No. 816,070. PATENTED MAR. 27, 1906.

T. R. BROWN.

HOPPER BOTTOM CAR.

APPLICATION FILED AUG. 14, 1905.

4 SHEETS—SHEET 1.

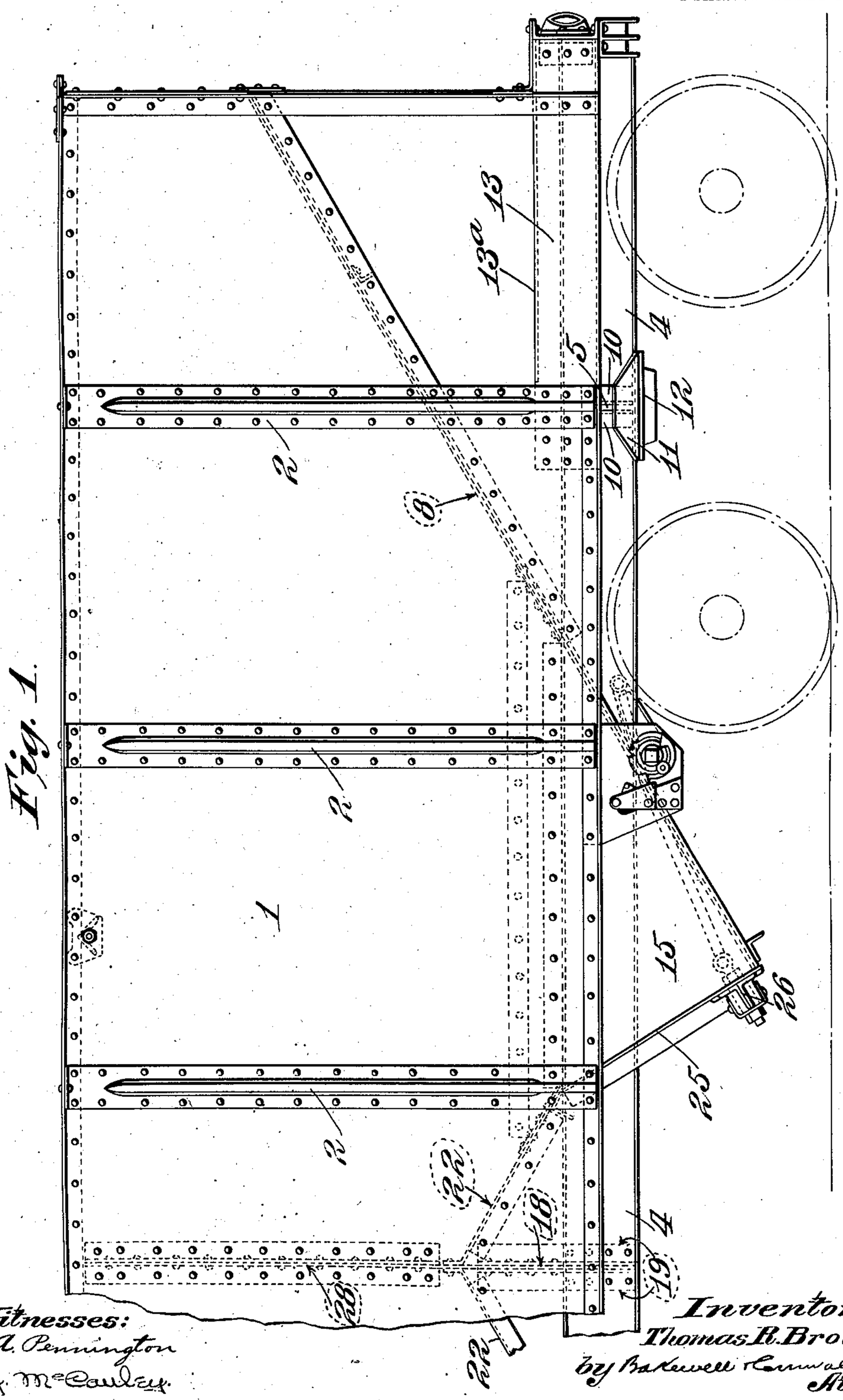

Fig. 1.

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4 SHEETS—SHEET 2.

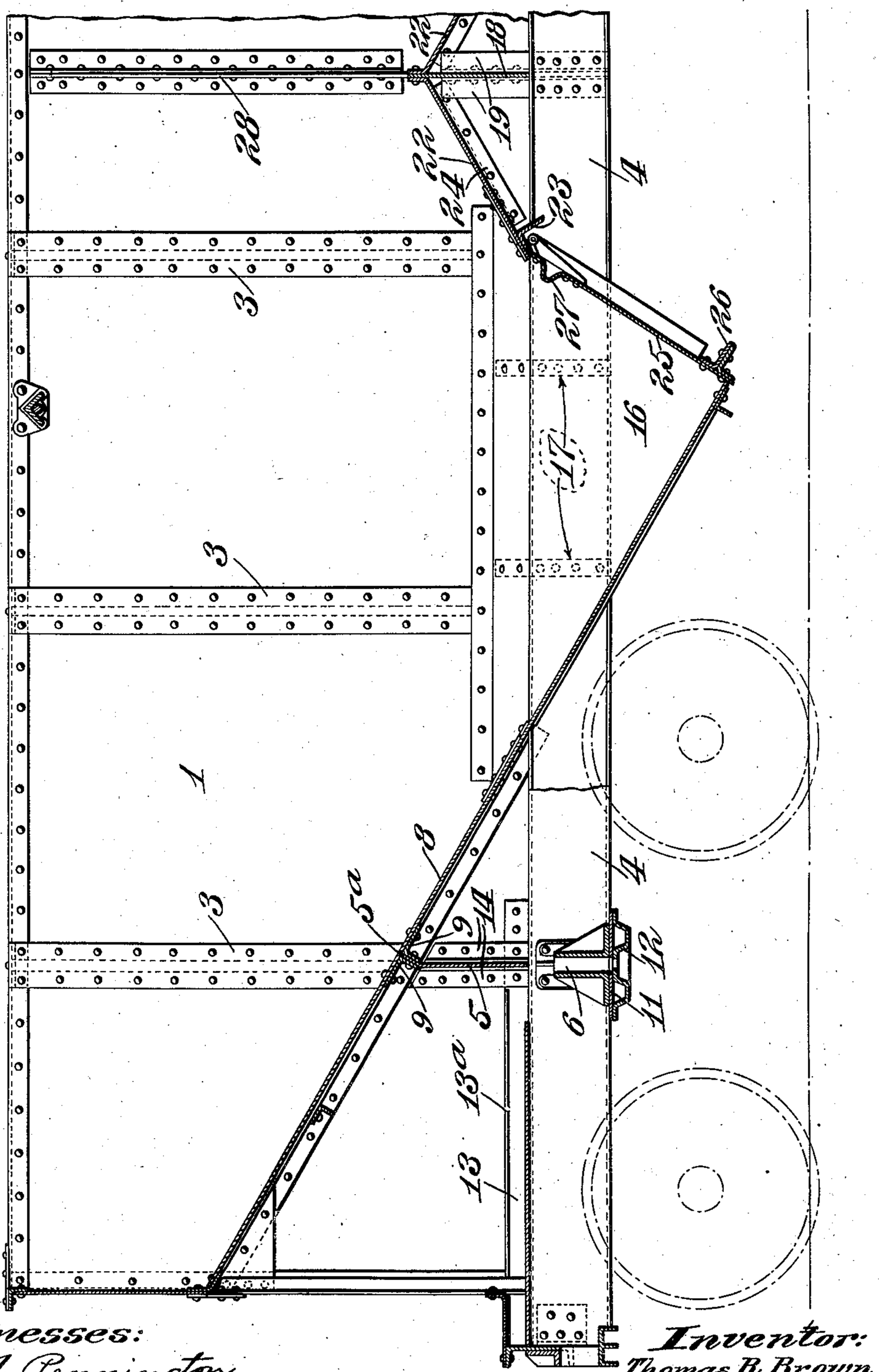

Fig. 2.

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4 SHEETS—SHEET 3.

Fig. 3.

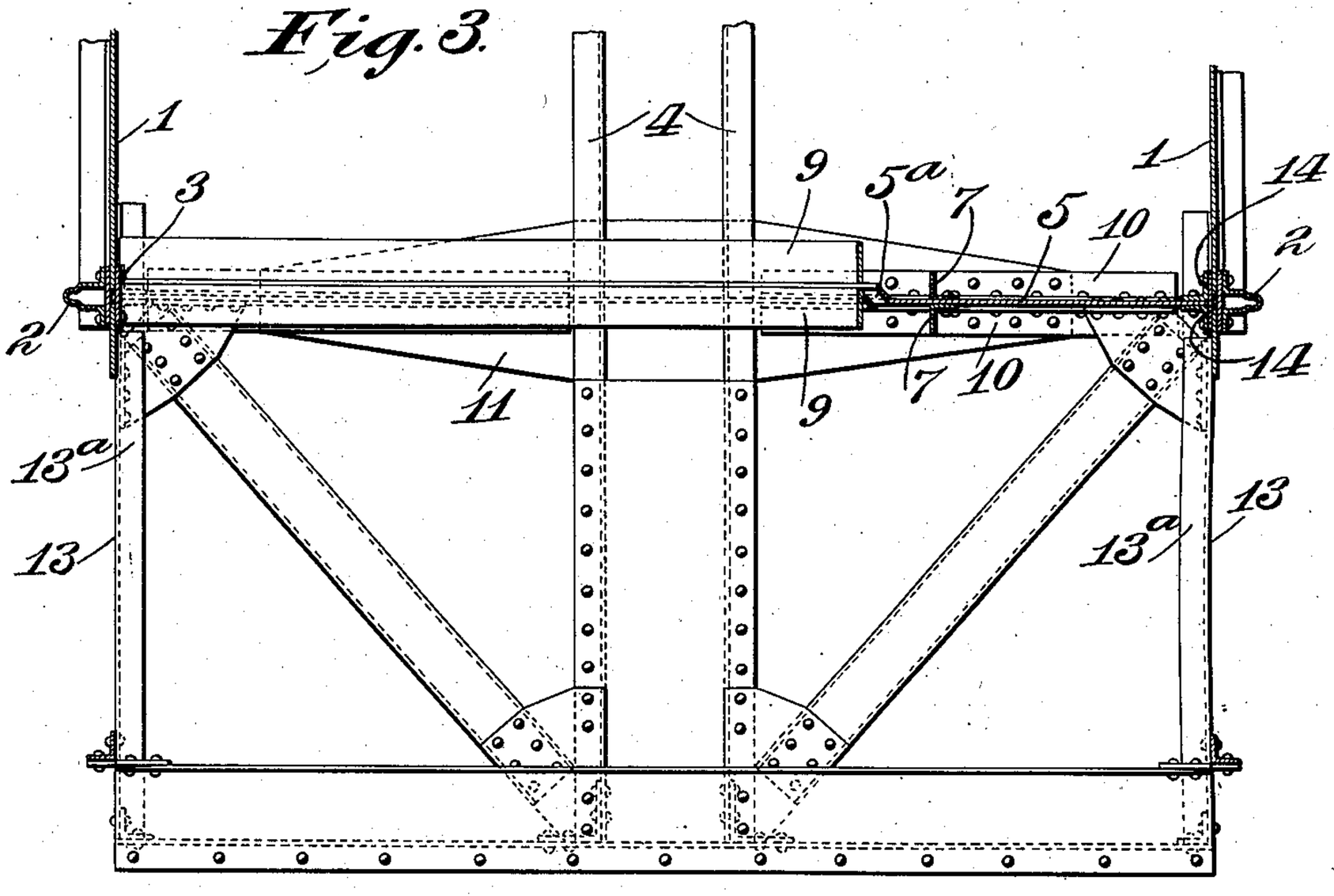
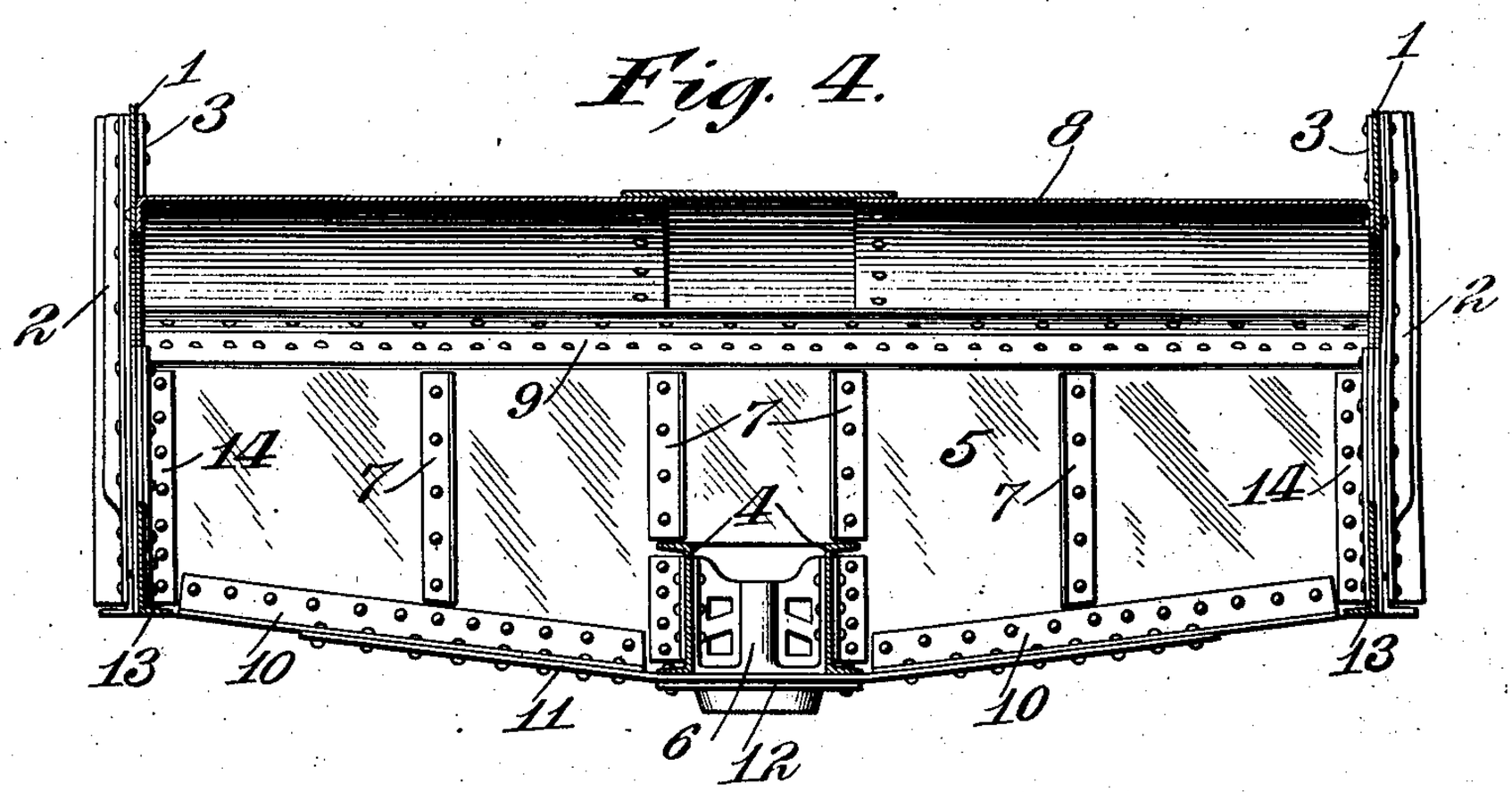


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 5.

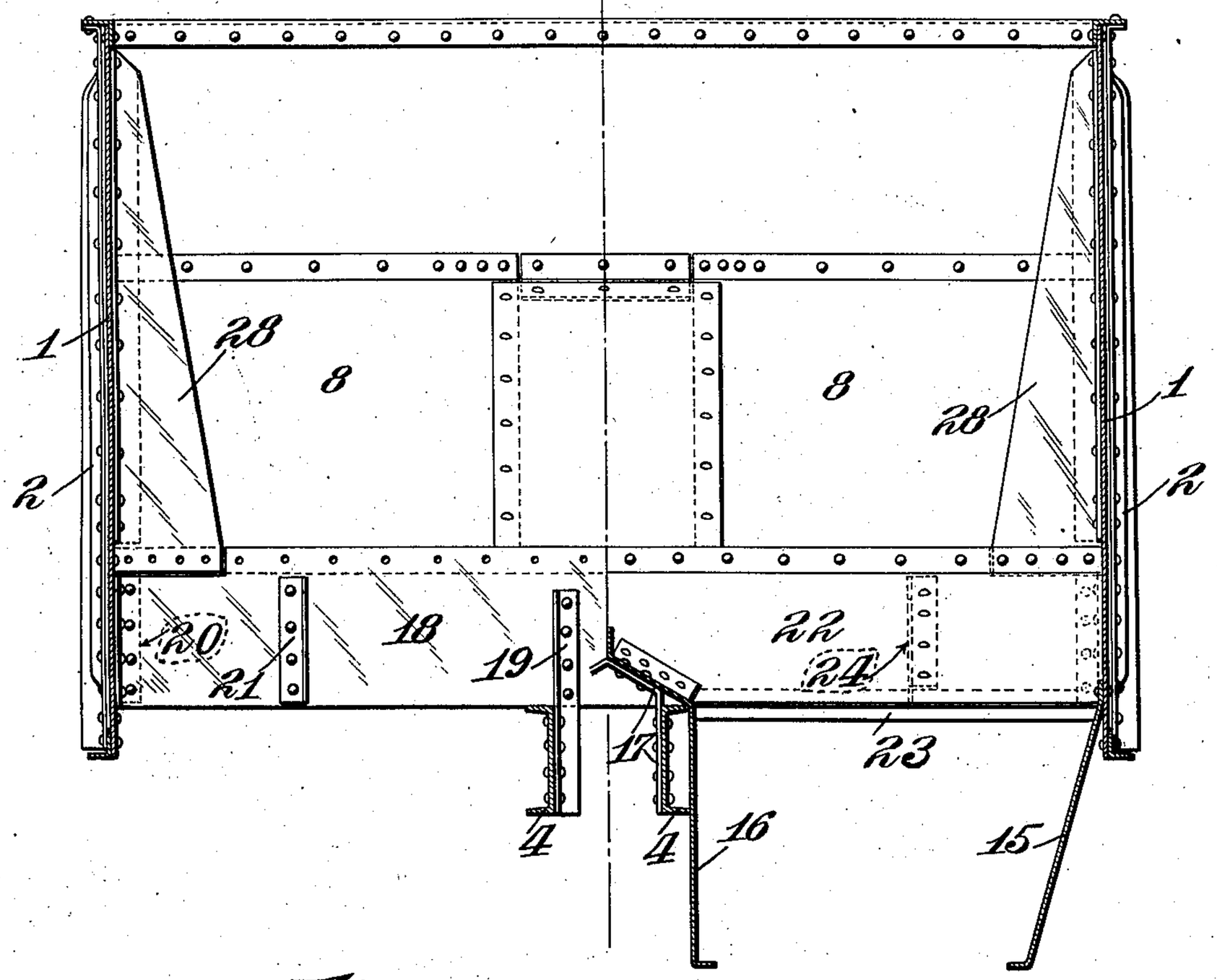
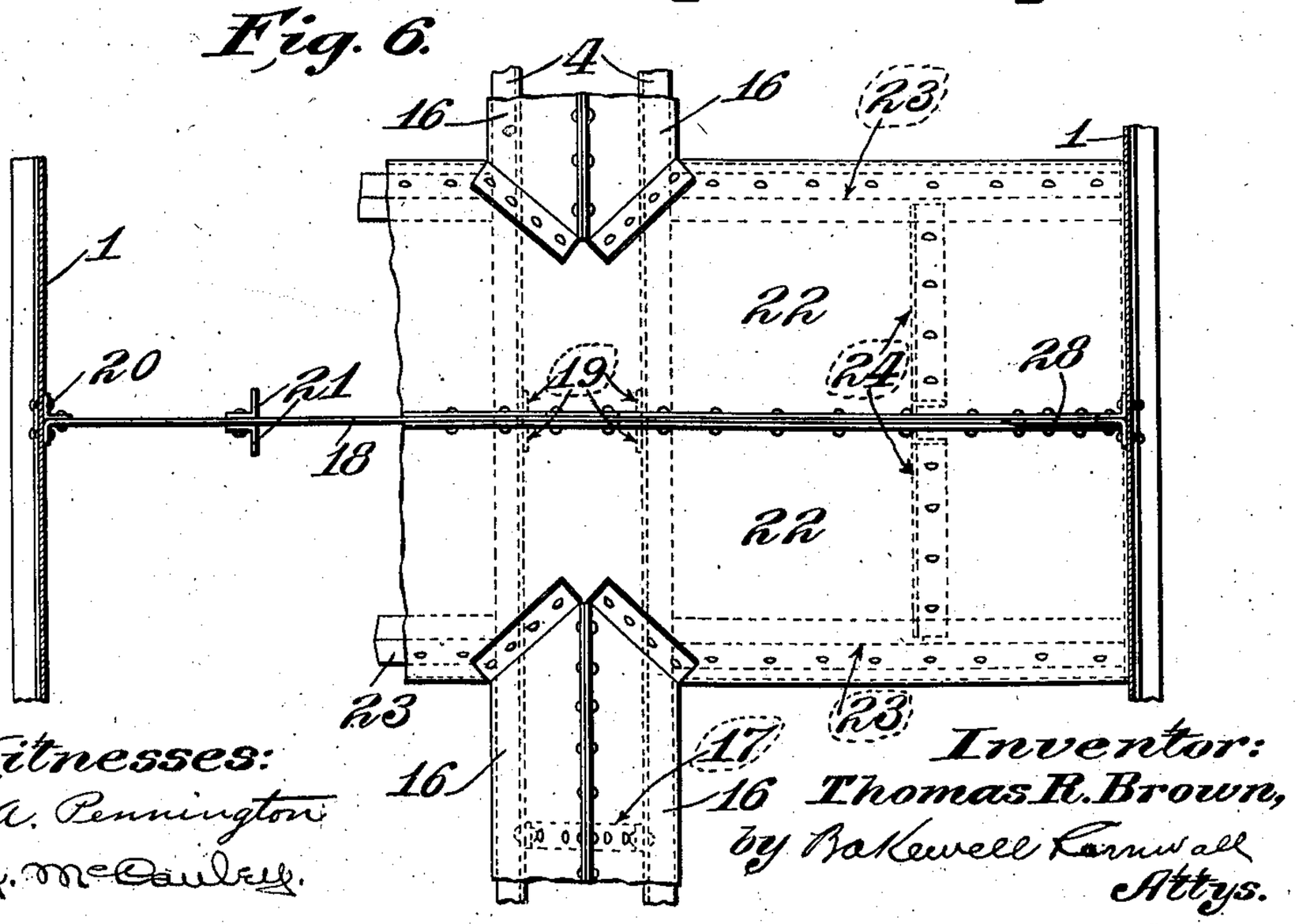


Fig. 6.



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UNITED STATES PATENT OFFICE.

THOMAS R. BROWN, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN CAR & FOUNDRY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF NEW JERSEY.

HOPPER-BOTTOM CAR.

No. 816,070. Specification of Letters Patent. Patented March 27, 1906.

Application filed August 14, 1905. Serial No. 274,067.

To all whom it may concern:

Be it known that I, THOMAS R. BROWN, a citizen of the United States, residing in the city, county, and State of New York, have invented a certain new and useful Improvement in Hopper-Bottom 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 of approximately one-half of my improved car. Fig. 2 is a longitudinal vertical sectional view through one end of the car. Fig. 3 is a plan view of the underframing at the end of the car. Fig. 4 is a vertical cross-sectional view in the transverse plane of the bolster. Fig. 5 is a vertical cross-sectional view in the transverse plane of the center of the car, and Fig. 6 is a plan view showing the central cross-ridge.

This invention relates to a new and useful improvement in cars, and particularly to that type known as "hopper-bottom cars," although it is obvious that features of the invention could be employed in cars of other types without departing from the nature and principle of the same.

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

In the drawings, 1 indicates the side walls of the car, which form plate-girders and sustain the major part of the load. These walls are provided with top and bottom flanges, forming the compression and tension flanges, respectively, of the plate-girder sides, and, as shown, these flanges are in the nature of angles riveted to the upper and lower edges of the walls; but it is obvious that the flanges could be integral with the walls. To reinforce the side posts, vertical stiffening-posts 2 are employed, and said posts are preferably ridged, as shown in Fig. 1, they being arranged on the outer faces of the side walls with their ridges presented outwardly. As an additional strengthening medium for the side walls, plates 3 are arranged on the inner faces of the side walls, through which the rivets for securing the posts 2 in position pass.

4 indicates the center sills, which are preferably in the form of channels with their flanges presented outwardly, said center sills being shown as extending from end to end of the car, although it is obvious that they could be interrupted and made of two or more pieces, as is well known in this art.

5 indicates the vertical web of the bolster, (see Fig. 4,) which is recessed in its lower edge to take in the center sills, which center sills at this point are spaced apart by a filler-casting or diaphragm 6, preferably cored to receive the king-bolt. The bolster-web 5 extends from side to side of the car and is strengthened by angles 7, riveted to the faces thereof, the said angles being properly disposed to resist buckling tendencies. The upper edge 5^a of the bolster-web 5 is bent or deflected (see Fig. 2) so as to lie perpendicular to the inclined end floor-sheet 8, said bent edge being secured to said floor-sheet by means of connecting-angles or bent plates 9, preferably arranged on each side thereof. The lower edge of the bolster-web 5 is stiffened by angles 10, which also afford a connecting medium for the bottom cover-plate 11 of the bolster, which extends under the center sills and, together with the center plate 12, is riveted thereto and to the filler-block 6.

13 indicates short side sills, preferably made in the form of channels with their flanges presented inwardly, the top flange 13^a thereof being cut away in the transverse plane of the bolster, as shown in Fig. 2, so as to accommodate the connecting-angles 14, which secure the bolster-web to the webs of the side sills and the posts in the transverse plane of the bolster.

15 indicates the outside hopper-sheet, whose upper edge is riveted to the side wall of the car, and 16 indicates the inside hopper-sheet, whose upper edge is bent inwardly over the center sills and riveted to straps 17, arranged between the center sills. The upper edges of the inside hopper-sheets above the straps are flanged and riveted together. Both hopper-sheets at their lower edges are preferably flanged, so as to provide means for the attachment of the inclined end floor-sheets.

18 indicates a vertical web extending across the center of the car and above the cen-

ter sills. This web is connected by angles 19 to the center sills and by suitable connection plates or angles 20 to the side walls of the car, and accordingly acts as a supporting means for the center sills at the central portion of the car, where said sills are subjected to great strain from the load carried by the car. Web 18 may be stiffened by stiffening-angles 21, arranged as desired to best resist buckling tendencies and strains transmitted through this web. The upper edge of web 18 passes through the apex flanges of inclined plates 22, which form the central cross-ridge of the car. These plates extend from side to side of the car and may be flanged at their ends and riveted to said side walls, as shown, or connecting-angles may be employed, as is well known. The lower edges of these plates 22 are stiffened by angles 23, and in addition stiffening-angles 24 may be riveted to the under side of the plates. Doors 25 may be hinged to the lower edges of the cross-ridge plates, the outer or closing edges of said doors being stiffened by angles 26 in a well-known manner. To stiffen the upper or hinged edge of the door, I provide the same with a strengthening-ridge 27, which may be embossed in the plate forming the door, as shown, or a strengthening-angle may be attached to the door at this point, so as to offer an additional securing means for the hinge.

The upper side edges of the web 18 are preferably cut away to accommodate the lower edges of gusset-plates 28, secured to the side walls of the car, said lower edges of said gusset-plates being riveted to the apices of the edge flanges, as shown in Fig. 5.

By the above construction it will be noted that the car, while being light, is amply strong, and, further, that very little press-work is required.

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

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a hopper-bottom car, the combination with center sills, of a bolster-web comprising a single plate whose lower edge is recessed to receive said center sills and whose upper edge is deflected to lie perpendicular to the plane of the end floor-sheets of the hopper-bottom car, said web being continuous from side to side of the car; substantially as described.

2. In a hopper-bottom car, the combination with center sills, of a bolster-web, comprising a single plate continuous from side to side of the car and arranged between said center sills and the inclined end floor-sheet of the hopper-bottom car, the upper edge of said web being bent so as to lie perpendicular to the plane of said floor-sheet and the lower edge of said web being notched to receive the center sills, and attaching-angles for securing said bent edge of the web to said floor-sheet; substantially as described.

3. In a hopper-bottom car, the combination with center sills, of a bolster-web, comprising a single plate extending from side to side of the car and recessed at its lower edge to receive said center sills, the upper edge of said web being deflected to lie perpendicular to the plane of the end floor-sheets of the hopper-bottom car, means for connecting the deflected portion of said web to said floor-sheets, and a bottom cover-plate riveted to said web and arranged under the center sills; substantially as described.

4. In a hopper-bottom car, the combination with a bolster-web extending from side to side of the car and forming a support for the inclined bottom floor-sheet of the car, center sills passing through said web, and short side sills terminating a short distance within said web and to which said web is connected; substantially as described.

5. In a hopper-bottom car, the combination with a bolster-web, of short side sills in the form of channels to which the ends of said web are connected, one of the flanges on said channel being cut away to accommodate the connection of said bolster-web to said short side sill; substantially as described.

6. In a hopper-bottom car, the combination with center sills, of inside hopper-sheets arranged on each side of said center sills, the upper edges of said hopper-sheets being bent inwardly toward each other at an angle to a meeting-point where said hopper-sheets are flanged and riveted together, and supports between the center sills, said supports being in the form of continuous straps which are connected to the center sills and extend up between the bent edges of the hopper-sheets and riveted thereto; substantially as described.

7. In a car, the combination with plate-girder side walls, center sills, a continuous transversely-arranged vertical web 18 arranged above said center sills at the central portion of the car and connected to said side walls and vertically-disposed angles 19 riveted to said web and to the center sills, whereby said sills are carried by said web; substantially as described.

8. In a car, the combination with plate-girder side walls and center sills, of plates forming a cross-ridge, and a continuous vertical web located at approximately the center of the car and connected to the side walls of the car, vertically-disposed angles 19 on said web which extend downwardly and are connected to the center sills to serve as a support therefor, the upper edge of said web being secured between the apex flanges of the cross-ridge plates; substantially as described.

9. In a car, the combination with plate-girder side walls and center sills, of inclined cross-ridge plates extending from side to side of the car and secured to the side walls of the car; a continuous vertical web-plate secured to the side walls of the car and being located above the center sills, vertically-disposed angle-bars depending from said web-plate and being secured to the center sills, said web-plate extending up and being secured between the apex flanges of the cross-ridge plates, and gusset-plates secured to the side walls of the car and to said cross-ridge plates; substantially as described.

10. In a car, the combination with plate-girder side walls and center sills, of a continuous vertical web-plate 18 arranged above said center sills and connected thereto by angles 19 and also connected to the side walls of the car, gusset-plates secured to the side walls of the car and whose lower edges are received in recesses formed in the upper side edges of said web-plate, and cross-ridge plates whose apex flanges are riveted to the upper edge of said web-plate and the lower edges of said gusset-plates; substantially as described.

11. A door for hopper-bottom cars having a reinforcing transversely-arranged strengthening-rib extending parallel to its hinged edge; substantially as described.

12. A door for hopper-bottom cars comprising a panel and a reinforcing strengthening-rib arranged in juxtaposition to its hinged edge; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 10th day of August, 1905.

THOMAS R. BROWN.

Witnesses:
ROBT. G. JEFFERY,
E. D. LAUDY.