car. Fig. 4 is a side elevation of the other half of the car. Fig. 5 is a transverse section of the car, the right-hand portion being taken on the line 5 5, Fig. 2, and the left-hand portion on the line 5^a 5^a, Fig. 2. Fig. 6 is a transverse section of the car on the line 6 6, Fig. 2, the side walls being broken off. Fig. 7 is a transverse section of the car, the right-hand portion being taken on the line 7 7, Fig. 2, and the left-hand portion on the line 7^a 7^a, Fig. 1. Fig. 8 is an end elevation of the car, and Fig. 9 is a perspective view of the end sill.

The car illustrated is of the type having center sills, but no side sills, the sides of the car-body being formed as plate-girders and serve to assist in supporting the load. The underframe comprises center sills, draft-sills, end sills, body-bolsters, and transoms or diaphragms. The center sills preferably are channel-shaped structures, such as the rolled channel-beams 1, placed parallel to each other, with the flanges of said channels preferably

extending outwardly. These center sills project through and beyond the body-bolsters 2 and have the draft-sills 3 secured thereto between the body-bolsters and the end sills. The body-bolsters 2 comprise top cover-plates 4, bottom cover-plates 5, and web-fillers 6. The latter are two in number, one located on either side of the center sills, and they preferably are of cast-steel or malleable cast-iron of a general I shape. At their inner ends they are riveted to the center sills, and preferably they taper toward their outer ends, which are preferably formed as angle-brackets 7 for receiving and supporting the sides of the car. The web-fillers are of less height than the center sills, and the top cover-plate 4 extends through slots 8, cut in the webs of the center sills. The cover-plates do not extend entirely to the sides of the car, but terminate inside of the same, as shown. To the lower cover-plate are secured the side bearings 9 and center bearing 10. This cover-plate 5 extends only to the outer sides of the side bearings, as shown, and passes underneath the center sills. Between the center sills is the brace or strut 11, also preferably formed of cast metal and provided with a boss 12, having a hole for the center pin. Angle-pieces 13 secure the center sills to the bolsters.

The draft-rigging sills are of Z shape, as shown in Fig. 6, having their upper flanges 14 turned inward and their lower flanges 15 turned outward. They are of slightly-greater depth than the center sills, and the webs thereof lie against the inner faces of the webs of the center sills and are riveted thereto, their upper flanges projecting inwardly substantially on a level with the upper flanges of the center sills and their lower flanges projecting outwardly and lying underneath the lower flanges of the center sills and preferably also riveted thereto. The lugs 18 for holding the draft-rigging 19 are riveted to the inner faces of the webs of these Z-bar sills. At their outer ends the lower edges of the draft-sills are pressed upwardly, as shown at 20, and the reduced ends rest upon and are secured to the flange 21 of the end sill 22. This sill is of general angle form, as shown in Fig. 9, having a vertical web of varying depth, as shown, greatest at its central portion and decreasing toward its end, while the

horizontal flange 21 is of varying width, being greater at its ends than at its central portion. This end sill is formed by taking a plate of uniform width and pressing it into shape, throwing into the flange to produce extra width the metal which is diverted from the web by reason of its decreased depth. At its central portion the web and horizontal flange are cut away, as shown at 23, to provide an opening for the draw-bar shank. A buffer-casting 24 is riveted to the outer face of the end sill at its central portion, this buffer-casting being provided with a notch through which the draw-bar shank passes and having bolted thereto the draw-bar carrier 25, in the form of a section of angle-bar. The vertical web of the end sill projects upwardly above the tops of the center sills, so as to permit the body end plates being riveted thereto. The draft-sills are secured to the end sill by means of angle-pieces 26.

The body of the car comprises the floor-plates 27, extending from the center sills to the sides and ends of the car and having their outer and end edges turned upwardly, as at 28, and riveted to the side plates 29 and end plates 30. The inner edges of these floor-plates are riveted to the upper flanges of the center sills, and between the center sills are the central cover-plates 31, which overlap the inner edges of the plates 27 and are secured thereto and to the center sills by the rivets which secure the floor-plates 27 in place. The sides of the car are composed of plates 29, which are sheared to shape and which lie in the same vertical plane. The meeting edges of these plates rest against the flanges of trough-shaped stakes 32, and inside of the car, opposite the stakes, are applied the cover-plates or welts 33 to exclude the lading from the troughs of the stakes. Rivets 35 pass through the cover-plates 33, side plates 29, and flanges of the stakes 32, thus securing the latter together. The stakes preferably are pressed to shape from rolled channels and are of uniform cross-section from top to bottom. The end plates 30 have their lower edges riveted to the vertical web of the end sill, and they extend outwardly to the side plates at the corners of the car and are united to the side plates by means of angle-posts 36, riveted to both the side and end plates. To the upper edges of the side and end plates are riveted angle-rails 37, said angle-rails being shown with their vertical members lying inside of the plates and their horizontal members projecting outwardly; but this is not essential, as they may be applied either inside or outside of the plates and project either inwardly or outwardly. They serve to stiffen the side plates and give a finish to the tops thereof and also prevent the exposure of the sharp edges of the plates, which otherwise would result. The top angle-rails are united at the corners of the car by means of the cover or gusset plates 38. The lower edges of the side plates have also secured thereto

angle-rails 39, which are also shown with their vertical webs lying inside of said plates and their horizontal legs projecting outwardly, although this may be varied, if desired. These angle-rails rest upon the brackets 7 of the body-bolsters and also serve to stiffen the side plates. They, together with the top angle-rails and the web-plates, provide a car side which is in effect a plate-girder, which assists in carrying the load without the necessity of using side sills. The stakes 32 lie between the horizontal members of the top and bottom angle-rails. The side plates are further stiffened by having riveted thereto centrally between the stakes 32 the vertical angle-bars 40, and the end plates are similarly stiffened by angle-bars 41. On each side of the body-bolsters diagonal stiffening-angles 43 are riveted to the side plates, as shown, and serve to strengthen the sides of the car.

The floor-plates, as stated, are riveted directly to the plate-girder sides, and they are supported above the bolsters by the short longitudinal stringers 44, which are preferably of Z shape, as shown. The floor-plates are further supported by angle-bars 46, connected at their inner ends to the center sills by angles 47 and connected at their outer ends to the side sills of the car. They serve as diaphragms to strengthen the frame and support the floor between the body-bolsters and the center of the car. At the center of the car are diaphragms composed of channels 48, which extend from the center sills to the sides of the car and are united thereto by means of angle-pieces 49. Braces 50, preferably of pressed steel, are interposed between the center sills opposite these diaphragms and serve to support the floor, as well as form a portion of the diaphragm. A transverse connecting member in the form of a cover-plate 51 is riveted to the lower flanges of the diaphragms 48 and may also be riveted to the brace between the center sills, this cover-plate extending underneath the center sills and out toward the ends of the diaphragms. The lower outer corners of the latter are cut away, as shown at 52. The center sills are strengthened between the bolsters by having riveted to their inner lower edges the angle-bars 53, which extend merely from bolster to bolster.

The construction so far described is applicable to any form of metallic car having a flat floor, commonly known as "gondola" cars. In the present instance I have shown the floor of the car provided with four hoppers, each hopper being formed of the inclined end walls 56, the outside hopper-sheets 57, and the inside hopper-sheets 58. The outside hopper-sheets are riveted to the inside of the side plates of the car, while the inside hopper-sheets have their upper edges bent, as shown in Fig. 7, and riveted to the webs of the center sills. Both the inside and outside hopper-sheets have their inclined ends flanged inwardly, as at 59, to support the inclined floor-plates 56, which are riveted thereto. The

lower straight edge of these sheets is strengthened either by being flanged inwardly, as shown at 60 in Fig. 7, or by having a separate angle-bar riveted thereto. The bottom of each hopper is closed by two doors 61, hinged near the lower edges of the inclined transverse hopper-sheets. When the doors are closed, they are in a horizontal position and their edges meet at the center of the hopper. These doors are connected in pairs by the angle-bars 62, which extend transversely of the car-body. The links of the door-operating mechanism 63 are attached to the horizontal flanges of these angle-bars at their centers and the door-operating mechanism lies between the center sills and is operated from a shaft 64, journaled in the center sills and extending to the outside of the car.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a metallic car, the combination with the longitudinal sills and the body erected thereon, of a metallic end sill of L-shape cross-section having both members of varying cross-section, the vertical member being deepest at its central portion and narrowest at its ends and the horizontal member being widest at its ends and narrowest at its central portion.

2. In a metallic car-body, the combination with flat end plates, of a metallic end sill of L-shape cross-section having its lower member turned inwardly and having its vertical member overlapping and secured to the end plates.

3. In a metallic car-body, the combination with the end plates, of an end sill of L-shape cross-section having its vertical member overlapping and secured to said end plates and having its horizontal member turned inward, said sill being provided with a central notch in its lower side for the passage of the shank of the draw-bar.

4. In a metallic car-body, the combination with flat side plates, of angle-bars secured to the upper and lower edges thereof and having their horizontal members projecting outwardly, and trough-shaped stakes of uniform cross-section lying between the horizontal members of said top and bottom rails and bearing against and secured to the edges of the side plates.

5. In a metallic car-body, the combination with flat side plates, of angle-bars riveted to the upper and lower edges thereof and having their horizontal members projecting outwardly, trough-shaped stakes of uniform cross-section lying between the horizontal members of said top and bottom rails and having their flanges bearing against the edges of the side plates, cover-strips overlapping the side plates inside of the car, and rivets passing through said cover-strips, the side plates and the flanges of the stakes.

6. In a metallic car, the combination with center sills and body-bolsters, of a car-body

erected thereupon and provided with plate-girder sides, a stake or post attached to the side plates opposite the ends of the body-bolsters, and two inclined angle-bars secured to the side plates one on each side of said side stakes and extending from the tops of said stakes in downwardly-diverging directions.

7. In a metallic car, the combination with the longitudinal sills and body-bolsters, of Z-shaped metal stringers supported on said bolsters, and a floor supported on said stringers.

8. In a metallic car, the combination with the center sills and body-bolsters of less depth than the center sills, of a body erected thereon comprising plate-girder sides and floor-plates secured thereto, and Z-shaped metal stringers secured to the body-bolsters and supporting said floor-plates.

9. In a metallic car, the combination with the center sills, of a body-bolster composed of a tension member passing through slots in the webs of said sills, a compression member passing below said sills, a center brace between the center sills, and two web-fillers lying outside of the center sills, said web-fillers being secured to the center sills and to the tension and compression members.

10. In a car-underframe, the combination with metallic end sills having a lower inwardly-projecting flange, of body-bolsters, center sills of channel form, and Z-shaped draft-sills riveted to the center sills and having their outer ends reduced and resting upon the inwardly-projecting flange of the end sill.

11. In a car-underframe, the combination with the metallic end sills, of body-bolsters, center sills of channel form having their flanges turned outwardly, and draft-sills extending from the end sills to the center sills and riveted to both, said draft-sills being of Z form having their upper flanges turned inwardly, their webs lying against the inner faces of the webs of the channel center sills and secured thereto and their lower flanges projecting outwardly and lying underneath the lower flanges of the center sills.

12. In a car-underframe, the combination with the body-bolsters, of rolled channel center sills extending from bolster to bolster, and angle-bars riveted to the lower edge of said center sills between the body-bolsters.

13. In a metallic car, the combination with the center sills and plate-girder sides, of diaphragms comprising two channel shapes secured to the center sills and the car sides, and transverse connections secured to the lower flanges of said diaphragms and extending underneath the center sills.

In testimony whereof I, the said JOHN M. HANSEN, have hereunto set my hand.

JOHN M. HANSEN.

Witnesses:

A. R. FRASER,
WM. BIERMAN.