

No. 854,403.

PATENTED MAY 21, 1907.

A. CHRISTIANSON.  
UNDERFRAME FOR PASSENGER AND LIKE CARS.

APPLICATION FILED AUG. 25, 1906.

2 SHEETS—SHEET 1.

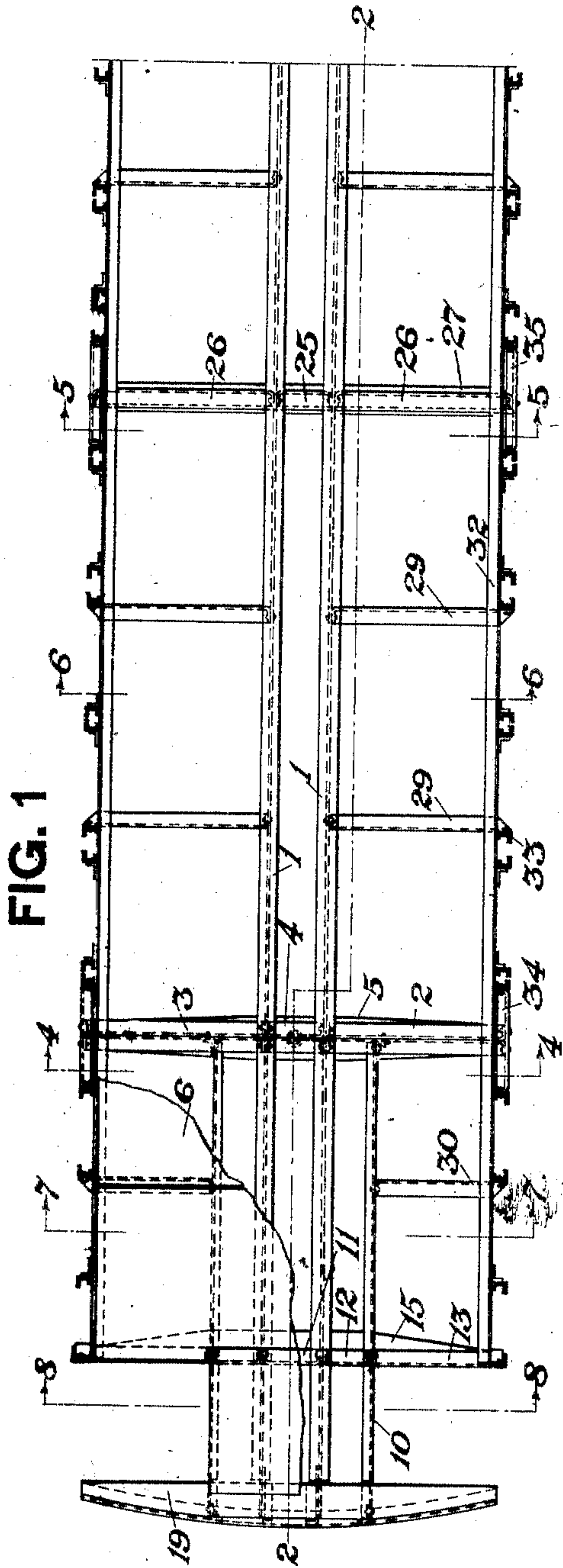


FIG. 1

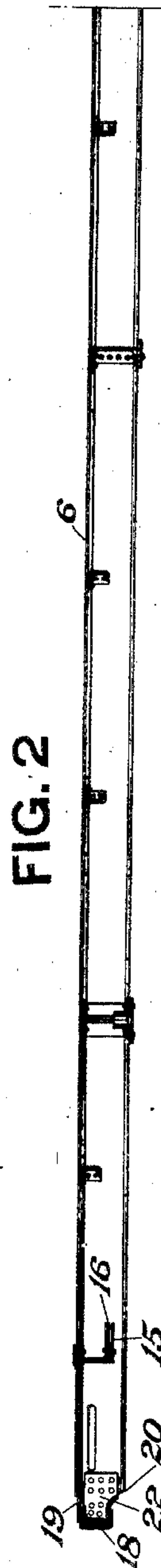


FIG. 2

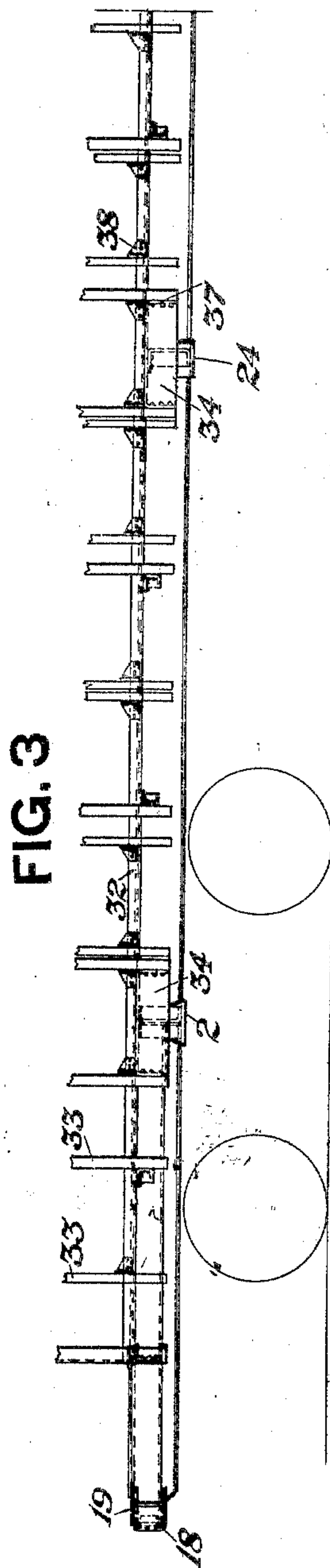


FIG. 3

WITNESSES.

*Arthur L. Day*  
*Robert C. Totten*

FIG. 10

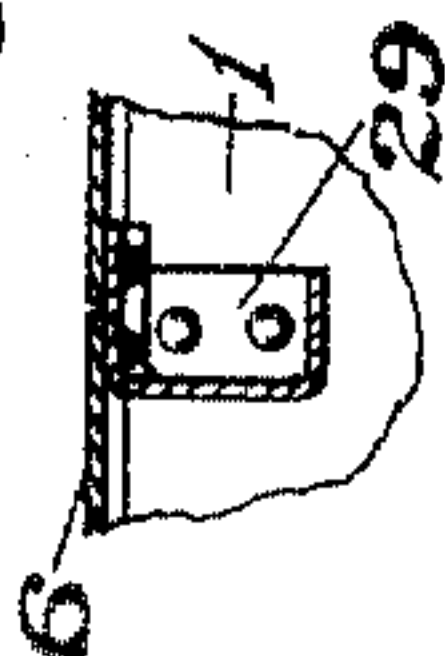
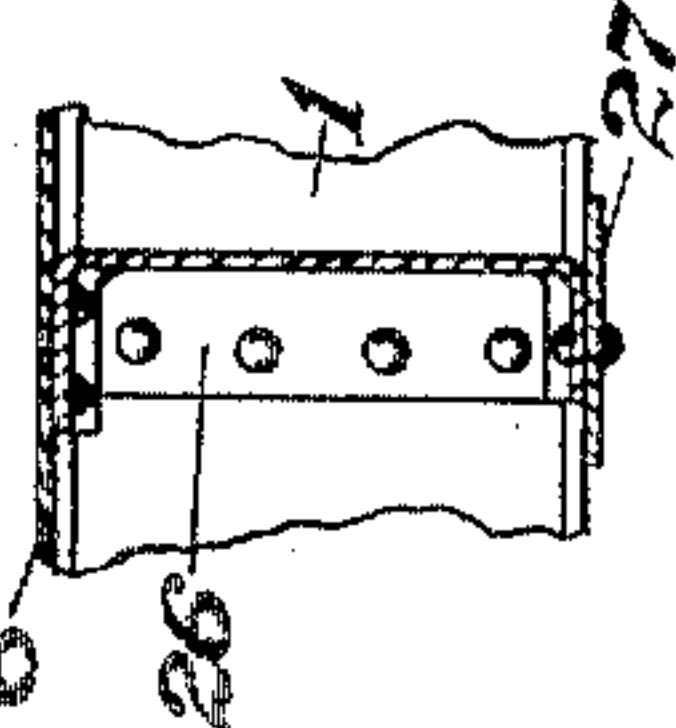


FIG. 9



INVENTOR.

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2 SHEETS—SHEET 2.

FIG. 4

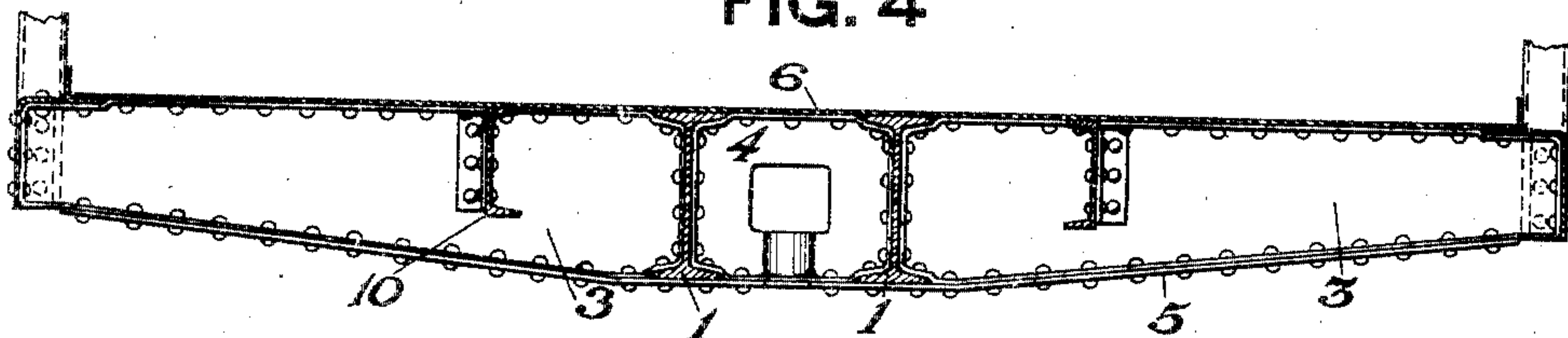


FIG. 5

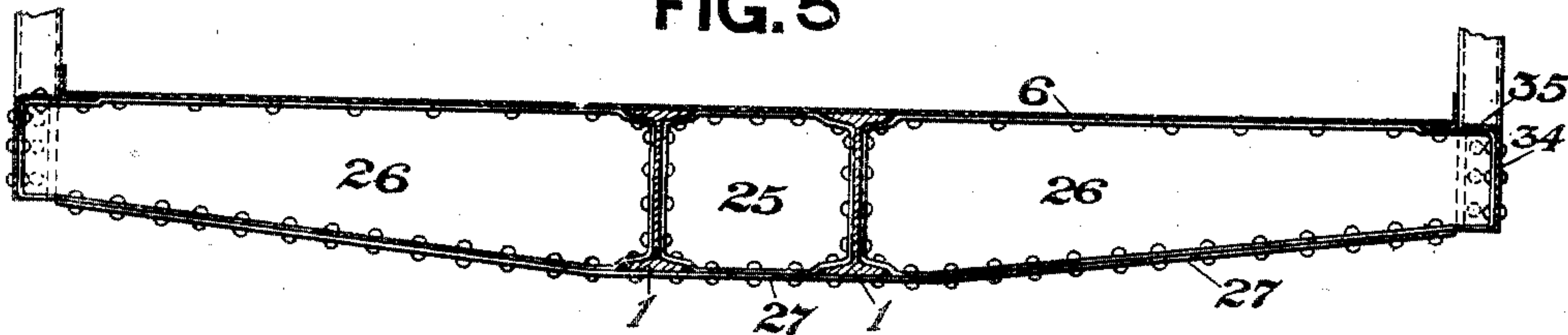


FIG. 6

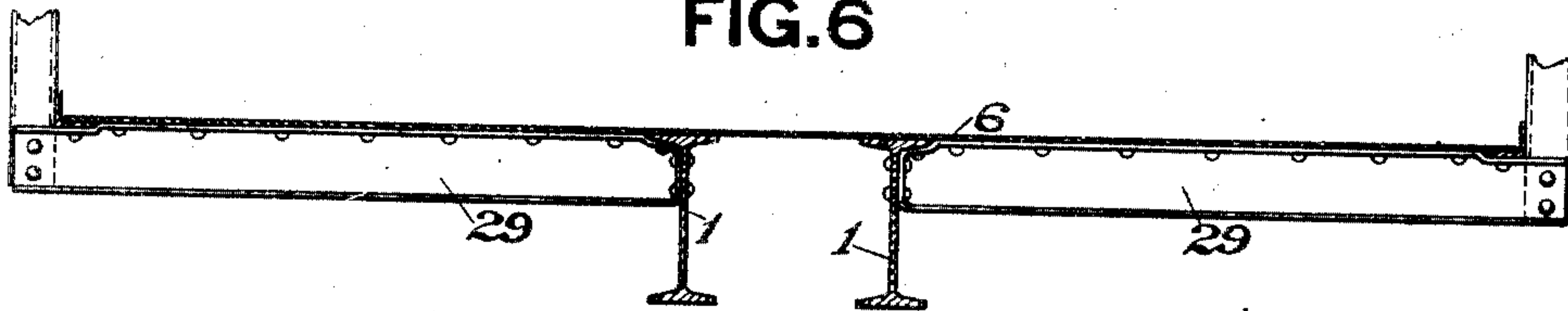


FIG. 7

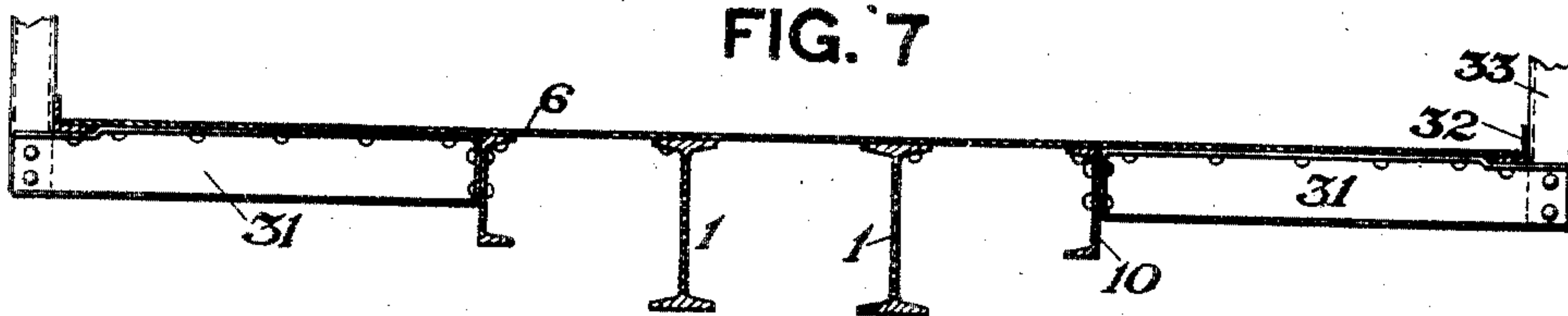
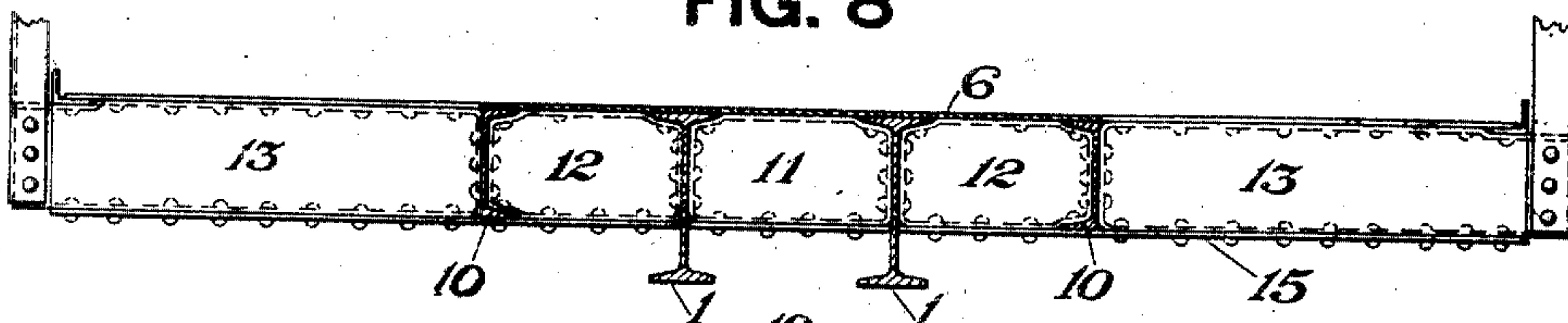


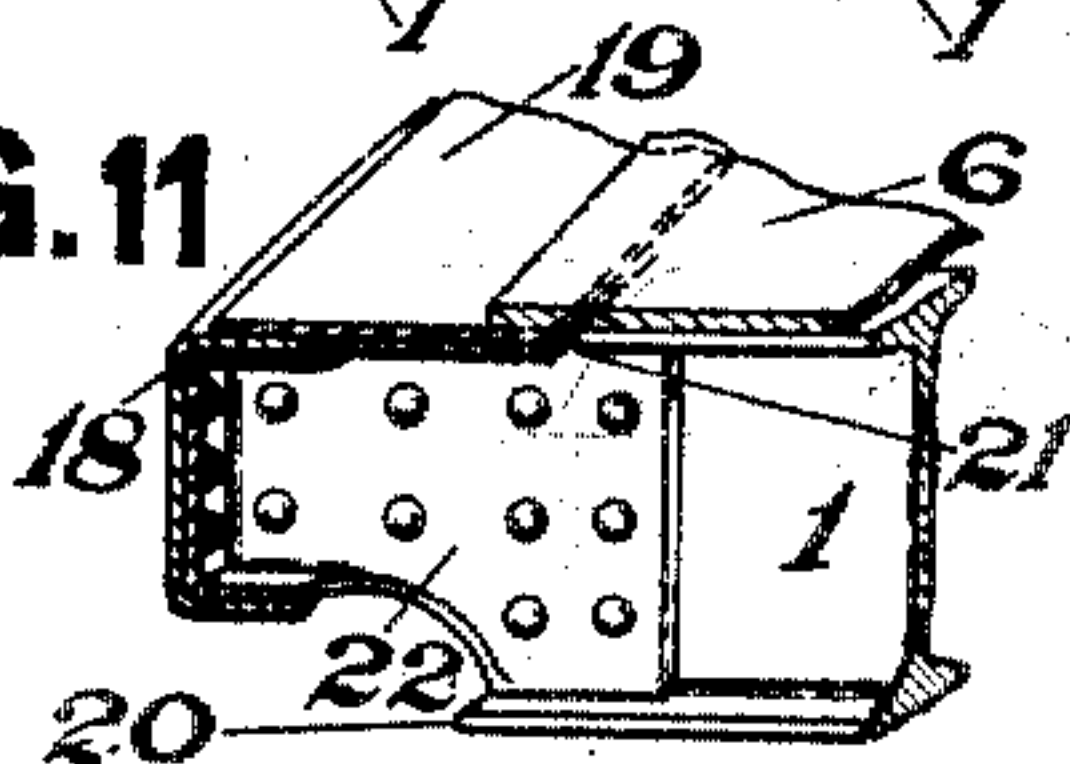
FIG. 8



WITNESSES.

*Arthur L. Lacey*  
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FIG. 11



INVENTOR.

*Arthur Christianson*  
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*attorneys*



# UNITED STATES PATENT OFFICE.

ANDREW CHRISTIANSON, OF BUTLER, PENNSYLVANIA, ASSIGNOR TO  
STANDARD STEEL CAR COMPANY, OF PITTSBURG, PENNSYLVANIA,  
A CORPORATION OF PENNSYLVANIA.

## UNDERFRAME FOR PASSENGER AND LIKE CARS.

No. 854,403.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed August 25, 1906. Serial No. 332,013.

*To all whom it may concern:*

Be it known that I, ANDREW CHRISTIANSON, a resident of Butler, in the county of Butler and State of Pennsylvania, have  
5 invented a new and useful Improvement in Underframes for Passenger and Like Cars, (Case 25) and I do hereby declare the following to be a full, clear, and exact description thereof.

10 This invention relates to metallic underframes for railway cars and more especially to underframes for passenger and similar cars, although the invention is applicable in some of its parts to underframes for any type  
15 of car designed to carry a light load.

The object of the invention is to provide an underframe which is composed of a minimum number of parts, one which is simple to construct and assemble, and especially one  
20 of light weight.

The invention consists in the arrangement and combination of parts hereafter described and claimed.

In the accompanying drawings Figure 1 is  
5 a plan view of one-half of my underframe, showing the floor plates mostly removed; Fig. 2 is a longitudinal vertical section on the line 2—2 Fig. 1; Fig. 3 is a side view of the frame; Figs. 4, 5, 6, 7 and 8 are cross sections  
10 on the lines 4—4, 5—5, 6—6, 7—7 and 8—8, respectively, Fig. 1; Figs. 9 and 10 are enlarged sectional views of the transoms and floor supports respectively; and Fig. 11 is a  
15 perspective view showing the connection of a center sill with the end or buffer sill.

In the drawings, the invention is shown applied to an underframe for a passenger car having end platforms, although the invention may be applied without material change  
20 to various forms of metallic underframes, and especially to mail, baggage, express and like cars.

The underframe shown is provided with a pair of longitudinal central sills 1, which are  
25 shown as standard rolled I-beams, although it is obvious that they may be channel beams or of special pressed or built up shapes. These center sills extend uninterruptedly from end to end of the car. The car is provided with two body bolsters 2, each of which  
30 is shown as composed of a pair of side diaphragms or web fillers 3 extending from the

center sills to the car sides and a center brace or diaphragm 4, located between the center sills. Each of the fillers or web members 3  
35 may be of any desired construction, but preferably they are pressed plates of general pan shape as shown, having integral flanges on both ends and top and bottom edges. The central brace 4 is also composed of pressed  
40 plates of general pan shape having integral flanges on their four edges, said flanges being dented inwardly at the corners in order to give a neat fit against the flanges of the center sills. The center brace and web mem-  
45 bers are composed of two pressed members arranged in pairs and placed back to back, being secured to the center sills by means of rivets passing through the flanges at the  
50 ends of the center braces and at the inner ends of the side webs, and the webs of the center sills. Each bolster is provided with a bottom transverse connecting member  
55 5, shown as a plate extending from side to side of the car and of greater width at its middle than at its ends. This plate is riveted to the bottom flanges of the web fillers and center braces. The bolster has  
60 no cover plate, but the floor plates 6 are riveted to the top flanges of the web fillers and center braces, and therefore constitute a top cover plate or connecting member.

The car is provided with a platform frame consisting of the projecting ends of the center sills 1 and platform beams 10, which  
65 extend inwardly as far as the body bolster, being secured to the web of the latter by suitable connecting pieces. These platform beams may be of any desired form, but preferably are rolled channel beams as shown,  
70 and are of less depth than the center sills.

The body end sill of the car is composed of filling members, comprising a central member 11 located between the center sills, inter-  
75 mediate members 12 located between the center sills and platform beams, and side connecting members 13 extending from the platform beams out to the car sides. Each of these members is shown as a pressed plate, having integral top and bottom flanges. The  
80 central and intermediate filling members 11 and 12 are also provided with end flanges for riveting to the webs of the center sills and platform beams. The side filling members  
85  
90  
95  
100



13 are provided with integral flanges at their inner ends for riveting to the platform beams, but at their outer ends are not provided with flanges. This body end sill is reinforced by a bottom tie plate 15, which extends from side to side of the underframe and is riveted to the bottom flanges of the several filling members. The center sills are slotted as at 16, in order to permit this cover plate to pass through.

The platform end sill, or buffer beam, is a rolled channel beam 18 bent to the desired curve of the car end with its web arranged vertically and secured to the ends of the center sills and platform beams. This buffer sill is provided with a top cover plate 19, as shown. In order that this top cover plate may be flush with the tops of the center sills, the top flanges of the latter are coped off as shown at 20. The end buffer sill 18 is of less depth than the center sills, and consequently the bottom flanges of the latter are also coped off as shown at 21. To strengthen the ends of the center sills by reason of this coping off of the flanges, the connection to the buffer sill 18 is made by means of pressed members 22, shown in Fig. 11. These have the web portions riveted to the webs of the center sills and are provided with top, bottom and end flanges, the latter being riveted to the web of the buffer sill, and the top and bottom flanges acting to stiffen and strengthen said connection plates.

The underframe is provided intermediate its body bolsters with a pair of transverse diaphragms or transoms 24, each comprising a central web member 25 located between the center sills, and side fillers or web members 26 extending from the center sills to the car sides. These web members are of pressed plates, having integral edge flanges similar to the web members of the body bolsters, the difference being that only single web members are used at the transom instead of pairs placed back to back as at the bolsters. These transoms are also reinforced by means of a bottom connecting plate 27, extending from side to side of the car and riveted to the bottom flanges of the web members, while the floor plates 6 are riveted to their upper flanges and serve as a top connecting member or cover plate.

Intermediate the transoms and bolsters are transverse floor supports 29, each composed of a channel shape, preferably a pressed plate as shown, having integral flanges at top and bottom as well as at the inner ends. These at their outer ends are unprovided with flanges as shown, and there are no center braces in line therewith between the center sills. Transverse floor supports 31 are also provided between the body bolsters and end sills, these being similar in construction to the floor supports 29 and extending from the platform beams 10 out to the car sides.

The web fillers of the transoms and floor supports 29 are of general channel shape, but the top flanges thereof are wider than the bottom flanges as shown in Figs. 9 and 10. The object of this is to lighten the structure. The top flanges are required to be of sufficient width to have riveted thereto the abutting edges of the two floor plates, said top flanges being provided for this purpose with two rows of rivet holes. The bottom flanges on the contrary, need be only sufficiently wide to provide enough metal for a tension member, and consequently are shown as comparatively narrow, thus saving weight.

The underframe is not provided with distinct side sills, but merely with angle bars 32 extending from body and sill to end sill, somewhat inside of the outer ends of the bolsters, transoms and floor supports, being riveted through its horizontal flange to the top flanges of the web members constituting these elements. These angle bars are placed with their vertical flanges projecting upwardly, and are nothing more than floor angles.

The superstructure when used, is connected to the underframe by securing the same to the outer ends of the bolsters, transoms and floor supports. As shown, the floor supports and end sill have vertical faces, formed by their webs, and lying transverse of the car outside of the floor angles 32. These vertical faces provide suitable means for riveting thereto posts or stakes, such as shown at 33. Posts or stakes may be similarly secured to the projecting ends of the bolsters and transoms, but for passenger car purposes the window spacing will not permit of this, and other means are shown for connecting the posts or stakes thereto. These comprise plates 34 each provided with a flange 35 on its top edge which rest on top of the end of the body bolster or diaphragm, the webs of the plates being arranged vertically and lying outside of the bolsters or diaphragms, and the ends of the plate being flanged inwardly as at 37, so as to provide vertical faces arranged transversely of the body of the car and to which faces the posts or stakes 33 are riveted. Angle brackets 38 connect the posts or stakes to the floor angle 32.

The underframe described is simple of construction, contains a minimum number of parts, and is as light as can be made for this type of car. Lightness is secured by reducing the number of parts, as well as by using pressed shapes to a large extent, which enables the use of a minimum number of parts, as well as allowing flanges of different widths, so that surplus metal is avoided wherever possible. The underframe is especially designed for a super-structure having a plate girder or trussed side frame construction, so that the load will be carried



largely by said side frame construction, although the underframe is adapted for various types of cars.

What I claim is:

1. In a metallic car underframe, the combination of central longitudinal sills, platform beams of less depth than the center sills, and an end sill consisting of spacing pieces between the sills and platform beams and outside of the beams, said end sill being of the same depth as the platform beams, and a bottom connecting member secured to the lower edges of the spacing pieces and extending underneath the beams and through slots in the webs of the center sills.

2. In a metallic underframe for railway cars, the combination of central longitudinal sills, platform beams of less depth than said sills, body end sills consisting of spacing pieces between the center sills and beams and outside of the beams and being of less depth than the center sills, and a bottom connecting plate tapering toward its ends and secured to the lower edges of the spacing pieces and extending underneath the beams and through slots in the webs of the central sills.

3. In a metallic underframe for railway cars, the combination of center sills provided with slots through their webs, side platform beams of less depth than said sills, and a body end sill consisting of spacing members between the sills and beams and between the beams and sides of the car, said spacing members being provided with top, bottom and end flanges, the latter being secured to the sills and beams, and a bottom connecting plate secured to the bottom flanges of said spacing pieces and extending underneath the platform beams and through the slots in the center sills.

4. In a metallic underframe for railway cars, the combination of longitudinal center sills, platform beams parallel thereto and of less depth than the center sills, a curved buffer channel sill secured to the outer end of said beams and sills, and a body end sill consisting of spacing members between the sills and beams and outside of said beams, and a bottom connecting member secured to the lower edges of the spacing members and extending underneath the beams and through slots in the center sills.

5. In a metallic underframe for railway cars, the combination of a center sill, and cross connectors or beams extending therefrom to the car sides and having top and bottom flanges, the top flanges being of greater width than the bottom flanges.

6. In a metallic underframe for railway cars, the combination of a center sill, and cross-connectors or beams extending from said sill to the car sides and being composed of members having integral top and bottom flanges, said top flanges being wider than the

bottom flanges, and having integral flanges at their inner ends for attachment to the sills.

7. In a metallic underframe for railway cars, the combination of a center sill, cross-connectors or beams extending from the center sill to the car sides and having top and bottom flanges, the top flanges being of greater width than the bottom flanges, and floor plates having meeting abutting edges over said cross-connectors or beams and secured to the top flanges thereof.

8. In a metallic underframe for railway cars, the combination of a center sill, transoms extending outwardly therefrom, and connection plates lying outside and secured to the ends of the transoms and extending longitudinally of the car with their bodies arranged vertically for the attachment of the car sides.

9. In a metallic underframe for railway cars, the combination of a center sill, a transom or cross-bearer extending outwardly therefrom, and a connection plate having its body arranged vertically and secured to the end of the transom and having a top flange resting on said transom.

10. In a metallic underframe for railway cars, the combination of a center sill, a cross-bearer or transom extending outwardly therefrom to the car sides, and connection plates secured to the ends of the transom or cross bearer and having their bodies arranged vertically and having flanges at their ends forming vertical faces lying transversely of the car for the attachment of the superstructure.

11. In a metallic underframe for railway cars, the combination of a flanged center sill having its top flange terminating short of its end, a buffer or end sill having a top plate located in the space of the omitted top flange of the center sill and flush with the top of said sill, and a stiffening and connecting member secured to the web of the center sill and buffer or end sill.

12. In a metallic underframe for railway cars, the combination of a center sill composed of a flanged shape and having the top flange at the end coped off, of an end or buffer sill secured to the end of the center sill, and a top cover plate secured to the buffer or end sill and lying in the space of the coped off flange of the center sill.

13. In a metallic underframe for railway cars, the combination of a longitudinal sill of flanged shape and having the flanges at the end coped off, of an end or buffer sill, a cover plate secured to the top of the latter and occupying the space of the coped off top flange, and a stiffening or connecting member riveted to the web of the longitudinal sill and to the buffer or end sill.

14. In a metallic underframe for railway cars, the combination of a longitudinal sill of



flanged shape and having the top flange at the  
end removed, a buffer or end sill, a cover  
plate secured to the top edge of the latter and  
lying in the space of the coped off flange or  
5 the longitudinal sill, and a connector and  
stiffener comprising a plate riveted to the web  
of the longitudinal sill and having top, bot-  
tom and end flanges, the latter being riveted  
to the end or buffer sill.  
10 15. In a metallic underframe for railway  
cars, the combination of a longitudinal sill of  
flanged shape and having the flanges at the  
end coped off, a buffer or end sill having top

and bottom flanges and a vertical web, a  
connecting member comprising a plate whose 15  
body is riveted to the web of the longitudinal  
sill and having integral top, bottom and end  
flanges, the latter being riveted to the web of  
the buffer or end sill.

In testimony whereof, I the said ANDREW 20  
CHRISTIANSON have hereunto set my hand.

ANDREW CHRISTIANSON.

Witnesses:

ROBERT C. TOTTEN,  
J. R. KELLER.