

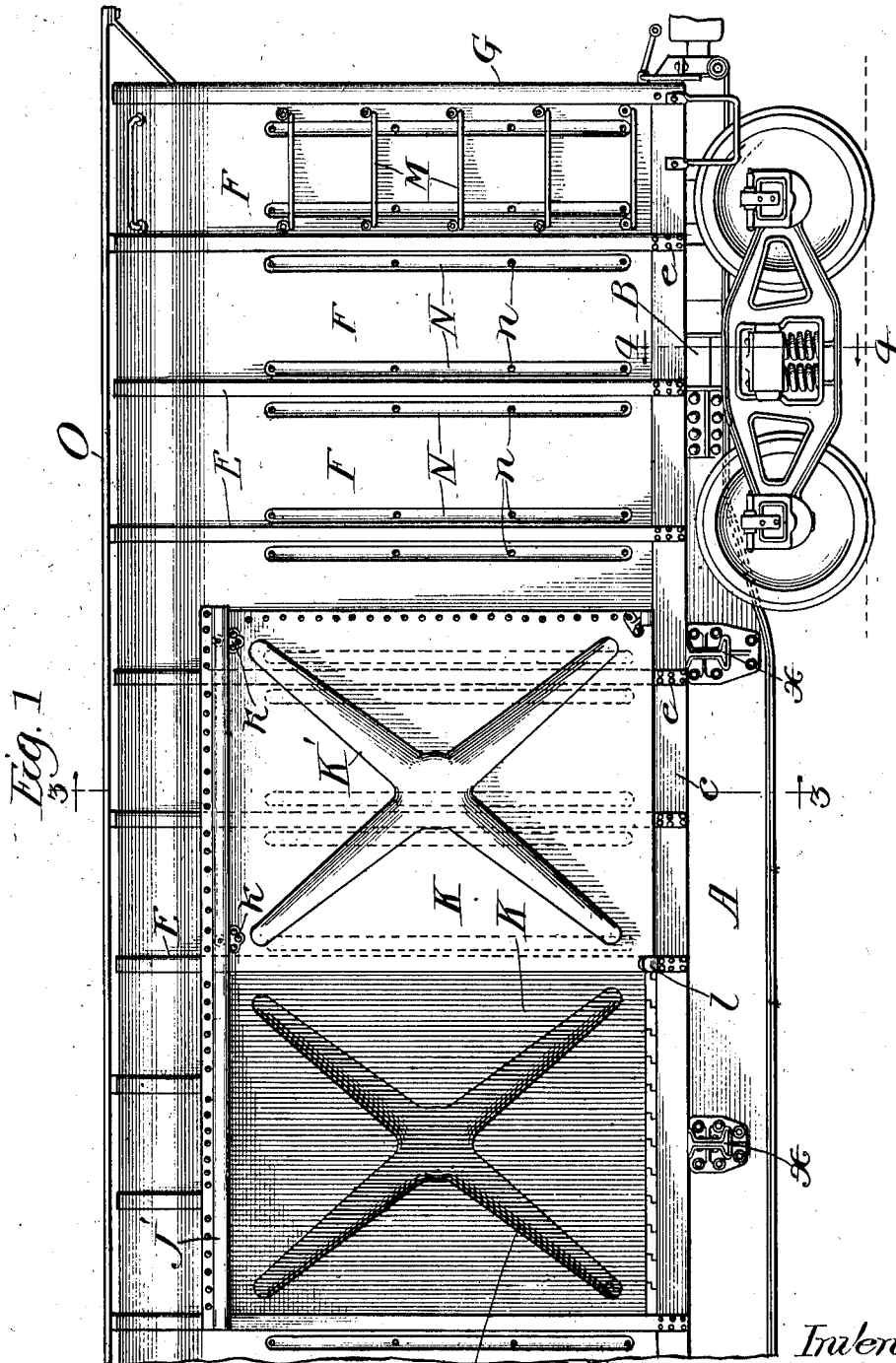
W. P. BETTENDORF.
BOX CAR.

APPLICATION FILED MAY 23, 1908.

953,115.

Patented Mar. 29, 1910.

6 SHEETS—SHEET 1.



Witnesses
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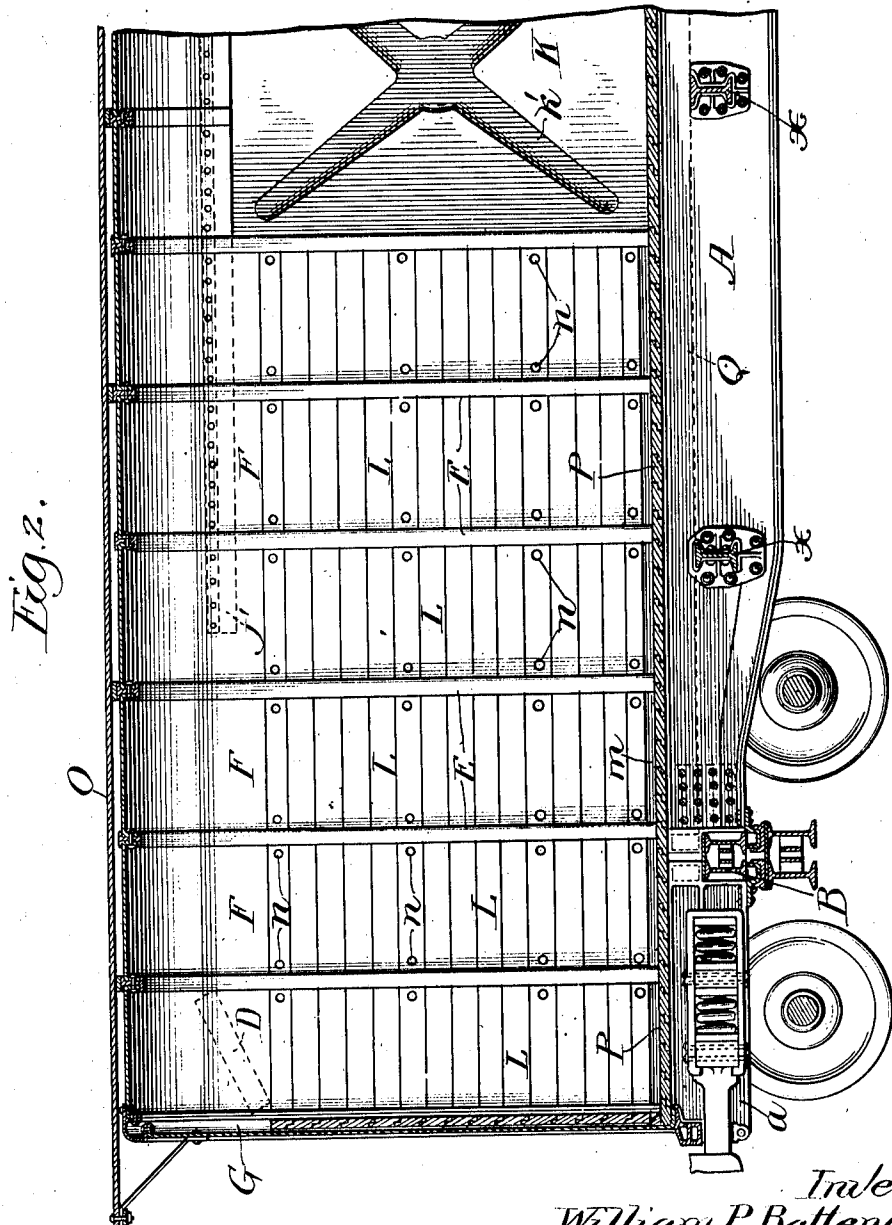


Fig. 2.

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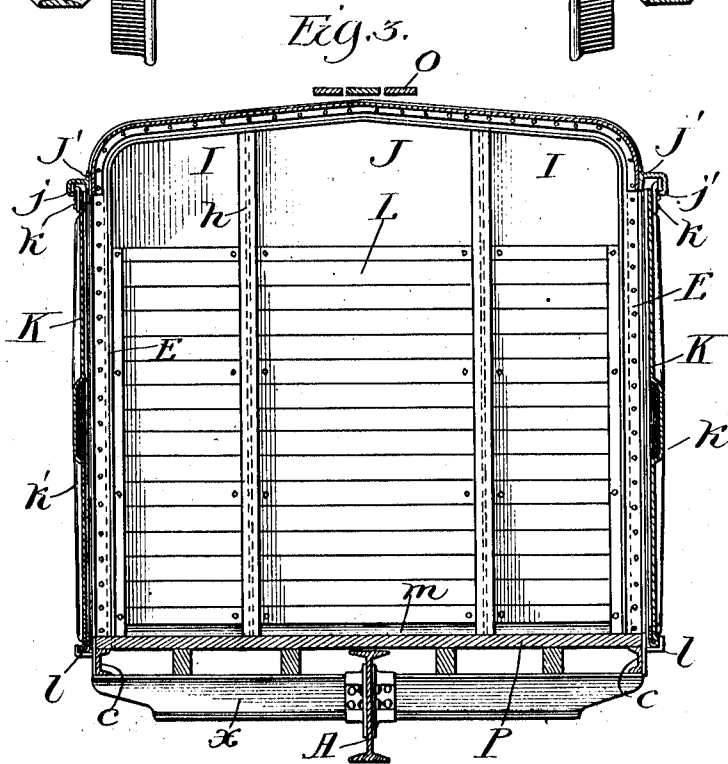
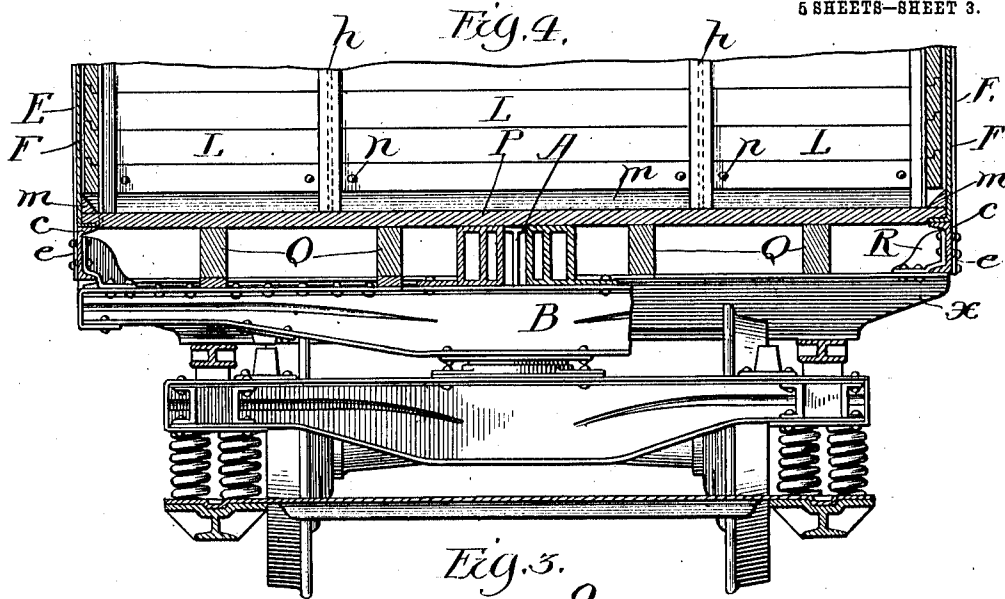
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5 SHEETS—SHEET 3.



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Fig. 5.

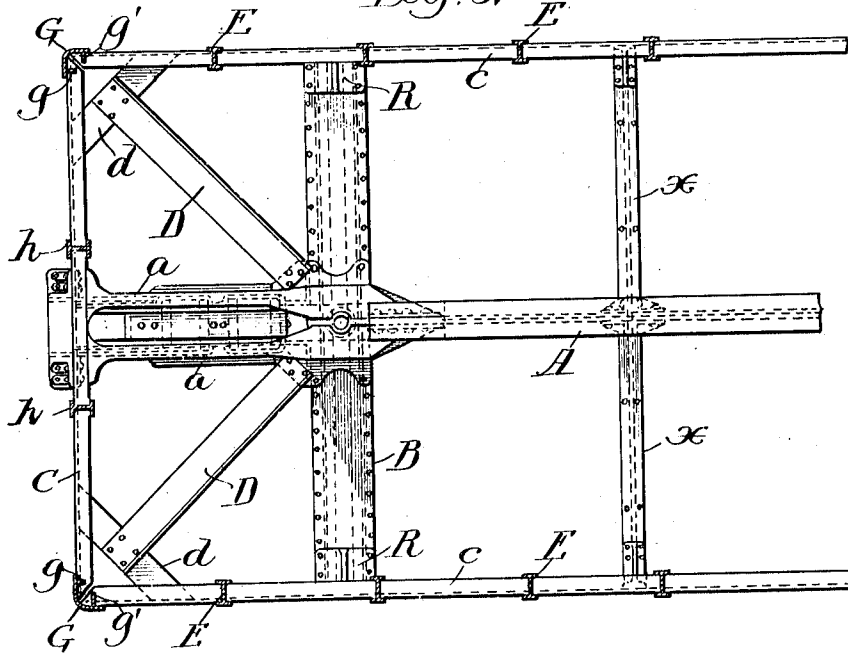


Fig. 7.

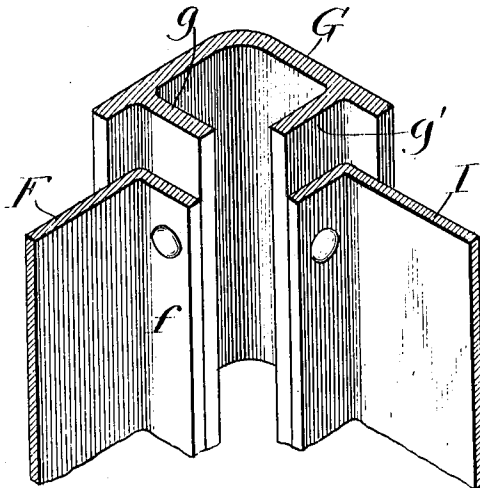
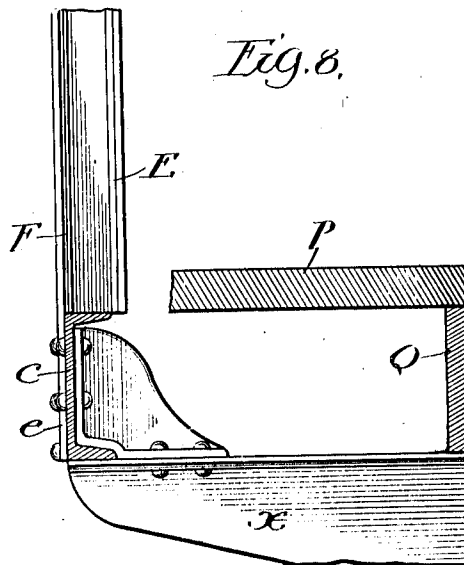


Fig. 8.



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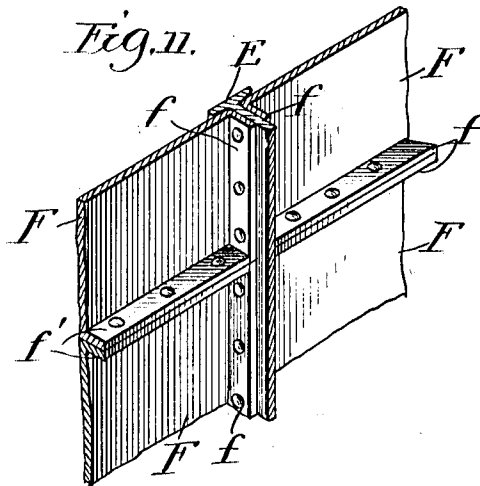
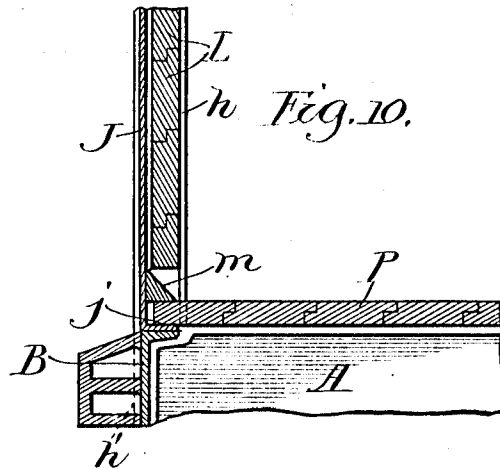
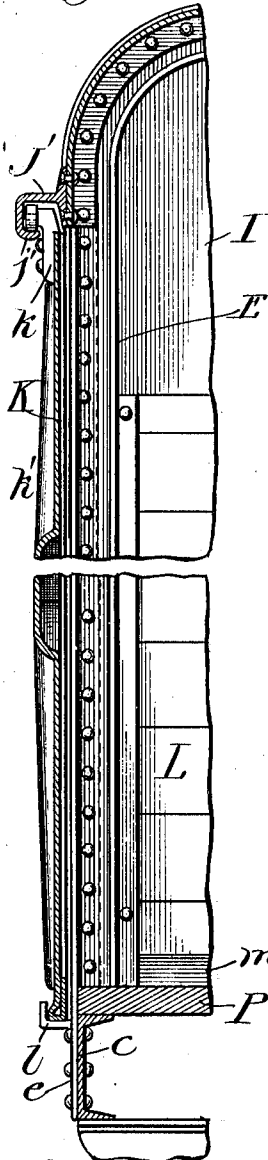
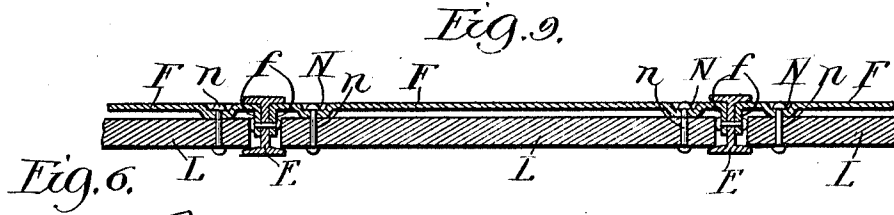
61) Frank J. Thompson
(Att)

W. P. BETTENDORF.
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

WILLIAM P. BETTENDORF, OF BETTENDORF, IOWA.

BOX-CAR.

953,115.

Specification of Letters Patent.

Patented Mar. 29, 1910.

Application filed May 23, 1908. Serial No. 434,671.

To all whom it may concern:

Be it known that I, WILLIAM P. BETTENDORF, a citizen of the United States, and a resident of Bettendorf, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Box-Cars, of which the following is a clear, full, and exact description.

My invention relates to railway car-bodies, and particular to the class of freight cars generally known as box cars.

The object of my invention is to produce a metal car-body in the construction of which sheet metal and rolled beams of conventional shapes predominate.

A further object of my invention is to so dispose of the metal elements of the body that injury to one element will not necessarily affect the integrity of the others, and so that the injured or incapacitated element can easily and quickly be replaced.

Another object of my invention is to enable the interior of the car to be lined with wood strips that can be secured in place easily and quickly, and without the employment of much labor, and yet another object is to provide a car the exterior of which will not present exposed rivet-heads and nuts where they are likely, while in transit, to interfere with colliding objects. This I accomplish by the means hereinafter fully described, and as particularly pointed out in the claims.

In the drawings:—Figure 1 is a side elevation of one-half of a box car embodying my invention. Fig. 2 is a longitudinal central section through one-half of such a box car. Fig. 3 is a vertical transverse section taken on dotted line 3—3, Fig. 1. Fig. 4 is a vertical transverse section of the lower part of said car taken on dotted line 4—4, Fig. 1, drawn to a slightly larger scale. Fig. 5 is a plan view of one end portion of the underframe of said car with the floor removed. Fig. 6 is a fragmentary view showing a vertical transverse section through one side of the car-body, and drawn to a larger scale than that shown in Fig. 3. Figs. 7, 8, 9, 10 and 11 are fragmentary views, illustrating details of construction of the same.

In the drawings A represents a center-sill, preferably consisting, between the body-bolsters B, of a single I-beam and provided with parallel cast metal end-extensions *a*, *a*, to which the ends of the single I-beam portion are suitably secured, and which arch

over the body-bolster and have their opposite ends secured to the end-sills C. The end-sills C are, preferably, made of a suitable channel-beam the flanged edges of which project inward, and the side-sills *c*, *c*, are, preferably, made of channel-beams of the same dimensions as the end-sills the flanges of which project inward. Near the corners of the car the end-sill and side-sills are connected by a diagonal corner-plate *d*, the center of which is connected by a brace D, extending at right angles from the center thereof to the rear portions of the parallel extensions *a* of the center-sill, adjacent to the body-bolster, as shown.

In do not employ posts and rivets in the construction of the framework of my improved car, but instead use a series of transverse arches that consist of I-beams E that are arranged so that their webs are in a transverse plane and are secured at each end to the side-sills *c* and have their vertical portions form the frame-work for the side-walls and their arched portion form the frame-work of the roof of the car. At each end these arch-beams E have their inner flanges and web thereof cut away, and the shoulder thus made rests upon the upper edge of said side-sill, and the extension *e* formed by the outer flange, laps against the outer surface of and is riveted to the web of the side-sills *c*. These arched-beams E are, preferably, located at equal distances apart throughout the length of the car, and the sheathing of the side-walls and roof of the car is made of sheet metal plates F, which, preferably, extend in one piece between the arched beams, from side-sill to side-sill of the car and have their end edges flanged inward and riveted to the upper edges of the same. The longitudinal edges *f* of these plates F are flanged inward, and the distance between the outer surface of these flanges *f* correspond to the distance between the transversely disposed webs of the arched-beams, to which latter said flanges are secured by rivets or bolts, or otherwise, at suitable points along their lengths. Should it become desirable or necessary to use sheathing plates F of less length than the arch-beams, the transverse engaging edges *f'* of the sections of said plate can be flanged inward, preferably to the same extent as flanges *f*, and secured together by riveting, or otherwise, substantially as shown in Fig. 11 of the drawings.

At the ends of the car I provide corner arch-beams G, that consist of rolled metal beams substantially like that shown and described in Letters Patent of the United States granted to me October 25, 1898, No. 29,545, for design for rolled metal beams, which are bent transversely throughout their lengths so as to bring the flanges g , g' , thereof, in planes at right angles to each other, or one parallel to the longitudinal plane of the car and the other parallel to the transverse plane of the car, substantially as shown in Figs. 5 and 7 of the drawings. These corner arch-beams have the flanges g and g' stripped back from their ends for a certain distance, and the web of the corner arch-beams, thus stripped, is secured, one-half to the web of the ends of the side-sills, and the other to the web of the ends of the end-sill. The ends of said flanges g and g' form shoulders that rest upon the upper edges of said side-sill and end-sill, substantially as shown. A plate F is secured to the transverse flanges g of the corner arch-beam, and to the web of the arch-beam E, nearest the end of the car, substantially in the manner hereinbefore described, and it will be noticed, that the space between the flanges g , and g' of said corner arch-beam, permits of the flanged edge f of said plate F being riveted thereto, in a convenient and practical manner without the necessity of disturbing or removing said corner arch-beam.

The end-wall of my improved car, is made in substantially the same way as the side-walls thereof, excepting that I use I-beam posts h , the lower ends of which have their inner flanges and necks removed, so as to leave only their outer flanges to form extensions h' similar to extensions e of the ends of the intermediate arch-beams E, that are secured to the outer surface of the webs of the end-sills and have the ends of their shortened webs and inner flanges rest upon the end-sills. The upper ends of these posts h also have their inner flanges and webs shortened, and the outer flange thereof riveted to the depending edges of the arch of the corner arch-beam. I prefer to use but two of these posts h in constructing the end-walls of the car, and to so position them that I can employ a sheet metal plate I of the same width and construction as the sheathing plate F, between the vertical portions of the corner arch-beams, and posts h , and to employ a wider plate J between said posts. These plates I and J of the end-walls have their lower edges j flanged inward, and secured to the upper flange of the end-sill C, and their side-flanges riveted to the longitudinally disposed flange g' of the vertical portion of the corner arch-beam and the web of posts h , and the upper edges of these plates are cut to correspond to the curvature and

incline of the roof, and are also flanged and riveted to the flange g of the said corner arch-beam.

At about the center of the car the side-walls of the car are removed to form a doorway, and a longitudinal plate J' for the arch of the door is provided, which consists preferably, of a suitable T-beam, the flanges of which are riveted or bolted to the lower edges of the short vertical portion of plates F, and have the outer portion of their webs bent downward, and then inward to form runways j' for the rollers of the hangers k of the door K. These doors are, preferably, made of one plate of sheet metal, and their lower edges are bent back upon the body thereof to stiffen the same, and they are likewise stiffened and strengthened by an X-shaped embossment K', the branches of which are, preferably, made tapering from their point of intersection to their ends, substantially as shown in Fig. 1 of the drawings. The T-beam plate J' extends from one vertical edge of the doorway, to and past the opposite vertical edge thereof, a distance corresponding to about twice the width of said doorway, to permit the door K to slide far enough to open the doorway its entire width. The lower edge of the door is confined by a suitable upturned bracket l of conventional shape, which is located and secured to the side-sill, below the center of length of the runway.

I prefer to line the side-walls of the car with short planks or boards L, of a length corresponding to a little less than the distance between the transverse webs of the arch-beams. In order to insert these planks between the arch-beams, so that their ends will be confined by the flanges of the beams, they are inclined, substantially as shown in dotted lines in Fig. 2 of the drawings, and then placed between said beams and made to resume a horizontal position. I prefer to provide these planks with over-lapping longitudinal edges, and to provide a triangular base-strip m for the lowermost plank to rest upon, substantially as shown in Fig. 10 of the drawings. When the lining of the side-walls of the car are thus built up, the planks forming the same are secured by riveting every fourth or fifth one of each tier by means of bolts n , which latter extend outward through the metal sheathing and have their outer ends or heads seated in vertical grooves N made in said sheathing, substantially as shown in Fig. 1 of the drawings. These grooves not only stiffen the plates F forming the sheathing of the side-walls of the car, and protect the outer ends of the bolts or rivets so as to prevent them tearing or abrading the objects they may come in contact with when the car is in motion, but bear inward against and keep the lining planks L bearing tight against the inner

flange of the vertical portions of the arch-beams and prevent looseness of the same.

The rungs M of the ladder at the ends of the car, are riveted to the end side-plate of the sheathing in the usual manner, and the running-board O of the car is supported and secured to the middle of the arch of the roof by means of suitable platforms which are, preferably, secured to the top of the arch-beams, substantially as shown in the drawings.

The floor of the car is made of transverse planks P, the ends of which rest upon and are secured to the flanged lower edges of plates F of the side-walls, and, mediate their ends, these planks are secured to the longitudinal floor timbers Q, that rest upon the needle-beams *x* and the body-bolster B whose ends are secured to the side-sills of the car by suitable castings R, substantially as shown in the drawings.

What I claim as new is:—

1. A car-body comprising a frame-work having a series of flanged transverse arch-beams extending from side to side of the car-body, and sheet metal plates having their side edges secured to the webs of said arch-beams and forming the side-walls and roof of the car.

2. A car-body comprising a frame-work having a series of flanged transverse metal arch-beams extending from side to side of the car-body, and sheet metal-plates secured between and riveted to the webs of said beams and extending coterminous with the same, and forming the side-walls and roof of the car.

3. A car-body comprising a frame-work having a series of I-beam arches extending from side to side of the car, and sheet metal plates secured between and riveted to said beams and extending coterminous with the same, and forming the side-walls and roof of the car.

4. A car-body comprising a frame-work having a series of I-beam arches extending from side to side of the car, and sheet metal plates the longitudinal edges of which are flanged inward and riveted to the webs of said beams, said plates extending coterminous with the I-beams and forming the side-walls and roof of the car.

5. A car-body comprising metallic end-sills, side-sills and center-sills, rolled metal beams secured at their ends to and extending continuously from side-sill to side-sill and forming the frame-work for the side-walls and roof of the car, and sheet metal plates placed between said rolled metal-beams and secured to the webs thereof.

6. A car-body comprising metallic end-sills, side-sills, and center-sills, metal I-beams having their inner flanges and web removed from the end portions thereof and the resulting extended end portion of their

outer flanges secured to said side-sills, and sheet metal plates secured to and between said I-beams.

7. A car-body comprising metal-sills, a frame-work having a series of I-beam arches extending from side to side of the car, and sheet metal plates having their end edges flanged and secured to the side-sills and the longitudinal edges thereof flanged inward and riveted to the webs of said beams, said plates extending coterminous with the I-beams and forming the side-walls and roof of the car.

8. A car-body comprising a frame-work having metallic sills, end arch-frames consisting of a rolled metal beam having a flat web, and two flanges projecting in the same direction therefrom parallel to but short distances removed from its longitudinal edges, which metal beam is bent transversely throughout its length and connects the corners of the end and side-sills, and sheet metal plates and arch-beams forming the side-walls and roof of said car.

9. A car-body comprising a frame-work having metallic sills, end arch-frames consisting of a rolled metal beam having a flat web, and two flanges projecting in the same direction therefrom parallel to but short distances removed from its longitudinal edges, which metal beam is bent transversely throughout its length and connects the corners of the end and side-sills, posts connecting the end-sills and overarched portion of said end arch frame, and sheet metal plates secured to and between said posts, and sheet metal plates and arch-beams forming the side-walls and roof of said car.

10. A car-body comprising a frame-work having metallic sills, end arch-frames consisting of a rolled metal beam having a flat web, and two flanges projecting in the same direction therefrom parallel to but short distances removed from its longitudinal edges, which metal beam is bent transversely throughout its length and connects the corners of the end and side-sills, I-beam posts connecting the end-sills and overarched portion of said end arch-frame, and sheet metal plates having their vertical edges flanged and riveted to the webs of said posts and the longitudinally disposed flange of the end arch-frame, and sheet metal plates and arch-beams forming the side-walls and roof of said car.

11. A car-body comprising metallic sills, arch-beams, the ends of which are connected to the side-sills, sheet metal plates secured to and between said arch-beams having vertically elongated depressions in the outer surfaces thereof, lining strips secured to the inner surface of said plates, and rivets therefor the heads of the outer ends of which are seated in said depressions.

12. A car-body comprising metallic sills, I-beam arches the ends of which are connected to the side-sills, sheet metal plates secured to and between said arches having vertically elongated depressions in the outer surface thereof, lining strips the ends of which are inserted between the flanges of said I-beam arches, and rivets for securing the same to said plates, the heads on the outer ends of which are seated in said depressions.
13. A car-body comprising metallic sills, I-beam arches, the ends of which are connected to the side-sills, sheet metal plates having their longitudinal edges flanged inward and secured to said arches between the flanges thereof, and having vertically elongated depressions in the outer surface of the same, lining strips the ends of which are confined between the flanges of said I-beam arches, and rivets for securing said strips to the inner surface of said plates, the heads on the outer ends of which are seated in said depressions.
14. A car-body comprising metallic-sills, a series of I-beam arches, the ends of which are connected to the side-sills, sheet metal plates secured to and between said I-beam arches, lining strips the ends of which are confined between the flanges of said I-beam arches, and means for securing the same to said plates.
15. A car-body comprising metallic-sills, a frame-work, a series of transversely arranged metallic arches extending from side-sill to side-sill, and sheet metal plates secured to the webs of said arches, and forming the side-walls and roof of the car, the former of which is provided mediate the ends of the car with a doorway, and horizontally disposed flanged metal beams forming the arch of said doorways, metal arches the ends of which terminate at said plates,

and sheet metal plates connecting said last mentioned arches and forming the roof of the car above the doorways.

16. A car-body comprising a frame-work having a series of flanged transverse arch-beams extending from side to side of the car, and sheet metal plates having inwardly flanged edges that are secured to the webs of said arch-beams and form the side-walls and roof of the car.

17. A car-body comprising a frame-work having a series of flanged transverse arch-beams extending from side to side of the car, and sheet metal plates having inwardly flanged edges secured to the webs of said arch-beams and with the outer flanges of said arch-beams lapping against their outer surfaces.

18. A car-body comprising a frame-work having a series of flanged transverse arch-beams extending from side to side of the car, and sheet metal plates having inwardly flanged edges that are secured by means that penetrate the inwardly flanged edges of the adjacent plates and the webs of the arch-beams engaged thereby.

19. A car-body comprising a frame-work having a series of flanged transverse arch-beams extending from side to side of the car, and sheet metal plates having inwardly flanged edges secured by means that penetrate the webs of said arch-beams and the inwardly flanged edges of the adjacent plates and with the outer flanges of said arch-beams lapping against their outer surfaces.

In testimony whereof I have hereunto set my hand and seal this 7th day of April, A. D. 1908.

WILLIAM P. BETTENDORF. [L. S.]

Witnesses:

G. S. THOMPSON,
E. K. LUNDY.