

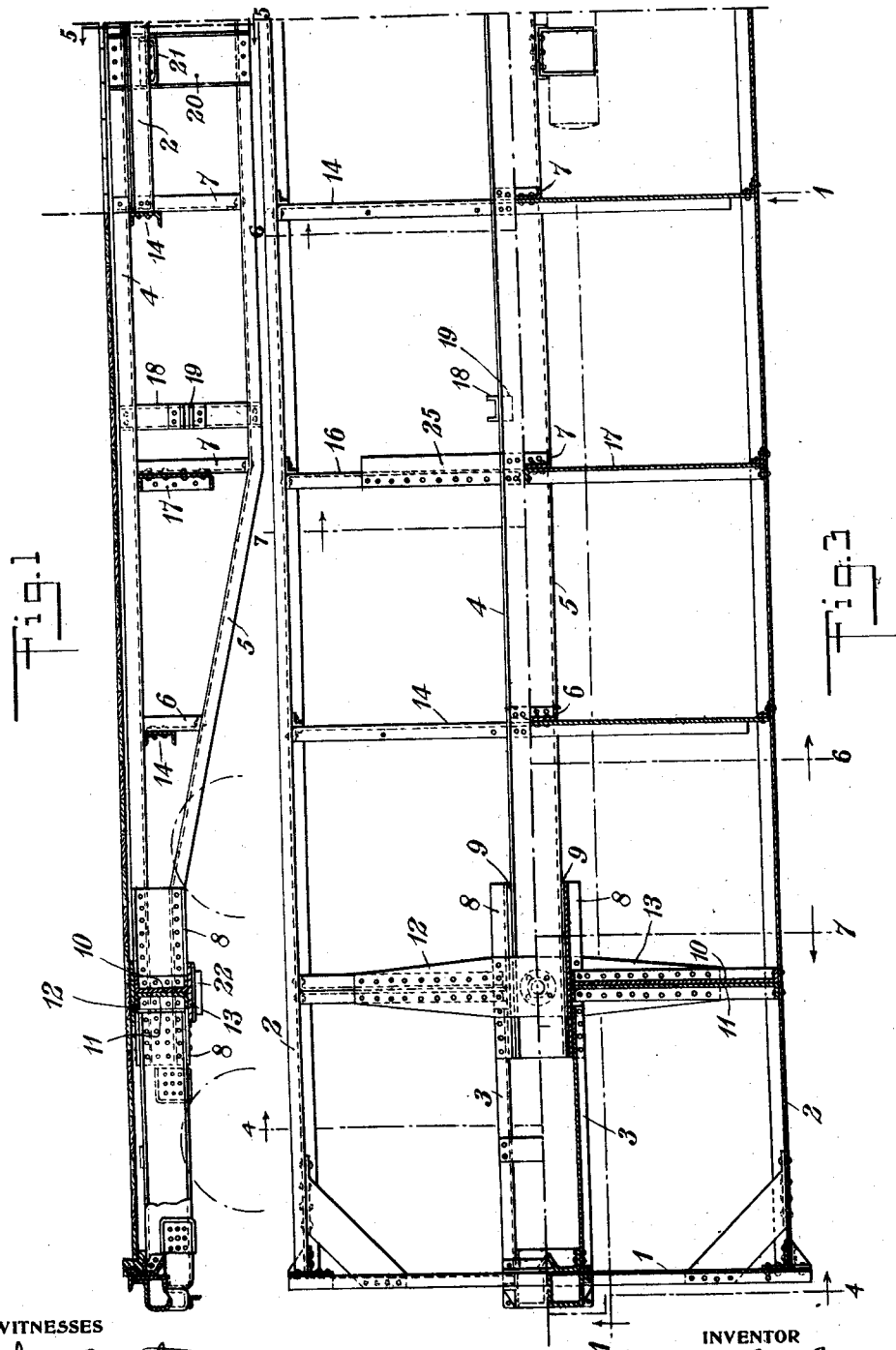
V. M. SUMMA.
UNDERFRAME.

APPLICATION FILED SEPT. 3, 1912.

Patented July 8, 1913.

3 SHEETS—SHEET 1.

1,066,548.



WITNESSES

John A. Berglund

Livingston L. Emery

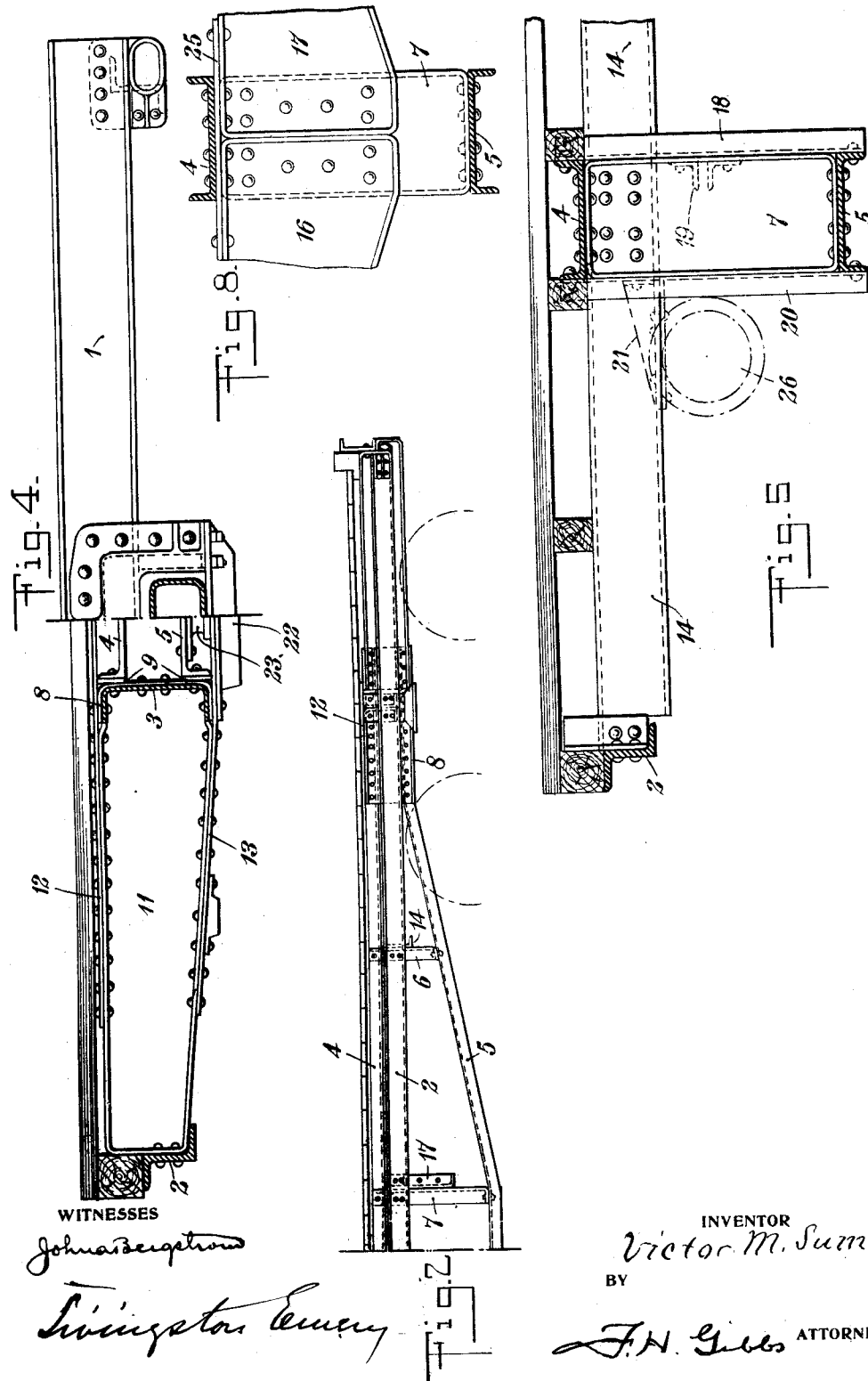
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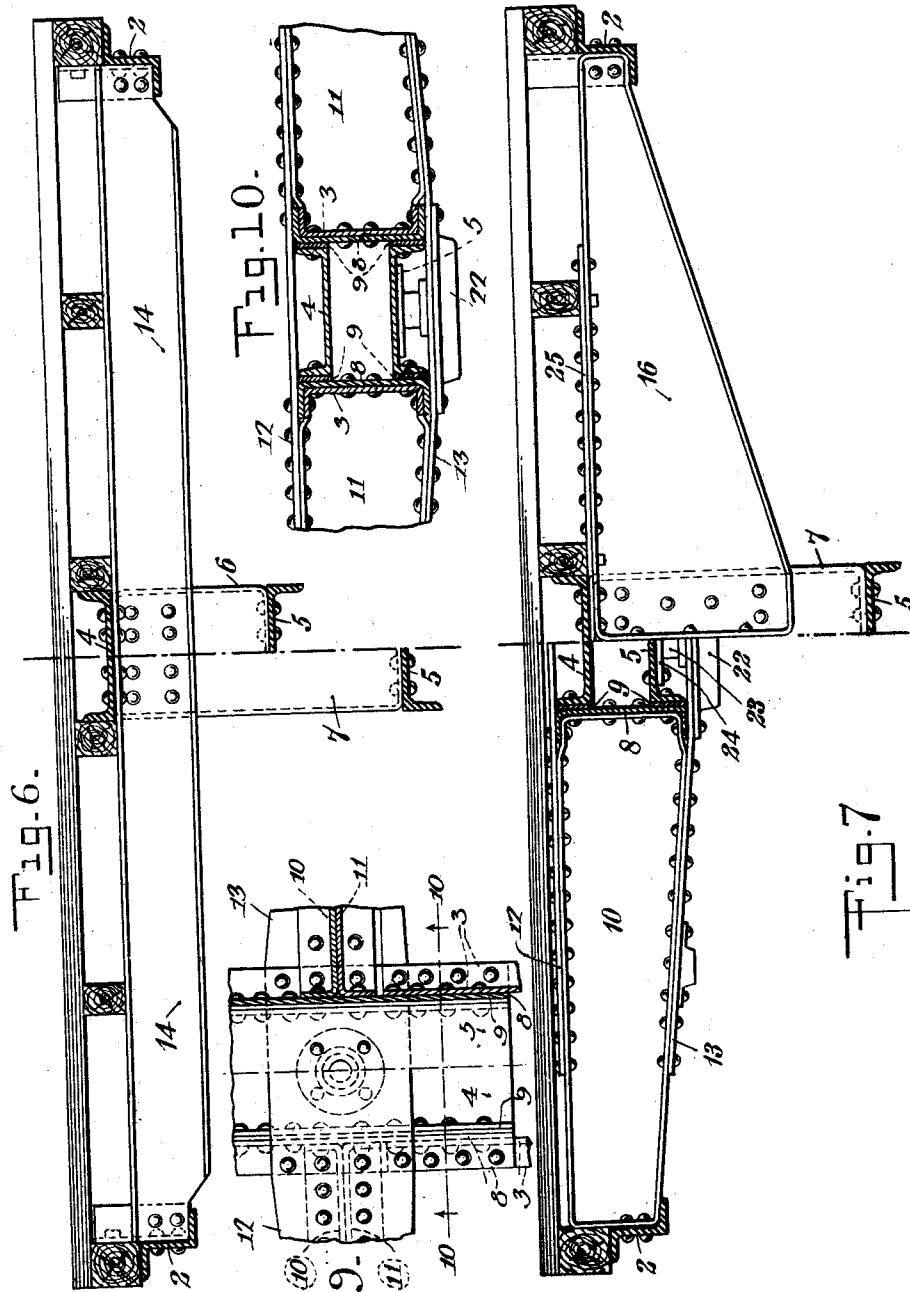
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UNITED STATES PATENT OFFICE.

VICTOR M. SUMMA, OF ST. LOUIS, MISSOURI, ASSIGNOR TO AMERICAN CAR AND
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UNDERFRAME.

1,066,548.

Specification of Letters Patent.

Patented July 8, 1913.

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To all whom it may concern:

Be it known that I, VICTOR M. SUMMA, residing at St. Louis, Missouri, and being a citizen of the United States, have invented certain new and useful Improvements in 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 to use the same, reference being had to the accompanying drawings, which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof will occur to persons skilled in the art.

In said drawings: Figure 1 is a longitudinal section on the line 1—1 of Fig. 3 of an underframe embodying my invention with the forward end of the draft sills cut away to show the position of the front follower stop, the rear follower stop being shown in dotted lines. Fig. 2 is a continuation of Fig. 1 showing a side view of the car in full lines. Fig. 3 is a plan view of the underframe with the flooring removed one-half being in section. Fig. 4 is an end view on the line 4—4 of Fig. 3 including one-half of the end sill in full lines and the section being taken on a line in front of the bolster looking in the direction of the arrow. Fig. 5 is a fragmental view on the section line 5—5 of Fig. 1 looking in the direction of the arrow. Fig. 6 shows a section as if taken on the line 6—6 of Fig. 3 looking in the direction of the arrow and illustrating the first and the center needle beam in full lines and also illustrating the form of center sills at these points. Fig. 7 represents a section as if taken on the line 7—7 of Fig. 3 looking in the direction of the arrows and illustrating the center sill construction in the rear of the bolster and also the shape and method of attaching the cross bearer diaphragms. Fig. 8 represents a fragmental view illustrating the method of forming a continuous cross bearer. Fig. 9 is a detached enlarged detail plan view (one-half of which is in horizontal section) illustrating the connection of associated parts at the bolster. Fig. 10 is a vertical sectional view taken on an imaginary section line just forwardly of the bolster, between the bolster and end sill.

This invention relates to new and useful improvements in underframe construction for cars and more particularly to certain novel details of construction relative to the center sills, bolsters and cross bearers, and comprehends in its construction the elimination of the conventional center sill as now used in railroad car construction, the elimination of cover plates and of the webs in the said center sill construction connecting the truss members thereof and the utilization of needle beams and through cross-bearers distributed at suitable intervals across the underframe and attached to suitable struts of the center sill trusses.

This invention also comprehends in its construction the utilization of a pair of channel sections, the flanges of which extend in a vertical plane and the webs of which face each other and are spaced apart to form the chords of the truss of the center sill construction.

This invention also comprehends a telescoping-like construction at the bolster wherein the center sill members telescope within the draft sills, and pass through the bolster sections and form at the same time a bolster filler and if desired a rear follower stop.

To more particularly describe this invention with reference to the accompanying drawings, the end sills 1, the side sills 2 and the draft sills 3—3 are of usual form used in underframe construction of rolled commercial sections and will only be used herein in combination as elements to produce a commercial underframe and therefore need no description further than to say that the side sills 2 are of the Z-shaped type and that the draft sills bear the usual draft gear stops.

The center sill construction comprises two main members 4 and 5 which are in the form of the usual 12 inch commercial channels and in this construction are arranged back to back or so that the flanges of the channels shall lie in practically the same vertical plane on opposite sides of the channels. The upper one of these channels, 4, is designed to extend beyond and through the bolsters at each end of the car and form the upper chord of a truss, wherein the lower channel which is also designed to extend beyond and through the bolsters at either end of the car is designed to form the lower chord of the

truss, the said channels being spaced apart at suitable intervals by struts 6 and 7 in form of a flanged diaphragm of a width corresponding to the web of the truss forming members. The forward ends of the truss members, as I have before said, extend through the bolsters and are of the usual commercial size (12 inch channels) and also penetrate a certain distance within the draft sills and if desired may form a rear follower stop. To compensate the relative difference in spacing between the center sill construction and the draft sill construction, which is $12\frac{1}{4}$ inches, a pair of channel shaped members 8 are inserted between the draft sills and the center sill construction and are designed to embrace the draft sills and lie outside of the center sill channels. As these channel sections are not of sufficient thickness to entirely compensate the difference in spacing between the channel members of the center sill construction and the spacing of the draft sills, suitable filler plates 9 are inserted between the center sill members and the channel member 8. It will therefore be seen that the channel member 8 acts practically as a splice plate between the center sill channel members and the draft sill channel members and that it also affords a sufficient riveting area for the proper connection between the center and draft sills and eliminates the necessity of cover-plates and permits of a uniform spacing between the draft sills regardless of the thickness of the plates used and at the same time rigidly secures the truss frame construction to the draft sills and forms a center sill from end to end of the car. This construction forms an effective bolster filler as will be more fully described hereafter.

The bolsters are composed of flanged diaphragms 10 and 11 placed back to back and formed deeper at the center than at the sides. The bolsters are suitably secured to the side sill and to the center splice plate 8 and are rigidly connected together by upper and lower bolster cover plates 12 and 13 extending across the top and bottom of the center sill construction, the lower plate 13 carrying the center plate 22 and king pin socket 23.

The bolster filler comprises the top and bottom channels 4 and 5 forming the upper and lower chord of the center sill construction and which are arranged back to back in such manner that the flanges of the said channels at each side of their longitudinal center extend in the same vertical plane. The channels of the center sill extend within the splice plate channels 8, and the tops of the flanges of the said channel sections extend to the plane of the top and bottom flanges of the said splice plate channels, thereby bringing the webs of the said center

sill channel members close together within the splice plate channels and within the draft sills and forming a bridge piece or filler across the draft sills and splice plate where the bolsters intercept the same. The lower bolster cover plate 13 is adapted to carry the center casting and king pin socket 22, and a projection 23 of the said socket extends upward joining and being fixed to the web of the bottom chord of the center sill construction, thereby forming an effective and simple bolster filler without the use of the usual bolster filler casting. To render this construction more rigid the center sill flanges are fixed by rivets through the splice plates, filler plates and draft sills to the inner bolster flanges.

The cross bearers employed in this construction are of two forms; a channel shape section 14, which in car terminology might be called a needle beam and tapered flanged diaphragms 16 and 17, deeper at the center than at the point where they join the side sills. The cross bearers and needle beams 14 are arranged to extend from side sill to side sill and are rigidly secured to alternate struts of the center sill construction and to the top chord 4 of the same. The compound cross bearers comprising the flanged diaphragms 16 and 17 are so arranged that the vertical flanges of each abut and are riveted together and to a second and fourth strut of the center sill construction, and are further secured together by a tie plate 25 attached to the upper flanges and to the top chord 4 of the center sill construction. The smaller end of these cross bearers are intended to be secured to the side sills. It will therefore be apparent that the cross bearers composed of the flanged diaphragms form practically a rigid connection from side sill to side sill. This construction of cross bearer has been adopted as it is possible to obtain two of such diaphragms from the same sheet of metal with comparatively little waste. A flanged plate 18 carried by the truss is designed to carry the floating lever fulcrum 19, and a flanged plate 20 also carried by the center sill construction, is designed to carry a bracket 21 which supports the brake reservoir cylinder 26. These plates 19 and 20 also assist in tying the center sill construction together. The center plate as I have said is carried by the bottom tie plate of the bolster diaphragm and the wall of the king pin socket 23 is extended upward therethrough and provided at its upper end with a flange 24 which is adapted to be secured to the lower chord of the center sill construction by means of rivets or in any other suitable manner; this permits, if desired, the perforating of the king pin socket wall for the purpose of inserting a cotter pin to secure the king pin in place. It will therefore be seen that the construction involved is very simple and

very light and very easily assembled and that the cross bearers being secured to the struts of the truss and to the side sills practically form a rigid support extending from one side to the other of the car. This construction of underframe is perhaps the lightest design in the market at the present time and is sufficiently strong to resist all the strains consequent to actual service.

What I claim is:—

1. A car underframe including side, end and draft sills, bolsters and cross bearers, a center sill construction comprising commercial channel sections arranged back to back and means for spacing said channels apart at suitable intervals to form a truss.

2. A car underframe including side, end and draft sills, bolsters and cross bearers, a center sill construction comprising channel commercial sections arranged back to back and means for spacing said channels apart at suitable intervals to form a truss, the flanges of said sections lying approximately in the same vertical plane.

3. A car underframe including draft sills, bolsters and a center sill construction comprising commercial channel sections arranged back to back and extending between said draft sills, the flanges of said commercial sections being fixed to the draft sills at each side of the bolster to space said draft sills within said bolster.

4. A car underframe including draft sills and bolsters, a center sill construction comprising commercial channel sections with their webs arranged back to back and the flanges thereof at each side of said webs lying approximately in the same vertical plane and struts in the form of flanged diaphragms intervening and filling the space between the webs of said channel sections to form a truss.

5. A car underframe including draft sills and bolsters a center sill construction comprising commercial channel sections with their webs arranged back to back, the flanges thereof at each side of said webs lying in approximately the same vertical plane, and flanged spacing plates embraced by the draft sills and acting as ties between said draft sills and the center sill construction.

6. A car underframe including draft sills and bolsters, a center sill construction comprising commercial channel sections with vertically spaced webs and having at each side of said webs flanges in approximately the same vertical plane, flanged plates embraced by the draft sills, and filler plates between the said flanged plates and the channel section flanges, the said flanged plates acting as a tie between the draft sills and the center sill construction.

7. In a car underframe, a center sill construction comprising standard channel sec-

tions having their webs vertically spaced apart and having their flanges on each side of said webs in the same vertical plane, draft sills of standard spacing overlapping said center sill construction and filler means between and uniting the draft sills and the center sill construction.

8. In a car underframe, a bolster, a center sill construction comprising commercial channel sections horizontally arranged with their flanges oppositely disposed, and draft sills overlapping the same and extending through said bolsters, said draft sills being vertically arranged back to back and fixed to said commercial channel sections at each side of said bolsters.

9. In a car underframe, a center sill construction comprising commercial channel sections horizontally arranged back to back, draft sills overlapping the same and vertically arranged back to back and splice plates in channel form vertically arranged back to back overlapping said channel sections and underlapping said draft sills.

10. In a car underframe, bolsters, a center sill construction comprising commercial channel sections horizontally arranged, telescoping draft sills and telescoping filler and uniting means for said elements, extending at each side of said bolsters, the bolsters being fixed to the said telescoping filler and uniting means.

11. In a car underframe, an open truss center sill, the webs of the chords forming the same being arranged in horizontal planes, flanged diaphragm struts intervening and filling the space between said webs, and vertical reinforcing flanges along the edges of said chords.

12. In a car underframe, an open truss center sill the webs of the chords forming the same being arranged in horizontal planes, flanged diaphragm struts intervening and filling the space between said webs, vertical reinforcing flanges along the edges of said chords, and cross bearers fixed to said diaphragms and the upper chord of the center sill.

13. In a car construction, a center sill comprising top and bottom commercially rolled channels spaced apart, and a continuous floor beam connected directly to the web of said top channel.

14. A car underframe including bolsters and a center sill construction comprising commercial channel sections arranged back to back, draft sills overlapping said channel sections, upper and lower tie plates for said bolsters and a center casting and king pin socket fixed to one of the said tie plates and to one of the said commercial channel sections.

15. In a car construction, an open truss center sill comprising vertically spaced commercially rolled channels having oppositely

disposed flanges, and a continuous floor beam fixed to the web of the upper channel of said center sill.

16. A car underframe including end, side and draft sills, bolsters and a center sill construction, cross bearers, comprising flanged metal sections deeper at the center than at the sides and secured together at their abutting edges and extending through the center sill construction and fixed to the side sills.

17. A car underframe including end, side and draft sills, bolsters and a center sill construction, cross bearers comprising flanged metal sections deeper at the center than at the sides and secured at their abutting edges and extending through the center sill construction and fixed to the top chord of the center sill construction, to the struts of the center sill construction and to the side sills.

18. A car underframe including end and side sills, bolsters and a center sill construction, and cross bearers comprising abutting flanged metal diaphragms secured at their abutting edges and extending through the center sill construction, the said cross bearers being fixed within the center sill construction to said center sill and also fixed to the side sills.

19. A car underframe including end, side and draft sills, bolsters, a center sill construction and side sill supporting members extending between the chords of the center sill truss and rigidly secured directly to the upper chord thereof, and means connecting said members with the lower chord thereof.

20. In a car underframe including bolsters and a center sill construction, cross bearers comprising tapered flanged metal sections secured at their abutting edges and extending through the center sill construction and fixed to the top chord of the center

sills, and to the side sills, a tie bar uniting the tops of the said sections.

21. In a car underframe including bolsters and a trussed center sill, cross bearers comprising tapered flanged metal sections secured at their abutting edges and extending through the truss center sills and fixed to a top chord of the center sills and to the side sills, and to a strut of the center sills, and a tie bar uniting the top of said sections.

22. In a car underframe including bolsters a truss center sill, cross bearers comprising tapered flanged metal sections secured at their abutting edges at the median line of the underframe, a tie bar uniting the upper flanges of said sections, said cross bearers being fixed to the truss center sill within the same.

23. In an underframe, a center sill comprising compression and tension members widely spaced intermediate their ends, cross bearers comprising separately formed diaphragms abutting between said tension and compression members, each diaphragm being connected with said compression member, and means connecting both diaphragms with said tension member.

24. In an underframe, a center sill comprising compression and tension members widely spaced intermediate their ends, cross bearers comprising separately formed diaphragms abutting between said tension and compression members, each diaphragm being connected with said compression member, and splicing means lapping said diaphragms and connecting them with said tension member.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

VICTOR M. SUMMA.

Witnesses:

OSCAR HOCHBERG,
A. MENDEZ.