

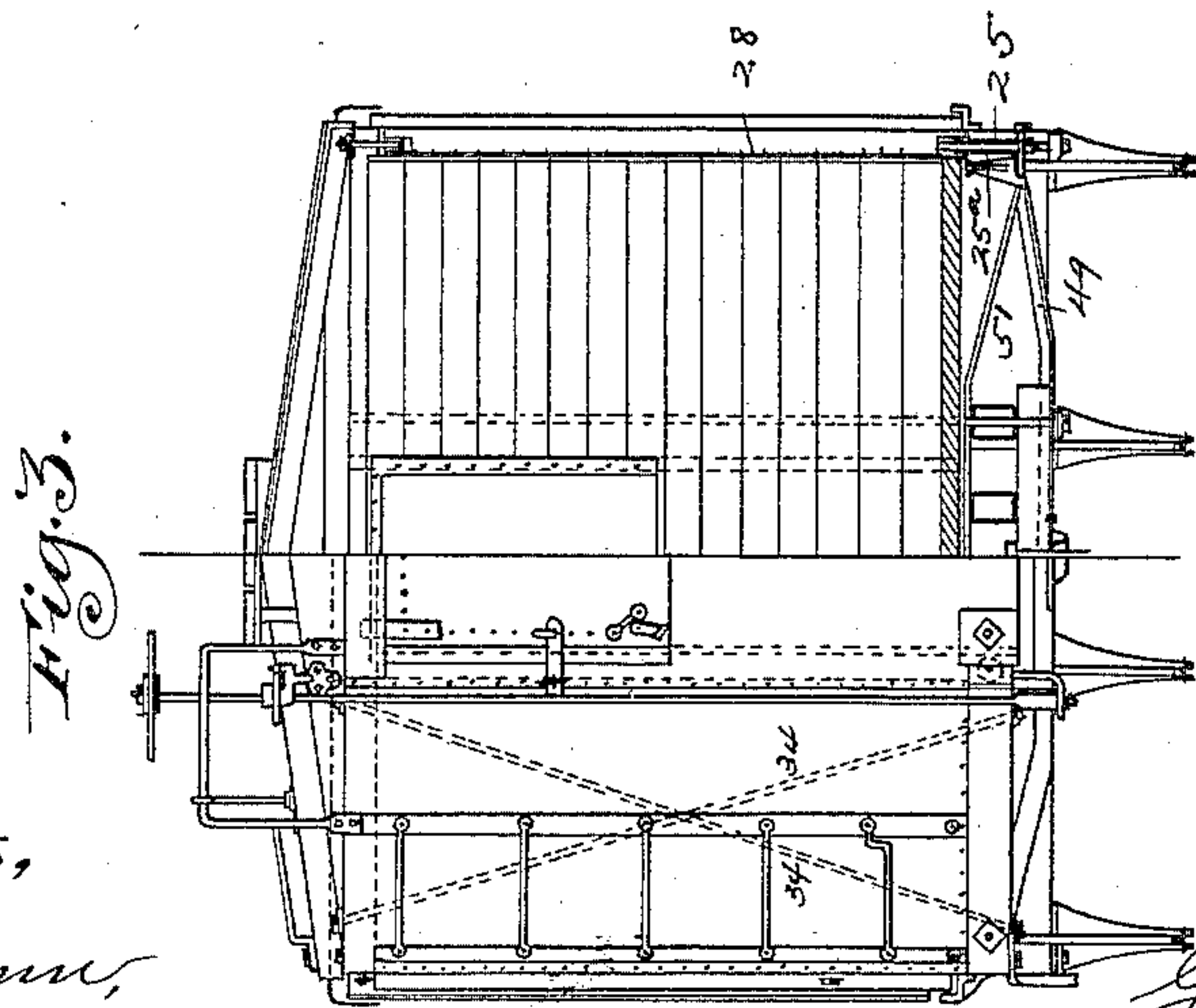
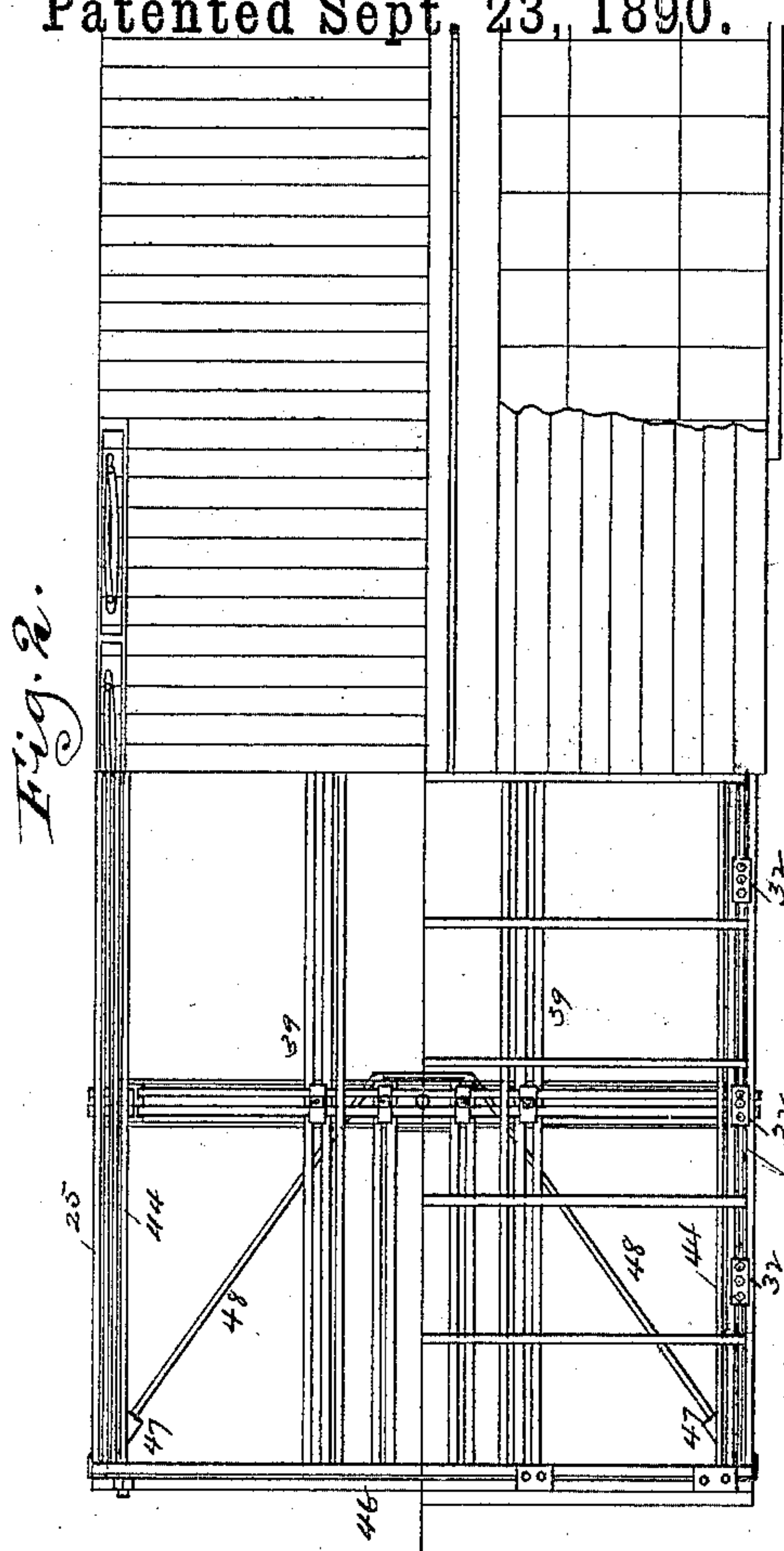
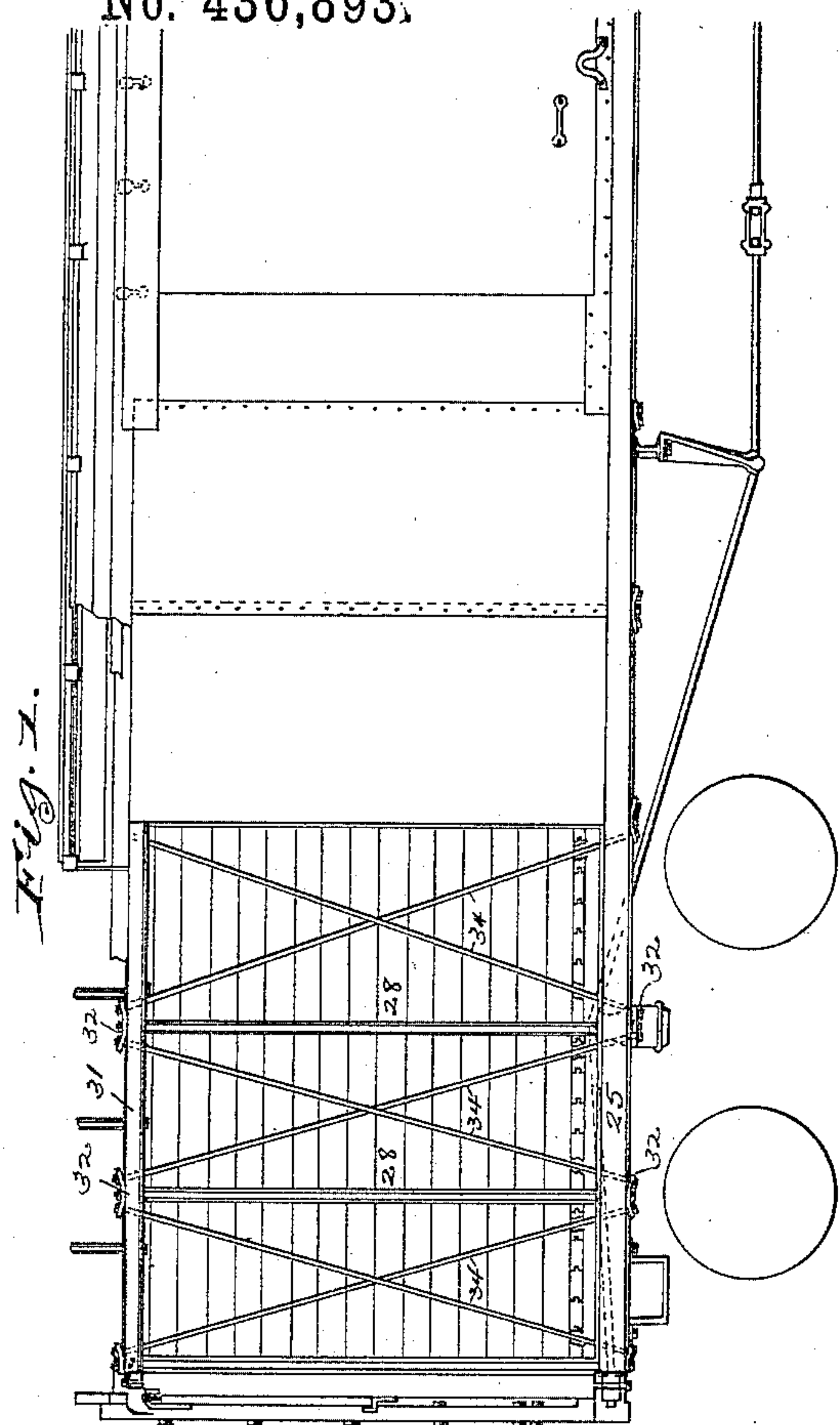
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G. L. HARVEY.
CAR CONSTRUCTION.

No. 436,893.

Patented Sept. 23, 1890.



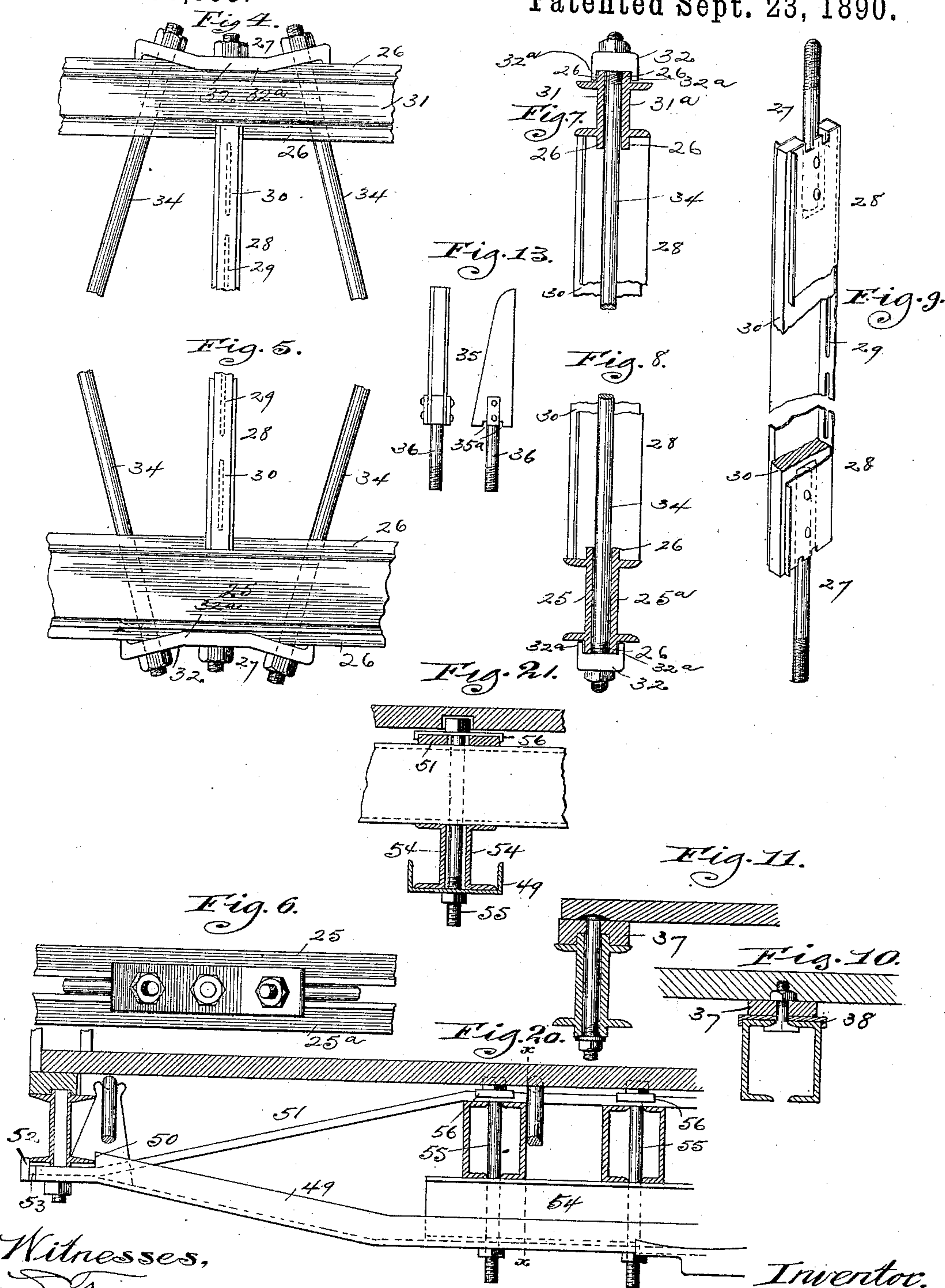
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4 Sheets—Sheet 2.

No. 436,893.

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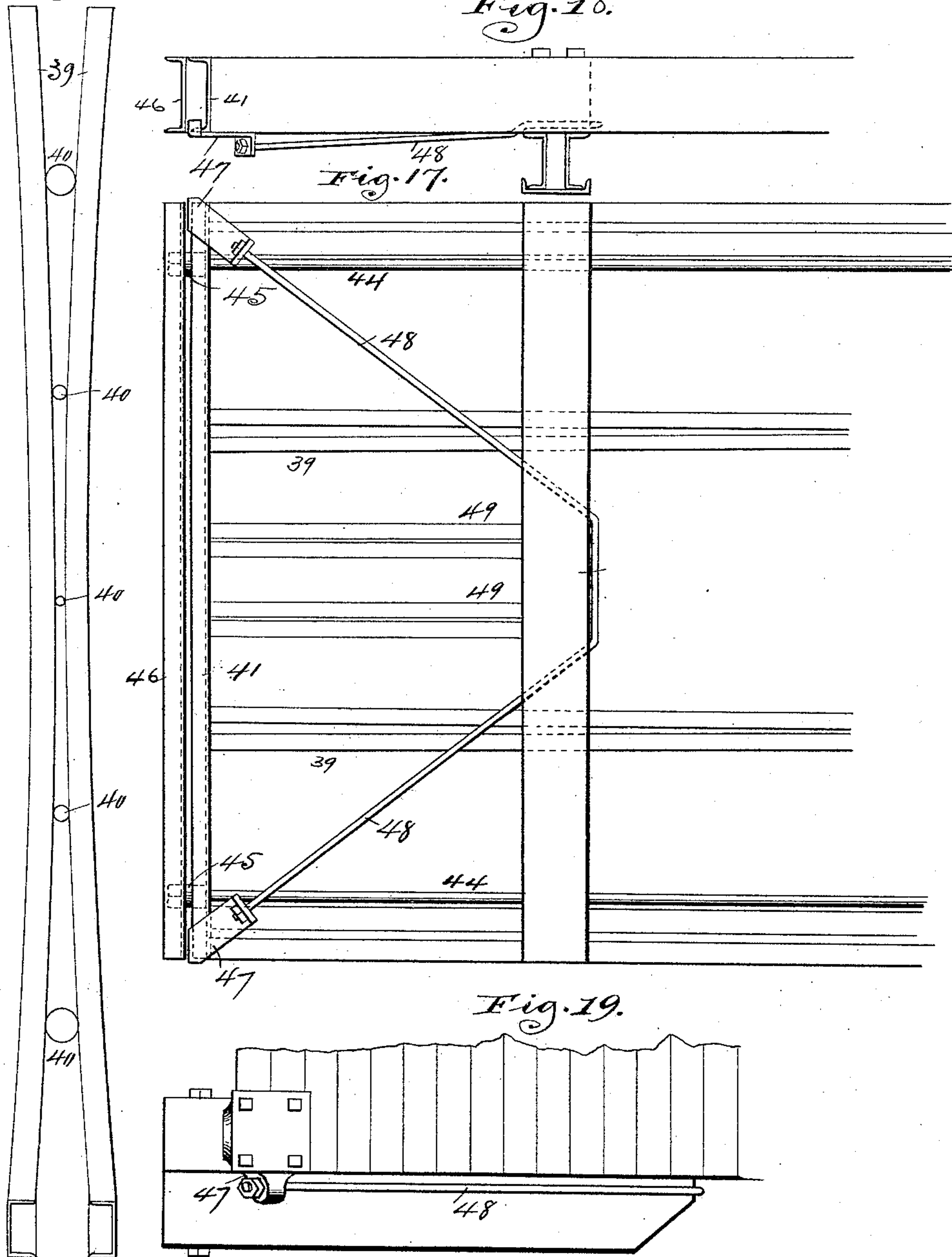
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Fig. 1a.

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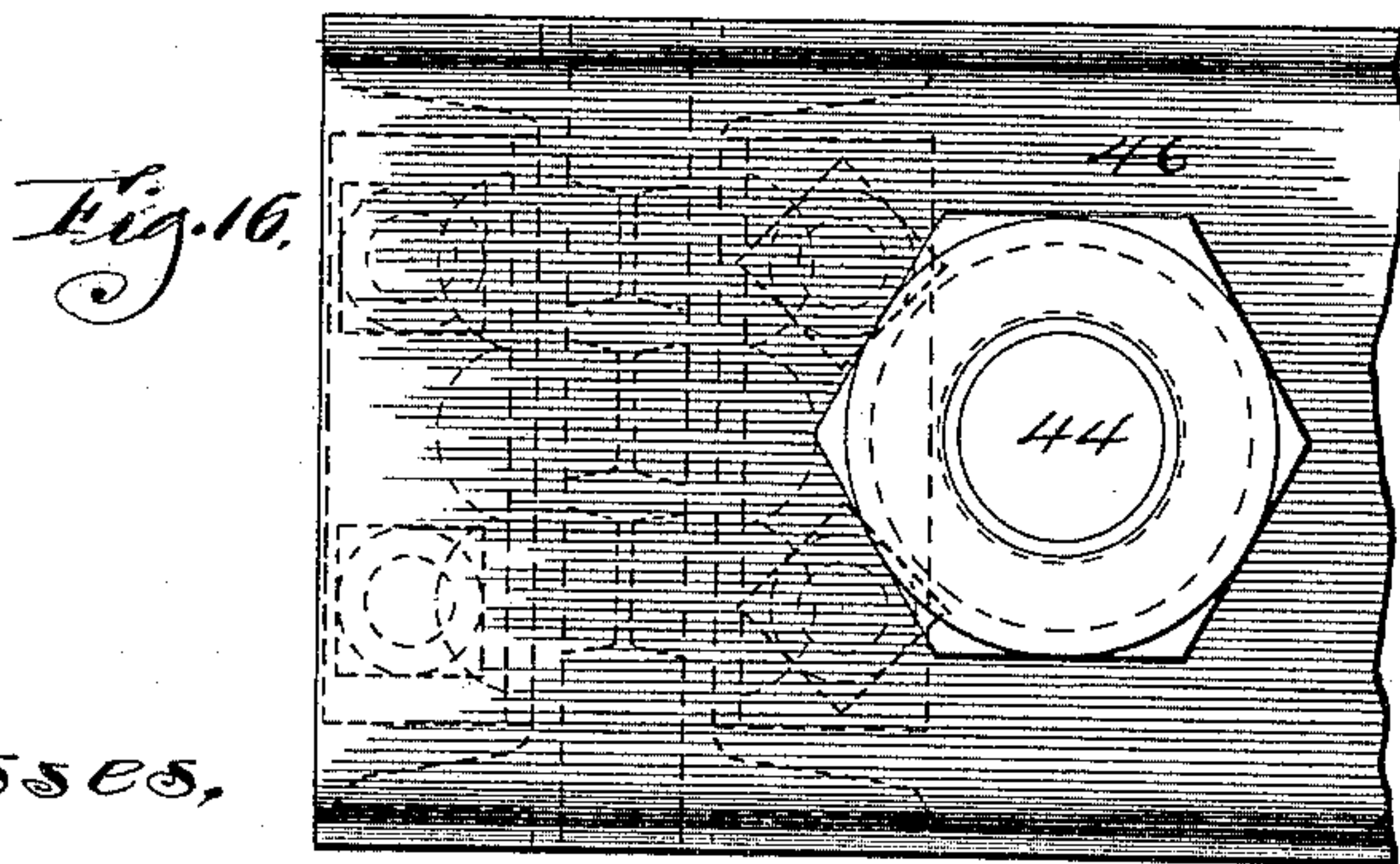
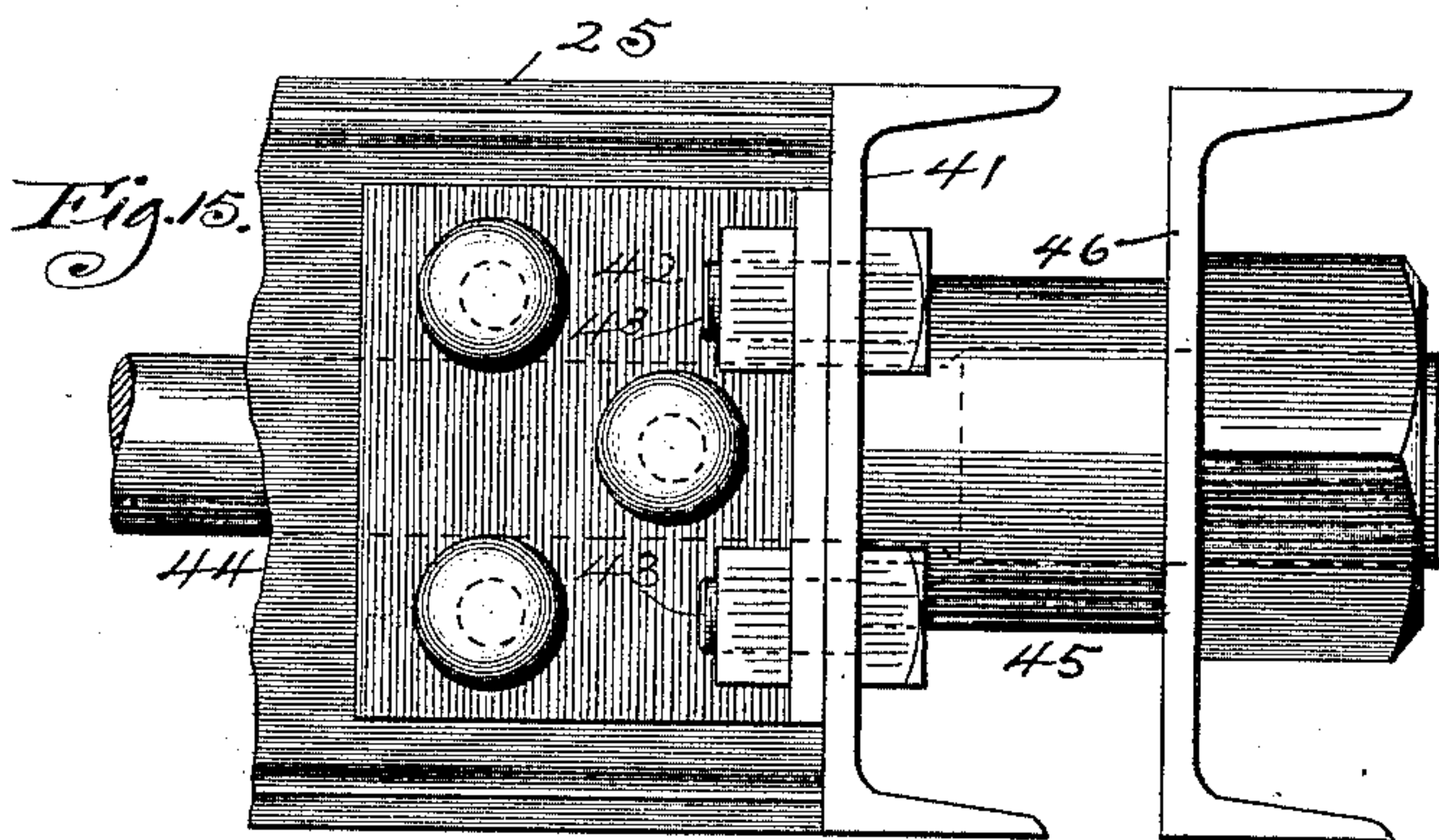
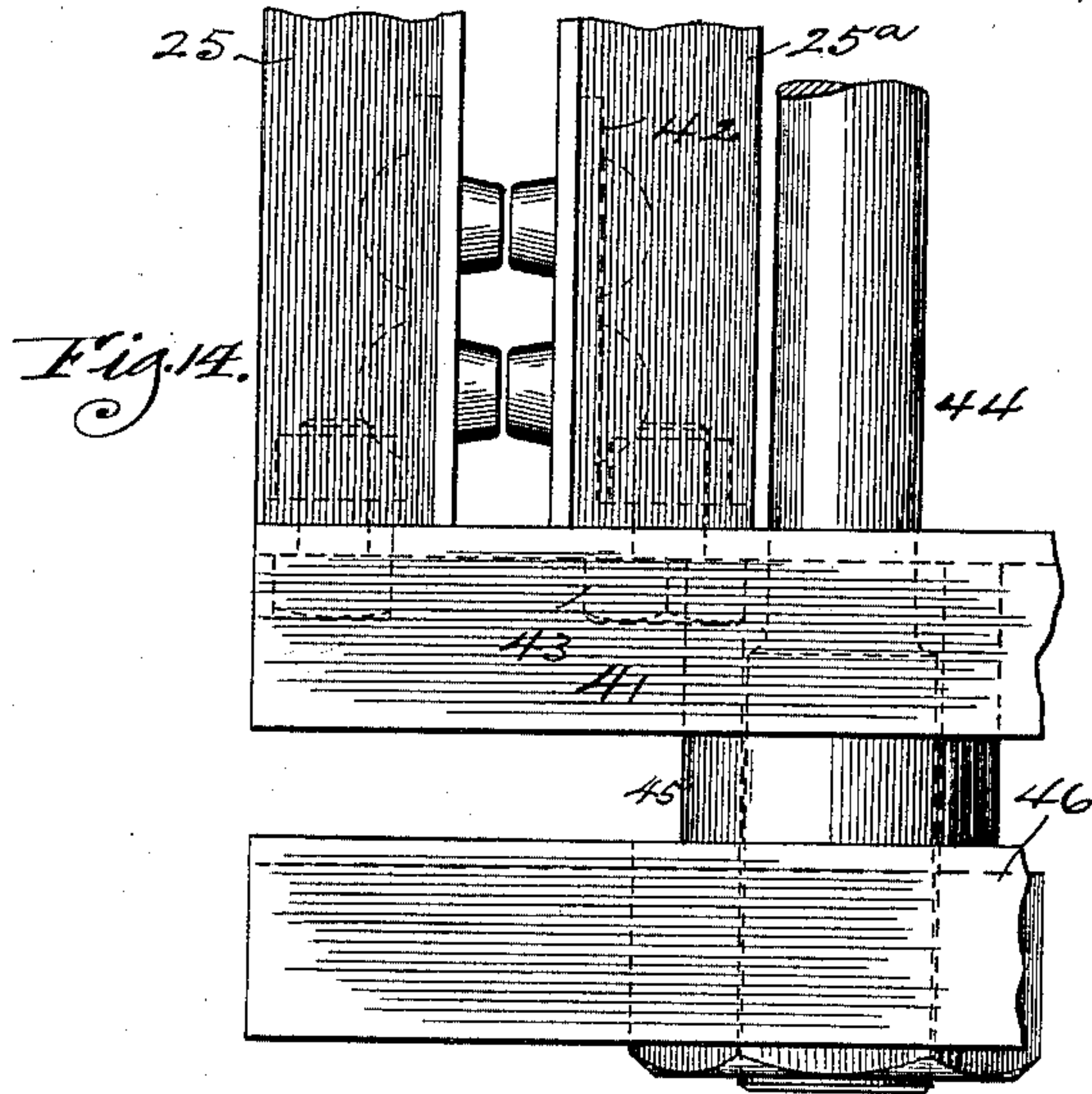
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UNITED STATES PATENT OFFICE.

GEORGE L. HARVEY, OF CHICAGO, ILLINOIS.

CAR CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 436,893, dated September 23, 1890.

Application filed June 10, 1890. Serial No. 354,942. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. HARVEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car Construction, of which the following is a specification.

My invention has for its object to improve the construction of freight-cars so as to secure maximum strength and at the same time reduce the weight of the cars; and to effect these ends I use as the preferred material of the car-frame metallic beams, which are preferably doubled for the sills and plates, the posts being secured by having their projecting ends passed between the members of the sills and plates, respectively, and secured above the plate and below the sill, thereby anchoring these members together without weakening the frame by mortising or by bolt or rivet holes.

The particular features of improvement comprised in my present invention relate to such a construction of the side sills and top plates as will enable the securing of a firm bearing of the posts thereon, whereby lateral movement of the parts is obviated, and to this end I provide a projecting flange lying in the plane of the web and at right angles to and projecting above the flanges of the beams, and the posts and cap-plates which secure the posts are fitted to these flanges.

Another feature of my improvement is a novel manner of securing the floor, and this is easily accomplished when the double longitudinal sills are employed by passing bolts or other fastenings through the floor-strips and between the members of the double sills, the head of the bolt having a bearing on the flanges directly or on a plate embracing the flanges.

Another feature of my improvement relates to a novel construction of the end sill of the car, which consists of two members, the inner one bolted to the ends of the longitudinal sills and having the body truss-rods passed through its substance and projected beyond it and supporting thereon the outer members of the end sill, with an interposed distance-piece between the two members, whereby the bolts or rivets of the inner member are projected and space is provided for passing the

end posts of the frame between the members of the end sill.

Another feature relates to a peculiar configuration of the interior sills of the car, whereby they are enabled to withstand shocks without buckling.

Still another feature of my improvement relates to a novel method of stiffening the end sills to prevent their crushing in collision and the knocking out of the draw-gear, and this construction also stiffens the corners of the frame. To attain these ends, I take a V-shaped rod, secured at its ends to the end sill toward the side of the car-body, and the middle portion of this rod has a bearing on the ends of the draw-gear timbers, so that any shock on said timbers is transmitted through these sills to the corners of the car-body instead of being exerted along the coupling-line. I have also improved the construction of the body-bolster and have provided a novel method of securing the sheathing and siding to the posts.

In the accompanying drawings, Figure 1 is a side elevation, partly broken away, of a car of my improved construction. Fig. 2 is a plan view with portions of the roof and floor removed. Fig. 3 is an end elevation, one-half of the figure being in vertical section through the body-bolster. Figs. 4, 5, and 6 are fragmentary detail views showing the manner of applying the posts, Fig. 4 being a side elevation of a fragment of the top plate, Fig. 5 a like view of the side sills, and Fig. 6 is an inverted plan view of the parts shown in Fig. 5. Figs. 7 and 8 are side elevations of the respective ends of one of the posts; Fig. 9, a broken perspective of the same, and particularly intended to show a wooden filling for the metallic posts and apertures, whereby said filling is secured with the posts, and for the passage of fastenings for the finish of the car. Fig. 10 is a cross-sectional elevation of the interior sill, showing the manner of securing the floor thereto. Fig. 11 is a section of the floor and stringers upon which it is laid, and showing a bolt anchoring said stringers to the side sills. Fig. 12 is a plan view of one of the interior sills composed of two curved members. Fig. 13 shows a stake for gondola-cars, adapted to be secured with the side sills by having its end projected between them. Figs.

14, 15, and 16 are detail views of the corner of the frame, showing the manner of supporting the end sills and connecting them with the longitudinal sills, Fig. 14 being in plan, Fig. 15 in side elevation, and Fig. 16 an end elevation, the side sills showing in dotted lines. Fig. 17 is an inverted plan view of the end of the frame, showing the method of bracing the end sills and anchoring the draft-sills. Fig. 18 is a side and Fig. 19 a like elevation of the same parts, the latter showing wooden longitudinal sills. Fig. 20 is a side elevation of one end of the body-bolster; and Fig. 21, a transverse section thereof, taken on the line *xx* of Fig. 20.

In the drawings, 25 25^a represent the two members of the sidesills of the car, and these members are preferably metallic channel-beams turned back to back. These beams have integral flanges 26 extending in the plane of the webs and projecting beyond the surface of the flanges and at right angles thereto, and the members 25 25^a are separated to permit the passage of the projecting ends 27 of the posts 28. These posts are preferably metallic U-beams, whose flanges are apertured, as shown at 29, the apertures being elongated slits. A wooden filling 30 is inserted in the hollow of these posts, and is secured thereto by screws or nails which are adapted to pass through the apertures, their heads engaging the edge of the aperture. The wooden filling projects beyond the U-beam, and to this projecting edge the covering of the car is nailed, the projection being sufficient to allow for shrinkage. The elongated apertures allow the passage of nails or screws into the filling to secure the inside finish. The projections 27 of the posts may be bars or rods welded or riveted between the flanges of the U-beam, or the web of the beam may be projected for this purpose. The ends of the projections are threaded or provided with key-holes, and suitable fastenings—such as nuts or keys—are applied to the ends. The plates are in all respects similar to the side sills and are marked 31 31^a.

In order to clamp the members of the outside sills and top plates together, I use the metallic cap-pieces 32, which are pressed, flanged, or cast to provide the lips or flanges 32^a to embrace the flanges 26 of the sills and top plates, and are also apertured for the passage of the projecting ends of the posts through them.

34 are diagonal bracing-rods whose ends are secured to the sills and top plates by being passed through the ends thereof, respectively, and through apertures in the top plates, and fastenings are applied to said ends.

In Fig. 14 I have shown a stake 35 for a gondola-car, which stake has a threaded shank 36, adapted to be passed between the members of the side sills and secured below them when a double sill is employed. This means of fastening prevents the working out and loosening of the stake in service, and the bet-

ter to adapt it to be secured on the side sills of the construction previously described I have notched the lower end of the body of the stake, as seen at 35^a, and these notches form seats to receive the flange 26 on the beam.

In Figs. 10 and 11 I have shown a novel manner of securing the stringers or floor-strips to the longitudinal sills of the car. 37 represents said strips, which are laid upon the tops of the sill members or upon an interposed clamping-plate 38, and bolts are passed through these strips and plates and between the members of the sills, their heads engaging the flanges thereof, as seen in Fig. 10; or, in the case of the outside sills, the bolts may be projected below the sills and secured by a nut taking its bearing on the lower flanges 26, while the floor-strips 37 are notched to receive the flanges 26 on the upper sides of the sills.

In Fig. 12 I have shown an interior sill constructed from two flanged metallic beams curved from end to end and placed with their convex sides toward each other. The members of the sill are marked 39, and they are separated by distance-blocks 40; or, instead of said distance-blocks, the bolts which secure the floor, body-bolster, and needle-beam to the sills may be made to subserve this purpose. The practical effect of this construction is to transmit the buffing strains through these sills without danger of bending or buckling them, as each braces the other. The end sills are also constructed from two channel-beams presenting outwardly, the inner member whereof is marked 41, and is connected to the longitudinal sills by means of angle-plates 42, whose members are secured by the bolts 43 to the webs of the end-sill members and the longitudinal sill, respectively.

44 represents the body truss-rods, which pass through the webs of the sill member 41 and carry on their projecting ends distance-pieces 45, against which the second member 46 of the end sills take a bearing, and nuts or other securing devices are applied to the projecting ends of the truss-rods to hold the outer member thereon. By this means the projecting ends of the posts may be passed between the projecting ends of the end sills, and the outer member protects the securing bolts or rivets in case of shock or collision. The interior sills are secured in the same way as the outside sills to the inner end-sill member.

In Figs. 17, 18, and 19 I have shown means for bracing the end sills and the corners of the car and for preventing the knocking out of the draw-gear.

47 represents angle-plates which are engaged with the corners of the inner member of the end sill and the outer member of the outside sill, and to these angle-plates are secured the ends of the rod 48, which is projected rearwardly and inwardly and takes a bearing against the inner ends of the draw-gear timbers 49. By this means the end sill is stiffened at its middle by being tied to the

corners of the car through the truss-rod 48 and the maintaining of the draw-gear timbers unyielding against it, and by the same means the knocking out of the draw-gear is made impossible by any shock less than sufficient to crush the end of the car-frame. The same construction may be applied to cars having a wooden frame, the only modifications required being clearly indicated in Fig. 19, in which the angle-plates 47 are supplanted by the push-pole pocket having an apertured lug for connection with the truss-rods, and instead of the truss-rods being passed behind the end of the draw-gear timbers they may take their bearing back of the follower-blocks or end stops of the draw-gear.

In Figs. 20 and 21 I have shown an improved construction of body-bolster, which consists of a compression-bar which is preferably a metal channel-beam presenting upwardly. The compression-bar is marked 49 in the drawings. It has a straight middle portion and its ends are upwardly inclined, and the flanges thereof are partly cut away to form shoulders 50, which engage the inner member of the outside sills. The webs and remaining portions of the flanges are projected beneath the outside sills.

51 represents the tension-bars, which may be flat bars having their middles straight and taking a bearing on the upper side of the center sills of the car, and their outer ends incline toward the side sills and extend between the shoulders 50 and project beyond the outside of the side sills, where they terminate in heads 52. Between these heads and the ends of the compression-bar 49 wedges 53 are driven, so as to tighten the members. Beams 54 are inclosed by the flanges of the compression-bar 49, and the center sills rest on these beams. A bolt 55 and clamps 56 securely bind the various parts together, forming an exceedingly strong, light, and inexpensive structure.

The construction hereinabove described is applicable not only to freight-cars, but some of the features thereof are applicable as well to passenger, mail, and other cars, and the particular construction above described may be varied as to details without departing from the spirit or scope of my invention.

It is obvious that some of the improvements above described may be embodied in cars where others of said improvements are omitted, and I do not therefore limit my invention to a car containing all of said improvements.

I claim—

1. In car construction, the combination, with the outside sills, of posts having a bearing on the upper surfaces of the sills and secured thereto by having their ends projected below the sills, and fastening devices applied to said projected ends.

2. In car construction, the combination, with outside sills composed of metallic beams

having integral flanges projecting from their upper surfaces, of posts having a bearing on the sills and provided with seats to receive the flanges, and having their ends projected below the sills and secured thereto, substantially as described.

3. In car construction, the combination, with outside sills and plates, each composed of two metallic beams having integral flanges projecting from their faces, of posts having their ends secured above the sills and below the plates, respectively, and fitted to said flanges, and bracing-rods secured also to the plates and sills, substantially as described.

4. In a car-frame, an end sill composed of two flanged metallic beams separated by distance-pieces and suitably connected with the longitudinal sills, substantially as described.

5. In a car-frame, the combination, with longitudinal sills, of body truss-rods extended longitudinally of the frame, an end sill composed of two flanged metallic beams separated by distance-pieces, through which beams and distance-pieces the truss-rods are passed, and distance-pieces separating the members of the end sill, whereby the end posts may be secured by having their ends projected between said members, and fastenings applied to the projecting ends, substantially as described.

6. In a car-frame, the combination, of longitudinal sills, each composed of two members slightly separated for the passage of securing-bolts for the connected parts, substantially as described.

7. In car construction, an interior floor-sill composed of two metallic beams curved longitudinally and secured with their convex faces toward each other, and distance-pieces interposed between said members, substantially as described.

8. A body-bolster for railway-cars, composed of two members separated at their middles and their ends converged to contact, the lower member consisting of a channel-beam whose flanges present upwardly and are cut away to form shoulders having a bearing on the inner side of the side sills, and the upper member having its ends projected beneath the side sills and headed for engagement therewith and with the end of the lower member, substantially as described.

9. A body-bolster for railway-cars, composed of two members separated at their middles and converged to contact at their ends, the upper member having a bearing on the upper side of the center sills of the car, and a transverse beam or beams interposed between the lower sides of said sills and the lower member of the body-bolster, substantially as described.

10. In car construction, metallic posts having elongated apertures for the passage of fastenings for the coverings.

11. In car construction, posts consisting of flanged metallic beams adapted to sustain a wooden filling and having elongated aper-

tures in their webs for the passage of fasten-
ings for the filling and sheathing of the car,
substantially as described.

12. In car construction, the combination,
5 with the outside sills and plates, each com-
posed of two separated members, of posts hav-
ing their respective ends projected between
the sill and plate members, caps having
flanges to clamp the sill and plate members

and through which the ends of the posts are 10
projected, and body brace-rods having their
ends also passed between the sill and plate
members and through the caps, substantially
as described.

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