

No. 771,589.

PATENTED OCT. 4, 1904.

C. VANDERBILT.
METALLIC CAR CONSTRUCTION.

APPLICATION FILED FEB. 7, 1902.

NO MODEL.

6 SHEETS—SHEET 1.

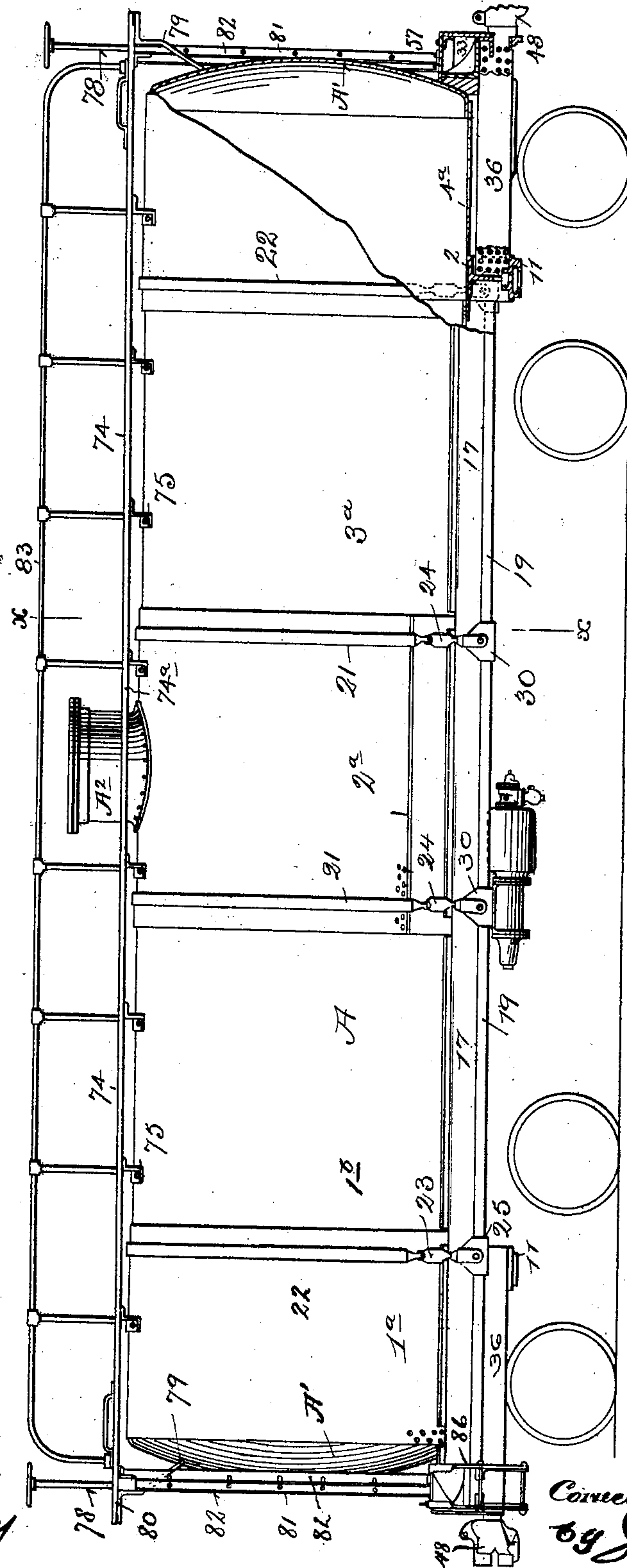


Fig. 1.

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6 SHEETS—SHEET 2.

Fig. 2.

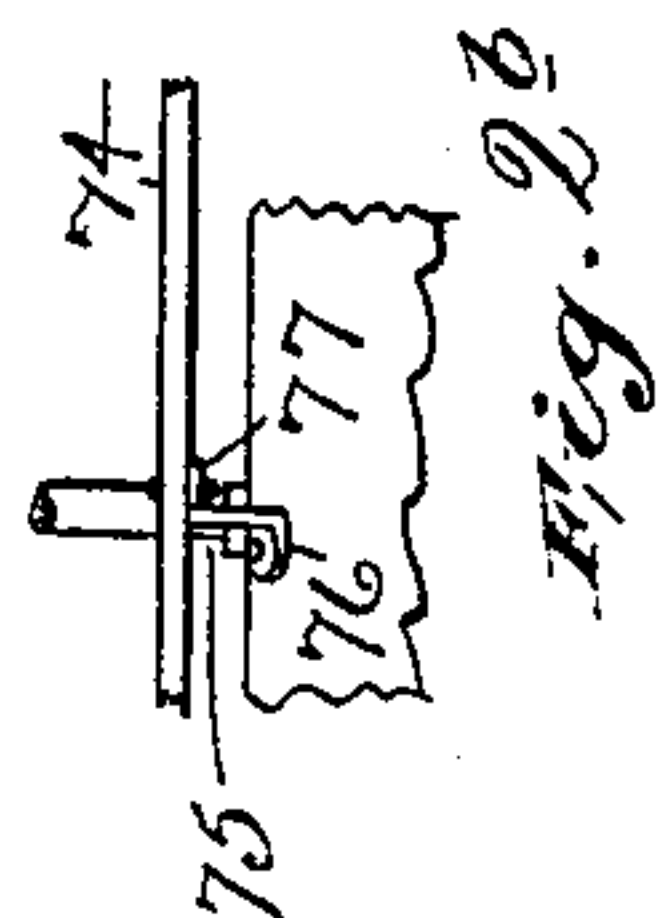
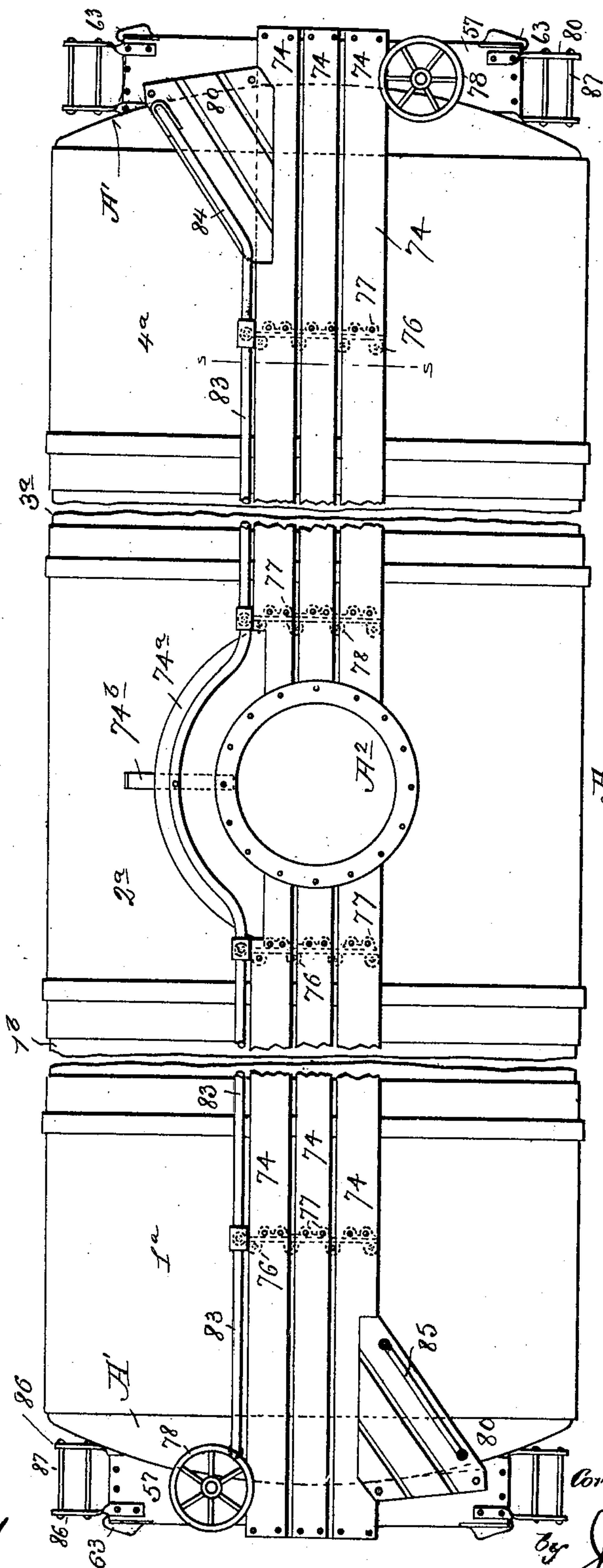


Fig. 2b

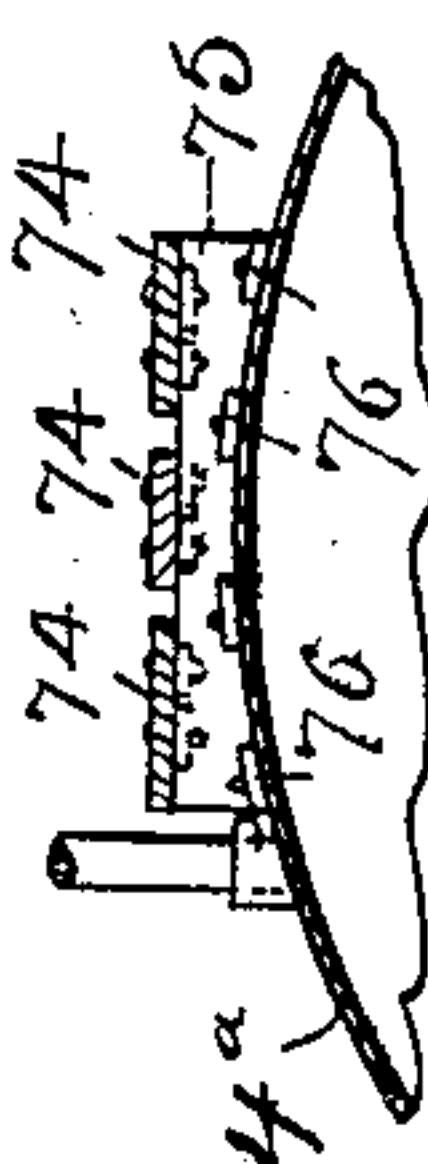


Fig. 2a

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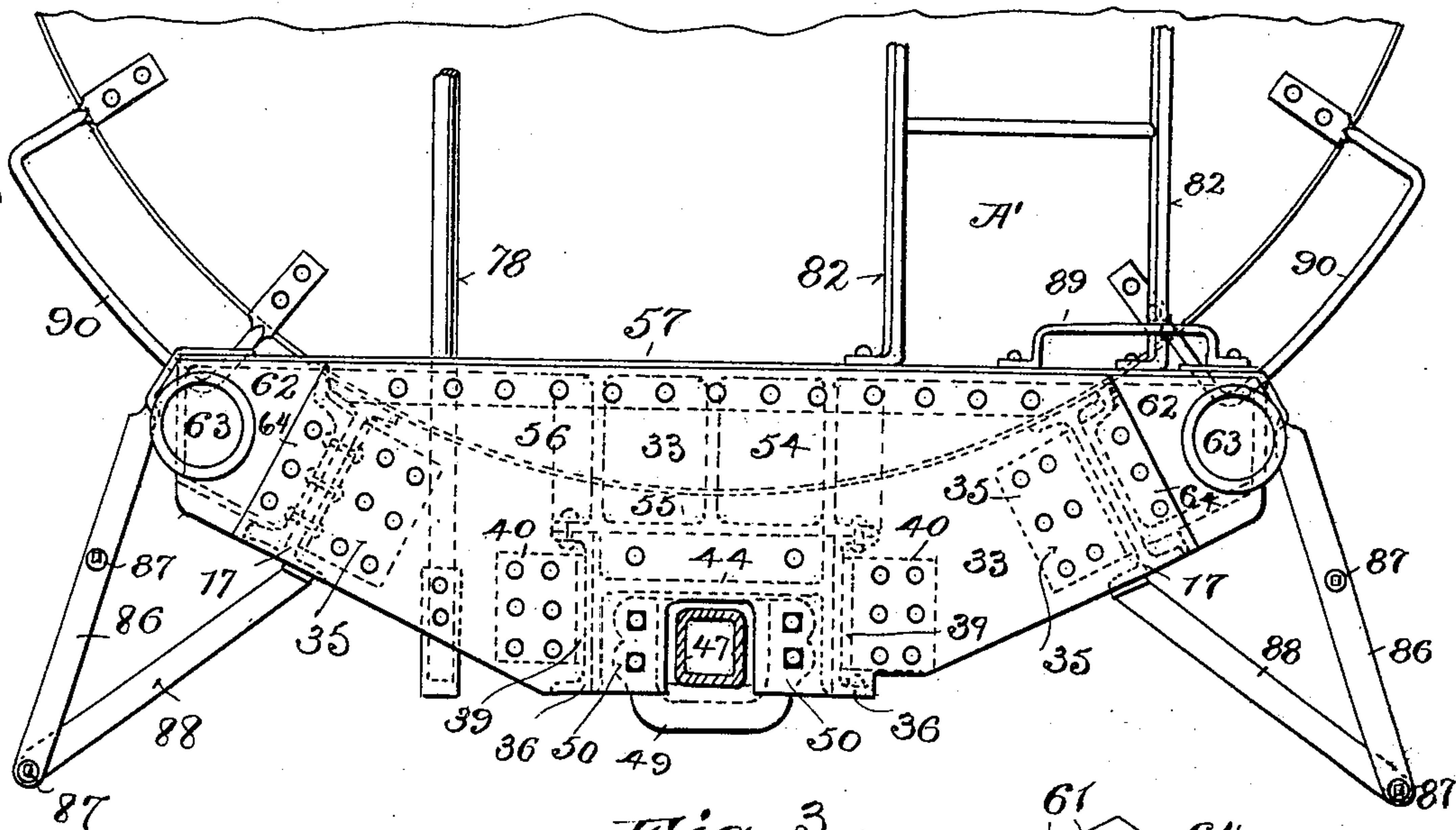


Fig. 3.

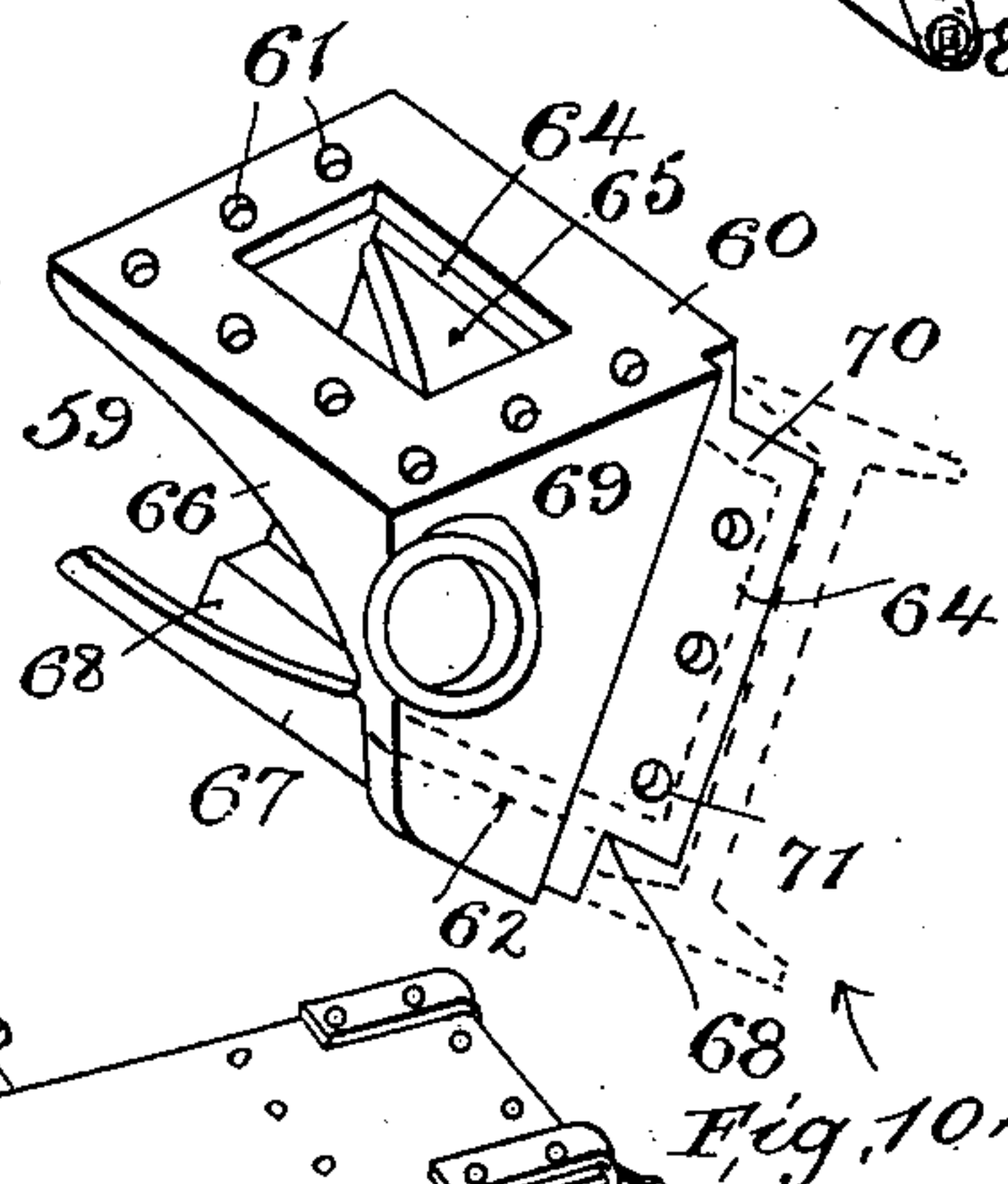


Fig. 10.

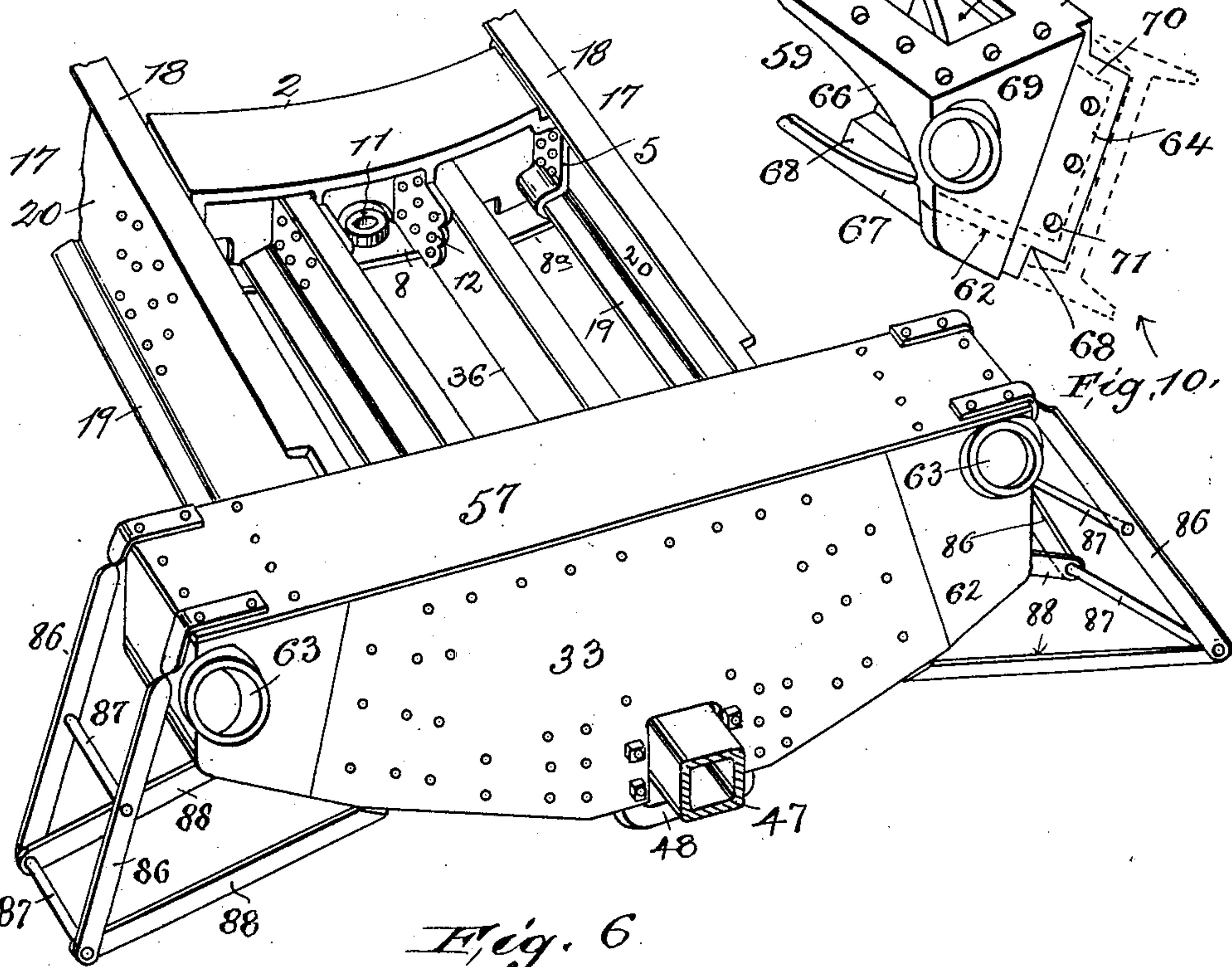


Fig. 6.

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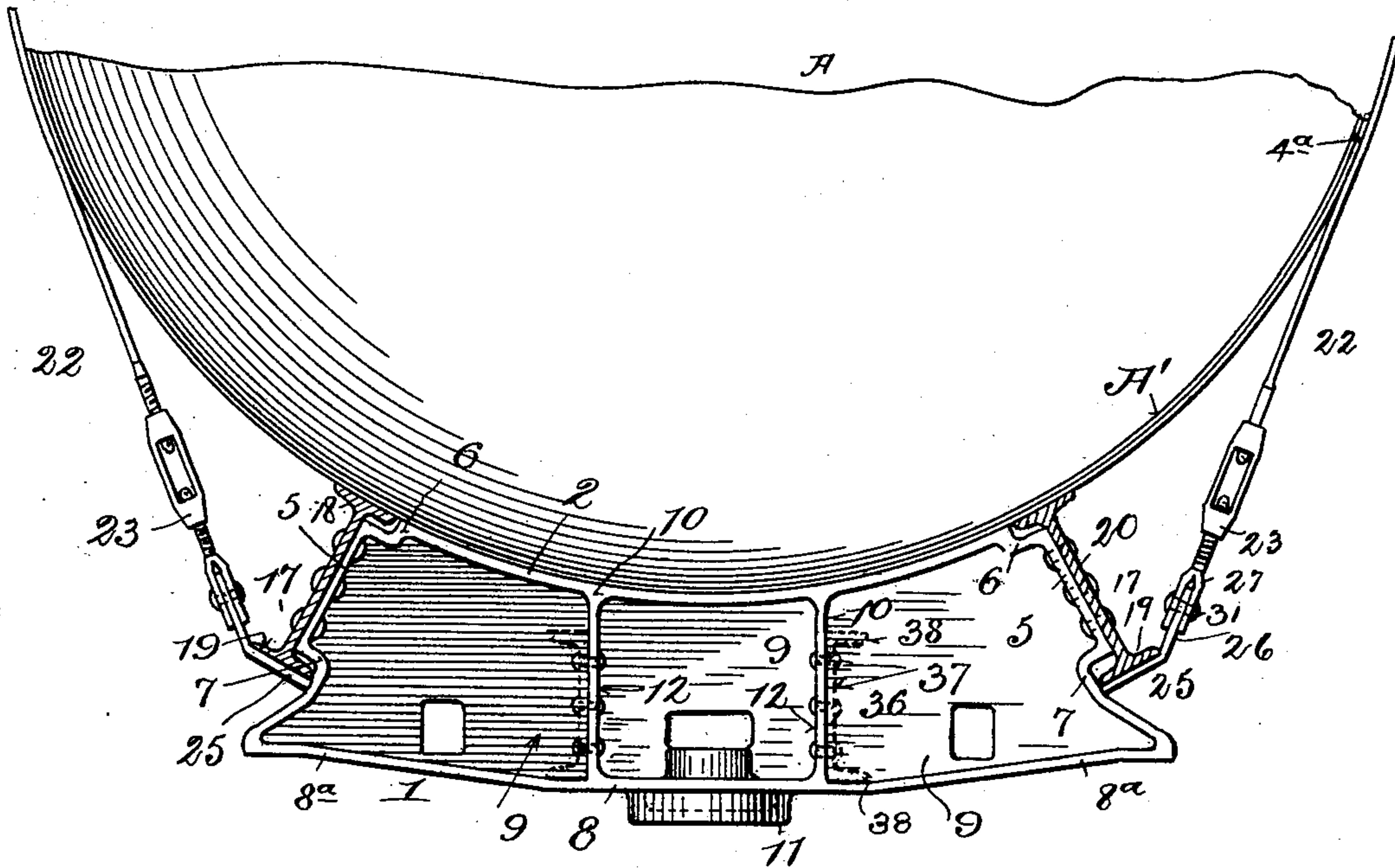


Fig. 5.

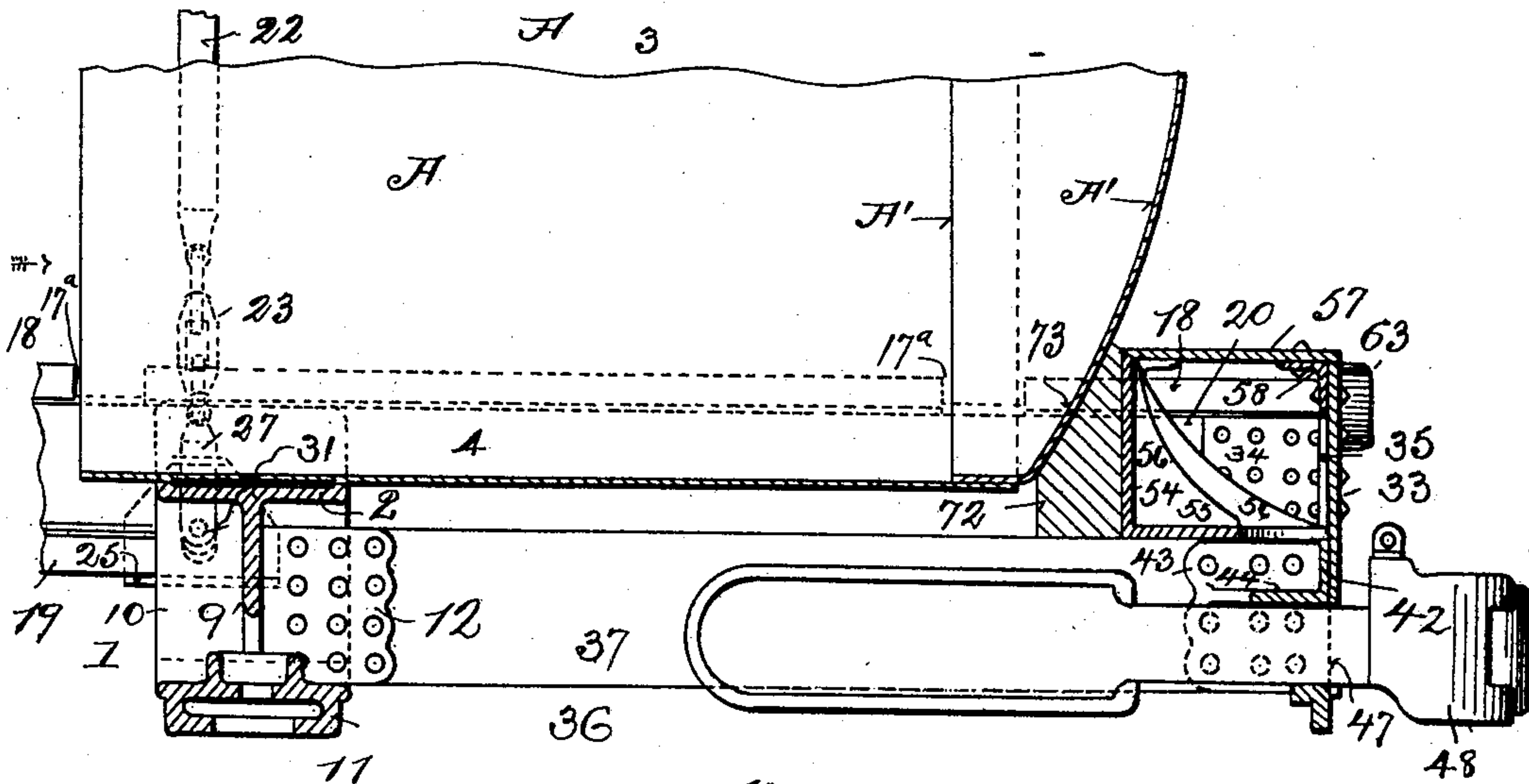


Fig. 4.

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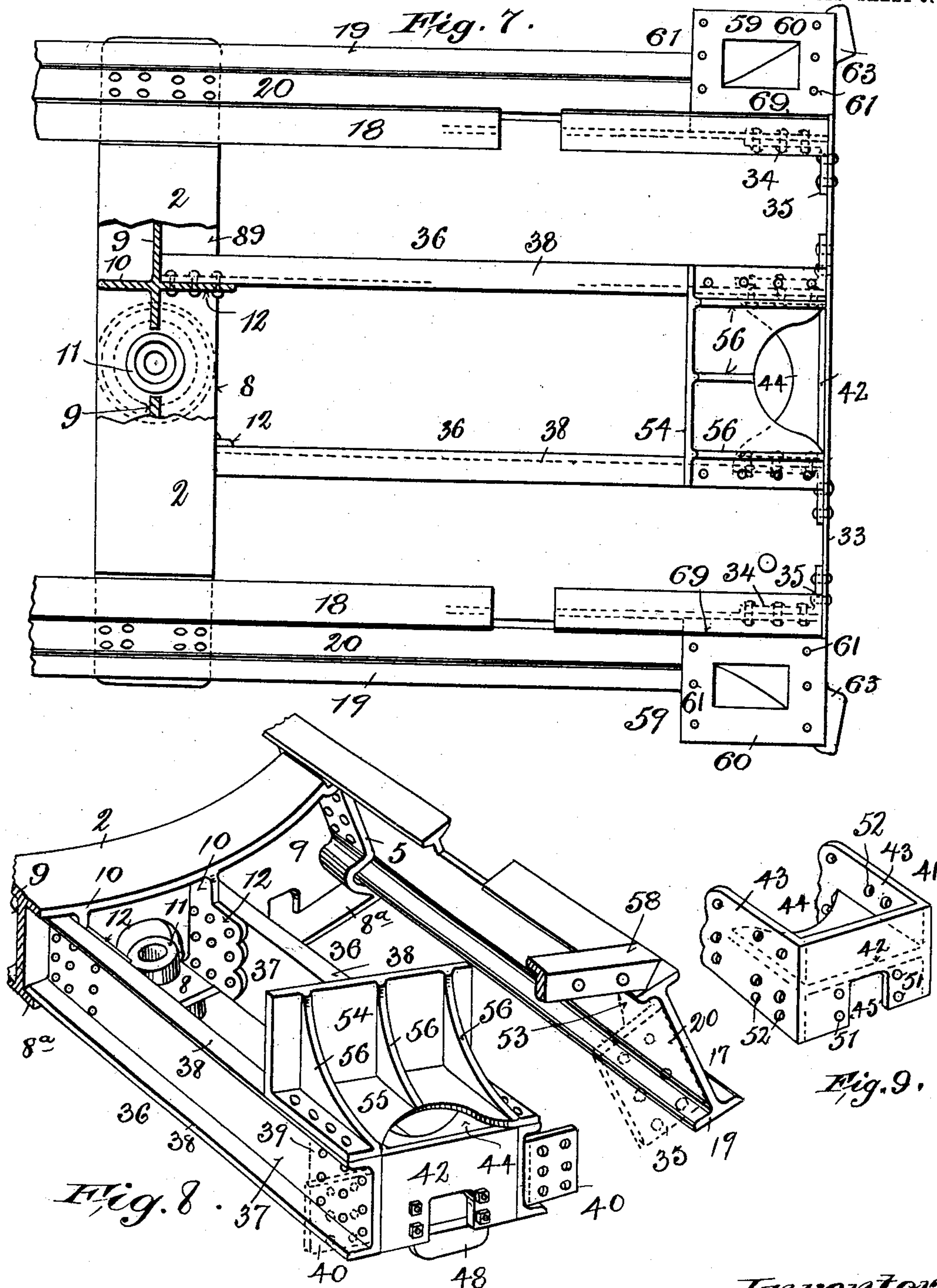
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8 SHEETS—SHEET 5.



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NO MODEL.

6 SHEETS—SHEET 6.

Fig. 11.

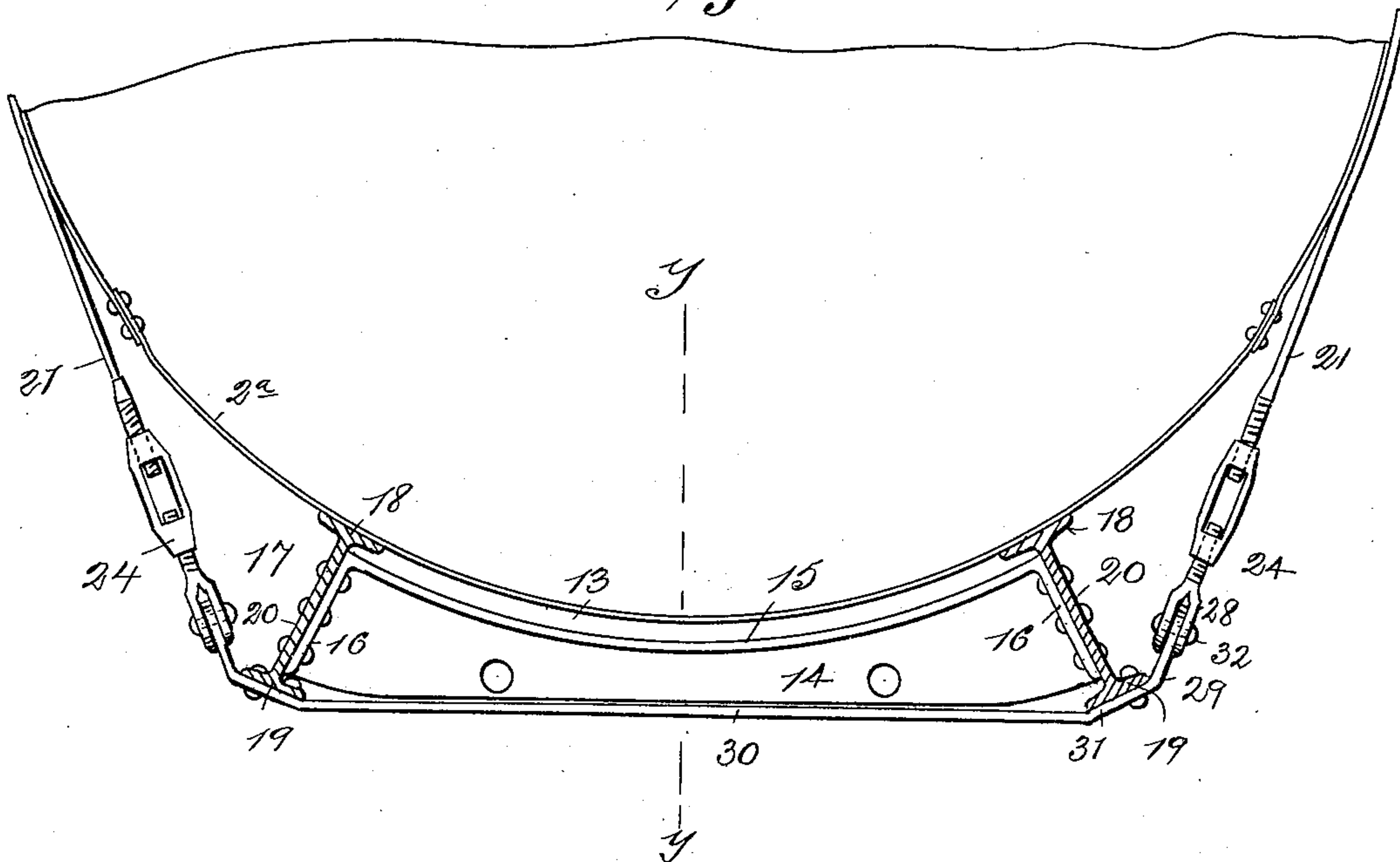


Fig. 12.

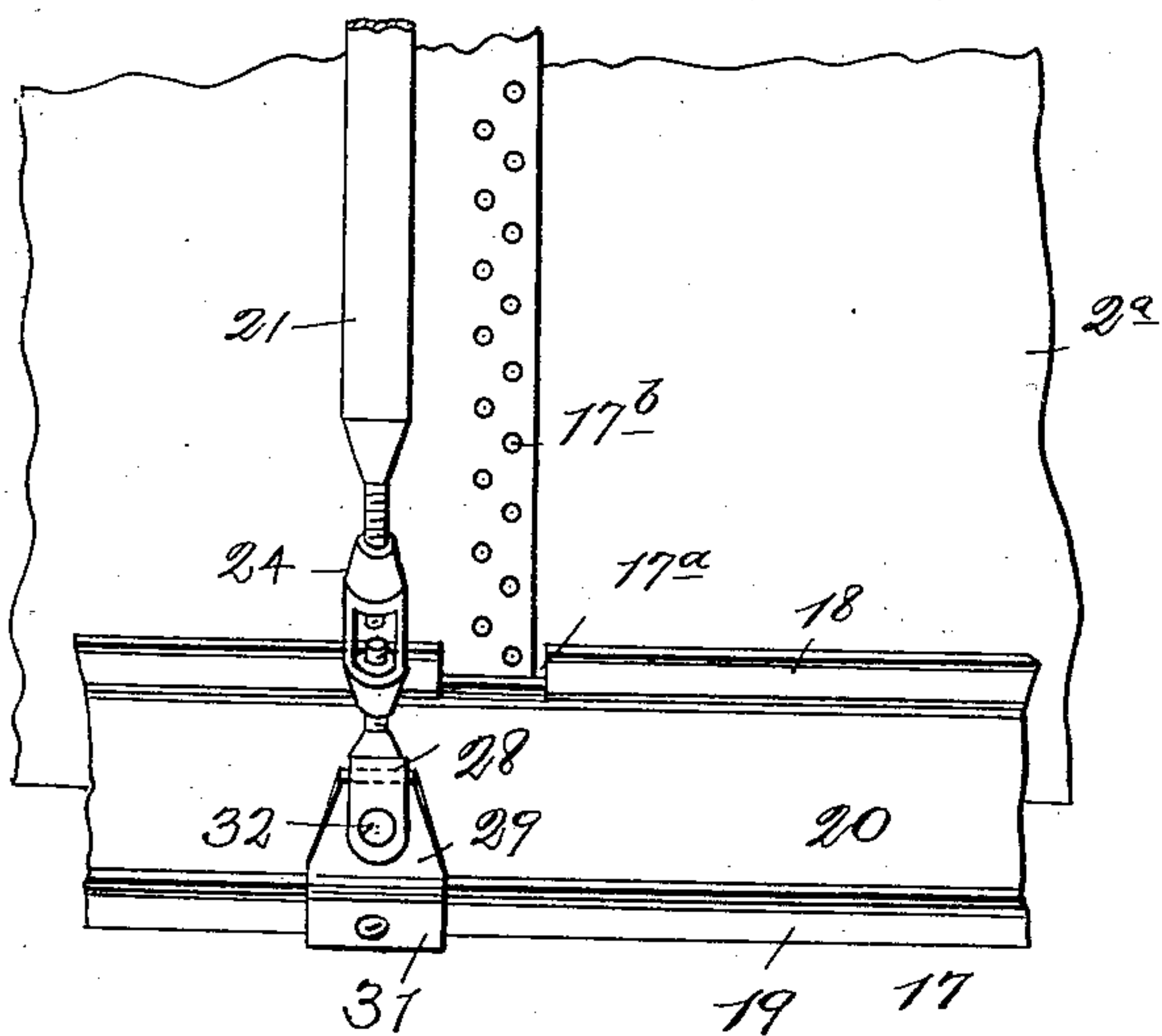
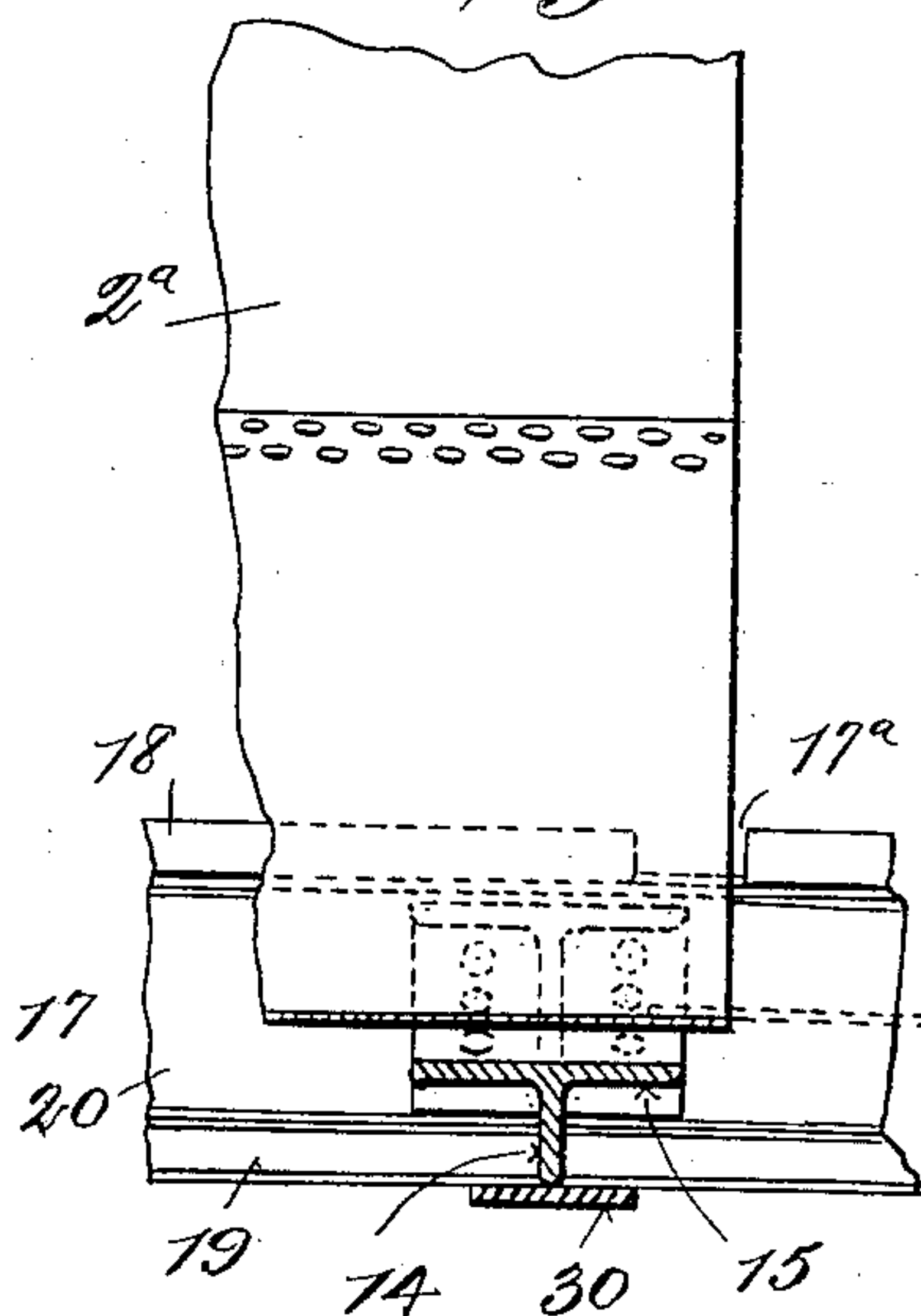


Fig. 13.



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UNITED STATES PATENT OFFICE.

CORNELIUS VANDERBILT, OF NEW YORK, N. Y.

METALLIC CAR CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 771,589, dated October 4, 1904.

Application filed February 7, 1902. Serial No. 93,021. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS VANDERBILT, a citizen of the United States, and a resident of the city and county of New York, borough of Manhattan, and State of New York, (whose post-office address is 100 Broadway, in said city,) have invented certain new and useful Improvements in Metallic Car Constructions, of which the following is a specification.

The object of my invention is to generally improve the construction of cars employed for the transportation of oil, grain, &c., and more especially to that class or type of car in which is embodied a circular tank, which is generally known under the name of "tank-car," and, further, to enable, mainly through the employment of commercial forms of metal in the construction of the same, to economize in weight and cost of construction and to preserve and increase the strength and stability of the car as a unit in proportion to the weight of metal employed.

My invention therefore resides in the novel construction and combination of parts herein-after described, and finally pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation, partly in section, of a car embodying my improvements. Fig. 2 is a plan view of the same broken away to save room in illustrating; and Figs. 2^a, 2^b, respectively, a sectional elevation on the line *s s*, Fig. 2, and a fragmentary side elevation of the running-board support. Fig. 3 is an end elevation of the end of the car-framing and a portion of the tank, enlarged. Fig. 4 is a sectional elevation on the line 3 3, Fig. 3. Fig. 5 is a transverse sectional elevation looking in the direction of the arrow, Fig. 4. Fig. 6 is a perspective view of one end of the framing. Fig. 7 is a plan view of one end of the framing. Fig. 8 is a perspective view of parts of the framing, partly in section, between the body-bolsters and the ends of the side sills. Fig. 9 is a perspective elevation showing the draw-casting. Fig. 10 is a perspective elevation of the frame-corner angle-casting, showing its connection with the side sills. Fig. 11 is a transverse

sectional elevation through the tank at one of the intermediate sills substantially on the line *xx*, Fig. 1. Fig. 12 is a side elevation of Fig. 11, showing a fragmentary part of the construction; and Fig. 13 is an elevation, partly in section, of a portion of the tank and the body-framing substantially on the line *yy*, Fig. 11.

My improvements contemplate supporting a tank A of the usual or desired construction, in this instance comprising the rings or courses 1^a 2^a 3^a 4^a and end header A' and dome or manhole A², directly upon a cradle formed in and by the body-bolsters and side sills, which forms a component part of the car-body frame, and instead of riveting the tank to the bolsters or frame or a component part or parts of the same I secure the tank in the cradles upon the sills and bolsters by straps or bands extending, preferably though not essentially, from the body-bolsters adjacent the ends of the frame and around the tank or body and by intermediate straps extending around the tank and under the intermediate cross-sills, each of the straps or bands being provided with means for detaching them or adjusting their tension upon the tank. These improvements, which may be variously embodied without departing from the spirit of my invention, I have utilized in the construction herein shown, which I shall now describe and which includes certain novel features of construction hereinafter pointed out relative to the body-framing.

The body-bolsters comprise a single casting 1, having the top and segmentally-depressed web 2 to conform to the curve of the tank 3 and in which the shell or course 4^a of the tank is seated, as indicated in Figs. 4 and 5, the side webs 5 upwardly and inwardly inclined, preferably radially to the longitudinal axis of the tank, which webs have upper and lower insets or recesses 6 7, a bottom web 8, flat centrally and extending upwardly and outwardly at 8^a to meet the side webs, the vertical compression-web 9, and intermediate vertical and longitudinal compression-webs 10 and between which and the web 8, cast integrally the recessed and apertured body center-bear-

ing 11, of conventional design. Extending from the central longitudinal webs 10 are vertical and forwardly-projecting lugs 12.

The intermediate cross-sills (which may be interchangeably termed cross "bolsters" or "sills," although in the present construction they do not directly support the tank) consist of castings 13, comprising the vertical web 14, the horizontal downwardly-curved web 15, and the inclined side web 16.

The side sills consist of the I-beams 17, having the upper and lower webs or flanges 18 19 and the central and the intermediate web 20. The longitudinal side sills, which extend the full length of the body-frame, are secured to the inclined side webs 15 16 of the bolsters and cross-sills by rivets passing through the respective side webs and of the webs 20, the upper and lower flanges 18 19 of the sills being received within the bolster-recesses 6 7, as in Fig. 5, the flange extending over and under the webs 14 15 of the cross-sills, or, in other words, the ends of the cross-sills are received within the flanges of the side sills. By reason of the inclined disposition of the side web of the bolsters and cross-sills the side sills are disposed at an angle or extending inwardly radially to the longitudinal center of the tank, whereby the tank may rest directly upon their upper flanges. In this way the tank is seated directly upon a cradle comprising the body-bolsters and side sills and upon the side sills continuously throughout their length, the intermediate cross-sills not bearing against the tank, but assisting in tying the side sills together transversely, the sills being cut away, as at 17^a, to allow for the projection of the rivets 17^b to permit the tank to be seated directly upon the sills.

To secure the tank rigidly upon the frame, I employ the straps 21 22, each provided with turnbuckles 23 24 at each side. These straps extend around the tank from the side sills adjacent body-bolsters and intermediate bolsters, and at the body-bolsters they are secured to the base-flanges 19 of the sills 17 by plates, an arm 25 of which is secured to the base-flange and the other, 26, to the eyebolts 27, forming a part of the turnbuckles 23, and at the cross-sills 13 the turnbuckles 24 are secured in the same way—viz., by means of the eyebolts 28—to the outwardly and upwardly projecting ends 24 of a strap 30, itself secured, through the angular part 31, to the base-web 19 of the side sills, which strap 30 extends completely across and beneath the intermediate sills, each of the eyebolts 27 28 being pivotally secured to the ends 28 29 by pins 31 32. The ends of the side sills abut against the end-sill plates 33 and are secured thereto by angular pieces or brackets, the arms 34 35 of which are riveted, respectively, to the main web 20 of the side sills and to the sill-plate, Fig. 4.

The body-bolsters and sill-plates 33 are tied

together longitudinally, and the ends of the body-frame are strengthened, preferably at a plane lower than the side sills for drawing and buffing purposes, by intermediate sills comprising channel-beams 36, with their compression-web 37 vertically disposed and their flanges 38 horizontally disposed, their channels being presented outwardly, the inner ends of the beams being secured to the flanges 12, extending from the bolsters, and their outer ends being secured to the sill-plate by angular brackets, one arm, 39, of which is riveted to the vertical web of the beams, the other arm, 40, being riveted to the sill-plate.

Between the web 37 of the channel-beams 36 is interposed a casting 41, Fig. 9, comprising the front web 42 and side and longitudinally-extending webs 43 and the connecting-web 44. The front web 42 abuts against the sill-plate 33. Both have openings 45 46, aligning and through which extends the draw-bar 47 of the coupler 48, their lower openings being crossed by the cross-bar 49, the end 50 of which extends up behind the front plate 42. The front and side webs 42 43 are each provided with holes 51 52, through which rivets for securing the side webs and webs 37 of the sills and further rivets for securing the front web, the arm 50 of the bar 49, and sill-plate 33 together pass.

Upon the web 43 of the casting 41 and the flanges 38 of the beams 36 rests a casting 53, forming an abutment which comprises the upright web 54, the horizontal web 55, and connecting-webs 56. The casting is secured to the sills 36 by rivets passing through the outer edge of the web 55 and the flanges 38 of the sills.

At 57 is a horizontal plate forming the end platform, formed upon the end of the body-frame beyond the ends of the tank. This plate is secured to the sill-plate 32 by means of the angle-iron 58, Figs. 4, 8, and to give the platform lateral extension beyond the side sills 17 to properly support the ends thereof on the sills 17 and to tie the plate 57 and the sill-plate 33 together I employ the corner angle-castings 59, Figs 7 to 10. The castings comprise the top horizontal web 60, having holes 61, the inclined front web 62 having a push-bar cup 63, an inclined projection or lug 64, and strengthening-webs 65 66 67. The lug 64 is of a height sufficient to enter between the flanges 18 19 of the sills 17, it having recesses 68 69 formed to receive them, and the front web 62 is recessed, as at 70, in which are formed the holes 71. The ends of the sill-plate 33 lie over the recesses 70 of these castings and are then riveted. The ends of the platform-plate 57 are riveted to the top web 60 through the holes 61, and the lugs 64, which abut against the outer faces of the webs 20 of the sills 17, and the arms 34 of the sill-brackets are all finally riveted together, as indicated in dotted lines in Fig. 3.

In order to prevent excessive longitudinal motion of the tank upon the frame, (the lower turnbuckle connections 31 32 with the sills being pivotal to allow for a slight longitudinal movement,) I interpose between the end headers A' and the plate 54 of the casting 53, which latter forms part of the end sills, blocks of wood 72, Fig. 4, having therein a recess 73 to receive and seat the end headers, thereby taking up the shock and jar incident to the longitudinal surging of the tank or its contents.

I have provided a running-board comprising the flat bars 74 74^a, secured upon the top of the tank by the interposed segmental castings or ribs 75, having the apertured lugs 76 77 offset or staggered in relation to each other, the lower lugs 76 being secured to the tank, the upper, 77, to the planks or bars 74 of the running-board, which latter extends from the dome A² out beyond the headers A' and overlap the end platform, so as to substantially bridge the space between the two connecting cars and permitting ready access to the brake-staff or windlass 78, the overhanging end of the running-board being supported by the brackets 79, secured to the planks 74 and header A'. The part 74^a of the running-board extends around one side of the dome A² and is supported by the bracket 74^b.

In order to gain access to the platform, I have provided a running-board at each opposite end with an offset 80, supported by the ladders 81, the side bars 82 of which extend from the outer ends of the offsets to the end platform-plates 57, to which parts the bars are secured. A hand-rail 83, having the offsets 84 85, is secured to one edge of the running-board in a conventional manner. Side steps comprise the bars 86 and the rungs 87 88, secured to the plate 57, the ends of the bars 86 being tied by the bars 88 to the sills 17, Fig. 3, and hand-grips 89 90, secured, respectively, to the plate 57 and headers A', complete the complement.

Having described my invention, I claim—

1. In a railway-car, a body-frame comprising body-bolsters, angularly-disposed I-beam side sills secured to the ends of the bolsters, end sills secured to the side sills, a tank supported upon the said frame, and straps encircling the tank and secured at their ends to the base-flanges of said side sills.

2. In a railway-car, the body-frame having bolsters comprising castings provided with inwardly-inclined side webs and a downwardly-curved upper web, a tank seated upon said curved web, the side webs having inwardly-extending recesses, I-beam side sills secured to the side webs between the top and base flanges of the said beams, said flanges extending into said recesses, and straps encircling the tank, and secured at their ends to the base-flange of the I-beams.

3. In a railway-car, a tank, and a body-frame comprising end sills, body-bolsters, and

intermediate cross-sills curved at the top to conform to the curve of the tank, and having side and upwardly and inwardly inclined webs, side sills comprising I-beams secured to the inclined side webs intermediate their upper and base flanges, a strap extending beneath said sills and secured to the base-flanges of the I-beams and extending outwardly therefrom, and tie-straps secured to said extended ends and encircling the tank.

4. In a railway-car, the frame comprising body-bolsters having downwardly-curved tops and upwardly and inwardly inclined ends and recesses formed in the inclined ends, side sills comprising I-beams, the intermediate webs of which are secured to the inclined ends of the body-bolsters, and intermediate cross-sills, a tank supported upon the upper flanges of the I-beams, and lying within and resting upon the upper curved portions of the body-bolsters, and disconnected from the upper portions of the intermediate sills, and straps secured to the lower flanges of the I-beams adjacent the bolsters and intermediate sills and encircling the tank.

5. In a railway-car, a body-frame comprising inclined I-beam side sills, cross-sills and the body-bolsters having curved top recesses, the cross-sills and bolsters being secured at their ends to the web of the side sills, end sills secured to the ends of the side sills, intermediate longitudinal sills secured to and extending between the body-bolsters and end sills, and a tank seated in said top recesses.

6. In a railway-car, the body-frame comprising the inwardly-inclined I-beam side sills, end sills, body-bolsters comprising a casting having a curved top flange and outwardly-extending and longitudinally-disposed integral flanges, intermediate sills extending between the said flanges and the end sills, and a tank seated on said curved top flanges.

7. In a railway-car, the body-frame comprising the side sills, the cross body-bolsters, the end-sill plates, intermediate longitudinal sills located between the side sills, and secured to the bolsters and sill-plates, and a casting interposed between the outer ends of the said intermediate longitudinal sills and the sill-plate and secured to the former.

8. In a railway-car, the body-frame comprising the side sills, cross-bolsters and end-sill plates, the intermediate longitudinal sills secured to the sill-plates and to the bolsters, a casting interposed between the intermediate longitudinal sills, a further casting supported on said first casting, and a horizontally-disposed plate supported upon said top casting and secured to the end-sill plate.

9. In a railway-car, the body-frame comprising the side sills, cross-bolsters, and end-sill plates, the intermediate longitudinal sills secured to the sill-plates and to the bolsters, a casting interposed between the intermediate longitudinal sills, a further casting supported

on said first casting, corner angle-irons secured to the side sills and sill-plates, and a horizontally-disposed plate supported upon said top casting and corner angle-irons.

5 10. In a railway-car, the body-frame comprising the I-beam side sills, cross-sills and end sills, and corner angle-irons having outwardly-extending recessed projections entering the flanges of the I-beams, and secured
10 thereto, and a front sill-plate located at the ends of the side sills, and secured to the front faces of the corner-irons.

11. The combination of a railway-car, of a body-frame comprising the side sills and body-
15 bolsters and end sills, intermediate longitudinal sills extending between the bolsters and end sills, a tank supported upon said frame, castings secured upon the ends of the intermediate sills, and abutment-blocks interposed
20 between the castings and the ends of the tank.

12. In a railway-car, the combination with a frame comprising side sills, body-bolsters, and end sills, intermediate sills extending between the bolsters and the end sills, an upwardly-extending casting secured to the intermediate sills, a tank supported upon said
25 frame, and abutment-blocks interposed between the ends of the tank and the castings.

13. In a railway-car, the combination with
30 a body-frame comprising the side sills, cross-bolsters and end sills, straps encircling the tank and movably secured to the said frame, and abutment-blocks interposed between the ends of the tank and the end sills.

14. In a tank-car provided with two longitudinal sills of rolled metal, end sills and two draft and buffer sills extending inwardly from the end sills between the two longitudinal sills, substantially as set forth.

40 15. In a tank-car, the combination with longitudinal sills of rolled metal, of wooden sleepers secured transversely on the longitudinal sills, and a tank resting on said wooden sleepers, substantially as set forth.

45 16. In a tank-car, the combination with longitudinal sills of rolled metal, of wooden sleepers placed transversely and resting on the longitudinal sills, which sleepers have their upper edges curved segmentally, and a tank resting on said sleepers, substantially as set forth.
50

17. In a tank-car, the combination with longitudinal sills of rolled metal, of end sills secured thereto, draft and buffer sills extending

inward from the end sills, between the longitudinal sills, and of less height than the longitudinal sills, and a draft-rigging mounted between the said draft and buffer sills, substantially as set forth. 55

18. In a tank-car, the combination with longitudinal sills of rolled metal, of sleepers on the same, a tank resting on said sleepers, straps passed around the tank and having screw-threaded bolt ends, brackets secured to the outer sides of the sills, in which bracket the bolt ends are secured, substantially as set
60 forth. 65

19. In a tank-car, the combination with longitudinal rolled-metal sills, of sleepers secured transversely on said sills, and provided at their inner sides with recesses shaped to fit the lower parts of the heads of a tank, and a tank supported by said sills, and locked between said end sleepers, substantially as set forth. 70

20. In a tank-car, the combination with longitudinal rolled-metal sills, of a tank supported on said sills, a transverse sleeper at each end of the tank, and a channel-bar on the outer faces of said sleeper, substantially as set forth. 75

21. In a tank-car, the combination with the body-frame and tank thereon, of brackets secured to the tank and provided at their outer ends with sockets, uprights held in said sockets, a rod connecting the uprights at their upper ends, and a floor on said brackets, substantially as described. 80

22. A tank-car or similar vehicle, provided with a frame, a tank, and straps passing entirely around said frame and tank to secure these parts together. 85

23. A tank-car or similar vehicle, provided with a frame, a tank resting on said frame, a set of straps passing under said frame, and a second set of straps passing over said tank, and secured to said first-mentioned straps. 90

24. A tank-car or similar vehicle, a frame, a tank resting on said frame, straps passing under said frame, a second set of straps passing over said tank, and united to said first-mentioned straps. 95

Signed in the city, county, and State of New York this 5th day of February, 1902. 100

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Witnesses:

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