

No. 743,496.

PATENTED NOV. 10, 1903.

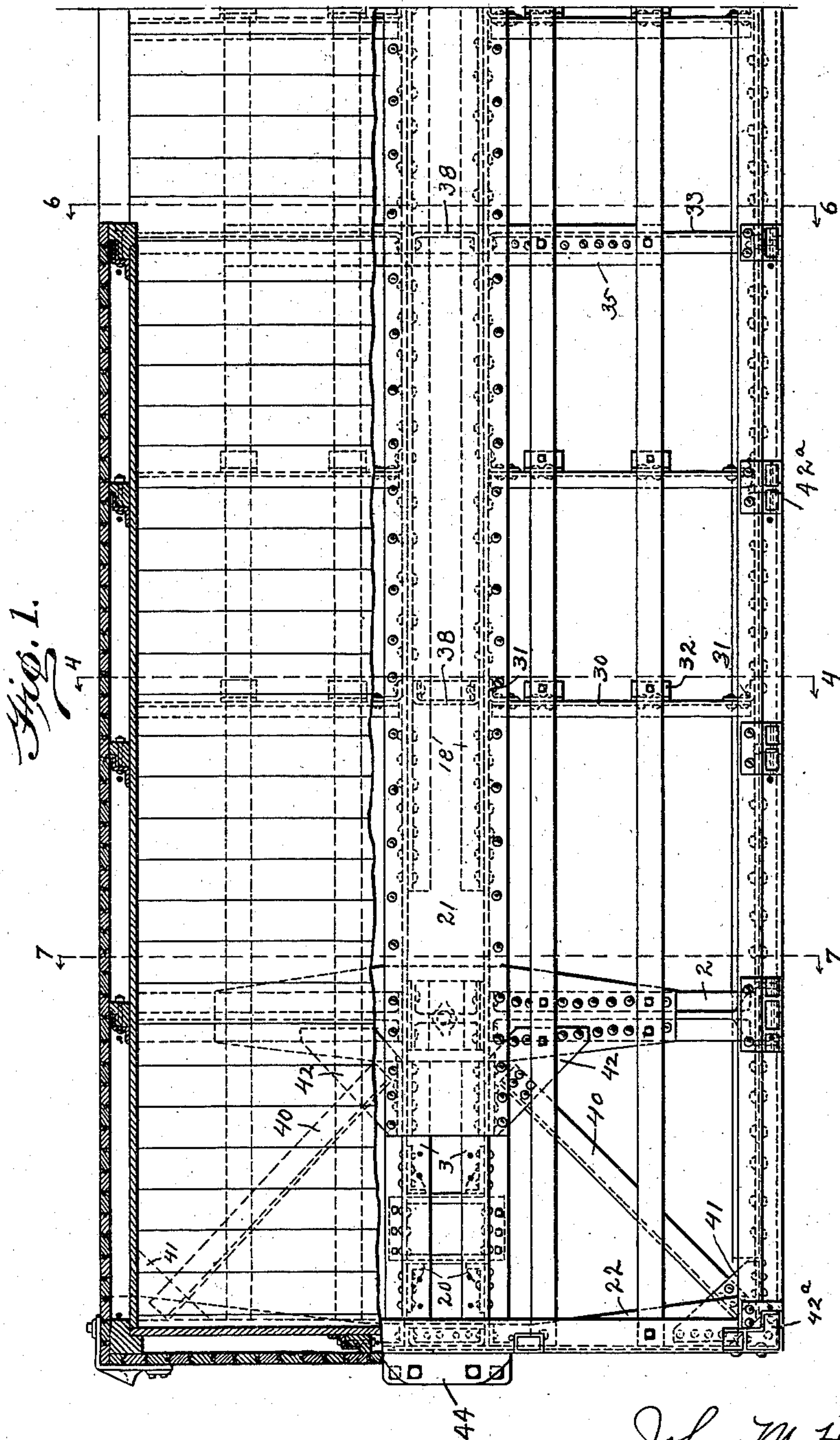
J. M. HANSEN.

CAR WITH METALLIC UNDERFRAMING.

APPLICATION FILED MAY 9, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses

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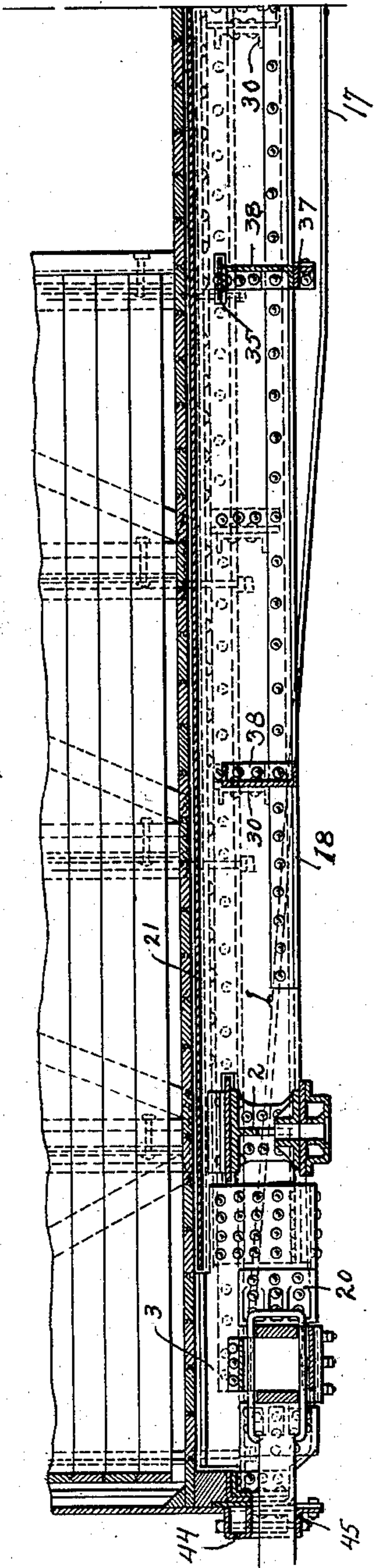
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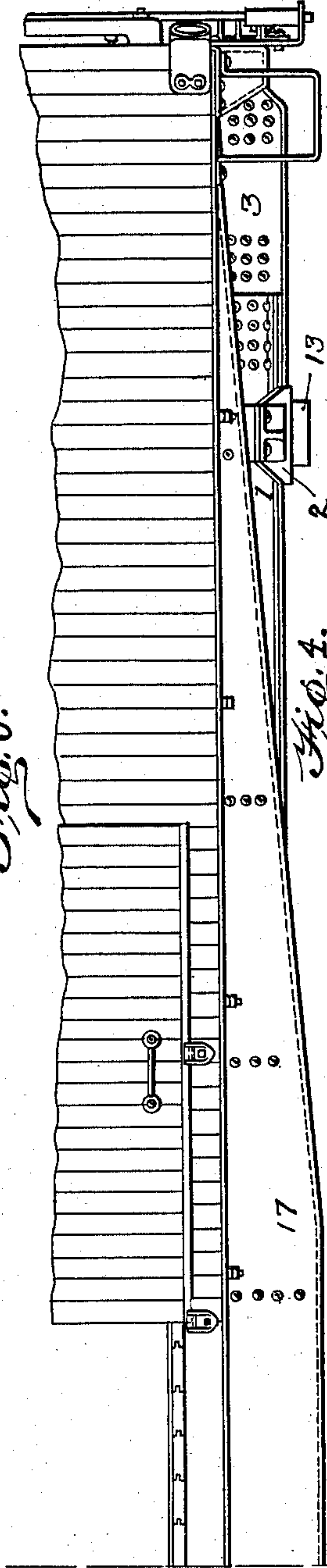
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4 SHEETS—SHEET 2.

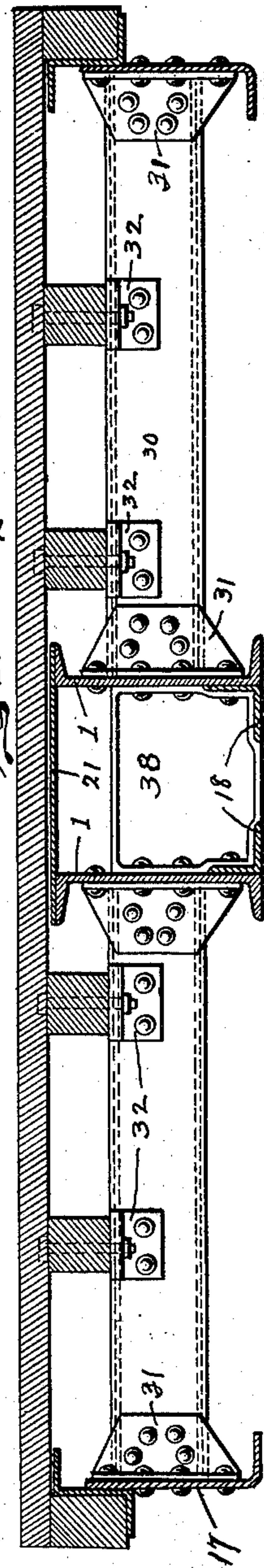
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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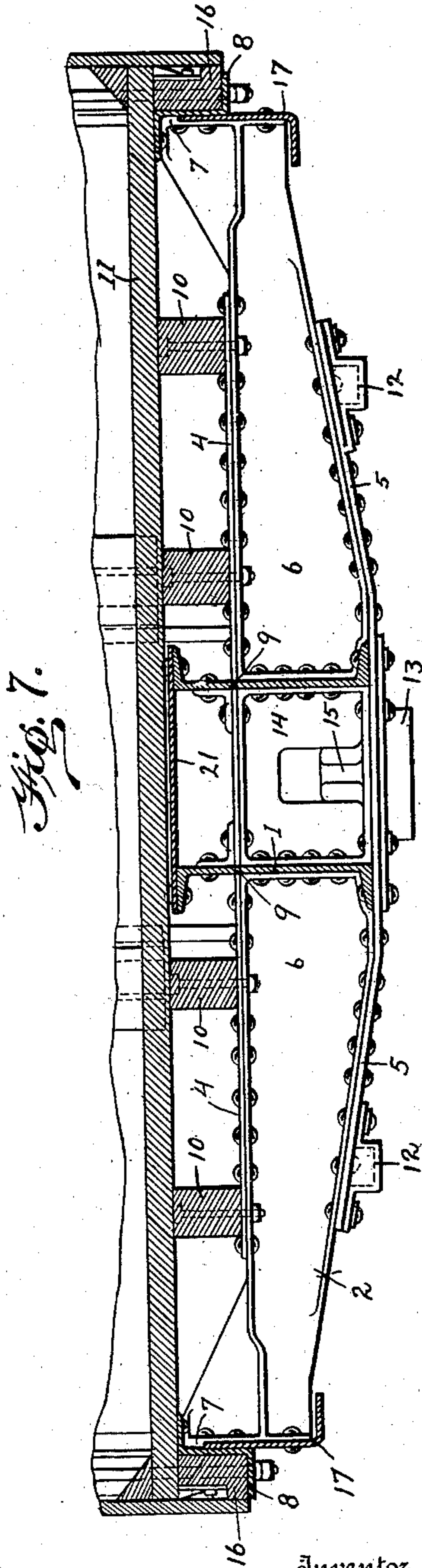
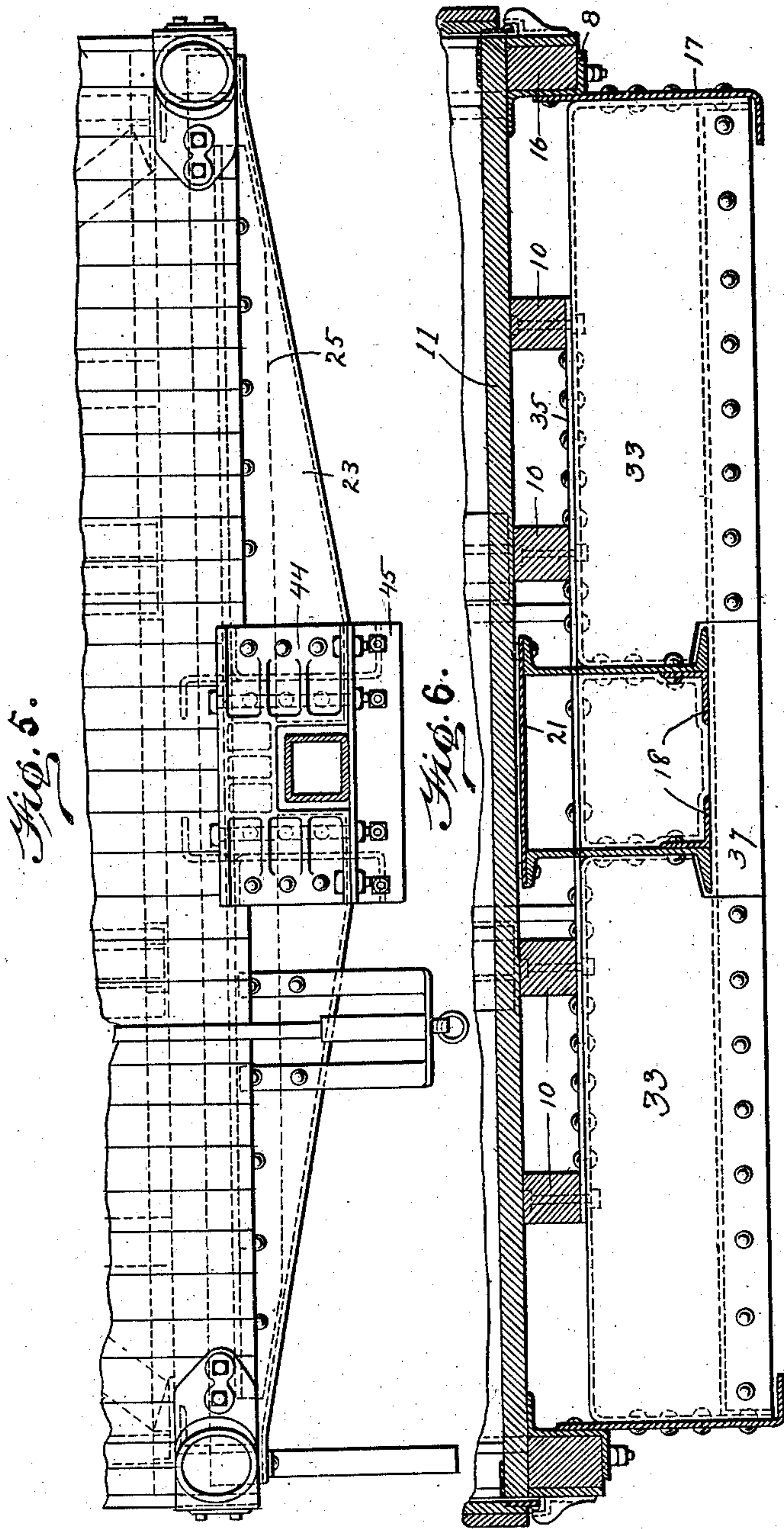
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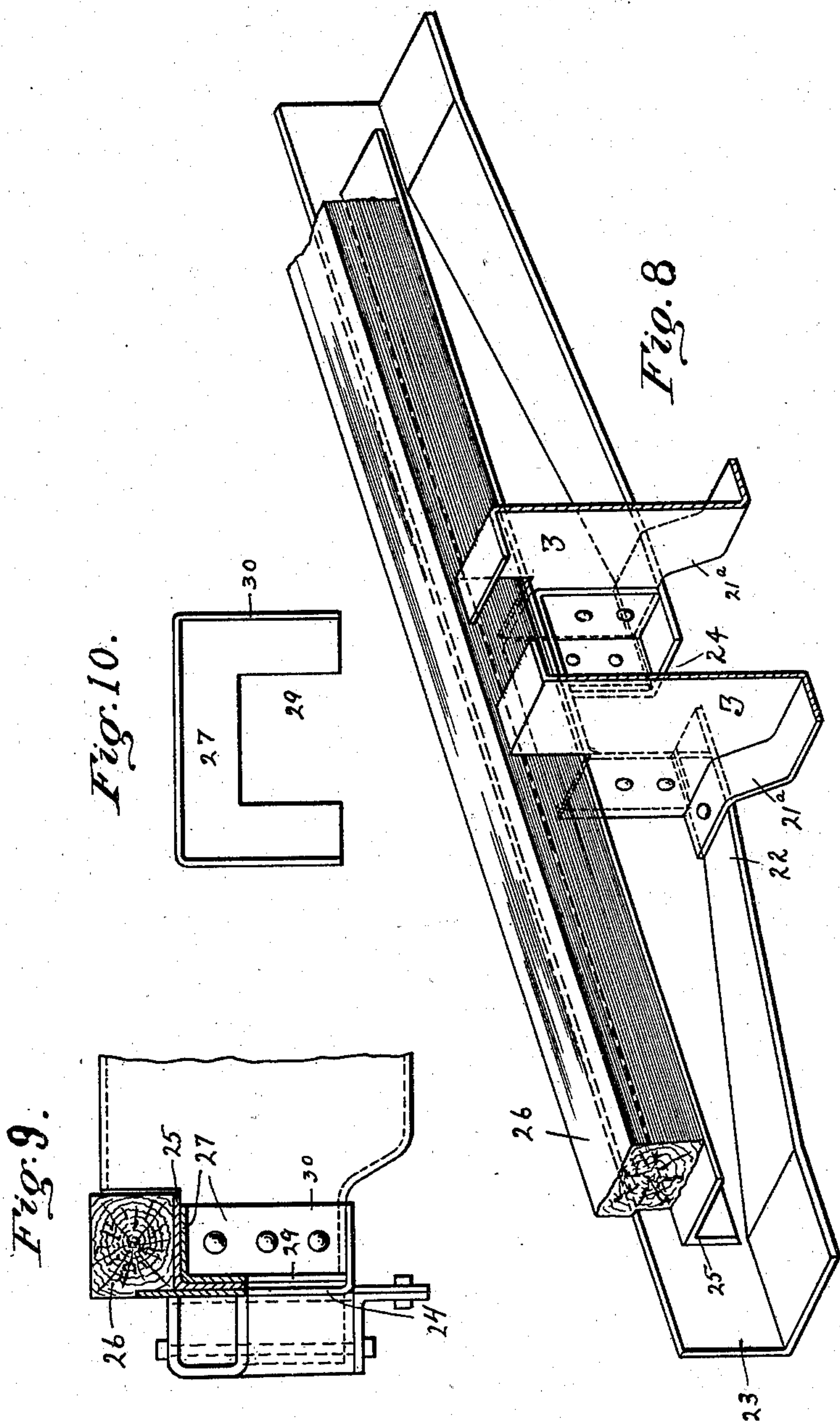
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NO MODEL.

4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

JOHN M. HANSEN, OF PITTSBURG, PENNSYLVANIA.

## CAR WITH METALLIC UNDERFRAMING.

SPECIFICATION forming part of Letters Patent No. 743,496, dated November 10, 1903.

Application filed May 9, 1902. Serial No. 106,577. (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 Cars with Metallic Underframing; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to box-cars, and more especially to the underframe thereof. Its object is to provide a metallic underframe for box and similar cars having a wooden superstructure; and its object is to improve underframes for cars of this character in details of construction, as will hereinafter fully appear.

In the accompanying drawings, Figure 1 is a plan view of one half of my improved car, the lower portion being shown with the wooden superstructure removed and the upper portion showing the wooden superstructure in horizontal section. Fig. 2 is a longitudinal central section through the body of one half of the car, the top being broken away. Fig. 3 is a side view of the other half of the car. Fig. 4 is a transverse section on the line 4 4, Fig. 1. Fig. 5 is an end view of the lower part of the car. Fig. 6 is a transverse view on the line 6 6, Fig. 1. Fig. 7 is a similar view on the line 7 7, Fig. 1. Fig. 8 is a detail perspective view showing the end sill and manner of connecting the draft-sills thereto. Fig. 9 is an enlarged longitudinal section of the end of the underframe, and Fig. 10 is a rear face view of the coupler-horn brace.

The car illustrated is provided with a wooden body and a metallic underframe. The latter comprises center, side, draft, and end sills, longitudinal stringers, 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 and with the flanges of the channels preferably extending outwardly. The 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 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 and of a general I shape

in cross-section. At their inner ends they are riveted to the center sills, and preferably they taper toward their outer ends, where they are provided with the flanges 7, by means of which they are riveted to the side sills 8. The web-fillers 6 are of less height than the center sills, and the top cover-plate 4 extends through slots 9, cut through the webs of the center sills, as indicated in dotted lines, Fig. 7. Supported on the bolsters are the longitudinal intermediate stringers 10, preferably of wood, as shown, to which the wooden floor 11 is secured. The cover-plate 4 does not extend entirely to the sides of the car, but terminates just outside of the outer intermediate stringer 10, as shown. To the lower cover-plate are secured the side bearings 12 and center bearing-plate 13. This cover-plate also does not extend to the ends of the bolster, but only to the outer sides of the side bearings, as shown, and passes underneath the center sills. Between the center sills, in line with the web-fillers 6, are the braces or struts 14, also preferably formed of cast metal and provided with a boss 15, having a vertical hole for the center pin.

The side sills 8 are formed of Z-bars having their webs placed vertically and their lower flanges turned outwardly, as shown in Fig. 7, to form brackets to support the outside stringers 16. The side sills are reinforced by the angle-bars 17, having webs of varying depth and increasing from the ends toward the center of the car, as shown in Fig. 3. The center sills are reinforced by angle-bars 18, riveted to their webs and having the under sides of their lower flanges flush with the lower sides of the flanges of the center sills, as shown in Fig. 6. The draft-sills 3 are Z-shaped in cross-section, having their upper flanges turned inwardly and their lower flanges turned outwardly. 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, the upper flanges of the draft-sills projecting inwardly substantially on a level with the upper flanges of the center sills, while the lower flanges of the draft-sills project outwardly and lie underneath the lower flanges of the center sills, and preferably are also riveted thereto. The draft-lugs 20 are riveted to the



inner faces of the webs of these **Z**-bar draft-sills. A cover-plate 21 is riveted to the upper flanges of the center sills and extends to the outer ends thereof. At their outer ends the lower flanges of the draft-sills are pressed upwardly, as shown at 21<sup>a</sup>, and said reduced ends lie upon the lower flange 22 of the end sill 23. This end sill is of general angle form, having its vertical member of varying depth, greatest at its central portion and decreasing toward its ends, while the horizontal member is of varying width, being greatest at its ends and less at its central portion. This end sill is formed by pressing from a plate of uniform width, throwing into the flange to produce extra width the metal which is diverted from the web by reason of its decreased depth. The web and horizontal flange of this end sill are cut away at the center thereof, as shown at 24, to provide an opening for the draw-bar shank. Riveted to the inner face of the end sill some distance below its upper edge is the angle-bar 25, which stiffens the end sill and serves as a bracket to support the wooden subend sill 26. The upper flanges and portions of the webs at the ends of the draft-sills are cut away, as shown in Figs. 8 and 9, to make room for the angle 25 and wooden subend sill 26. A coupler-horn brace 27 is applied between the draft-sills and fits the inside horizontal and vertical faces of the stiffening-angle 25. The coupler-horn brace is formed of a plate notched, as at 29, and having flanges 30 formed on three of its edges. The underframe is tied together between the body-bolsters by shallow channel-shaped diaphragms 30, secured to the side and center sills by means of angle knee-pieces 31 and having riveted thereto the angle-pieces 32, to which the intermediate stringers 10 are bolted. The underframe is also tied together by diaphragms 33 of greater depth, which comprise plates having flanges formed on their ends and upper edges, but being unflanged or straight on their lower edges. Their end flanges are riveted to the side and center sills, and a cover-plate 35 is riveted to their upper flanges and extends through slots cut in the center sills. The diaphragms are further tied together by transverse connections in the form of angle-bars 37, riveted to their straight lower edges and extending from side to side of the car underneath the center sills. Braces 38, preferably of box-shaped pressed metal, are riveted to the center sills in line with each pair of deep diaphragms 33 and also in line with part or all of the shallow diaphragms 30. At the corners of the car are diagonal braces 40, preferably of angle-bars, riveted at their outer ends to the corner gusset-plates 41, secured to the side and end sills and at their inner ends to the gusset-plates 42, secured to the webs of the center sills and top cover-plates of the bolsters, being connected to the latter by the same rivets which secure the web-fillers and top cover-plates together.

The body of the car is made of wood and may be of any desired construction, being built up on the wooden longitudinal stringers and the wooden subend sills, and the body bears on the underframe only through these stringers and subend sills. Castings 42<sup>a</sup> are secured to the side sills and corners of the car and are provided with pockets for receiving the lower ends of the posts and diagonal braces of the body. Buffer-castings 44 are secured to the outer faces of the end sills, said castings serving as a guide for the draw-bar shank and having bolted thereto the draw-bar carrier 45.

The underframe described is adapted to any car having a wooden superstructure, whether in the form of a box-car or gondola car, and it provides an underframe which is simple of construction, extremely strong, and which can be built up mostly of commercially-rolled steel, necessitating very few special parts.

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

1. A metallic car-underframe comprising an end sill of **L**-shaped cross-section having a bottom flange turned inwardly and having a central notch cut in its lower edge for the passage of the shank of the draw-bar, and a stiffening-angle secured to its inner face.

2. In a metallic car-underframe, the combination with a metallic end sill of angle shape and having a bottom flange turned inwardly and having a central notch cut therethrough for the passage of the shank of the draw-bar, of metallic draft-sills, connected to said end sill and a coupler-horn brace united to the end sill between the draft-sills, said coupler-horn brace comprising a notched metal plate flanged on three sides.

3. In a metallic car-underframe, the combination with the longitudinal center and side sills, of a body-bolster composed of an upper or tension member, a lower or compression member, a brace between the center sills, two web-fillers between the upper and lower members, one on either side of the center sills and secured thereto and having flanges formed on their outer ends for securing them to the side sills.

4. In a car-underframe, the combination with the metallic center sills, of a body-bolster composed of an upper or tension member passing through slots in the webs of the center sills, a lower or compression member passing below the center sills, a brace between the center sills, two web-fillers between the upper and lower members and lying outside of the center sills and extending to and secured to the car sides, and longitudinal stringers supported on the upper or tension member.

5. In a car-underframe, the combination with the metallic end sills, of metallic center sills, metallic **Z**-shaped draft-sills secured to the center sills and to the end sills and having their upper outer ends notched, and a stiffening angle and subend sill secured to the me-



tallic end sill and lying within the notched ends of the draft-sills.

5 6. In a car-underframe, the combination with the longitudinal sills, of a metallic end sill of general L form, and a stiffening-angle secured to the inner face of said end sill below the upper edge thereof.

10 7. In a metallic car-underframe, the combination with the longitudinal sills, of transverse diaphragms secured thereto, and transverse cover-plates secured to the upper edges of the diaphragms and extending through slots cut in the webs of the intermediate longitudinal sills.

15 8. In a metallic car-underframe, the combination with the longitudinal sills, of transverse diaphragms secured thereto, metallic cover-plates riveted to the upper edges of the diaphragms and extending through slots cut in the webs of the center or intermediate longitudinal sills, and a continuous metallic member connected to the lower portions of the diaphragms and passing beneath the intermediate longitudinal sills.

20 9. In a metallic car-underframe, the combination with the longitudinal sills, of transverse diaphragms between said sills, said diaphragms comprising web-plates suitably secured at their ends to said longitudinal sills and having plain or unflanged lower edges extending below the longitudinal sills, and a transverse connector secured to the lower edges of said web-plates and extending beneath the intermediate longitudinal sills.

35 10. In a metallic car-underframe, the combination with the longitudinal sills and body-bolsters, of transverse diaphragms intermediate the body-bolsters and between the sills and secured thereto, said diaphragms comprising web-plates flanged at their upper edges and having plain or unflanged lower

edges extending below the longitudinal sills, and a transverse connector secured to the lower edges of the diaphragms and extending beneath the intermediate longitudinal sills. 45

11. In a metallic car-underframe, a longitudinal sill composed of a bar of uniform Z-shaped cross-section with its web placed vertically, and an L-shaped bar having its web of varying depth and overlapping the web of the Z-bar and secured thereto. 50

12. In a metallic car-underframe, the combination with rolled channel center sills, of stiffening-angles secured to the lower portions of the webs thereof, side sills composed of a bar of uniform Z-shaped cross-section with its web placed vertically, and an L-shaped bar with a web of varying depth overlapping the web of the Z-bar and secured thereto. 55

13. In a metallic car-underframe, the combination with the center sills, of a body-bolster, a cover-plate riveted to said body-bolster, gusset-plates secured to the center sills and to said cover-plate by the same rivets which secure the cover-plate to the bolster, and diagonal braces extending to the corners of the car and secured to said gusset-plates. 60

14. In a metallic car-underframe, the combination with the center sills, of a body-bolster having a flat top, gusset-plates secured to the center sills and to the top of the bolster by a row of rivets substantially parallel to the axis of the bolster, and diagonal braces secured to said gusset-plates and extending to the corners of the car. 65

In testimony whereof I, the said JOHN M. HANSEN, have hereunto set my hand. 70

JOHN M. HANSEN.

Witnesses:

A. R. FRASER,  
WM. BIERMAN.