

No. 713,748.

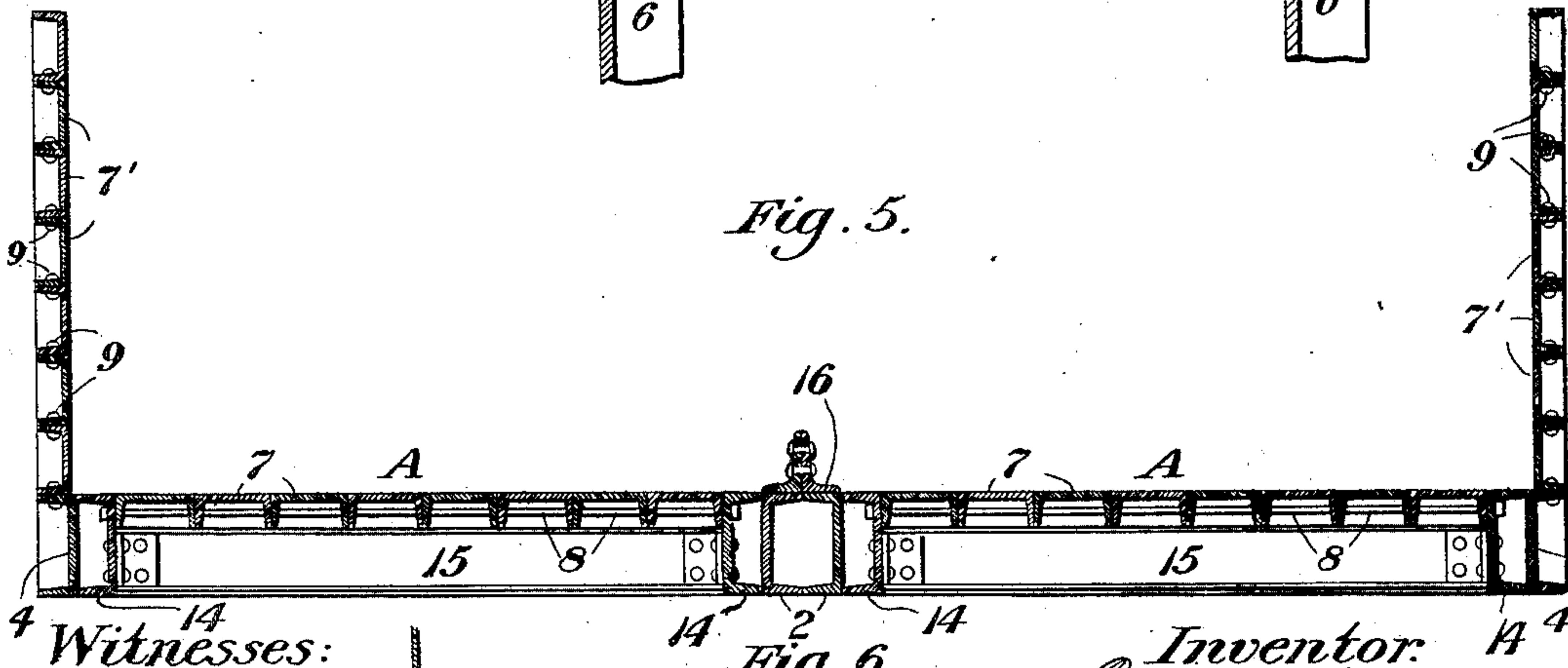
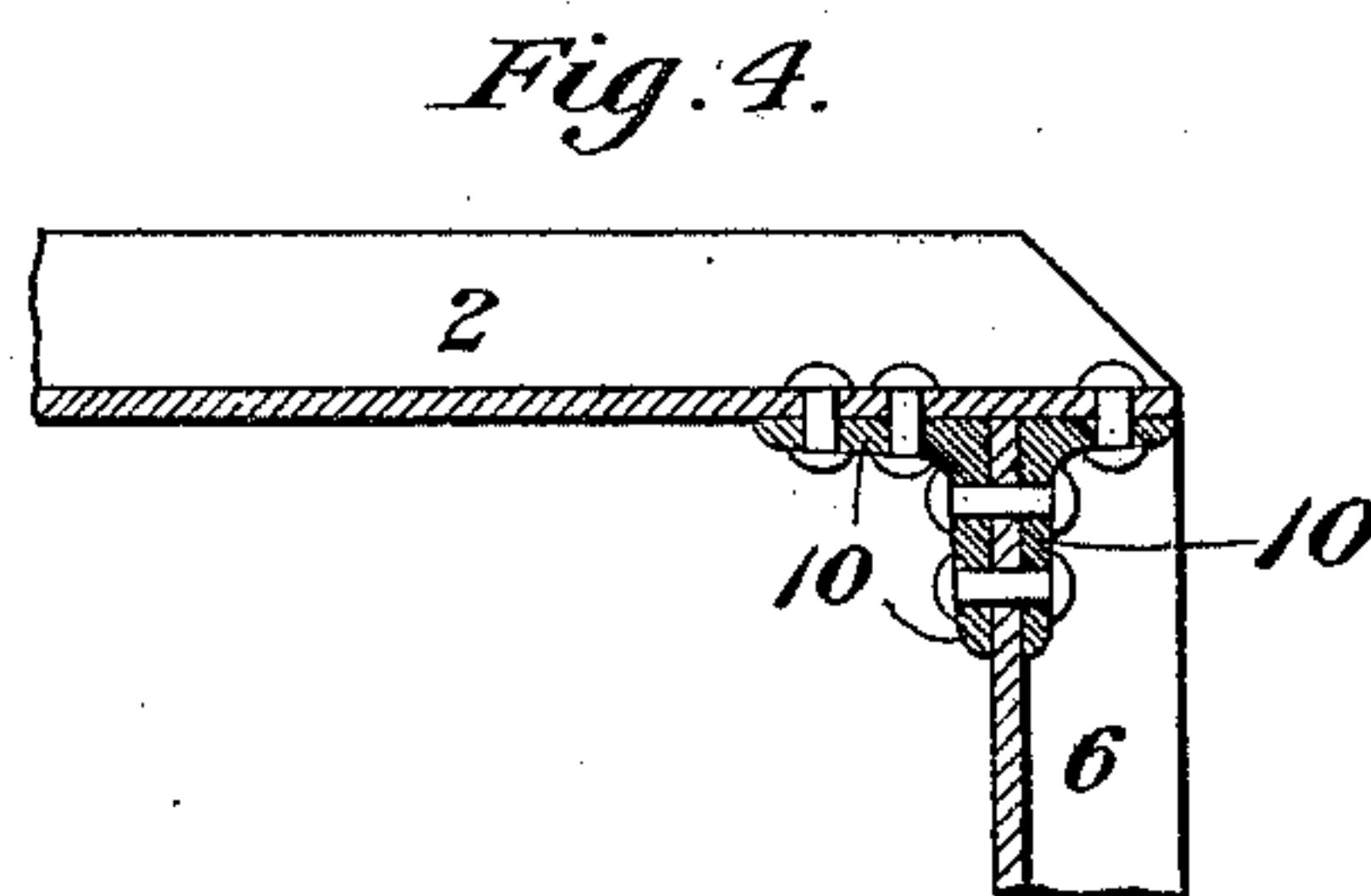
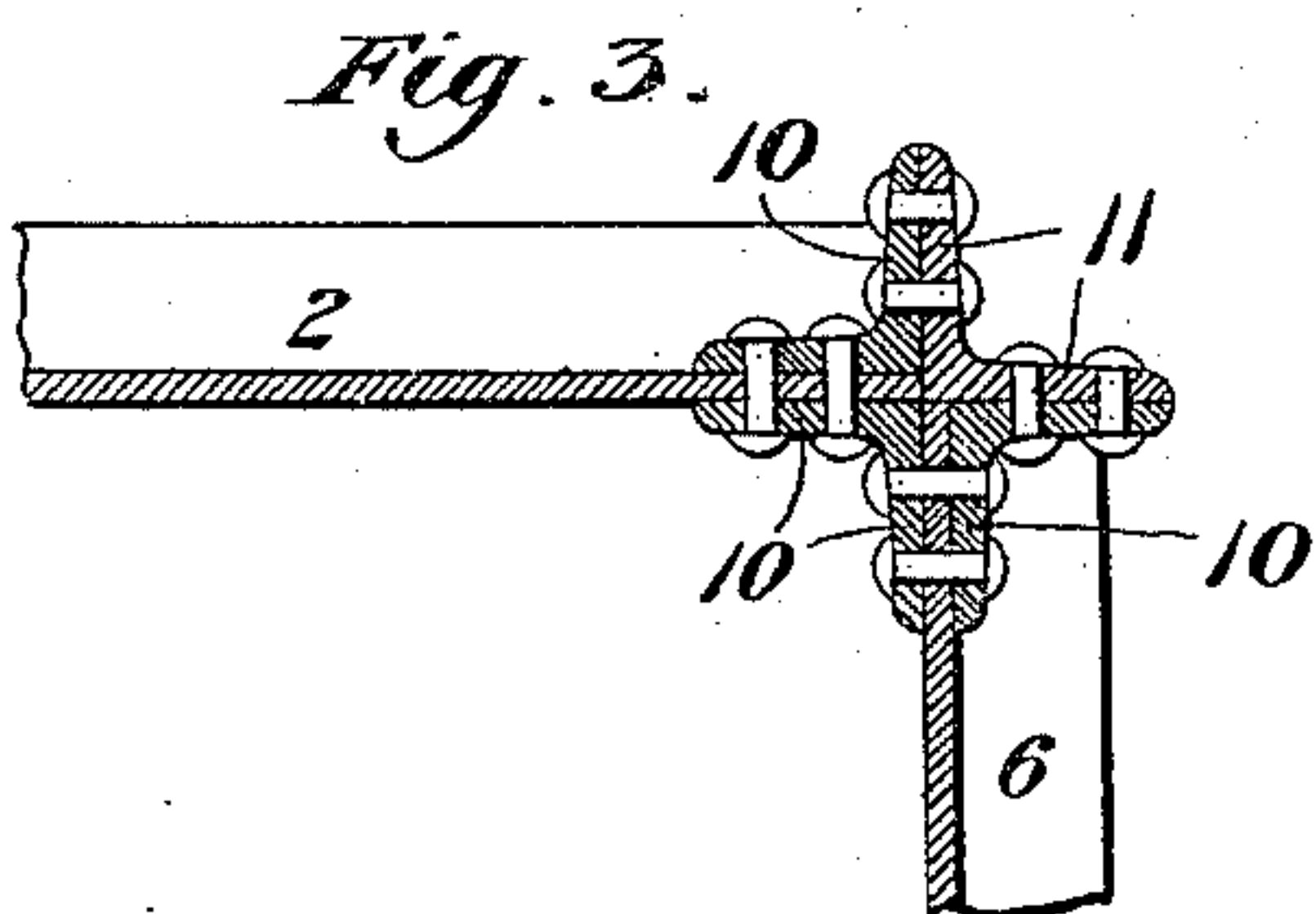
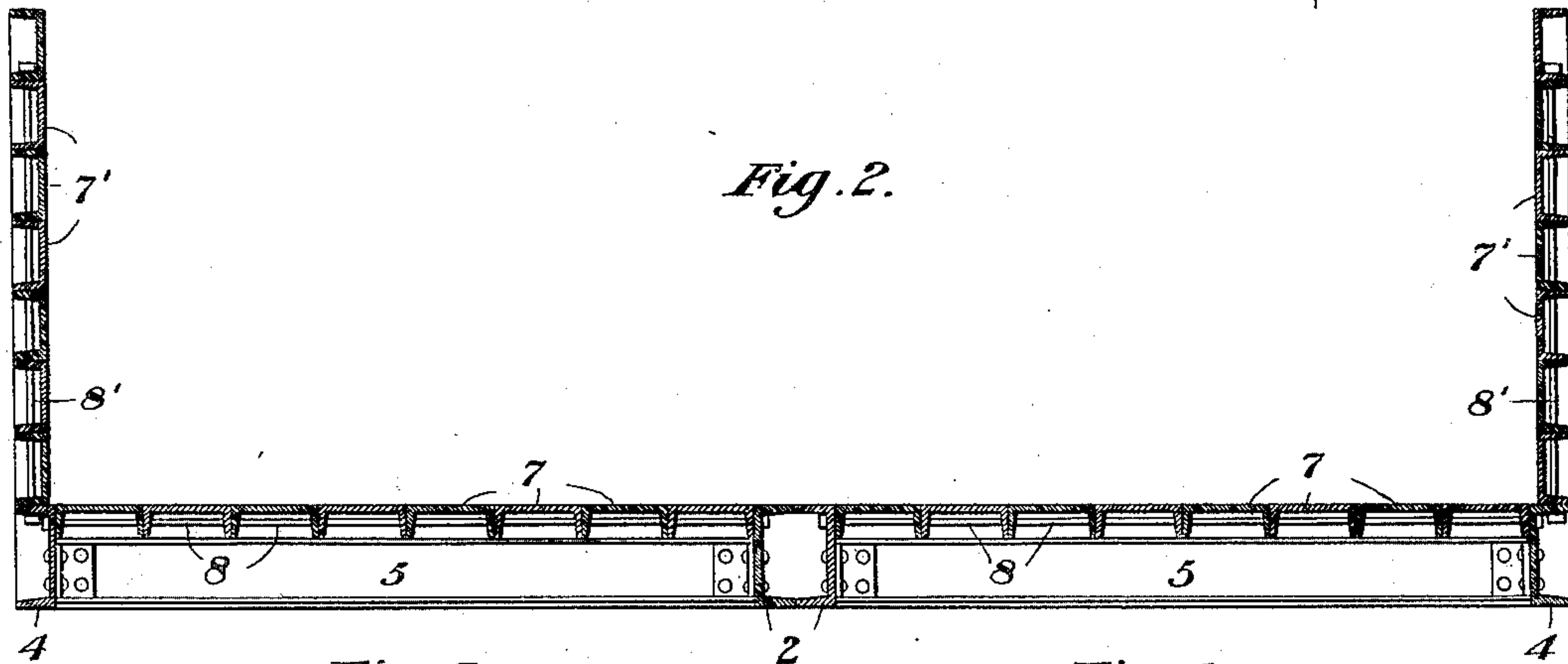
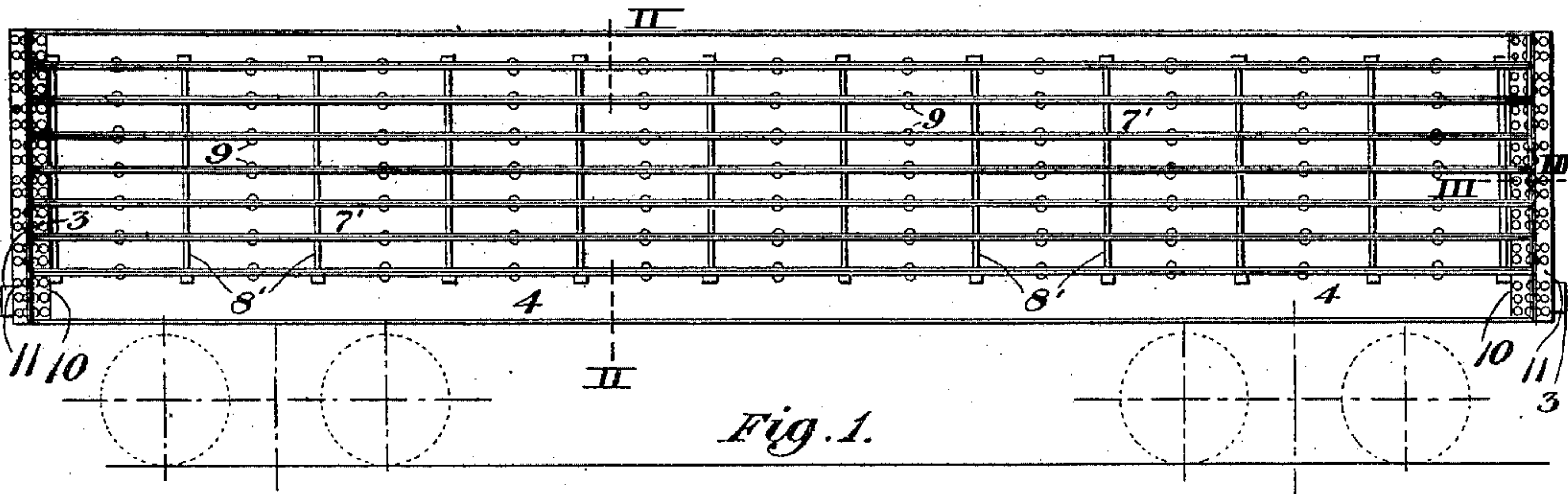
Patented Nov. 18, 1902.

C. M. CARNAHAN.
METALLIC CAR CONSTRUCTION.

(Application filed Nov. 13, 1901.)

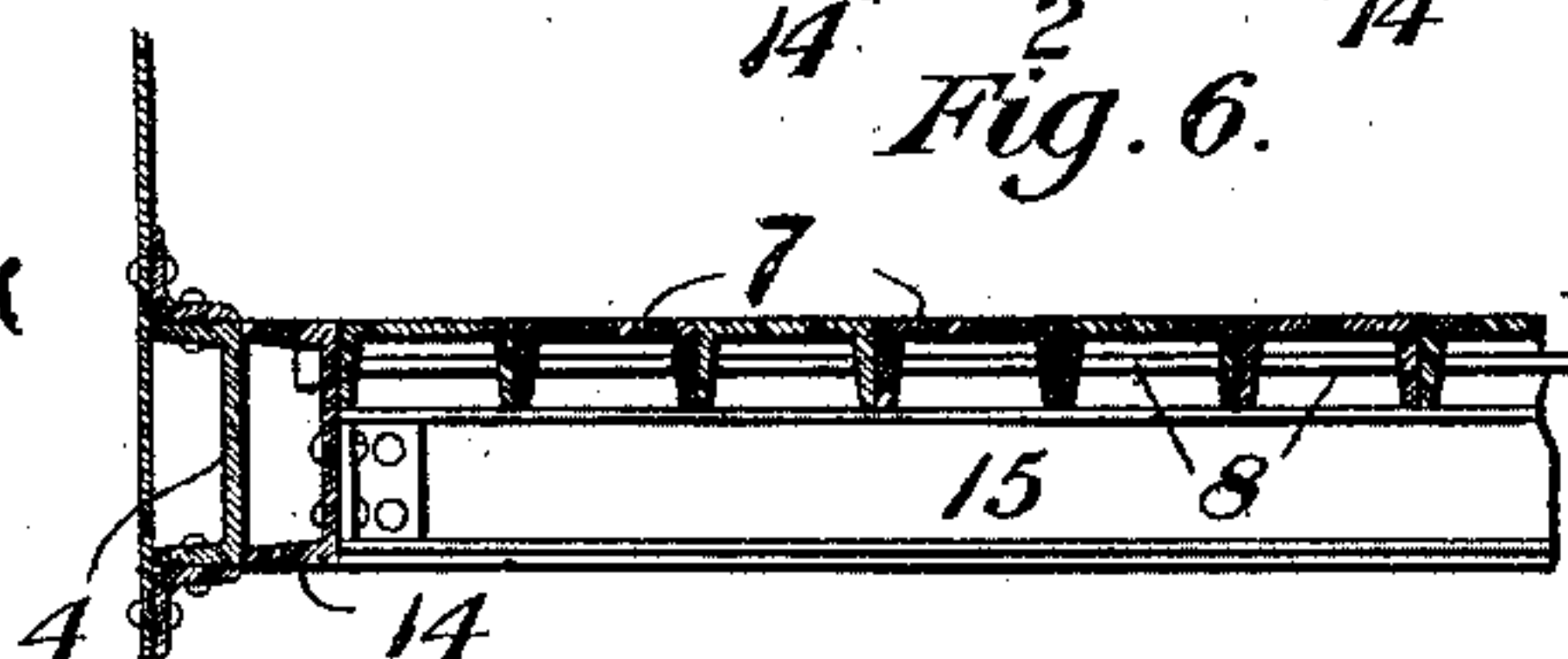
(No Model.)

2 Sheets—Sheet 1.



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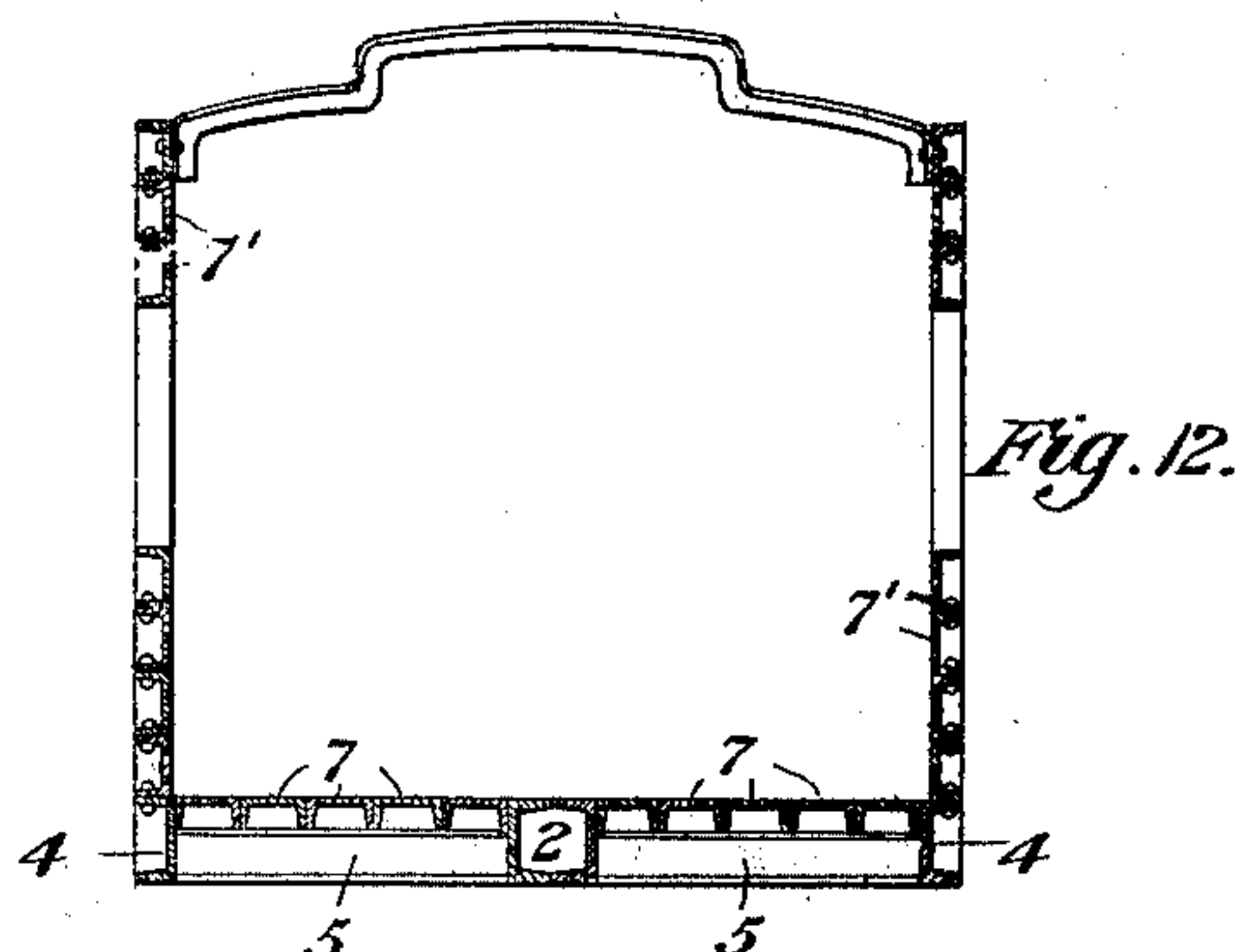
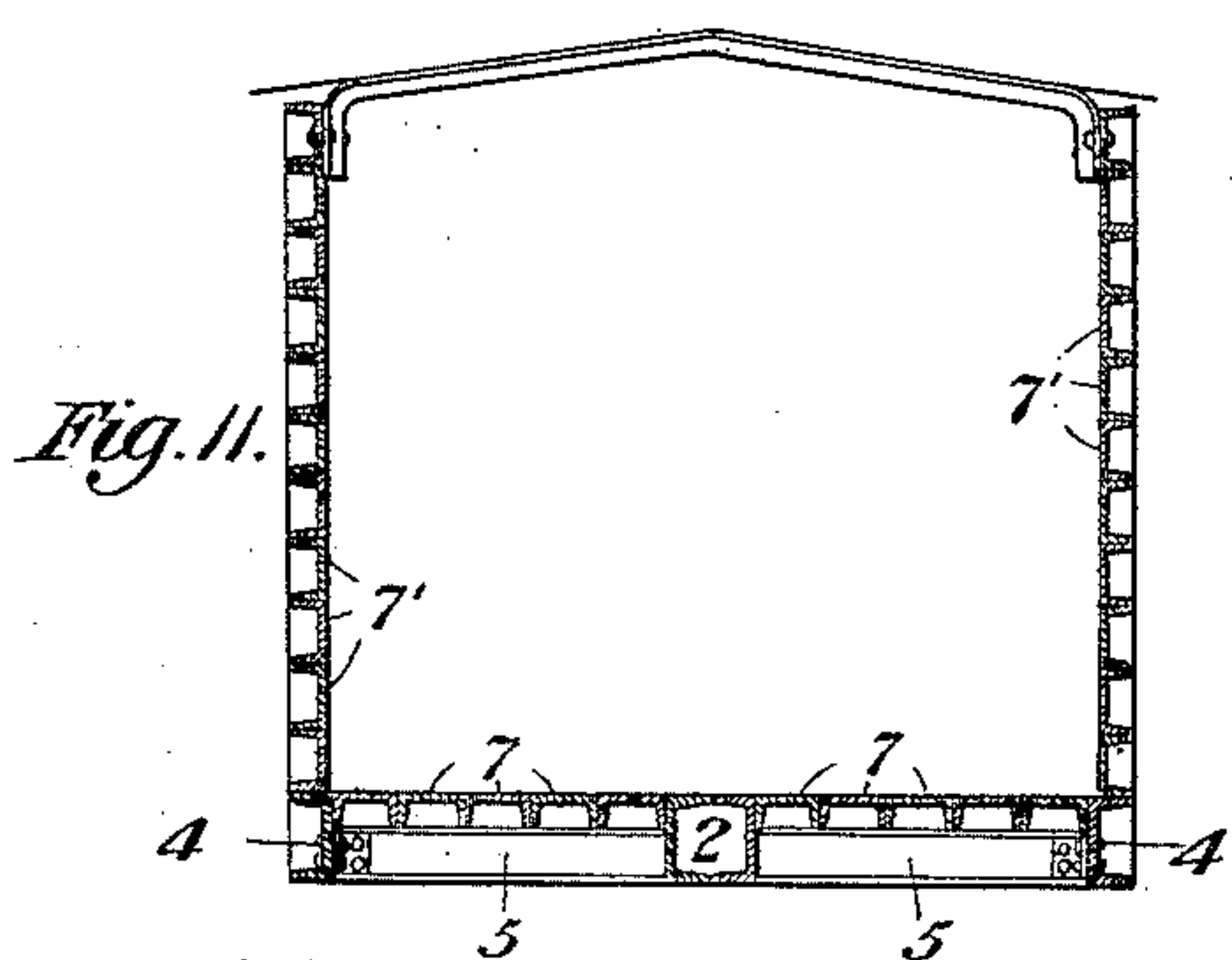
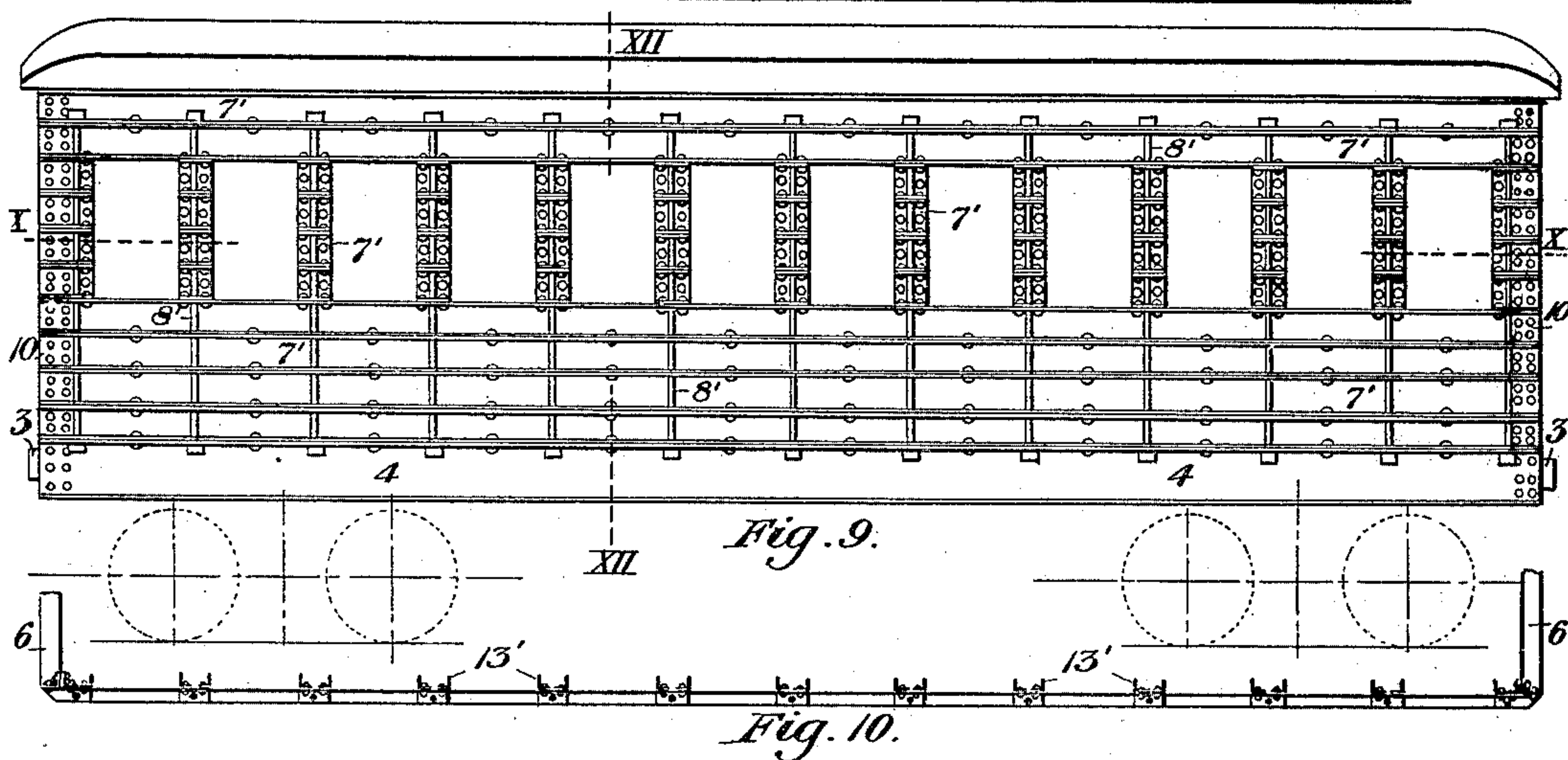
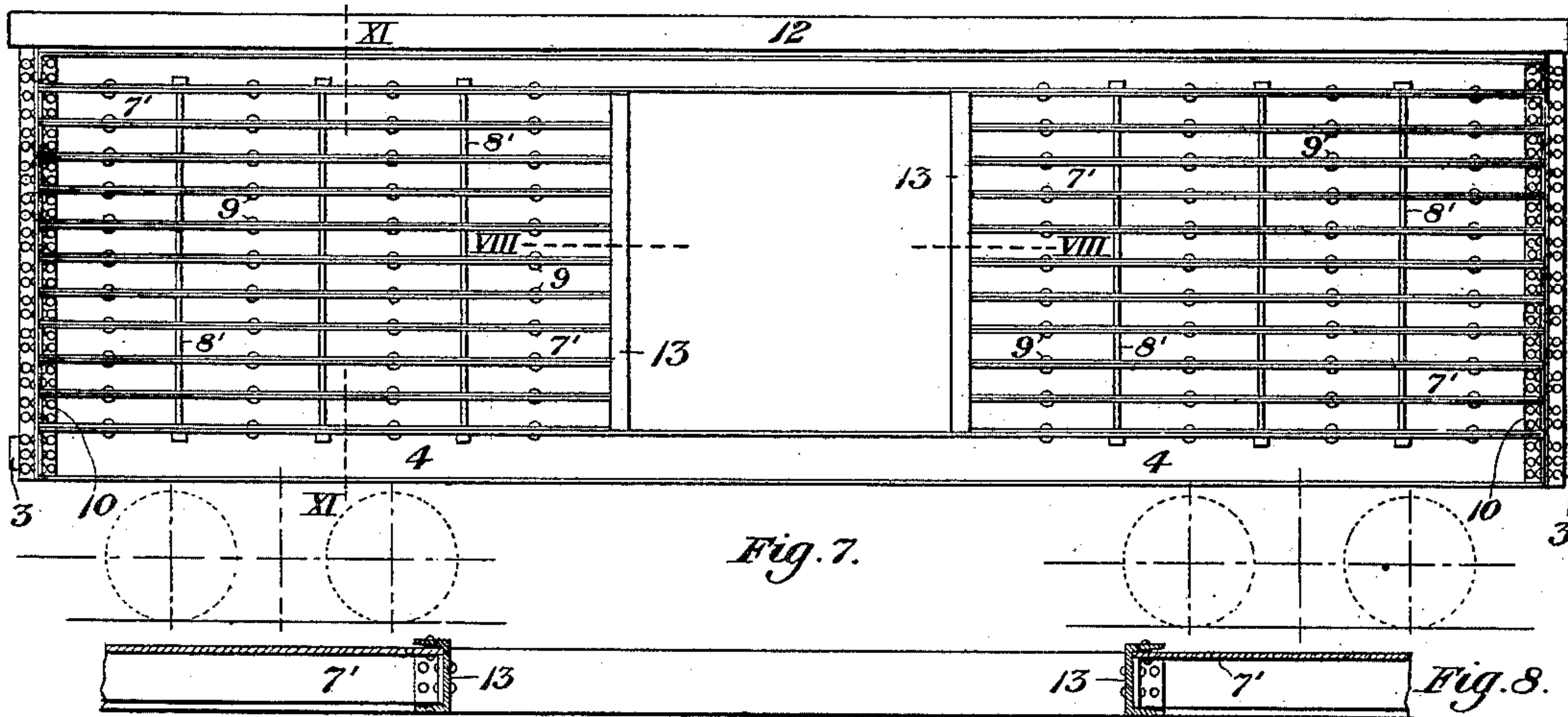
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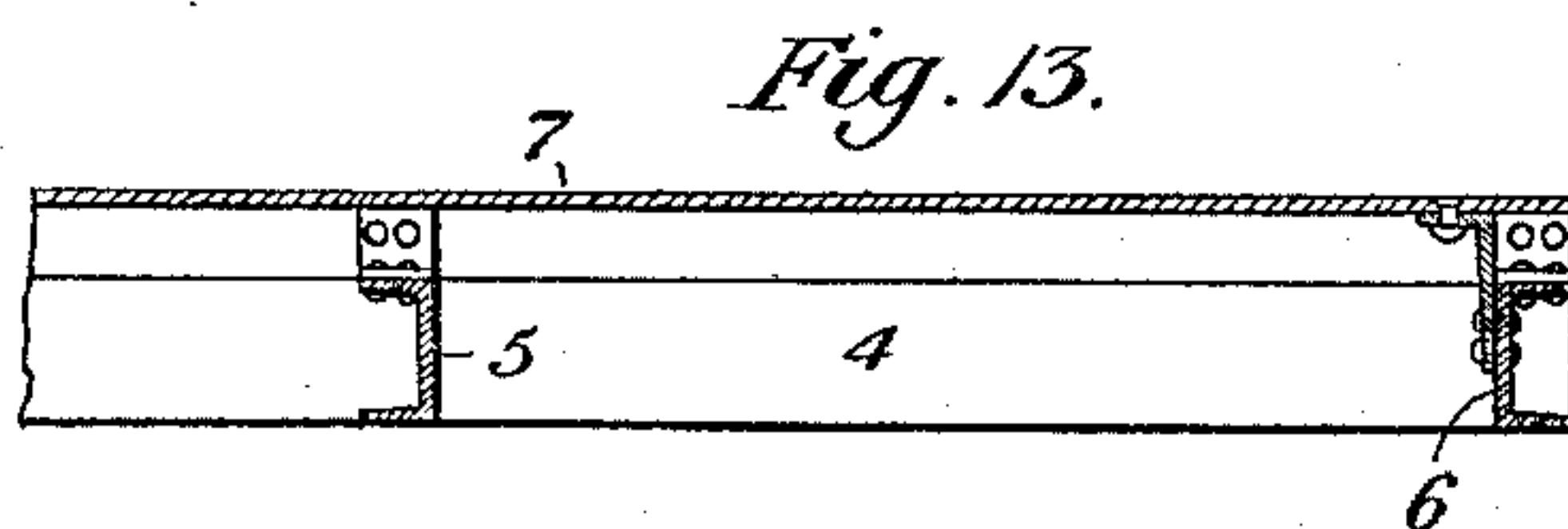
(Application filed Nov. 13, 1901.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

CYRUS M. CARNAHAN, OF ALLEGHENY, PENNSYLVANIA.

METALLIC-CAR CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 713,748, dated November 18, 1902.

Application filed November 13, 1901. Serial No. 82,084. (No model.)

To all whom it may concern:

Be it known that I, CYRUS M. CARNAHAN, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Metallic-Car Construction, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in side elevation of a gondola type of car constructed in accordance with my invention. Fig. 2 is a cross-sectional view, on an enlarged scale, indicated by the line II II of Fig. 1. Fig. 3 is a detail cross-sectional view, on an enlarged scale, illustrating the corner construction indicated by the line III III of Fig. 1. Fig. 4 is a similar view illustrating a modified arrangement. Fig. 5 is a cross-sectional view similar to Fig. 2, showing the construction as applied to a car having a dumping-bottom. Fig. 6 is a detail view illustrating a modified construction. Fig. 7 is a view in side elevation of a box-car type. Fig. 8 is a cross-sectional view on the line VIII VIII of Fig. 7. Fig. 9 is a view in side elevation showing the construction as adapted to a passenger-car. Fig. 10 is a horizontal section therethrough on one side, indicated by the line X X of Fig. 9. Fig. 11 is a vertical cross-sectional view indicated by the line XI XI of Fig. 7. Fig. 12 is a similar view indicated by the line XII XII of Fig. 8. Fig. 13 is a detail view illustrating the connection of the floor members with the cross and end sills.

My invention relates to the construction of railroad and other cars or vehicles for the transportation of freight, passengers, &c.; and it consists in the features of construction as shown in the drawings and as hereinafter described.

The invention has in view the cheapening, strengthening, and simplifying in construction of what are known as "steel cars" by the use of standard rolled sections of structural steel, such as channels, &c., resulting in the advantages incident to the use of such forms in the construction of rolling-stock, which is peculiarly subjected to excessive strain and wear due to its severe continuous use.

Referring to the drawings, 2 2 are the cen-

ter sills, made of suitable structural shape, midway of the main framework, running longitudinally for the full length of the car, assembled in close relation to each other and with sufficient intervening space to receive the draw-heads 3 with their accompanying draft-gear at each end. On each outer side on corresponding levels with the center sills are the side sills 4, consisting of suitable structural shapes, as channels or I-beams, with which center sills and side sills are incorporated the cross-sills 5, also of structural channels or I-beams. At suitable locations for providing truck-bearings are also located the usual body-bolsters, which may be of any preferred or suitable form or construction; but inasmuch as the present invention relates particularly to the construction of the car-body these parts have not been illustrated in detail. The end sills 6 are similar to the side sills and are likewise made of similar structural members incorporated with the side sills and with the center sills by suitable angle-brackets riveted to each, so as to properly secure the parts together in the manner customary in structural work. The floor of the car is composed of series of longitudinal channel members 7, laid edge to edge for the full length of the car, their flanges abutting against each other and resting upon the cross and end sills, while the upper faces of the webs of such channels when thus assembled form a continuous flat surface, smooth, unbroken throughout the full length and width of the floor. At intervals bolts 8 are passed through the flanges of all of the floor members and also through the side sills 4 and tightened up by nuts, such bolts thereby securely holding all of the cross members together and in alinement and rigidly securing them to the side sills.

The sides of the car are constructed in a similar manner of the channels 7', the flanges of which are laid together, as shown, the webs forming the inner surface of the sides of the car in a similar manner to the floor, and such side channel members are likewise held together and in alinement by bolts 8', extending from top to bottom and through one or both flanges of the side sills 4, tightened up and securely and rigidly holding the members together. These bolts are located at suitable distances apart, and, if desired, between the

bolts the flanges may be further secured together by rivets 9, and it will be understood that, if desired, the bolts may be used throughout to the exclusion of the rivets, or the bolts may be dispensed with and the flanges of the channels secured together by rivets only. The ends are constructed in the same manner, the channels extending across from side to side, while at the corners the side and end channels are secured together by structural members having diverging flanges, as angle-brackets 10, upon the inside and outside of the car, riveted through the webs of the channels. An especial advantage of such corner-angles is that when arranged as shown in Fig. 3, wherein a supplemental outer angle 11 is employed, the corner is further stiffened, and such angle provides a convenient bearing for the push-bar of a shifting-engine, thus obviating the necessity of such a separate element being mounted upon the end sill of the car. When thus constructed in the form of a gondola or open-top car, the channels provide a finished floor, sides, and ends, the edges of which require no further reinforcing or finishing, while the corners when secured together as I have shown and described present a finished and workmanlike appearance.

When made in the form of a box-car, as shown in Fig. 7, the roof 12 may be of sheet-iron or other material and supported upon any suitable roof-framing, while the opening for the door is surrounded by supplemental frame members 13, into which the side members 7' are framed and to which they are secured by riveting through the webs and flanges of such side members and door-frame or in any other suitable manner.

When the construction is utilized in the building of passenger-coaches, as illustrated in Fig. 9, the columns between the windows are made of short sections of channels or other suitable structural shapes, secured together and to the main longitudinal upper and lower side members by bolts or rivets in the manner already described, and the columns may be further reinforced by inner vertical angles or channel members 13, riveted to the column member in the manner illustrated in Fig. 10. When utilized as a dump-car, the dumping-sections A A, which may be either single or of double width across the car, are arranged with the independent outer side sills 14 and cross-sills 15, all of the parts being bolted and riveted together in the manner already described. In such construction the upper sides of the center sills 2 are preferably reinforced, as by upwardly-extending angle members 16, which constitute a stiffening hog-back.

The construction is well adapted to utilization in dumping-cars. The floor provides a perfectly smooth hard surface, upon which material of all kinds will readily slide, while upon a flat surface material may be shoveled with equal ease, and this feature of ease of

handling and shifting the contents of the car is an important and valuable one.

The present invention is not designed to relate specifically to any particular type of car or to the details of its construction, but embodies generally the principle of utilizing channel forms of structural steel, whereby to secure the smooth-finished inner surface of the floor, sides, and ends and the various other features of advantage which have been hereinbefore set forth and which will be readily appreciated by all those familiar with the general subject of steel cars. It will be seen also that these inner surfaces in addition to being continuous and unbroken are entirely unobstructed incidentally by rivet or bolt heads, all such parts being entirely covered and concealed from view. None of these securing elements are therefore exposed to the injurious effects of moisture, acid, &c., and they are, moreover, readily accessible and easily removed when for any reason it is desired to do so, as for the replacement of bent or broken parts. When, however, it is desired to cover either the inner or outer surfaces, or both, with wood or other facing material—as, for instance, in the construction of passenger-cars—a suitable wooden framing structure may be easily and readily attached to the metal framework and the superstructure laid over it in any manner desired or preferred.

Various changes, modifications, or adaptations of the invention may be made by the skilled mechanic without departing from my invention, and I do not desire to be confined to the detailed construction as shown and described, but to include all such changes and variations as within the scope of the following claims.

What I claim is—

1. In a metallic car the combination of end and cross sills of structural members; a floor composed of channel members laid over such end and cross sills, and side and end sills of structural members incorporated with said sills and floor, with means for securing the members together.

2. In a metallic car the combination of end and cross sills of structural members, a floor composed of channel members laid over the said end and cross sills, side and center sills of structural members incorporated with said sills and floor, and sides composed of channel members, with means for securing the members together.

3. In a metallic car the combination of end and cross sills of structural members, a floor composed of channel members laid over the said end and cross sills, side and center sills of structural members incorporated with the said sills and floor, and sides and ends composed of channel members, with means for securing the members together.

4. A metallic car composed of a foundation-framework of structural members, and a floor, sides and ends of channel members support-

ed upon such framework, and means for securing the channels together and to such framework consisting of bolts passing through the flanges thereof.

5 5. A metallic car composed of a foundation-framework of structural members, and sides and ends of structural members, with means for securing the sides and ends at the corners and thereby providing recessed push-bar
10 bearings.

6. A metallic car composed of a foundation-framework of structural members, and sides and ends of structural members, with means for securing the sides and ends at the corners
15 consisting of structural members having diverging vertically-arranged flanges, providing a vertical recessed push-bar bearing and securing devices.

7. A metallic car composed of a foundation-
20 framework of structural members, and sides and ends of structural members, with means for securing the sides and ends at the corners consisting of angle members, and securing devices, the flanges of said angle members
25 flaring outwardly and providing a push-bar bearing.

8. A metallic car composed of a foundation-framework, consisting of center, side, end, and cross sills of channel members, and a floor
30 of channel members laid over such framework, and secured thereto, by bolts passing through the flanges of the channel members.

9. A metallic car composed of a foundation-framework consisting of center, side, end, and cross sills of channel members, and a floor
35 of channel members laid over such framework, with securing means consisting of bolts passing through the flanges of such floor members connecting them together and to
40 such framework.

10. A metallic car composed of a foundation-framework consisting of center, side, end, and cross sills of channel members, sides and ends of channel members supported upon
45 such framework, with means consisting of bolts passing through the flanges of the side and end members, securing them together and to the framework.

11. A metallic car composed of a foundation-
50 framework consisting of center, side, end, and cross sills of channel members, a floor,

sides and end of channel members supported upon such framework, with means consisting of bolts passing through the flanges of the floor, side and end members, securing them
55 together and to the framework.

12. In a metallic car, means for securing the sides and ends together consisting of vertically-arranged angle members, the flanges of which provide a push-bar bearing, with
60 securing devices connecting the members.

13. In a metallic car, the combination of a foundation-framework of structural members, and sides consisting of rolled channel members with lateral apertures through the
65 sides.

14. In a metallic car, the combination of a foundation-framework of structural members, and sides consisting of rolled channel members with door-openings therein, framing
70 structures therefor, and means for securing the members together.

15. In a metallic car, the combination of a foundation-framework of structural members, a floor, sides, and ends of rolled channel members, means for securing the mem-
75 bers together, and lateral apertures through the sides.

16. In a metallic car, the combination of side, center, end and cross sills of channel
80 members, a floor, sides, and ends of channel members, means for securing the members together, and lateral apertures through the sides.

17. In a metallic car having sides and ends
85 composed of structural members; means for connecting the members at the corners, consisting of angle-irons riveted to the members and to each other, so as to provide a corner-bearing for a push-bar.
90

18. In a metallic car having sides and ends composed of channel-beams; inner and outer angle members, secured to the beam, and a corner angle member secured to the outer angle members, providing a rest for a push-
95 bar.

In testimony whereof I affix my signature in presence of two witnesses.

CYRUS M. CARNAHAN.

Witnesses:

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C. M. CLARKE.