

J. W. KING.  
RAILWAY CAR.

APPLICATION FILED APR. 30, 1903.

2 SHEETS—SHEET 1.

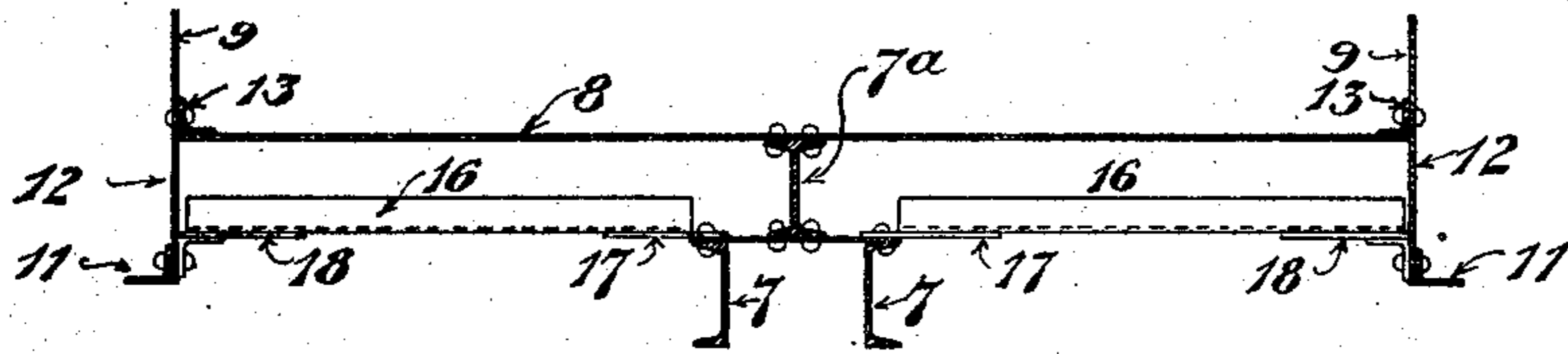


Figure 5

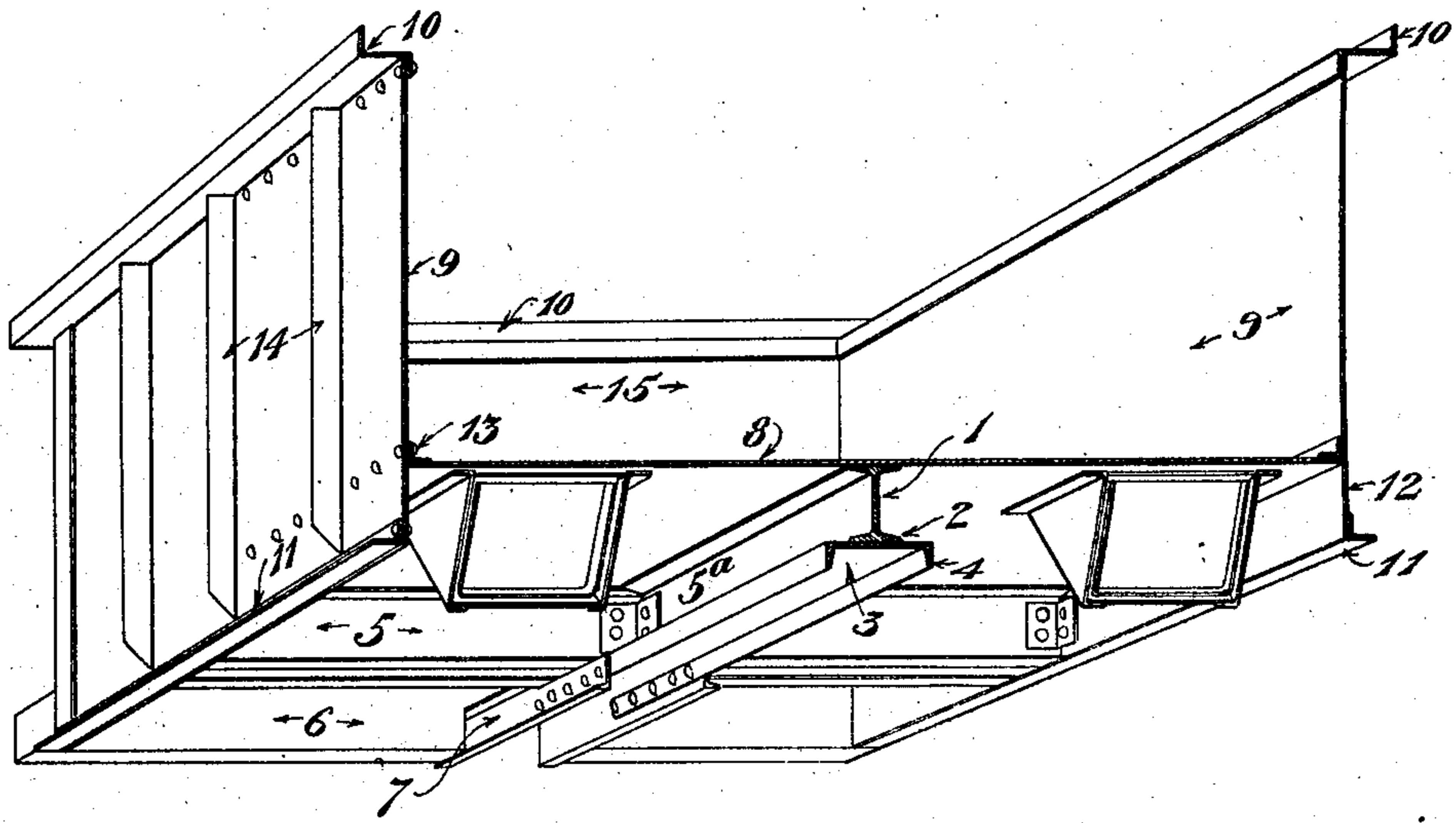


Figure 1

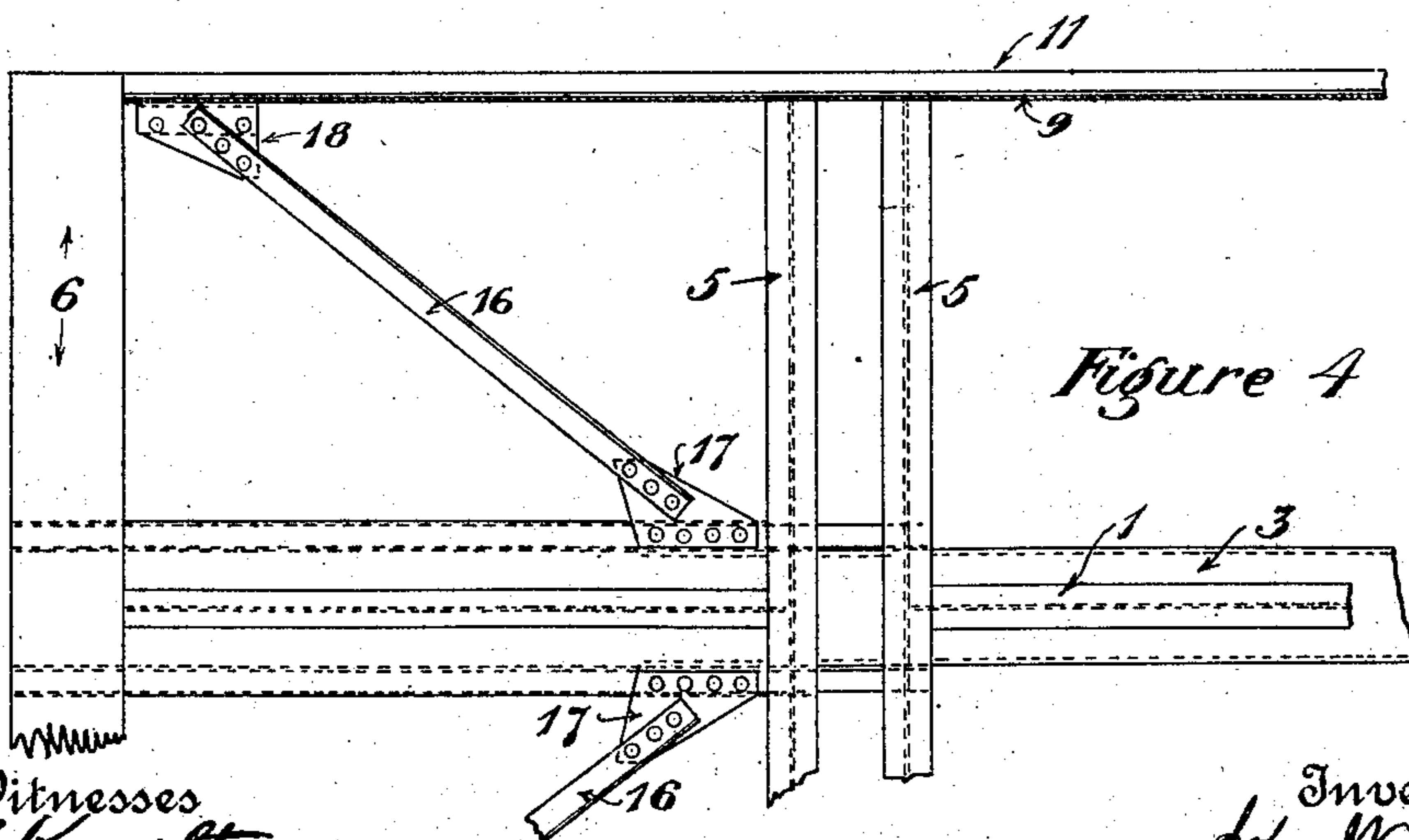


Figure 4

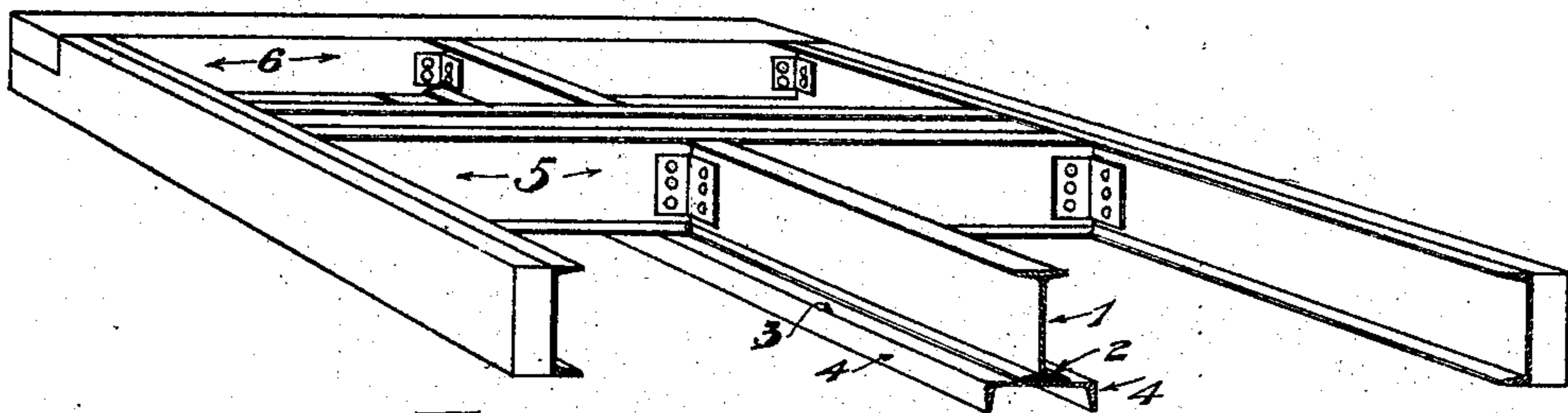
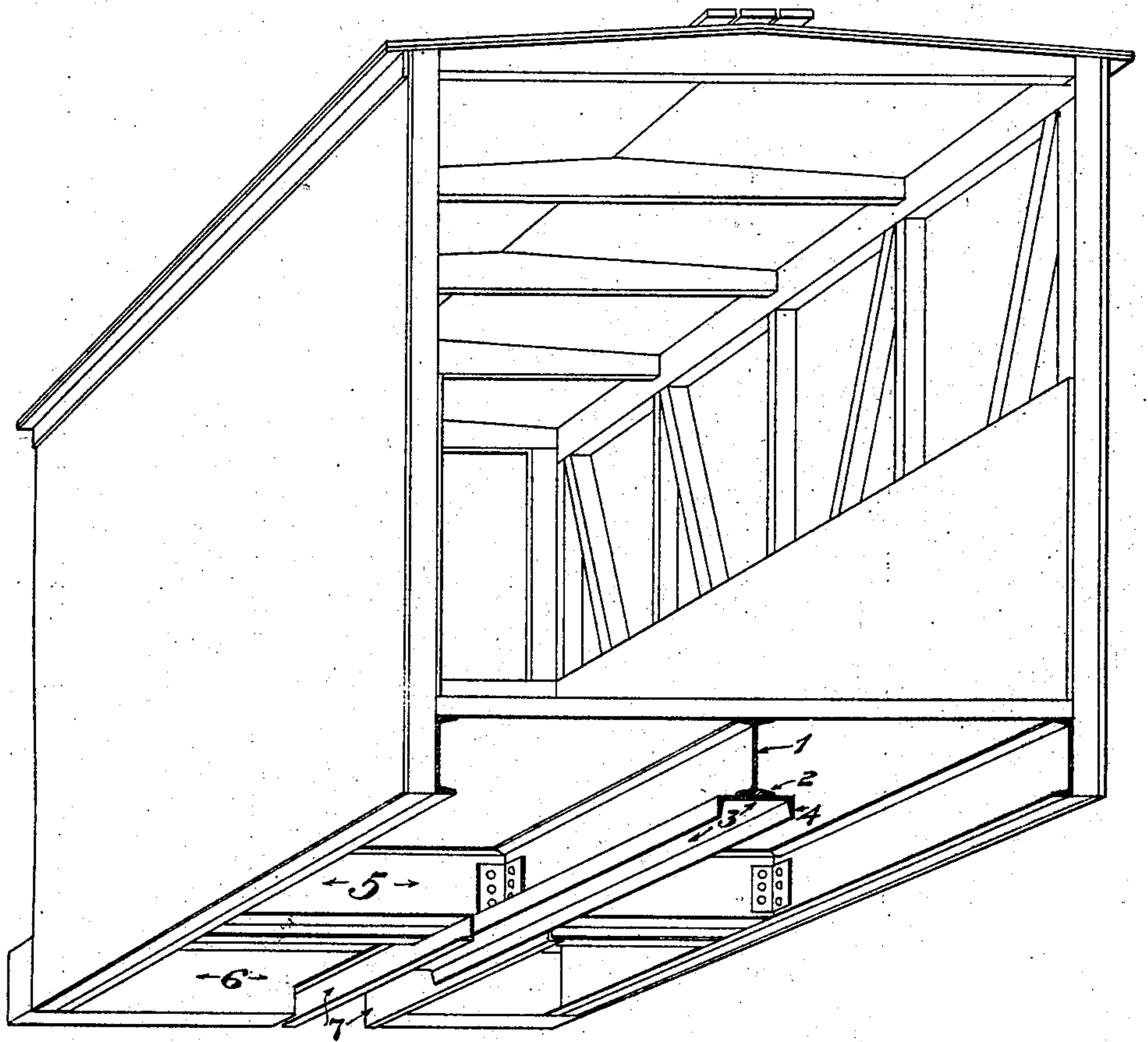
Witnesses  
D. E. Knowlton  
H. Bender.

Inventor  
John W. King  
By his Attorney  
Charles A. Stephens

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*Figure 2*



*Figure 3*

Witnesses  
*D. C. Knowlton*  
*M. Bender.*

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*John W. King*  
By his Attorney  
*Charles A. Stephens*



# UNITED STATES PATENT OFFICE.

JOHN W. KING, OF NEW YORK, N. Y.

## RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 785,174, dated March 21, 1905.

Application filed April 30, 1903. Serial No. 154,941.

*To all whom it may concern:*

Be it known that I, JOHN W. KING, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Railway-Cars, of which the following is a specification.

My invention relates to railway-cars; and its primary object is to provide an underframe of improved construction especially adapted for freight-cars of the types known as "gondolas," "flat-cars," "box-cars," "hopper-cars," "tank-cars," &c.

A further object of the invention is to provide a car-body of improved construction in which strength, rigidity, and durability will be combined with simplicity and economy of building.

The distinguishing characteristic features of my improved underframe is its center sill, which comprises a vertically-disposed main or body member having horizontal projections in combination with a horizontally-disposed and longitudinally-extended reinforcing member secured to the projections of the vertical member.

A prominent feature connected with the invention resides in the fact that the horizontally-disposed reinforcing member of the center sill is of extended character relative to the underframing of the car, while the vertical member of said sill comprises sections which abut and are secured at their contiguous ends to the bolsters, thus permitting the former to be of continuous character for attaining all the advantages consequent upon such construction. Efficient means are also provided at the end portions of the underframing, bracing the body sides contiguous to the end sills and relative to the center sill, so as to fortify the end portions of the car structure against transverse or torsional strains.

The construction of my improved car will be fully described hereinafter in connection with the accompanying drawings, which form part of this specification, and its novel features will be defined in the appended claims.

In the drawings, Figure 1 is an isometric view showing in transverse section a car embodying the invention, the car-body being of

gondola type. Fig. 2 is a similar view illustrating my improved center sill and novel bolster arrangement in connection with a box-car. Fig. 3 is a fragmental perspective view of one of the end portions of the underframe, disclosing characteristic features of my invention. Fig. 4 is a detail plan view illustrating a portion of the underframe at one end of the car structure, the means for bracing parts against lateral or torsional strain being more particularly shown. Fig. 5 is a detail vertical cross-sectional view taken in a plane intermediate of one of the bolsters and the adjacent end sill.

The center sill of the car-underframe comprises a vertically-disposed member 1, having horizontally-projecting flanges 2 and a reinforcing horizontal member 3, secured below the vertical member 1. The central member of the center sill in the form of the invention shown in the drawings consists of an I-beam, and the horizontal reinforcing member is shown as consisting of a channel-iron, with its flanges 4 turned downward or in depending relation to the body of the channel. This construction constitutes a very simple and effective form of center sill and is my preferred construction. The invention consists, broadly, of a center sill comprising a vertically-disposed flanged member and a reinforcing horizontally-disposed member below the vertical member and of longitudinally-extended character.

An important advantage of my improved form of center sill is that it permits of the employment in a car-underframe, and in a horizontal plane coincident with the center sill, of continuous bolsters 5 in connection with a continuous draft member, thus obviating the expensive and cumbersome lateral stays or trusses ordinarily required for supporting and bracing sectional bolsters. In pursuance of this feature of the invention the upper member of the center sill is of sectional character, the contiguous ends of sections of which abut against and are secured to the adjacent bolster at opposite sides of the latter by angle-plates 5<sup>a</sup>, the lower horizontal member of said sill extending continuously immediately beneath the bolsters.



As shown in Figs. 1 to 4, inclusive, the end of the horizontal member 3 of the center sill extends, as stated, under and beyond the adjacent bolster 5, and the ends of the member 3 are secured to the end cross-sills 6 of the car by side plates 7, which overlap and are firmly secured to the depending flanges 4 of the member 3 and carry the draft-rigging.

A further obvious advantage of my improved center sill is that the floor 8 is supported directly thereon, thus economizing space and insuring both compactness and strength in the car structure.

While the underframe constructed as above described is well adapted for use with car-bodies of the varying types now in common use, it is specially designed for use in combination with steel cars of the gondola type, such as illustrated in Fig. 1, and a feature of the present invention is the car-body there shown, comprising the sides 9, reinforced along their upper edges by Z-bars 10 and at their lower edges by angle-bars 11, said lower edges depending well below the car-floor to provide side sills 12, angle-bars 13 being employed to connect the floor to the sides of the car at their points of juncture.

To the outer surfaces of the sides of the car-body are secured vertically-arranged stiffening-plates 14, each consisting of an angle-iron riveted at top and bottom to the reinforcing-bars 10 and inner reinforcing angle-bars 13 of the sides, as clearly shown in Fig. 1. This construction of car-body insures the requisite strength and rigidity to overcome or withstand the lateral thrust or overturning strain of the load against the sides of the car, as the stress or strain is so equalized or distributed as to be borne by and between both the upper and lower reinforced portions of the body and not with an undue overturning effect against the sides close to the floor plane, as in a prior construction with which I am familiar.

The Z-bars 10 extend across the upper edges of the sides and ends 15 of the car-body.

The end plates 7 have upper I-beam 7<sup>a</sup> cut away or removed at one end, so that said beam will abut against the inner vertical face of the contiguous end sill 6, while those portions of the lower channels 7 projecting longitudinally beyond the bodies extend immediately beneath and through the sill to provide a medium by which the center sill can be connected with the end sills of the underframing and support and connect with the draft attachment.

Diagonally-disposed angle-braces 16 are located at each end of the underframe, connected at their inner ends to the plates 7 by brackets 17, riveted on the outer sides of said plates adjacent to the nearest bolster, the outer ends of said braces being secured by angle-plates 18 and rivets, to the inner faces of the depending parts of the car sides contiguous to the end sills. This arrangement

provides for bracing the car structure at each end against lateral or torsional strain, which, in connection with the continuous character of the bolsters 5, acting to rigidly brace the parts transversely at intermediate points, together with the longitudinally continuous character of the lower member of the center sill, serve to equip the structure for resisting strain or stress in the several directions wherein it is ordinarily most seriously experienced.

The members of the center sill, the bolsters, plates 7, diagonal braces, and other prominent parts enumerated, will be of rolled material.

I would have it understood that I reserve the right to make all such modifications and variations in the details of construction of the several features of the improved car as may be resorted to without departing from the spirit and scope of the invention as set forth and defined in the following claims.

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

1. In a car-underframing, a longitudinal sill comprising a vertically-disposed member having horizontally-projecting top and bottom flanges, and a horizontally-disposed member secured below the vertically-disposed member and having vertical side flanges.

2. In a car-underframing, a longitudinal sill comprising a vertically-disposed member including a plurality of longitudinal sections, and a horizontally-disposed longitudinal member secured and extending below said vertically-disposed member, said horizontally-disposed member having vertical flanges.

3. In a car-underframing, a longitudinal sill comprising a vertically-disposed I-beam, and a channel below said beam, said channel having its flanges turned downward.

4. The combination in an underframe for cars, with a center sill comprising a vertically-disposed member including a plurality of longitudinal sections having lateral flanges, and a horizontally-disposed member secured and extending continuously relative to said vertically-disposed member, and a bolster against which abut the contiguous ends of the sections of the vertically-disposed member.

5. The combination in an underframe for cars, with a center sill consisting of a vertically-disposed member and a horizontally-disposed member, of a continuous bolster, and plates secured to opposite sides of the center sill.

6. The combination in an underframe for cars, with a center sill consisting of a vertically-disposed member and a horizontally-disposed member, of a continuous bolster, and plates secured to opposite sides of the center sill and extending under the bolster.

7. A car-underframing embodying a center sill comprising a vertically-disposed member provided with laterally-extending flanges, and



a horizontally-disposed member of longitudinally-extended character secured below the vertically-disposed member, and a car-bottom supported directly upon the vertical member.

8. In a car-underframing, a center sill comprising a vertically-disposed member having horizontally-projecting top and bottom flanges, and a horizontally-disposed member secured below the vertically-disposed member and having vertical side flanges.

9. In a car-underframing, a center sill comprising a vertically-disposed member including a plurality of longitudinal sections, and a horizontally-disposed longitudinal member secured and extending below said vertically-disposed member, said horizontally-disposed member having vertical flanges.

10. In a car-underframing, a center sill comprising a vertically-disposed I-beam, and a channel below said beam, said channel having its flanges turned downward.

11. The combination in an underframe for cars, with a center sill comprising a vertically-disposed member including a plurality of longitudinal sections, and a horizontally-disposed member secured and extending continuously relative to said vertically-disposed member, and a continuous bolster against which abuts the contiguous ends of the sections of the vertically-disposed member.

12. The combination in an underframe for cars, with a center sill comprising a vertically-disposed member including a plurality of longitudinal sections having lateral flanges, and a horizontally-disposed member secured and extending continuously relative to said vertically-disposed member, and a continuous bolster against which abut the contiguous ends of the sections of the vertically-disposed member.

13. The combination in an underframe for cars, with a center sill consisting of a vertically-disposed member and a horizontally-disposed member having vertical flanges, of a continuous bolster, and plates secured to opposite sides of the center sill.

14. The combination in an underframe for cars, with a center sill consisting of a vertically-disposed member and a horizontally-disposed member having vertical flanges, of a continuous bolster, and plates secured to opposite sides of the center sill, and extending under the bolster.

15. In a car the combination with a body comprising a floor and sides, the latter depending below the floor plane and forming side sills of continuous bolster provision beneath and connected to the side sills, and a center sill embodying a vertical member disposed in the same horizontal plane as that occupied by the side sills and bolster provision and secured to the latter.

16. In a car, the combination with the center sill and bolsters, of a body, the sides of which intersect the horizontal plane of the center sill and bolsters, and form side sills,

said center sill comprising a vertically-disposed member located below the floor plane and provided with laterally-extending flanges, and a horizontally-disposed member secured below the vertically-disposed member.

17. The combination in an underframe for cars, with continuous bolsters, the latter presenting uninterrupted vertical faces at their central portions, and a center sill comprising a vertically-disposed member in a horizontal plane common with that of said central bolster portions, said center sill extending at each end beyond the positions of the continuous bolsters, of diagonal braces at the end portions of the frame, connected at their inner ends with the center sill and suitable side sills to which the outer ends of the braces are connected.

18. The combination with an underframe for cars having a center sill comprising a vertically-disposed member, and bolsters, of body sides depending within the horizontal plane of the center sill, and diagonal braces at the end portions of the frame, connected independently of the floor by being attached at their inner ends directly to the vertical member of the center sill and at their outer ends to the depending parts of the body sides.

19. The combination with an underframe for cars having continuous bolsters and a center sill comprising a vertically-disposed member extending at each end to points beyond the position occupied by the said bolsters, of body sides depending below the floor plane, and diagonal braces at the end portions of the frame and connected independently of the floor by being attached at their ends with the center sill and at their outer ends to the depending body sides.

20. The combination in an underframe for cars, with a center sill consisting of a vertically-disposed member having horizontally-projecting flanges, and a horizontally-disposed member, of a continuous bolster, and parallel side plates secured to opposite sides of the center sill and extending under the bolster.

21. The combination in an underframe for cars, with a center sill consisting of a vertically-disposed member having horizontally-projecting flanges, and a horizontally-disposed member having depending flanges, of a continuous bolster, and parallel side plates secured to opposite sides of the center sill and extending under the bolster.

22. In an underframe for cars, the combination with a continuous bolster, of a center sill consisting of a vertically-disposed member having horizontally-projecting flanges and a horizontally-disposed member extending under and beyond the bolster, and side plates or bars on opposite sides of the center sill connecting the latter to the end sill of the car.

23. The combination in an underframe for cars, with continuous bolsters, the latter presenting uninterrupted vertical faces at their



central portions, and a center sill comprising a vertically-disposed member in a horizontal plane common with that of said central bolster portions, metallic sides extending below the floor, such extended portions connected with the center sill, reinforcing angle-bars secured to the top and bottom edges of said sides, and a plurality of vertically-disposed angle-bars secured to the outer surfaces of the sides between said reinforcing angle-bars.

24. The combination in an underframe for cars, with continuous bolsters, the latter presenting uninterrupted vertical faces at their central portions and a center sill comprising a vertically-disposed member in a horizontal plane common with that of said central bolster portions, of a car-body comprising metallic sides extending below the floor, such extended portions connected to the center sill angle-bars connecting the sides and floor at their points of juncture, and reinforcing angle-bars secured to the top and bottom of the sides of the car.

25. The combination in an underframe for cars, with side sills, continuous bolsters the latter presenting uninterrupted vertical faces at their central portions and a center sill comprising a vertically-disposed member, said sills, bolsters and center-sill member connected substantially as described and all lying in a horizontal plane, and a horizontally-disposed member extending longitudinally supplementary to the center sill.

26. The combination in a car, of side sills,

end sills continuous bolsters, the latter presenting uninterrupted vertical faces at their central portions and a center sill comprising a vertically-disposed member, said side sills, end sills, bolsters, and center-sill member all connected substantially as described and all lying in a common horizontal plane, and a horizontally-disposed member extending longitudinally supplementary to the center sill connected with the end sills and having provision for attaching the draft-rigging.

27. The combination with the floor of a car-body, of sides connected thereto by lower angle-bars, and Z-bars secured to the sides at their top for coacting with said sides to resist the overturning action of the load, the depending flanges of said bars bearing against vertical surfaces of the sides.

28. The combination with the floor of a car-body, of sides connected thereto by lower angle-bars, Z-bars having their inner depending flanges secured to the sides at their top for coacting with the sides to resist the overturning action of the load, and stiffeners externally on the sides for bracing the latter between the rigid points presented by said upper and lower bars.

Signed at city of New York, in the county of New York and State of New York, this 28th day of April, A. D. 1903.

JOHN W. KING.

Witnesses:

D. C. KNOWLTON,  
M. BENDER.