

G. I. KING.  
CAR UNDERFRAME.  
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998,696.

Patented July 25, 1911.

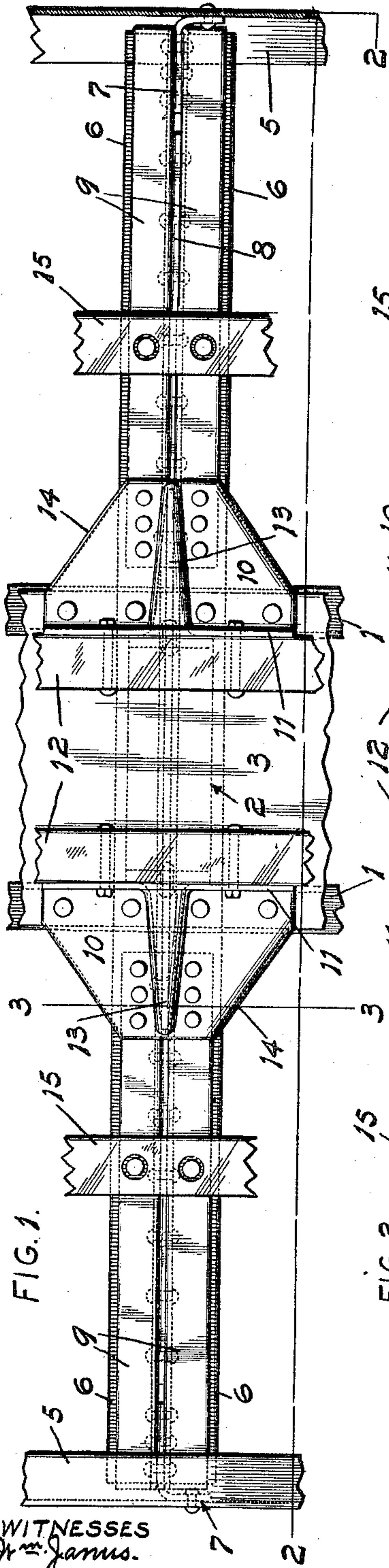


FIG. 1.

WITNESSES  
J. M. James.  
E. M. Harrington.

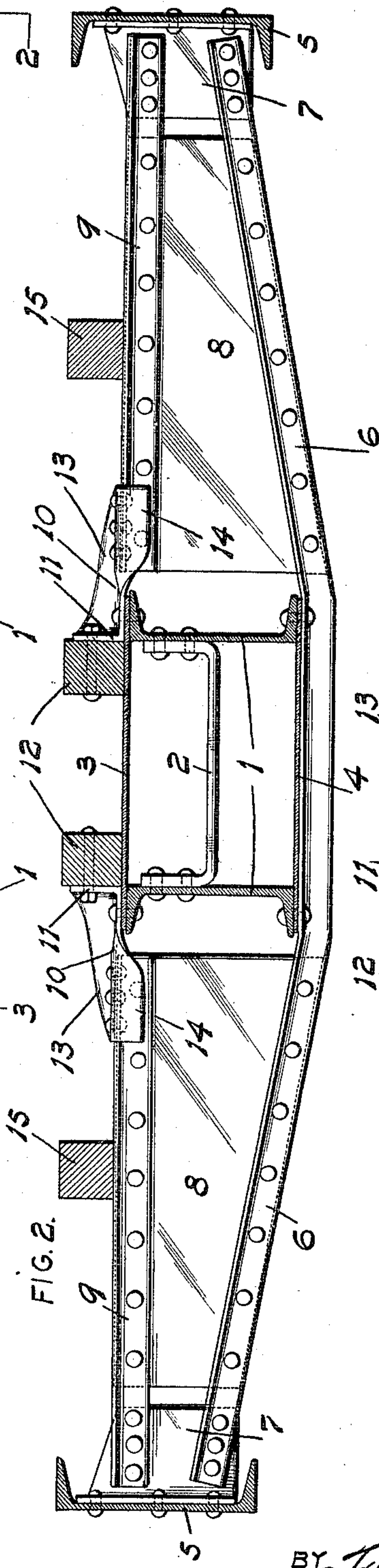


FIG. 2.

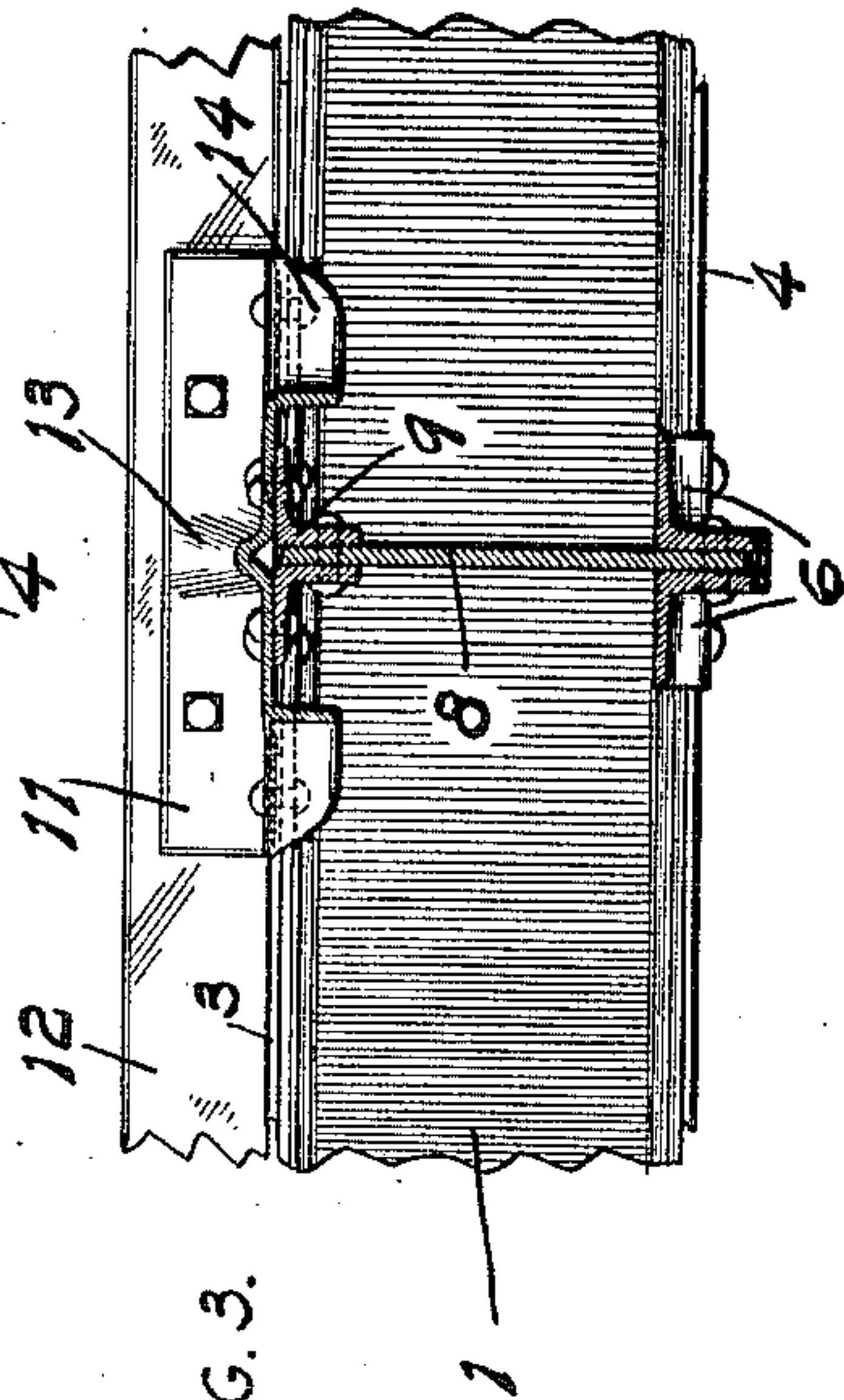


FIG. 3.

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# UNITED STATES PATENT OFFICE.

GEORGE I. KING, OF MIDDLETOWN, PENNSYLVANIA, ASSIGNOR TO AMERICAN CAR & FOUNDRY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## CAR-UNDERFRAME.

998,696.

Specification of Letters Patent.

Patented July 25, 1911.

Application filed December 2, 1909. Serial No. 530,956.

*To all whom it may concern:*

Be it known that I, GEORGE I. KING, a citizen of the United States, residing at Middletown, Pennsylvania, have invented a certain new and useful Improvement in Car-Underframes, 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 plan view of a portion of an underframe of my improved construction, and showing one of the transversely disposed cross frames thereof; Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a detailed section taken on the line 3—3 of Fig. 1.

My invention relates generally to steel car underframes, and more particularly to the transversely disposed cross bearers or frames, which are arranged between the center sill and the side sills or side walls of the car.

The principal objects of my invention are to provide a simple cross frame of great strength which can be built up and placed in position with comparatively little labor, and without necessitating the cutting of the center and side sills; to provide a cross frame which is particularly adapted for resisting vertical stresses due to the loads on the intermediate and side sills, and which cross frame is of such construction as to permit the use of intermediate wood sills of large cross section, and which wood sills are easily placed in position without being cut up into a number of small pieces as is frequently the case in underframe construction.

To the above purposes my invention consists in certain novel features of construction and arrangement of parts hereinafter more fully described and claimed.

In the construction of my improved underframe, as shown, I employ a central member of box girder form, comprising a pair of commercially rolled channels 1, spaced apart and tied together at suitable distances by means of transversely disposed tie-rods or plates 2, the ends of which are riveted to the webs of the channels. Top and bottom plates 3 and 4, are arranged above and below the channels 1, the edges of which plates are riveted to the flanges of said

channels. 5 designates the side sills which are preferably in the form of commercially rolled channels disposed so that their top flanges occupy a plane above the plane occupied by the top plate 3 of the box girder.

The cross frames as contemplated by my invention are arranged at suitable distances apart upon the box girder, and extend between the same and the side sills 5. The lower portion of each cross frame comprises a pair of angle bars 6, constituting the compression member, which pass beneath the box girder, the outer ends of said angle bars being riveted to angle plates 7, which latter are riveted to the inner faces of the side sills 5. The lower edges of the web plates 8, are arranged between and riveted to the vertically disposed legs of the angles 6.

A pair of angle bars 9, are riveted to the upper edge of the web plate 8, and the outer ends of these angle bars 9 are riveted to the angle plates 7. A reinforced pressed steel plate 10 is utilized for uniting the inner ends of each pair of angle bars 9 and the box girder, said plate being approximately triangular in plan view with its apex lying on top of the inner ends of the angle bars 9 and being riveted thereto. The base of this plate 10 overlies and is riveted to the corresponding edge of the top plate 3, and the corresponding top flange of the channels 1. The inner edge of this plate is bent upward at right angles to the body portion of the plate as designated by 11, to provide a shoulder against which one of the wooden sills 12 of the underframe is fixed. An upwardly projecting reinforcing rib 13 is pressed from the central portion of the plate and extends from the upwardly bent portion 11 of said plate, to the outer end or apex thereof. The side edges of each plate are bent downward as designated by 14 to form reinforcing ribs or flanges. Intermediate sills 15, of wood, are arranged on top of the cross frames between the sills 12 and the side sill 5, and the tops of all of the sills 12 and 15 occupy the same plane with the tops of the upper flanges of the sills 5, thus forming a level foundation for the flooring of the car.

A car underframe of my improved construction can be advantageously employed in the construction of flat cars, gondolas and box cars, and by my improved construction of cross frames the stress and loads on the intermediate and side sills are to a large



degree transmitted to the box girder center sill at the center of the frame.

The cross frames are easily built up and can be constructed at a comparatively low cost inasmuch as it is only necessary to employ commercial shapes and bent plates in their construction.

My improved construction does away entirely with any cutting of the center and side sills at points where the cross frames are connected, and by arranging the side sills with their top flanges in a place considerably above the plane occupied by the tops of the cross frame and box girder, the use of wood intermediate sills of comparatively large cross section is permitted, which is a desirable feature in underframes of this particular type.

I claim:

1. In a car underframe, the combination with a center sill, of a cross bearer frame, pressed metal plates arranged on the upper edge of and connecting the central portion of the cross frame with the top of the center sill, and diagonally disposed reinforcing flanges formed on said plates.

2. In a car underframe, the combination with a center sill and side sills, of a two part cross frame arranged between the center sill and side sills, a continuous flanged member constituting a compression flange for the cross frame and connecting the two parts of the cross frame and which member extends relatively from one side sill to the other beneath the center sills, and diagonally reinforced pressed metal plates arranged on the upper edges of the cross frame and connecting the inner ends of the two parts of the cross frame with the center sill.

3. In a car underframe, the combination with a center sill, of a cross frame fixed to said center sill, the top of which cross frame occupies the same plane with the top of the center sill, a pair of side sills to which the outer ends of the cross frame are united, the tops of which side sills occupy a plane above the plane occupied by the tops of the cross frame and center sill, intermediate sills arranged in the space between the top of the cross frame and the tops of the side sills and embossed plates connecting the cross frames and center sills and providing abutments for certain of the intermediate sills.

4. In a car underframe, the combination with a center sill and side sills, of a cross frame arranged between the center sill and side sills, and pressed metal plates connecting the central portion of the cross frame with the upper portion of the center sill, the inner edges of which plates are bent upward to serve as abutments for wooden sills.

5. In a car underframe, the combination with a center sill and side sills, of a cross frame arranged between the center sill and side sills, pressed metal plates connecting

the central portions of the cross frame with the upper portion of the center sill, reinforcing flanges formed on said plates, and the inner edges of which plates are bent upward to form abutments for wooden sills.

6. In a car underframe, the combination with a center sill and side sills, of a cross frame arranged between the center sill and side sills, angle plates connecting the outer ends of the cross frame and the side sills, and pressed metal plates arranged on the upper edge of and connecting the central portion of the cross frame with the upper portion of the center sill, said plates being formed with upwardly extending reinforcing mid-ribs.

7. In a car underframe, a cross frame comprising a pair of continuous angle bars, a pair of web plates fixed to said pair of angle bars and projecting upwardly therefrom, a pair of angle bars fixed to the upper edge of each web plate, and an embossed plate fixed to the inner ends of each of the last mentioned pairs of angle bars for connecting the upper portion of the cross frame to the center sill, said plates forming abutments for wooden furring strips.

8. In a car underframe, a cross frame comprising a pair of web plates arranged between the center sill and the side sills of the underframe, a pair of angle bars fixed to the upper portion of each web plate, a pair of angle bars fixed to the lower portion of the web plates and extending from one plate to the other beneath the girder of the frame, angle connection plates connecting the outer ends of the angle bars with the side sills, and embossed plates connecting the inner ends of the pairs of angle bars at the tops of the web plates with the center sill of the frame, said last named plates forming abutments for wooden sills.

9. In a car underframe, a center sill, a pair of side sills, a two part cross frame arranged between the center sill and side sills, a portion of which frame passes beneath and is fixed to the center sill, and pressed metal, flanged plates connecting the upper inner corners of the two part cross frame with the upper portion of the center sill, said plates being provided with reinforcing mid-ribs.

10. In a car underframe, a center sill, a pair of side sills, a two part cross frame arranged between the center sill and side sills, a portion of which frame passes beneath and is fixed to the center sill, pressed metal, flanged plates connecting the upper inner corners of the two part cross frame with the upper portions of the center sill, said plates having reinforcing mid-ribs and intermediate sills supported by the cross frames, certain of said intermediate sills cooperating with the flanges of said connecting plates.

11. A reinforced connection plate for car



5 construction which is substantially flat and triangular in shape, said plate having an up-turned flange at the base of the triangle and down-turned flanges at the legs of the triangle and an upwardly extending reinforcing mid-rib arranged substantially perpendicular to the base flange.

10 12. In a car underframe, the combination with a center sill, of a two-part cross frame and independent means for connecting the end of each cross frame with the center sill, said means comprising a reinforced connection plate substantially triangular in shape,

said plate having a down-turned flange at the base of the triangle and flanges at the legs of the triangle, with an upwardly extending reinforcing mid-rib substantially perpendicular to the base flange. 15

In testimony whereof I hereunto affix my signature in the presence of two witnesses, 20 this 24th day of November, 1909.

GEORGE I. KING.

Witnesses:

G. A. BAUSMAN,  
H. B. BAUMBACH.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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