

No. 751,299.

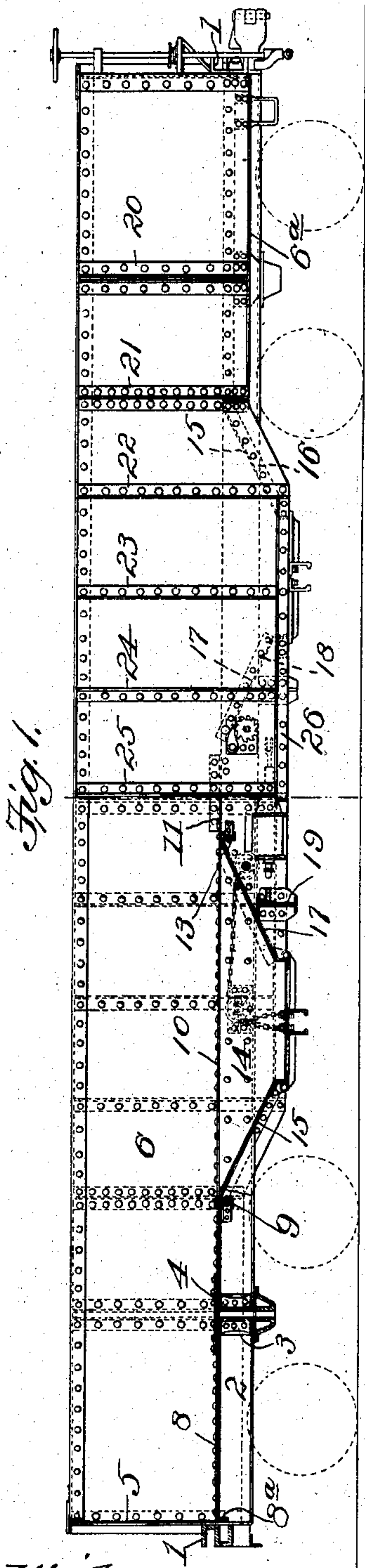
PATENTED FEB. 2, 1904.

G. I. KING.
GONDOLA CAR.

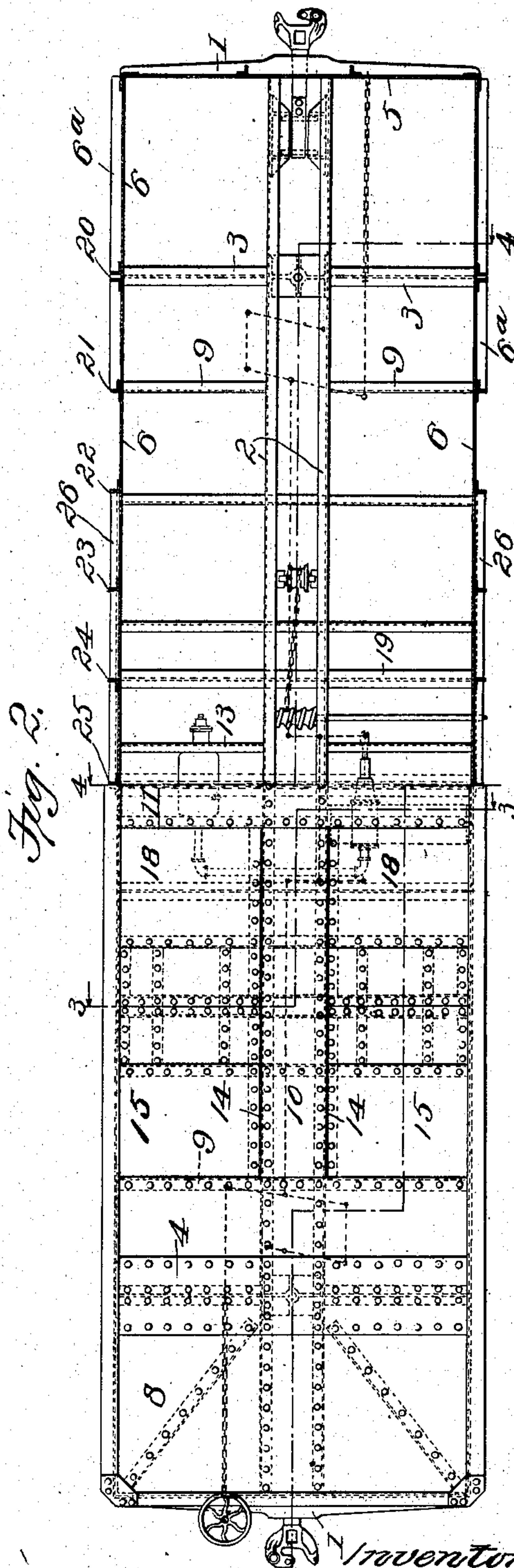
NO MODEL.

APPLICATION FILED JAN. 2, 1902.

2 SHEETS—SHEET 1.



Witnesses:
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2 SHEETS—SHEET 2.

Fig. 3.

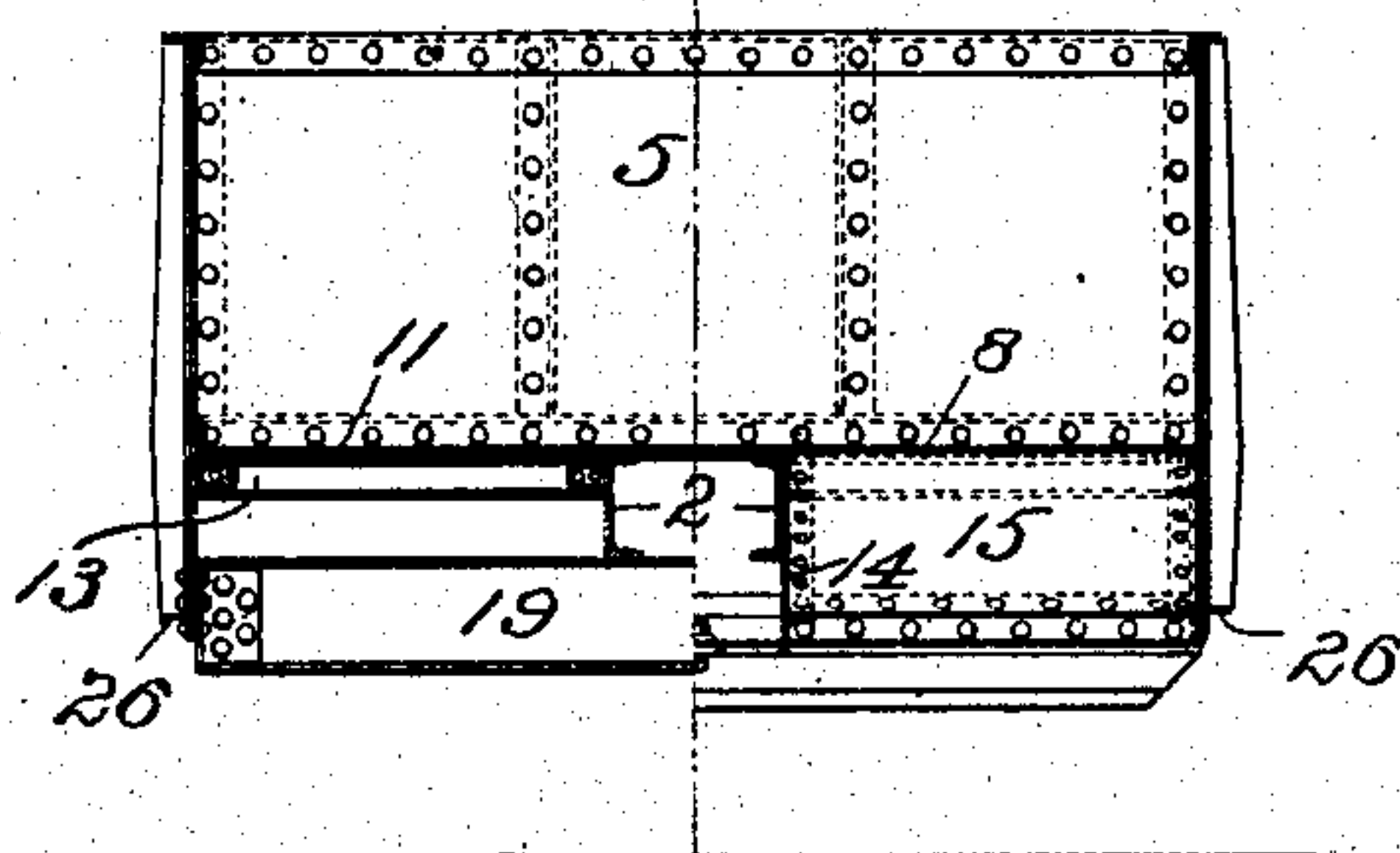


Fig. 4.

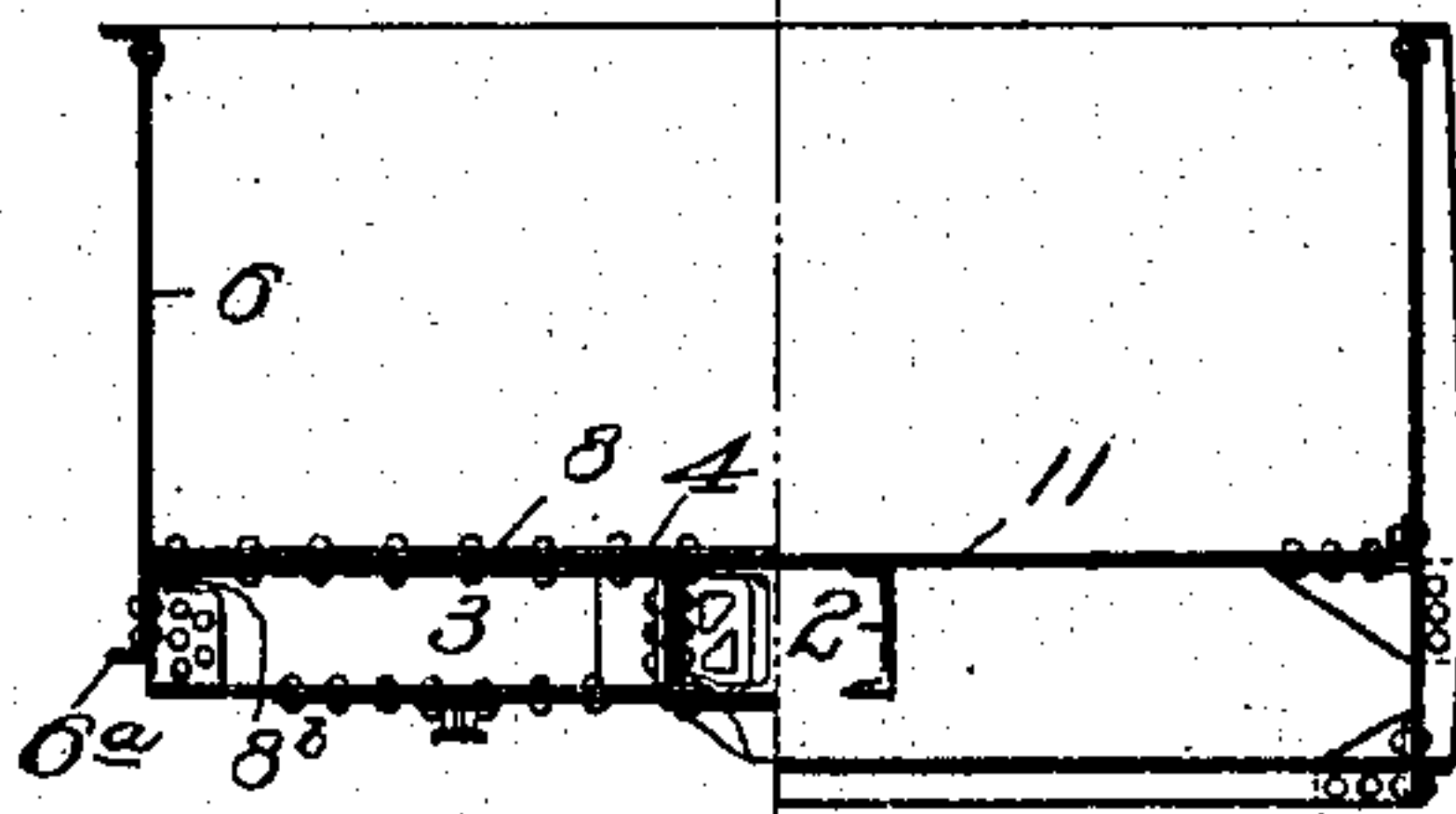


Fig. 5.

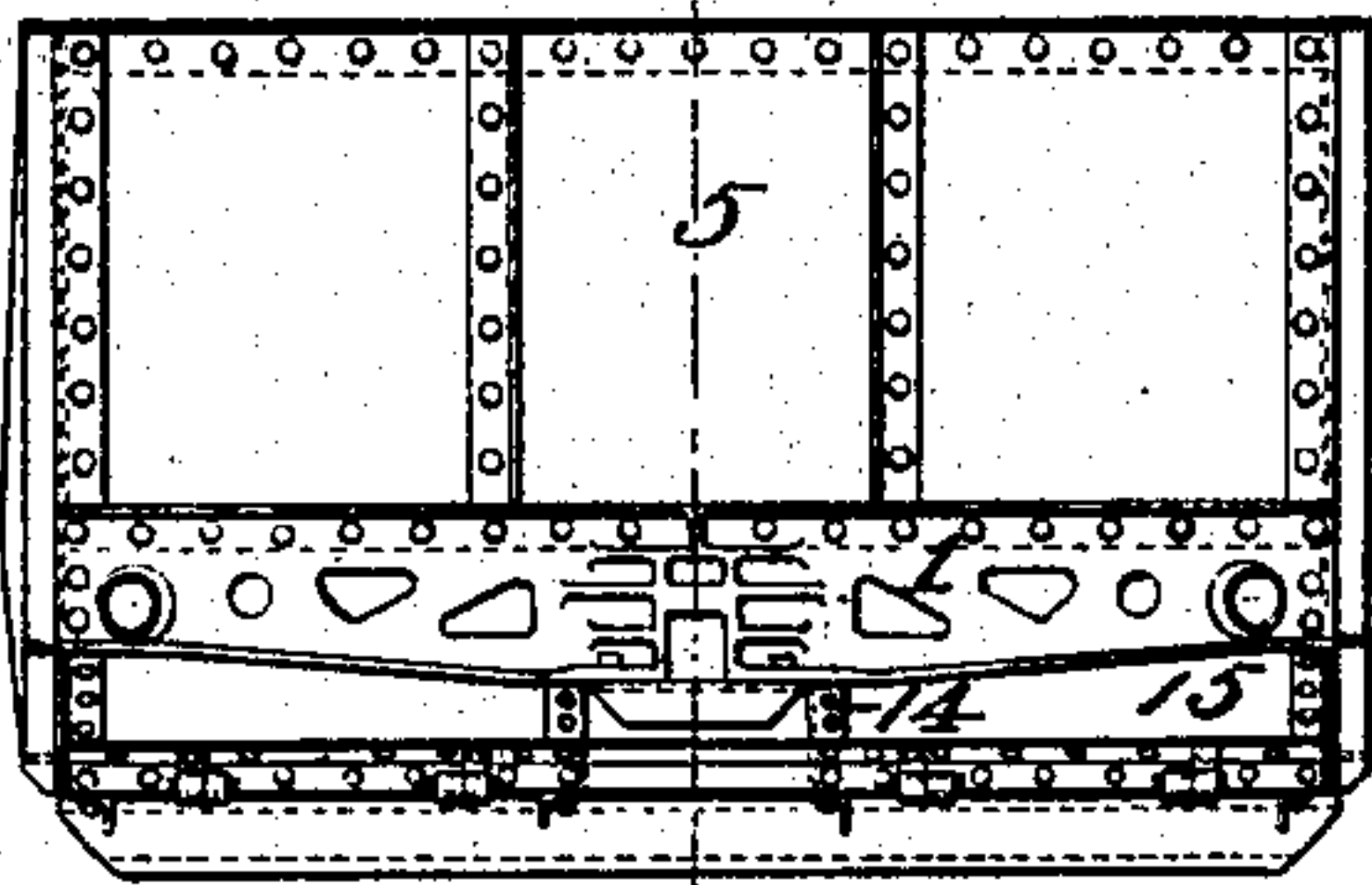
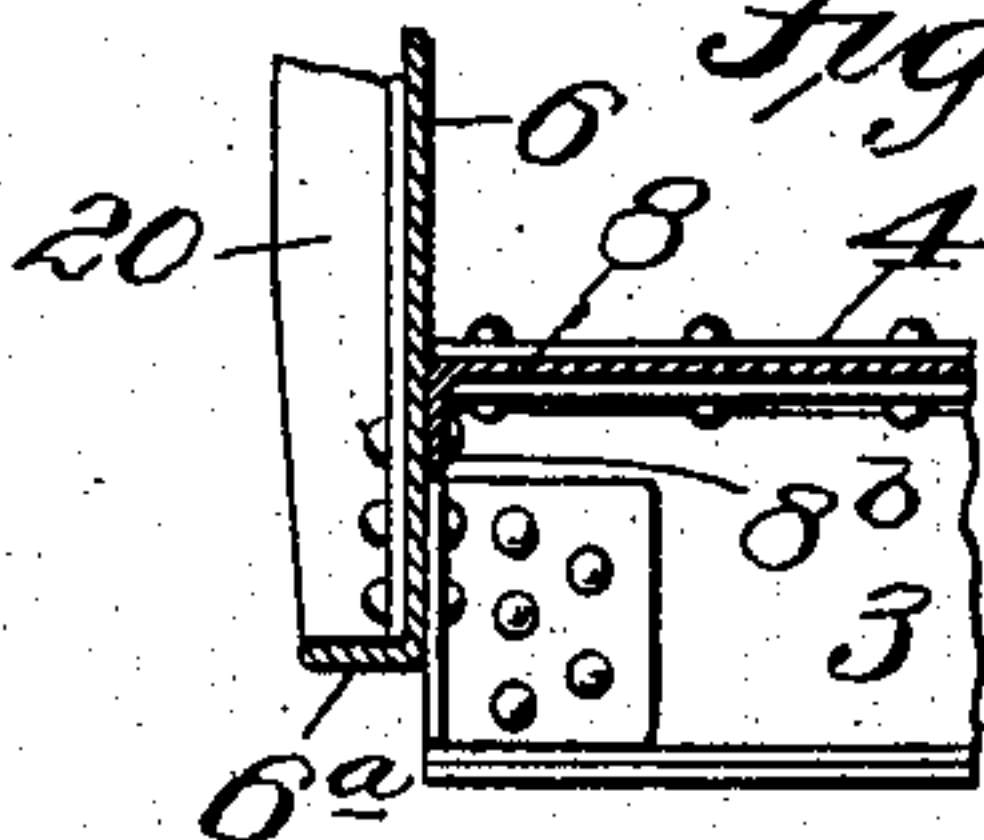


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE I. KING, OF MIDDLETOWN, PENNSYLVANIA, ASSIGNOR TO
AMERICAN CAR & FOUNDRY COMPANY, OF ST. LOUIS, MISSOURI,
A CORPORATION OF NEW JERSEY.

GONDOLA CAR.

SPECIFICATION forming part of Letters Patent No. 751,299, dated February 2, 1904.

Application filed January 2, 1902, Serial No. 88,162. (No model.)

To all whom it may concern:

Be it known that I, GEORGE I. KING, a citizen of the United States, residing at Middletown, Pennsylvania, have invented a certain
5 new and useful Improvement in Gondola Cars, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevational view, one end thereof being shown in vertical section, of my improved car. Fig. 2 is a top plan view, the
15 floor-sheets being removed at one end to more clearly show the underframing. Fig. 3 is a vertical cross-sectional view on line 3 3, Fig. 2. Fig. 4 is a vertical sectional view on line 4 4, Fig. 2. Fig. 5 is an end elevational view,
20 and Fig. 6 is an enlarged vertical sectional view showing the method of attaching the floor-sheet and side wall to the bolster.

This invention relates to a new and useful improvement in gondola cars of that type
25 wherein hoppers are provided in the floor for discharging the greater portion of the load through the exit-openings. These exit-openings are closed by appropriate doors manipulated by suitable mechanism, and as these
30 doors and the operating mechanism therefor form no part of my present invention I will not describe the same in detail here.

The objects of this invention are to utilize the side sheets, they being in the form of plate-
35 girders and capable of carrying the larger part of the load. These side sheets are made deepest at their middle portions, the tension-flanges therefor being provided by the floor-sheets in part, the inclined hopper-sheets in part, and re-
40 inforcing externally-arranged angles in part, the latter being located at the deepest portions of the side walls. These side walls in the form of plate-girders also support cross-beams lo-
45 cated well toward the center of the car, (said cross-beams being preferably located within the central cross-ridge,) which cross-beams support the center sills.

With these objects in view the invention

consists in the construction, arrangement, and combination of the several parts, all as will
50 hereinafter be described and afterward pointed out in the claims.

In the drawings, 1 indicates the end sills of well-known construction, and 2 the center sills, the latter being preferably continuous
55 from end to end of the car and being in the form of channels with their flanges presented inwardly.

3 indicates body-bolsters, which preferably consist of I-shaped fillers attached to and ex-
60 tending from the center sills to the sides of the car, an intermediate casting being arranged between the center sill and top and bottom cover-plates riveted to said parts, the top
65 cover-plate preferably extending from side wall to side wall. The top cover-plate is indicated at 4 and, as shown in Figs. 1 and 4, is arranged above the end floor-sheet, the end
70 floor-sheet being thus made to serve also as a cover-plate.

5 indicates the end walls of the car, and 6 the side walls, said walls having angles attached to their upper edges for well-known purposes, the angles attached to the side walls serving
75 as compression-flanges for the plate-girders. At points intermediate the body-bolsters the side walls are deepened, as shown in Fig. 1, the deepest portion having its lower edge
80 preferably parallel with the upper edge. These side walls are reinforced by stiffening members, which may be arranged vertically, as shown in the drawings, or said members may be inclined, if preferred. Opposite the
85 body-bolsters the braces or posts are made extra strong for well-understood purposes.

8 indicates the end floor-sheets, which, as shown in Fig. 1, are flanged downwardly (or
90 upwardly, as most convenient) at their outer ends, as at 8^a, and riveted to the lower edges of the end walls and also to the end sills, if desired, while the sides of said end floor-sheets are flanged downwardly, as at 8^b, and riveted
95 to the side sheets above the lower edges thereof. The lower edges of the side sheets along the shallow portions at the ends of the car are flanged outwardly, (or inwardly,) as at 6^a, for

the purpose of strengthening the same. The end floor-sheets extend inwardly beyond the body-bolsters and terminate above floor-supports 9, arranged on each side of the center sill and extending to the sides of the car. The outer ends of these floor-supports 9 are attached to the sides of the car, the side walls being strengthened at these points of attachment by stiffening members before referred to.

10 10 indicates a cover-plate riveted to the top flanges of the channels forming the center sill, said cover-plate having butt-joints with the end floor-sheets and with the transversely-arranged ridge-sheet 11, located at the center of the car. This ridge-sheet 11 is preferably continuous from side to side of the car and has its edges attached to floor-supports 13, extending from the center sill to the sides of the car.

14 indicates center hopper-sheets riveted to the backs of the channels forming the center sills, there being four of such hopper-sheets shown in the accompanying drawings. These hopper-sheets have their inclined edges flanged outwardly for supporting the inner edges of inclined sheets 15. The outer edges of these inclined sheets are supported by and attached to angles 16, said angles being riveted to the side walls, as shown in Fig. 1, or the sheets 15 may be flanged downwardly and riveted to the side walls, thus dispensing with the angles 16. These hopper-sheets serve to strengthen the center sill at points between the cross-beams 8 and the body-bolsters.

17 indicates flanges riveted to the side walls, said flanges being located at the outer edges of inclined plates 18, said inclined plates terminating at their upper edges above the floor-supports 13, to which they are attached.

19 indicates cross-beams suspended by the use of suitable connection-angles from the lower edges of the side walls at points adjacent the center of the car, said cross-beams being located under the center sill for the purpose of supporting same.

It will be noted with respect to the system of bracing the side walls, which side walls act as plate-girders, that heavy posts are employed opposite the body-bolsters, posts are also arranged opposite points of connection of the floor-sheets 9, posts are also employed approximately in the transverse planes of the inner edges of the inclined sheets 15, posts are also employed approximately in the transverse planes of the center line of the hopper-openings, posts are also employed in the transverse planes of the cross-beams 19, and the central posts are opposite the ridge-sheet 11. For the purpose of distinguishing these posts I have indicated the same by the numerals 20, 21, 22, 23, 24, and 25, respectively. However, it is obvious that instead of vertical posts inclined braces could be employed or diagonals could be used in conjunction with the vertical posts. It will also be noted with respect to the posts 23, 24, and 25 that said posts do not extend to

the lower edges of the deepest portion of the side walls, but terminate a short distance thereabove in order to accommodate an angle 26, riveted to the exterior face of the side walls at their lower edges and along their deepest portions.

The above construction is extremely strong in that the side walls are relied upon in their capacity as plate-girders to carry the greater portion of the load. The beams 19 support the center sill at points intermediate the body-bolster and adjacent to the center of the car. These beams in no way interfere with the discharge of the load through the hopper-openings by reason of their being located under or within the medial cross-ridge. By employing the side walls as plate-girders heavy side sills are dispensed with; but to take up the pulling and buffing stresses it may be said that light side sills or their equivalent are employed, said side sills being made up as follows: by the flanges 8" of the end floor-sheets and the flanges 6" of the side sheets, the former being located within the side walls and the latter projecting outwardly therefrom, by the inclined angles 16, arranged upon the inner faces of the side walls, and by the angles 26, arranged upon the outer faces of the side walls. It will also be noted that the ends of the angles 26 overlap the ends of the angles 16, so as to make a firm connection between the two, which connection is reinforced by the stiffener 22; also, that at the upper ends of the angles 16 the posts 21 reinforce the joint and make a rigid connection.

It will be obvious that instead of flanging the end sheets down for connection with the side walls angles can be employed substantially in the same manner as the angles 16 are used under the inclined sheets 15; also, that instead of flanging the side walls at the ends of the car outwardly, as indicated at 6", angles could be riveted to the lower edges of said side walls in substantially the same manner as the angles 26 are riveted to the deep middle portions of the side walls. Thus it is evident that any one or more of these angles may consist of an integral flange bent up from the side or floor sheets, as heretofore described, and by the term "angular flange" in the claims I intend to cover the above construction whether the flange is integral with the car side or floor sheets or is formed separately therefrom and secured to said parts.

One advantage resulting from the use of the three angular flanges, whether integral with or secured to the side or floor sheets, is that the floor is supported by the intermediate angle, so that the side walls extend therebeneath and dispense with the use of heavy side sills. Furthermore, by the use of the cover-plates 4, secured to the I-shaped bolster-fillers (which fillers are sometimes called "flying transoms") on each side of the center line, I obtain an extremely strong connection at this point, and

by extending the end floor-sheet inwardly beyond the bolster the said sheet also adds to the section of the top cover-plate.

The end floor-sheets 8 and inclined floor-sheets 15 are secured slightly above the lower edges of the side walls at the ends of the car, as above described, and the inclined sheets 17 and the ridge-sheet 11, located at the center of the car, are arranged some distance above the lower edges of the deep middle portions of the side walls. The extent to which the side walls project below the ridge-sheet 11 and the inclined sheets 17 on each side thereof provides a truss formation which considerably strengthens the central portions of the sides.

The vertical posts or angles 20, 21, 22, 23, 24, and 25 not only strengthen the side walls, but by reason of their securing-rivets passing through the angular flanges before referred to an extremely strong construction results. The lower ends of the posts 24 are connected to the cross-beams 19 for well-understood purposes. The angles 26 and 16, which are carried by the deep portions of the side walls, form, substantially, truss members, which extend downwardly from the end floor-sheets and thence horizontally beneath the middle portion of the car. The side walls of the car practically act as web members for this truss formation. The end portions of the trussed members—to wit, the angles 16—are riveted to the floor-sheets, which sheets contribute considerably to the strength of the structure.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my device may be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a car, the combination with the body-bolsters, of side walls attached to said body-bolsters, which walls act as plate-girders, a center sill, cross-beams carried by the side walls for supporting the center sill at points near the center of the car, and a cross-ridge arranged above the cross-beams; substantially as described.

2. In a car, the combination with the body-bolsters, of side walls attached thereto, said side walls acting as plate-girders, a center sill, cross-beams supported by the side walls at points intermediate the body-bolsters, for supporting the center sill, and hopper-sheets attached to the center sill between cross-beams and bolsters, for strengthening the same; substantially as described.

3. In a car, the combination with a side wall made deepest at its middle portion, the lower edges of the shallow ends being flanged outwardly, and floor-sheets attached to said side walls, above said outwardly-projected flanges; substantially as described.

4. In a car, the combination with a side wall made deepest at its middle portion, the lower edges of the shallow ends being flanged outwardly, and floor-sheets attached to said side walls above said outwardly-projected flanges; substantially as described.

5. In a car, the combination with a side wall made deepest at its middle portion, the lower edges of the shallow ends thereof being flanged outwardly, downwardly-flanged floor-sheets riveted to said shallow ends above said flanges, and horizontal angles riveted to the deepest portion of the side wall; substantially as described.

6. In a car, a containing side wall in the form of a plate-girder whose tension-flange is made up in part by a horizontally-arranged angle and two inclined angles at the ends of the first-mentioned angle upon the inner side of the side wall; substantially as described.

7. In a car, the combination with a side wall in the form of a plate-girder, made deepest at its middle portion, the shallow ends thereof being flanged at their lower edges, floor-sheets attached to said shallow ends, and angles 16 and 26; substantially as described.

8. In a car, the combination with side walls in the form of plate-girders, made deepest at their middle portions, of stiffening-braces therefor, angles 16 and 26, whose ends overlap each other approximately in the transverse plane of said stiffening members; substantially as described.

9. In a car, the combination with a side wall flanged as at 6^a, of a floor-sheet flanged downwardly and attached to said side wall above the flange 6^a, an angle 16 for supporting an inclined sheet, and a post 21 opposite the junction of the angle 16 and the end floor-sheet; substantially as described.

10. In a car, the combination with the side walls, made deepest at their middle portions, angles along the lower edges of said side walls, cross-beams supported by said side walls, and stiffening members in the transverse planes of said cross-beams; substantially as described.

11. In a car, the combination with the side walls and center sills, of floor-supports extending from the center sills to the side walls, a ridge-sheet extending transversely the car and attached to said floor-supports, center hopper-sheets attached to the center sills, and inclined sheets 18 attached to flanges on said hopper-sheets and to said floor-supports; substantially as described.

12. In a car, the combination with side walls acting as plate-girders, of a center sill, cross-beams 19, supported by the side walls and in turn supporting the center sill, floor-supports 13 extending from the center sill to the side walls, a ridge-sheet 11, extending transversely the car and attached to said floor-supports, and cover-plates for the center sill on each side of said ridge-sheet; substantially as described.

13. In a car, the combination with an un-

derframing, of end floor-sheets, cover-plates for the bolster, a cross ridge-sheet, and inclined sheets 15 and 18; substantially as described.

5 14. In a car, the combination with the underframing, of end floor-sheets, a reinforcing cover-plate for the bolster, a cross ridge-sheet riveted to the center sill, and cover-plates for
10 the center sill forming butt-joints with the end floor-sheets and with said cross ridge-sheets; substantially as described.

15 15. In a car, the combination with the underframing, including the floor-supports 9, of end floor-sheets terminating at their inner edges above said floor-supports, center hopper-sheets, inclined sheets 15 and 18, a centrally-located ridge-sheet, extending transversely the car and riveted to the center sill, and cover-plates for the center sill between
20 said ridge-sheet and the end floor-sheets; substantially as described.

25 16. In a car, a side wall in the form of a plate-girder, whose tension-flange is made up of an exteriorly-arranged angle 26, and interiorly-arranged angles 16 with the horizontal members of said angles oppositely disposed; substantially as described.

30 17. The combination with the side wall of a car, of a side sill formed of members located at alternate points on opposite sides of the side walls; substantially as described.

18. In a car, a side wall in the form of a plate-

girder whose tension-flange is made up of an exteriorly-arranged angle along its deep middle portion, and interior angular flanges at
35 the ends of the car with the horizontal members of said angles oppositely disposed, combined with floor-sheets supported by the interior angular flanges.

40 19. In a car, a side wall in the form of a plate-girder whose tension-flange is made up of exteriorly and interiorly arranged angular flanges, some of said interiorly-arranged angular flanges being inclined, and floor-sheets separately formed and supported upon said
45 inclined flanges; substantially as described.

50 20. The combination with the side wall made deepest at its middle portion and flanged at the lower edges of its shallow ends, of floor-sheets riveted thereto for strengthening the same, inclined sheets 15 riveted thereto for strengthening the same, and a horizontal angle 26 attached to the lower edge of the deepest portion of the side wall, said angle 26 overlapping the inclined sheets 15 at both ends;
55 substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 20th day of December, 1901.

GEORGE I. KING.

Witnesses:

EMMA CAMPBELL KING,
LYDIA A. KING.