

No. 664,760.

Patented Dec. 25, 1900.

G. I. KING.

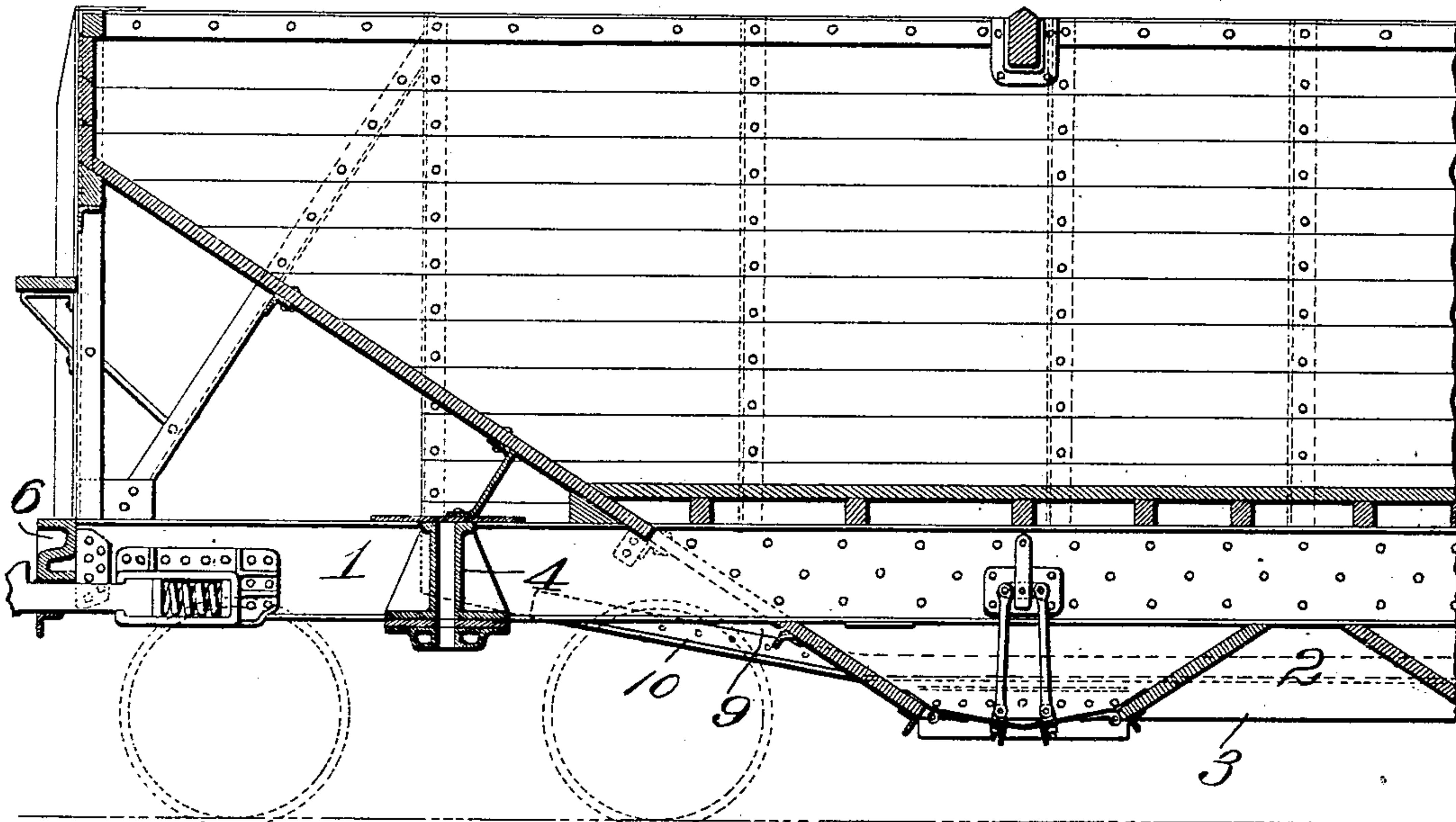
DOUBLE HOPPER BOTTOM CAR.

(Application filed Aug. 17, 1900.)

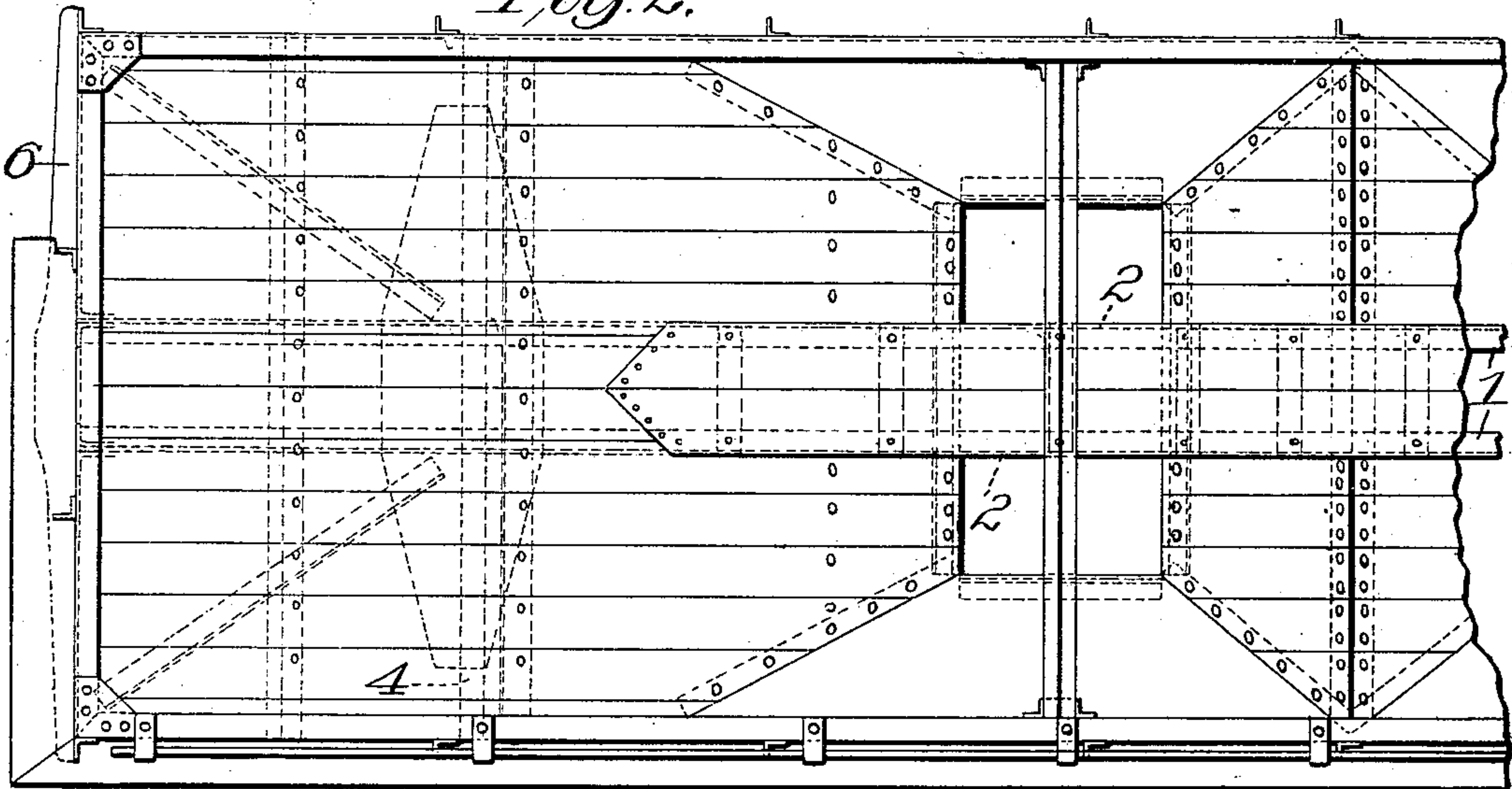
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3 Sheets—Sheet 1.

*Fig. 1.*



*Fig. 2.*



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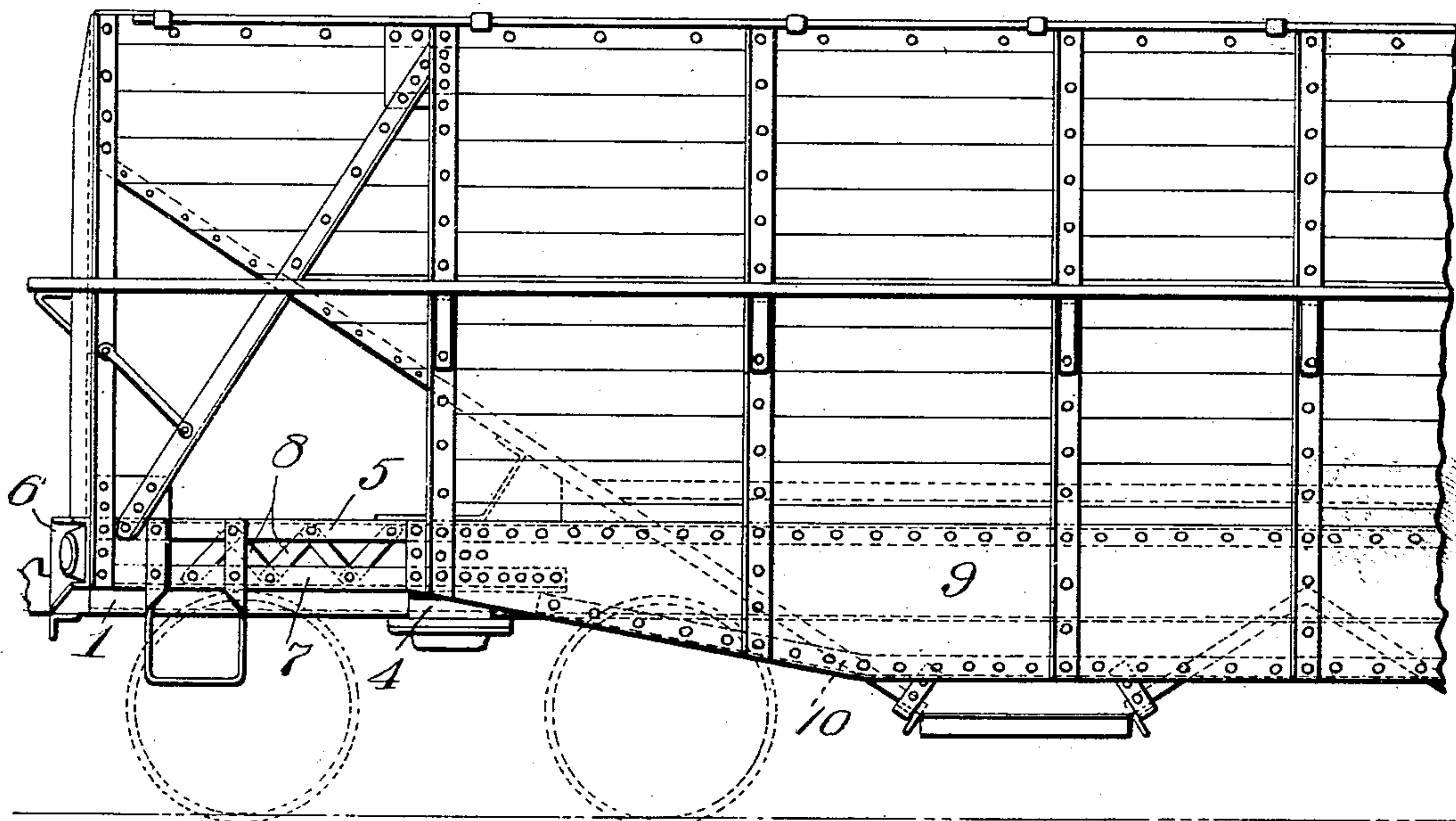
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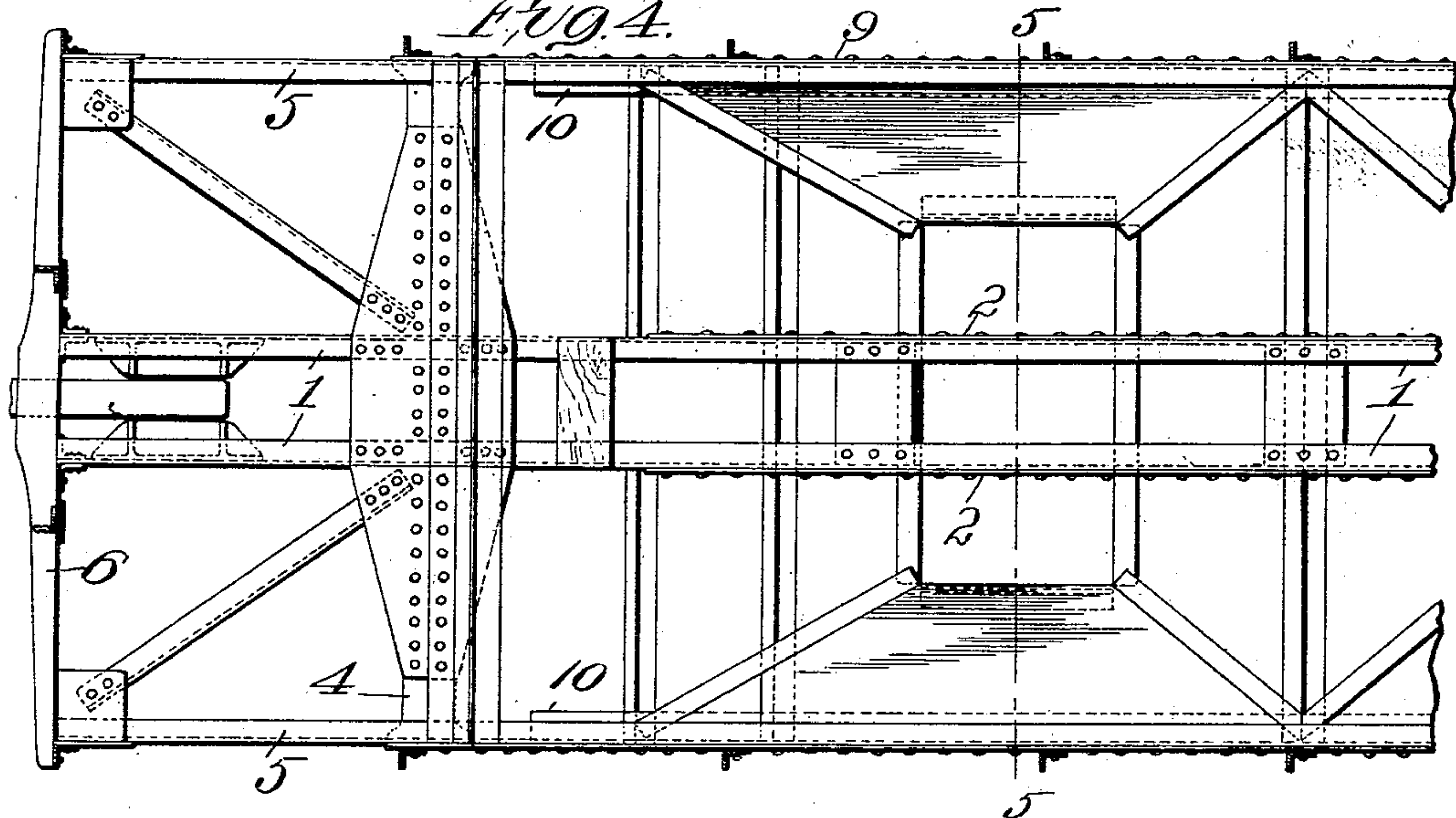
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*Fig. 3.*



*Fig. 4.*



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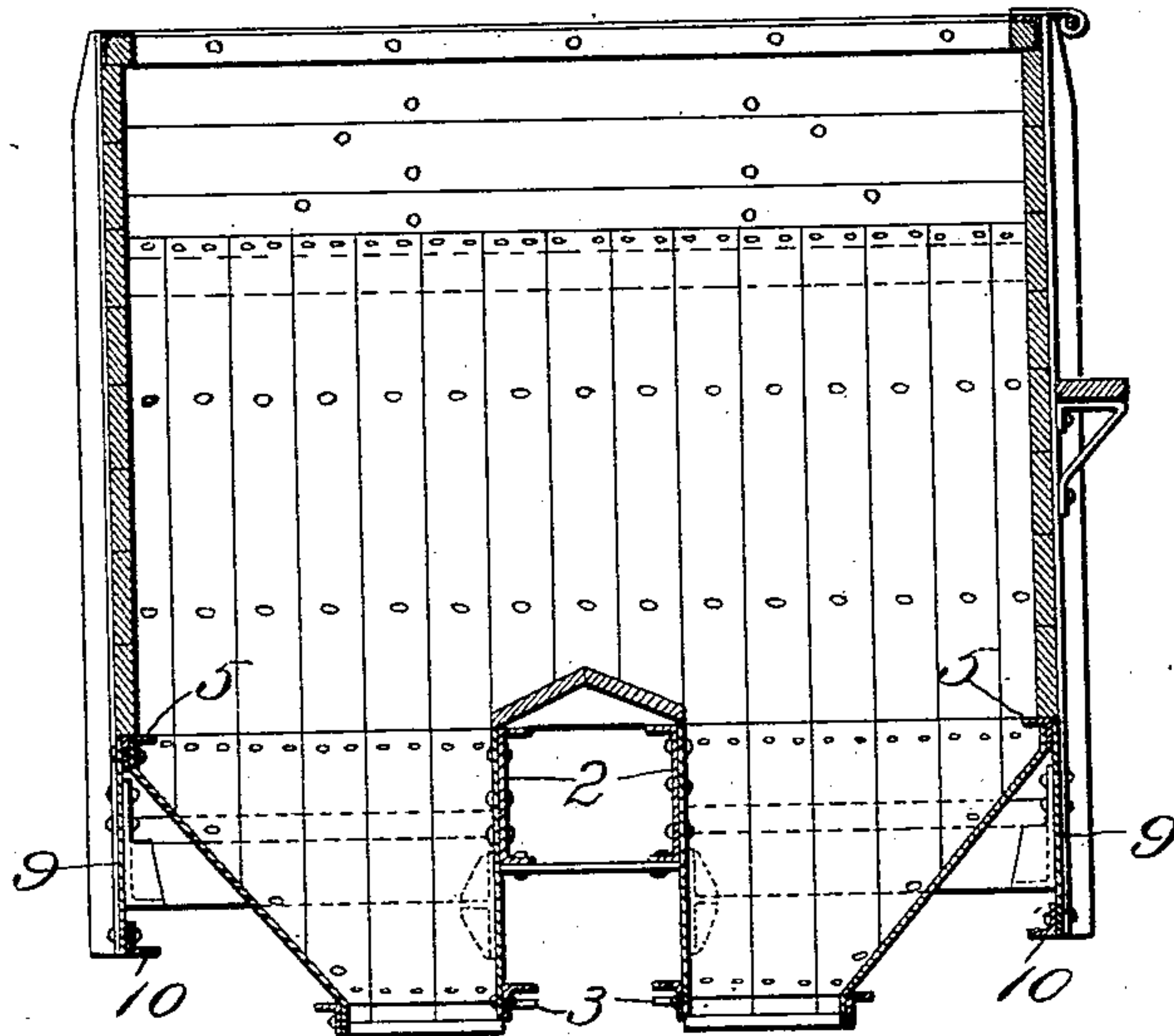
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*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

GEORGE I. KING, OF DETROIT, MICHIGAN, ASSIGNOR TO THE AMERICAN  
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## DOUBLE-HOPPER-BOTTOM CAR.

SPECIFICATION forming part of Letters Patent No. 664,760, dated December 25, 1900.

Application filed August 17, 1900. Serial No. 27,162. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE I. KING, a citizen of the United States, residing at the city of Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Double-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 vertical sectional view through one end of my improved car. Fig. 2 is a top plan view of the same. Fig. 3 is a side elevational view. Fig. 4 is a top plan view of the framing of the car; and Fig. 5 is a vertical cross-sectional view on line 5 5, Fig. 4.

This invention relates to a new and useful improvement in car construction, and particularly to the underframing, and while entitled a "double-hopper-bottom car" it will be obvious that my improved underframing can be employed in connection with other types of cars—such, for instance, as gondola, box, and flat cars, or cars wherein a single hopper is used.

The special features of this present invention reside in the provision of strengthening-plates upon the side sills, which plates preferably extend beneath said sills, or it is obvious that said plates may extend above the sills, said plates continuing substantially from support to support of the car-framing. These supports are usually in the form of body-bolsters, and the ends of the strengthening-plates shown in the accompanying drawings are secured directly to the ends of said body-bolsters. The center sills are also preferably provided with strengthening-plates which extend therebeneath, producing substantially plate-girders. In the instance of the plates for the center sills their lower edges are provided with tension-flanges, while with the plates which are secured to the side sills an angle may be riveted on their lower edges, said angle forming the tension-flange of this side structure, which is substantially in the form of a plate-girder.

Another feature of my invention consists in forming the side sills of parallel angles,

said side sills thus being made extremely light, enabling the lower member to be cut off slightly within the lines of the body bolsters or supports; the upper member of the side sill preferably extending throughout the length of the car. The two members which constitute the side sills have their flanges preferably presented inwardly.

I do not deem it necessary to describe in detail the various parts of the car shown in the accompanying drawings, and will therefore direct my description chiefly to those parts and combination of parts which I deem new.

1 indicates the center sills, which are preferably channels with their flanges presenting inwardly. To the outer faces of these center sills are riveted plates 2, said plates being formed deepest at their middle portions and having their ends inclined coincident with the inclined floors at the ends of the car. These plates 2 form the inner hopper-walls and have their lower edges flanged inwardly, as at 3, (shown in Fig. 5,) these inwardly-extending flanges forming the tension-flanges of a plate-girder made up of the center sills and these plates, the compression-flange of each girder being formed by the upper flange of the center sill to which the plate is attached.

4 indicates the body-bolster, and 5 the upper member of the side sill, which member preferably extends throughout the length of the car, being attached at its ends, as are the center sills, to the end sill 6.

7 indicates the other member of the side sill, which is attached to the end sill and arranged parallel to the member 5. This member 7 is also secured to the body-bolster, but terminates a short distance beyond said body-bolster. Lattice-bars 8 may be employed between these parallel members of the side sills for the purpose of giving them strength.

9 indicates a plate made deepest at its middle portion, said plate being secured at its ends to the body-bolsters and throughout its upper edge to the upper member 5 of the side sill. The shallow ends of the plate are also preferably secured to the inner ends of the lower member 7 of the side sills, as shown in Fig. 3.

10 indicates an angle which is preferably arranged on the inner face of the plate 9 and



along the lower edge thereof substantially throughout the length of said plate, said angle being bent to conform to the shape of the lower edge of the plate.

5 By this construction it will be seen that the side sill of the car outside of the body-bolsters consists of parallel members strengthened by lattice-bars, if desired, one of said members  
10 extending throughout the length of the car and forming the top flange of a plate-girder, the web of which is secured to said side-sill member and to the body-bolster, the lower edge of said web being provided with a flange in the form of an angle riveted thereto, said  
15 angle forming the tension-flange of the plate-girder, while the upper member of the side sill forms the compression-flange of said plate-girder. This construction is extremely strong and rigid and is sufficient to carry the vertical  
20 load between the bolsters or points of support.

It is obvious that instead of having the member 7 at the side sill form the top flange of the plate-girder the member 5 can be continued  
25 throughout the length of the car, (said member 7 being cut short,) said member 5 forming the tension-flange of the plate-girder and being arranged at the lower edge thereof, while the angle 10, arranged at the upper  
30 edge of the plate-girder, would form the compression-flange of said girder.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

35 1. In a car, the combination with the body-bolsters, of an angle extending throughout the length of the car and forming a side-sill member, said angle being secured to the ends of the bolsters, a web-plate also secured to  
40 the ends of the bolsters and having one edge riveted to said angle, and an angle riveted to the other edge of said web-plate; substantially as described.

45 2. In a car, the combination with the body-bolsters, of an angle 5 extending throughout the length of the car and secured to the ends of the bolsters, a web-plate 9 riveted to the angle 5 and secured to the ends of the bolsters, and an angle 10 riveted to the lower

edge of said web-plate and forming the tension-flange of a plate-girder structure, of which the angle 5 is the compression-flange; substantially as described.

3. In a car, the combination with body-bolsters, of an angle 5 extending throughout the  
55 length of the car and secured to the ends of said bolsters, web-plates 9 which are deepest at their middle portions and which are secured to the ends of said body-bolsters, and to said angle 5, an angle 10 secured to the  
60 lower edge of said web-plate, and vertical posts secured to said plate; substantially as described.

4. The combination with body-bolsters, of plate-girder side sills consisting of angles 5  
65 and 10 and the web-plates 9, the ends of said web-plates being directly attached to the ends of the bolsters; the center sills, and the plates 2; substantially as described.

5. The combination with the center sills, of  
70 the plates 2 secured thereto and provided with flanges 3 at their lower edges, the body-bolsters 4, the angles 5, the end sills to which said angles 5 and the center sills are connected, the angles 7 parallel to the angles 5,  
75 the web-plates 9, and the angles 10 secured to the lower edges of said plates 9; substantially as described.

6. In a car, the combination with the body-bolsters, of a side-sill consisting of parallel  
80 angles at the ends of the car, one of said angles extending throughout the length of the car, and the others terminating a short distance inside of the bolsters, a plate secured to the continuous angle, to the inwardly-projecting  
85 ends of the short angles, and to the ends of the body-bolsters, said plate being deepest at its middle portion, and an angle 10 secured to the lower edge of said plate, said angle conforming to the shape thereof; sub-  
90 stantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 14th day of August, 1900.

GEORGE I. KING.

Witnesses:

WM. H. SCOTT,  
F. R. CORNWALL.