

No. 701,720.

Patented June 3, 1902.

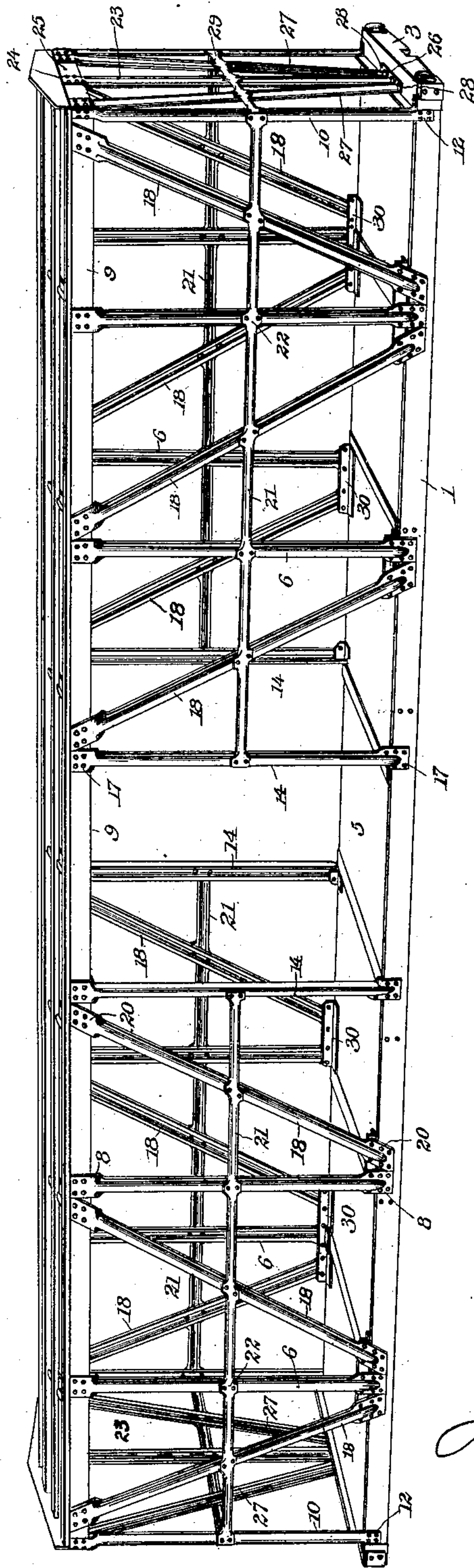
J. M. HANSEN.
METALLIC FRAME BOX CAR.

(Application filed July 26, 1901. Renewed Apr. 11, 1902.)

(No Model.)

4 Sheets—Sheet 1.

Fig 1



Witnesses:

Ed. Finckel
Ada Briggs

Inventor:

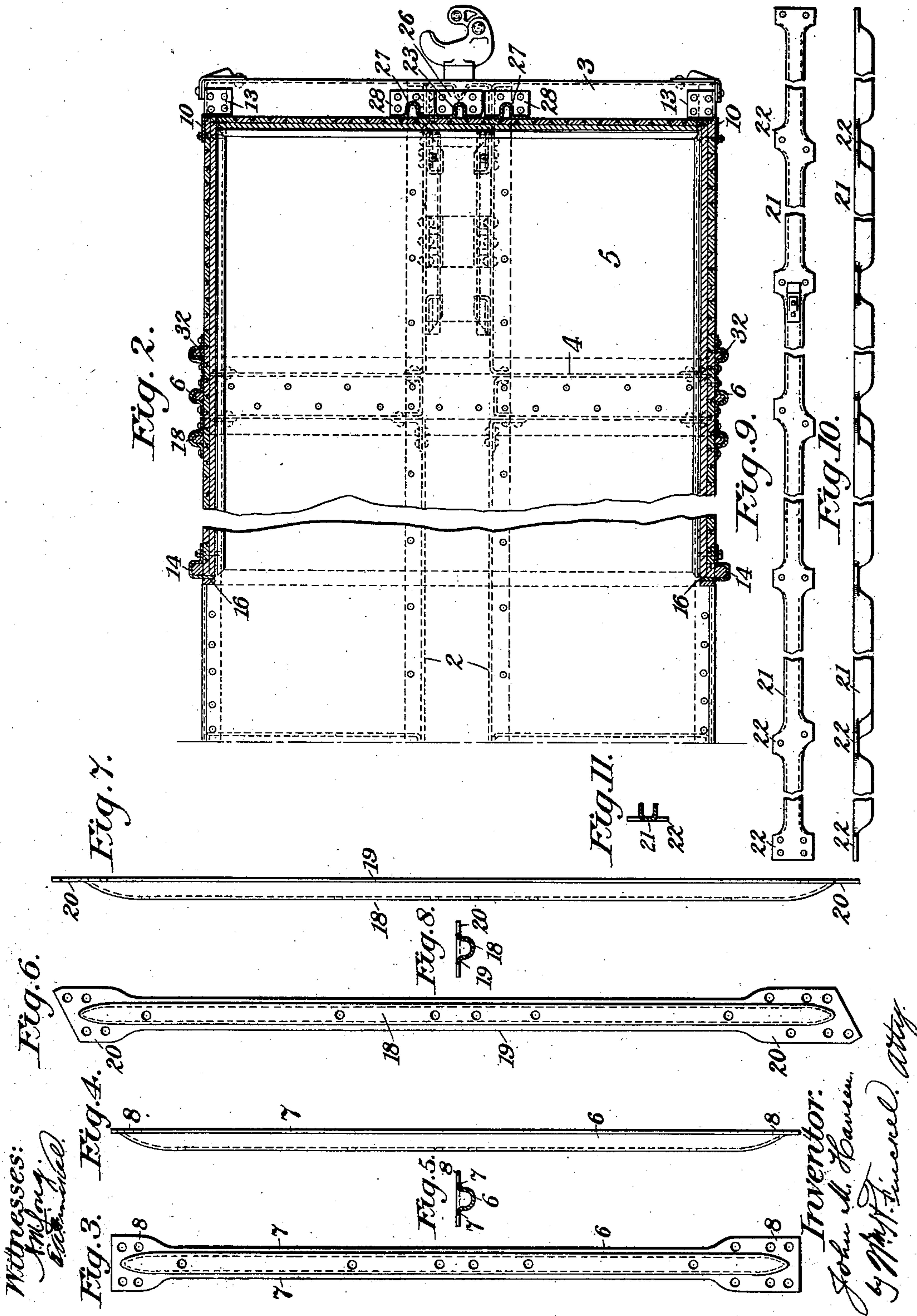
John M. Hansen
by *Wm. H. Finckel*
Atty.*

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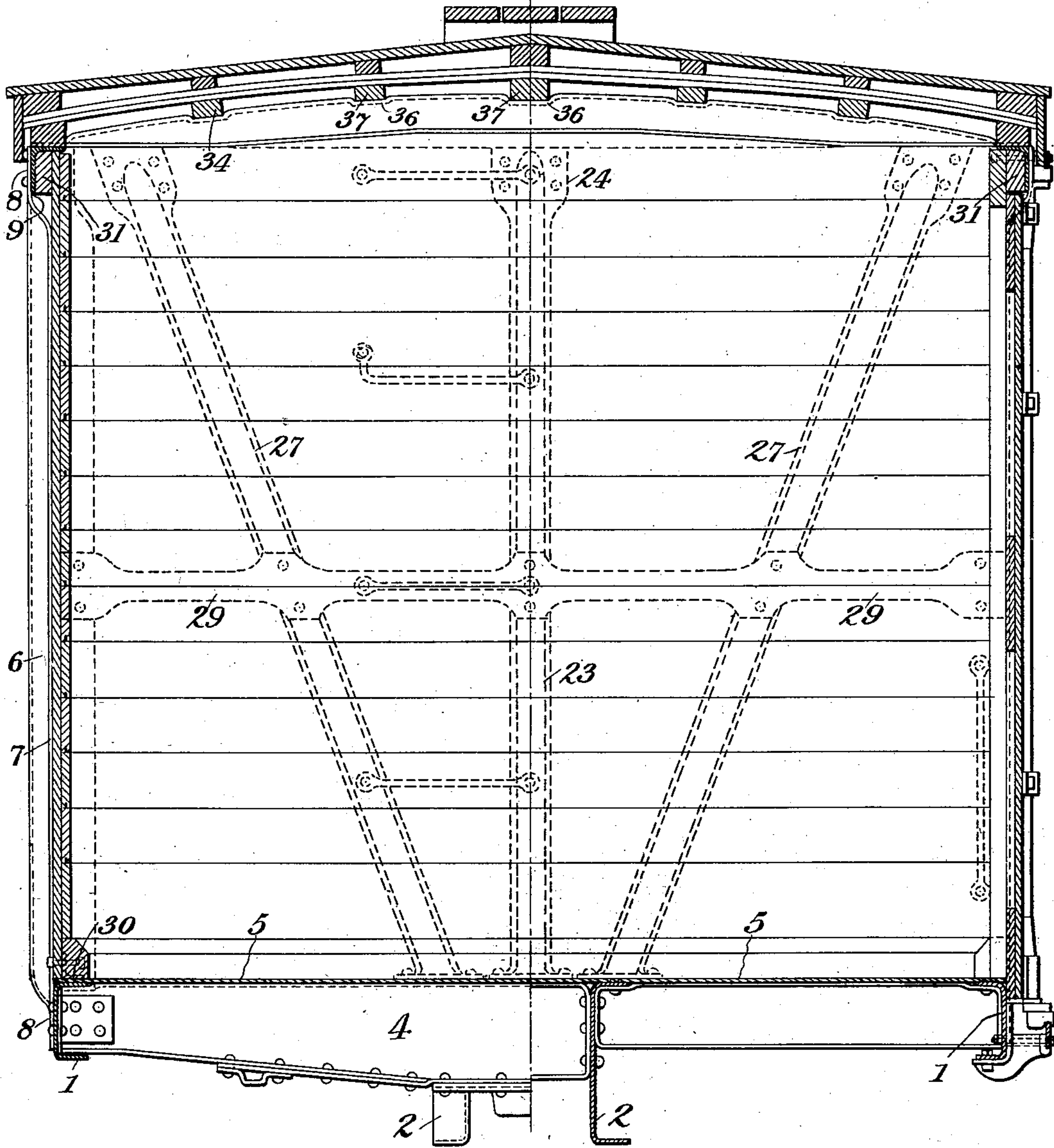
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Fig. 12.



Witnesses:

J. M. Long.
E. J. Finckel.

Inventor:

John M. Hansen
by W. H. Finckel
Att'y

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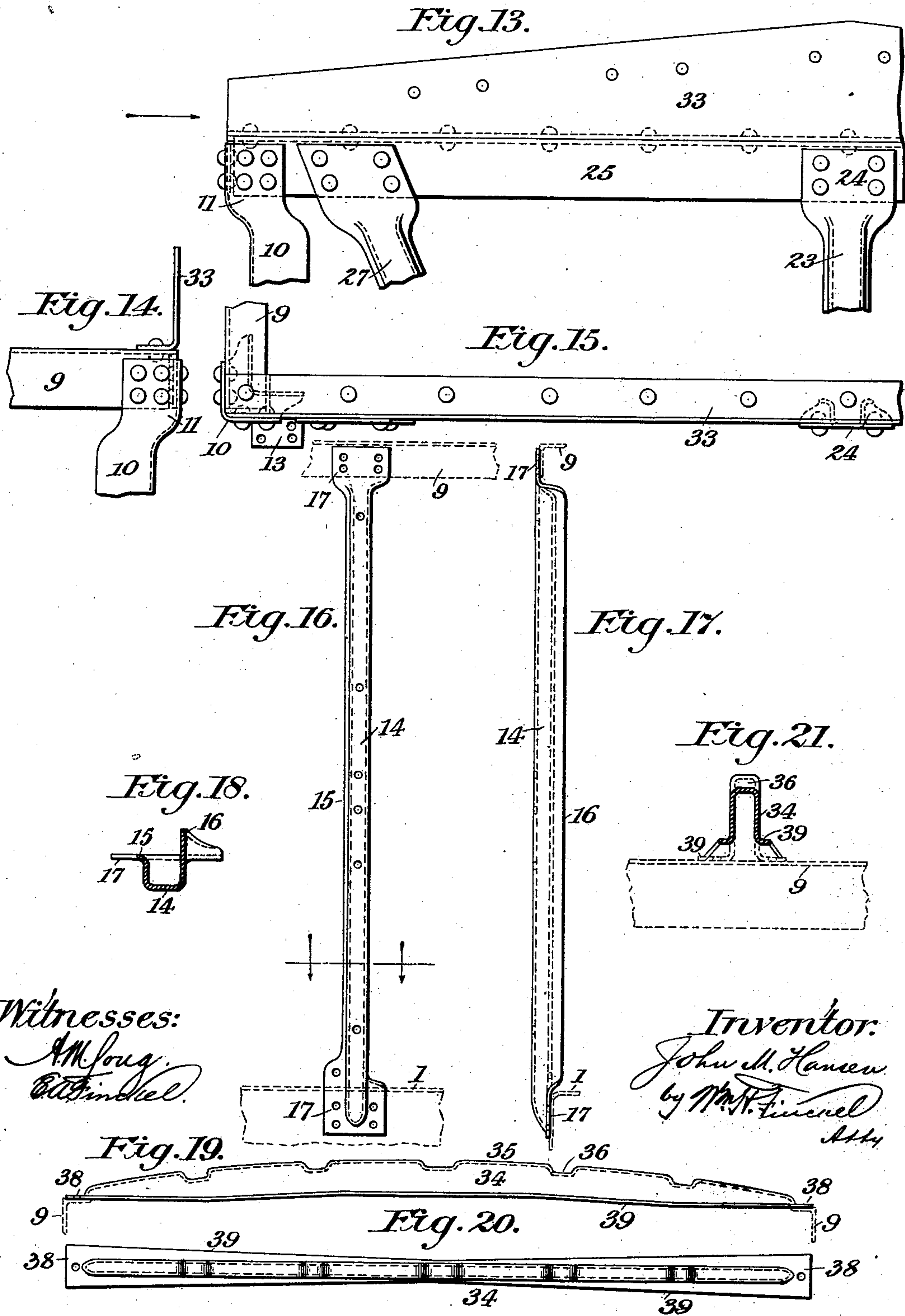
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(No Model.)

4 Sheets—Sheet 4.



Witnesses:

A. M. Soudy.
C. H. Finckel.

Inventor:

John M. Hansen
by W. H. Finckel
Att'y

UNITED STATES PATENT OFFICE.

JOHN M. HANSEN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO PRESSED STEEL CAR COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

METALLIC-FRAME BOX-CAR.

SPECIFICATION forming part of Letters Patent No. 701,720, dated June 3, 1902.

Application filed July 26, 1901. Renewed April 11, 1902. Serial No. 102,473. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. HANSEN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Metallic-Frame Box-Cars, of which the following is a full, clear, and exact description.

The object of this invention is to provide a metallic frame for the body of a box-car or similar car of sufficient strength and rigidity or stiffness to adequately support the wooden and other parts and roof and to withstand the strains to which the car is subjected in service.

In carrying out the invention use is made of pressed-steel shapes so far as they are available, and while it is preferred to use this construction still it is to be understood that the invention is not limited to such use.

The invention consists, first, of a car-frame of metal having end posts, braces, and girths combined with each other and with the end sills, end plates, and corner-posts; second, of side posts, braces, and girths combined with each other and with the corner-posts, door-posts, side plates, and side sills; third, of hollow posts adapted to receive wooden nailing-strips, and, fourth, of carlines of peculiar construction and arrangement, all as will be hereinafter more particularly described and finally claimed.

In the accompanying drawings, illustrating this invention, in the several figures of which like parts are similarly designated, Figure 1 is a perspective view of the metallic frame or skeleton of a box-car body. Fig. 2 is a horizontal section taken in the plane of the top of the floor and showing half of the car broken away between bolster and doorway. Fig. 3 is a front elevation. Fig. 4 is a side view, and Fig. 5 is a cross-section, of one of the posts. Fig. 6 is a front elevation. Fig. 7 is a side view, and Fig. 8 is a cross-section, of one of the braces. Fig. 9 is a front elevation, and Fig. 10 is a side view, of one of the girths broken out at intervals, and Fig. 11 is a cross-section illustrating any one of the girths. Fig. 12 is a vertical cross-section of a car-body and underframe, the right-hand side being

substantially in the plane of the doorway and the left-hand side being substantially in a plane in front of the bolster. Fig. 13 is an elevation, on a larger scale, of part of the upper portion of one end of the car-frame. Fig. 14 is an end elevation of Fig. 13 looking in the direction of the arrow opposite Fig. 13. Fig. 15 is a top plan view of the parts shown in Fig. 13. Fig. 16 is a front elevation, and Fig. 17 is an edge view, of the door-post, and Fig. 18 is a cross-section, on a larger scale, of the door-post. Fig. 19 is a front elevation, and Fig. 20 is a top plan view, of the carline, and Fig. 21 is a central cross-section, on a larger scale, of the carline.

Parts herein shown but not particularly described may be of any usual or approved construction, and without going into details the underframe may be and is here shown as including pressed-steel side sills 1 and center sills 2, connected by suitable transoms or diaphragms, end sills 3, bolsters 4, and floor-plates 5, constructed and arranged in accordance with the practice of the Pressed Steel Car Company.

The frame of the body of a box-car may be constructed in accordance with this invention as follows: Side posts 6 are provided, having a channel, trough, or substantially U-shape cross-section with lateral flanges 7, as shown especially in Figs. 2, 3, 4, and 5, and terminating in flat end portions 8, by means of which the said posts may be riveted or otherwise rigidly united at opposite ends, respectively, to side plates 9 and the side sills 1. The corner-posts 10 are substantially of rectangular cross-section, as shown in Figs. 2 and 15, and have their upper ends 11 deflected, as shown in Figs. 1, 13, 14, and 15, to conform to the roof projection and secured by rivets or otherwise to the side plates 9 and also to end plates, presently described, and each having a vertical foot 12 for riveting to the side sill and a horizontal foot 13 for riveting to the end sill. (See Figs. 1, 2, and 15.) The door-posts 14, as shown more especially in Figs. 1, 2, 16, 17, and 18, have a substantially U-shape body, with one lateral flange 15 extending parallel to the side of the car,

and a leg or door-jamb flange 16 and flat ends 17, opposite ends 17 being attached, respectively, to the side plates and side sills. Between adjacent posts are arranged the oblique or diagonal braces 18 of substantially the construction of the posts 6, as will be seen by reference to Figs. 6, 7, and 8. The braces 18, which are arranged adjacent to the posts substantially in the plane of the body-bolsters, diverge in opposite directions, and thus constitute, with the interposed post, a trussed construction of great strength at a point of great strain and weakness. These braces have lateral flanges 19 and also have flat ends 20, opposite ends 20 being attached, respectively, to the side plates and side sills, as shown in Figs. 1, 6, and 7. The end posts, side posts, and door-posts are connected at or somewhat below their longitudinal center by means of a girth or girths 21, which may be of channel form and with flat portions, as 22, at the points where these girths intersect the various posts and braces, (see details, Figs. 1, 9, 10, and 11,) whereby the girths, braces, and posts may be riveted or otherwise rigidly united. The ends of the car-frame have posts 23, the upper ends 24 of which are flat and riveted to the end plates 25, and the lower ends 26 of which are bent out at substantially right angles, as shown in Figs. 1 and 2, and riveted to the end sills. These posts 23 are of substantially the construction otherwise of the posts 6. Between the posts 23 and the corner-posts 10 and diverging from the feet 26 of the posts 23 are oblique braces 27 of substantially the construction of the side braces 18, excepting that their feet 28 are bent out horizontally for riveting to the top of the end sills. (See Figs. 1 and 2.) The end posts and end braces are united by means of end girths 29, which, as in the case of the side girths, are made of channel form, with flat portions where the girths intersect with the corner-posts, end posts, and end braces, as shown more particularly by the dotted lines, Fig. 12, and as seen in Fig. 1, whereby they may be riveted or otherwise rigidly secured thereto.

If desired, angle-pieces 30 may be arranged upon the inside and riveted to adjacent posts and braces by one flange and to the car-floor or side sills by the other flange.

Both the side plates and the end plates may be made as right angles in order to receive the wooden nailing-strips 31, as shown in Fig. 12.

The posts and also the braces and, if desired, the girths, too, are hollow or made trough-like not only for strength, but also to receive, where required, wooden nailing-strips, as shown, for example, at 32 in Fig. 2.

The gables 33 may be of metal of L shape in cross-section, as shown more particularly in Figs. 13, 14, and 15, and riveted to the end plates.

The carlines 34 are of inverted-trough shape or hollow, as seen in Fig. 21, with their

upper edges 35 of substantially the profile of the roof and provided with depressions 36, forming pockets to receive the roof-boards, strips, or purlins 37, as shown in Fig. 12, and these carlines are provided with end flanges 38, by means of which they are riveted or otherwise rigidly united to the side plates. As shown in Figs. 12, 19, 20, and 21, the bases of the carlines have lateral flanges 39 and the carline as a whole is substantially a hollow arch.

In Fig. 12 the roof is shown as comprising the well-known Winslow metal-roof construction; but the invention is not limited to the roof construction outside of the novel form of carlines herein shown and described and preferred.

The construction of frame hereinbefore described differs mainly from prior constructions in that it is composed of metal posts, braces, side plates, end plates, girths, and carlines, which may be riveted together, and a distinguishing feature of the posts, braces, girths, and carlines is that they are hollow or of trough or U shape in cross-section. This U-shape cross-section of the posts provides for the reception of square nailing-strips on the inside, so that the wooden lining of the car can be nailed thereto, and in this way the nailing-strip does not increase the over-all dimensions of the posts in the least degree. Both the posts and the braces having this U-shape cross-section can be produced by pressing from plates of uniform width and with ends wide enough for the application of rivets at top and bottom where they are connected to the sills and plates. It will be observed, further, that the U shape increases in depth from the ends toward the center, substantially as indicated in Fig. 4, so that in the middle of the post and brace the greater depth will afford the maximum resistance against compression and bending.

The ends of the car require more strength at the center and at a point about one-third of the way from the bottom than elsewhere, and the arrangement of post, braces, and girth herein shown obtains this strength.

By providing horizontal feet at the bottoms of the end posts and braces and applying these feet to the end sills brings their rivets into direct shear instead of being partially in tension, as is the case with the side posts and braces, and thus the greatest strength is obtained at the point where most needed. Another advantageous feature of this construction is that the metal side and end girths are shaped so that between the posts and braces nailing-strips can be secured inside of the girths, while at the posts and braces the girths are flat to afford surfaces for riveting. These girths tie the center of all the posts and braces together, thus making them act more or less as one piece.

The construction of door-posts shown and described is adopted because more strength is required therein than in the intermediate

posts, and the leg or flange 16 of these door-posts which extends in toward the center of the car, as seen especially in Fig. 2, offers a very smooth finish for the door-frames, and thus does away with the necessity for the use of metal strips heretofore frequently applied on a wooden frame at this point.

The hollow carline having pockets for the reception of the purlins possesses the advantage of great strength and of retaining the purlins in position.

Other forms of underframe and roof construction than those described may be employed in carrying out the invention and are intended to be included in the claims herein.

What I claim is—

1. A skeleton frame for car-bodies, having side and end sills, side and end plates, hollow, vertical posts secured to the sills and plates, and adapted to receive wooden nailing-strips, oblique braces interposed between the posts, sills and plates, and transverse girths secured to the posts and braces, said girths having flat portions at their points of intersection with the posts and braces and said posts, braces and girths terminating in flat ends.

2. A metal car-frame, having ends comprising essentially sills and plates, right-angle corner-posts, an intermediate vertical post, and oblique braces diverging upwardly from the foot of the intermediate post, the said intermediate post and braces being of substantially U shape in cross-section, with flat ends and secured to the said end sills and plates by riveting through such flat ends.

3. In a car-frame, an end having a central, vertical, hollow post, and oblique braces of similar construction, the upper ends of the said post and braces being flat and the lower ends being substantially horizontal, the said several ends being rigidly secured in place.

4. A metal frame for car-bodies, composed essentially of hollow, vertical posts, hollow diagonal braces, and transverse girths of channel cross-section, with flat portions at the points of intersection with the posts and braces and riveted at such points and through such flat portions to the said posts and braces, substantially as described.

5. In a car-frame, a post constructed of pressed steel, U shape in cross-section midway between ends and having flat ends, similarly-constructed diagonal braces, and channel-girths having flat portions to fit the posts

and braces, the said posts, braces and girths adapted to receive wooden nailing-strips.

6. In a car-frame, a vertical post arranged substantially in the plane of the bolster, diagonal braces springing from the foot of the post, and a girth connecting said post and braces, said several parts constructed of hollow or channeled metal with flat intervening portions and flat ends, substantially as described.

7. In a car-frame, vertical side, end and corner posts, diagonal braces between adjacent posts, and girths intersecting and riveted to said posts and braces and having flat portions at the points of intersection and flat ends, combined with the underframe and the roof construction to which the posts and braces are riveted, substantially as described.

8. A hollow metal door-post for cars, having one leg or flange projecting inwardly toward the center of the car, substantially as described.

9. A hollow metal door-post, for cars, of channel form, having one leg or flange projecting inwardly toward the center of the car, the other leg laterally flanged and its ends flattened.

10. A carline of pressed steel, provided with pockets in its upper solid face for the reception of the purlins.

11. A hollow pressed-steel carline, provided with a foot-flange 39, end flanges 38, and pockets 36 in its solid face for the reception of the purlins.

12. A pressed-steel post, for car-frames, of channel form, provided with lateral flanges extending continuously between its ends and flat end portions.

13. A pressed-steel brace, for car-frames, of channel form, provided with lateral flanges extending continuously between its ends, and flat end portions.

14. A pressed-steel girth, for car-frames, of channel form and having flat portions at its ends and at intervals throughout its length, and adapted to be riveted to the posts and braces of the frame, substantially as described.

In testimony whereof I have hereunto set my hand this 24th day of July, A. D. 1901.

JOHN M. HANSEN.

Witnesses:

WM. BIERMAN,
CHAS. F. CHUBB.