

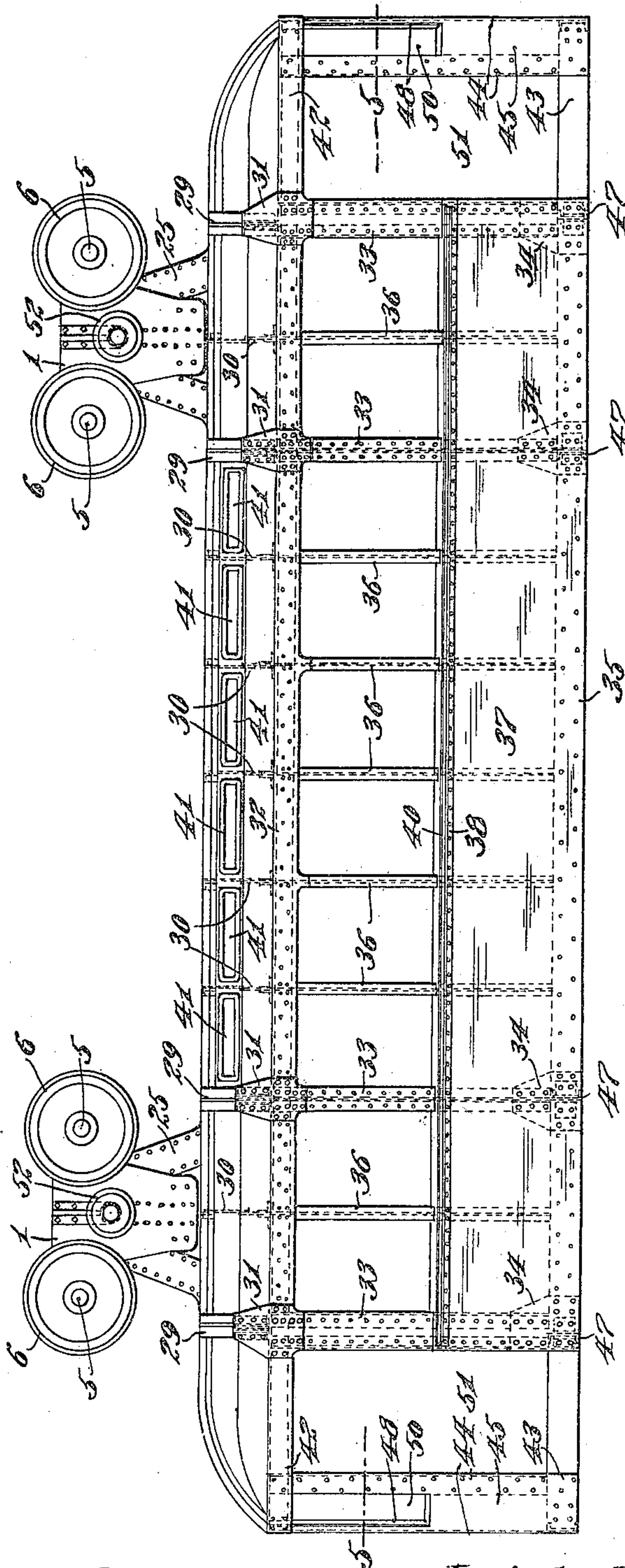
J. H. SMITH.
 SUSPENSION RAILWAY CAR FRAME AND SUPPORTING TRUCK THEREFOR.
 APPLICATION FILED JUNE 16, 1909.

953,352.

Patented Mar. 29, 1910.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses
 Thos. Brennan.
 J. A. L. Mulhall.

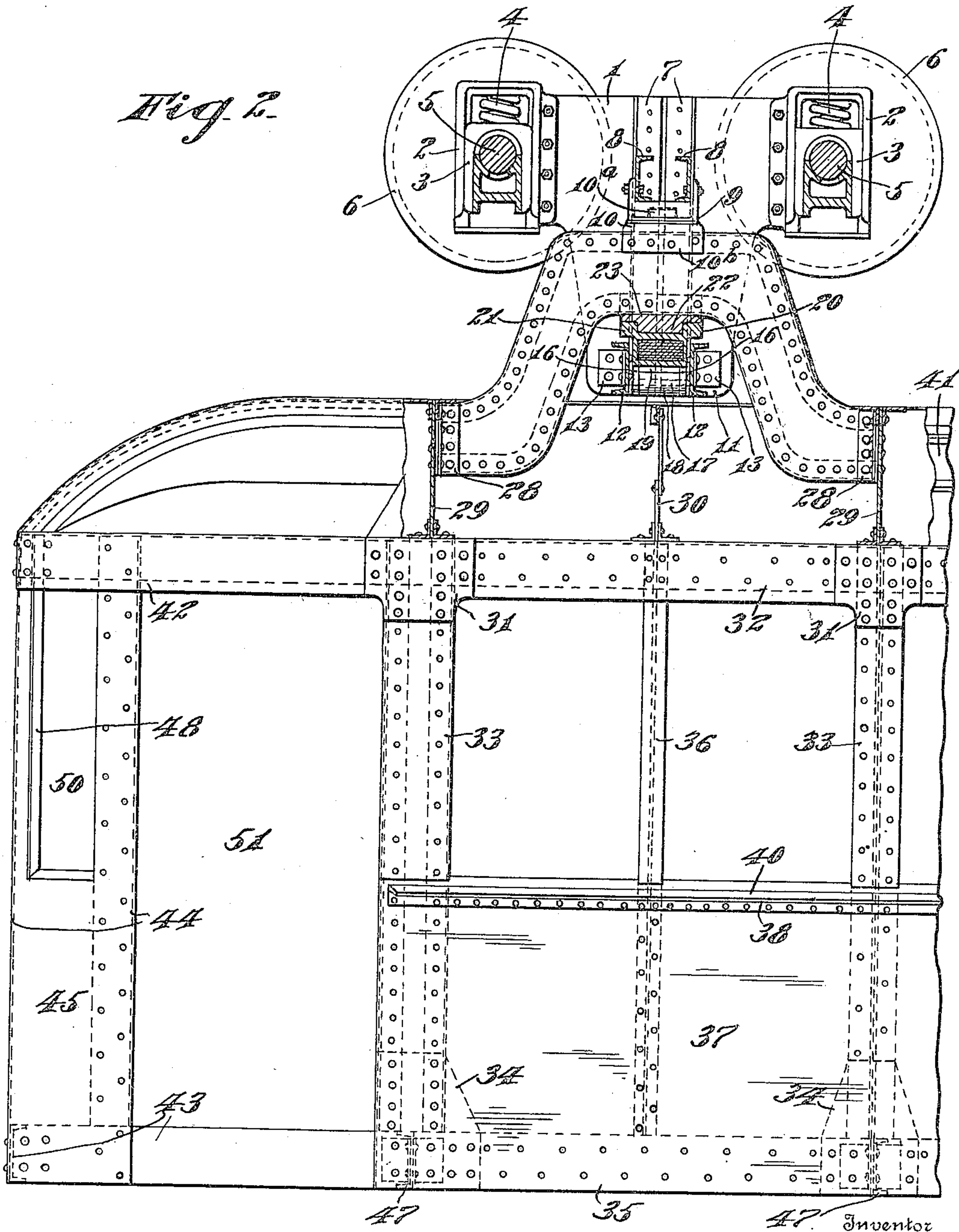
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5 SHEETS—SHEET 2.



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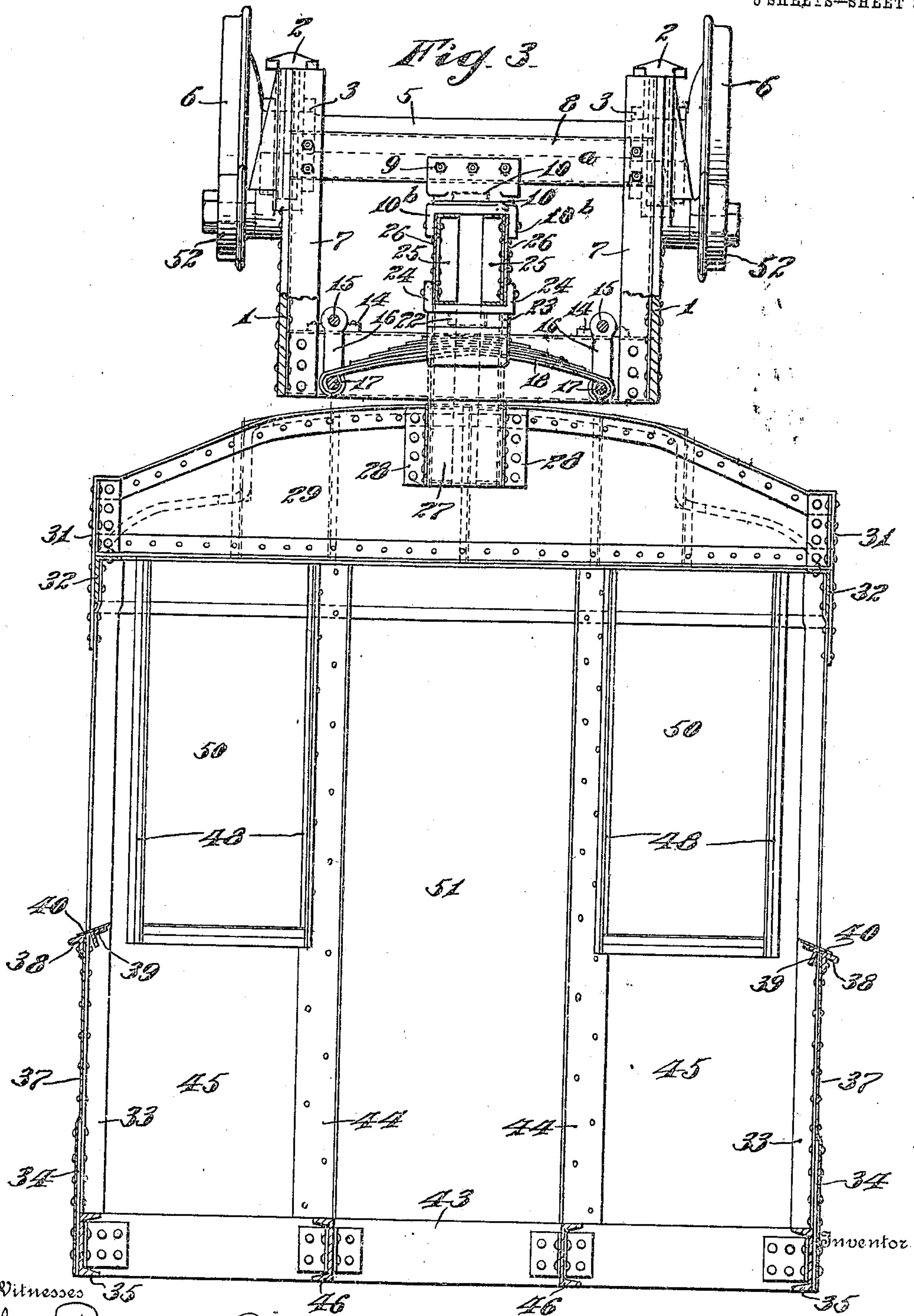
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5 SHEETS—SHEET 3.



Witnesses
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J. O. L. Mulhall.

By

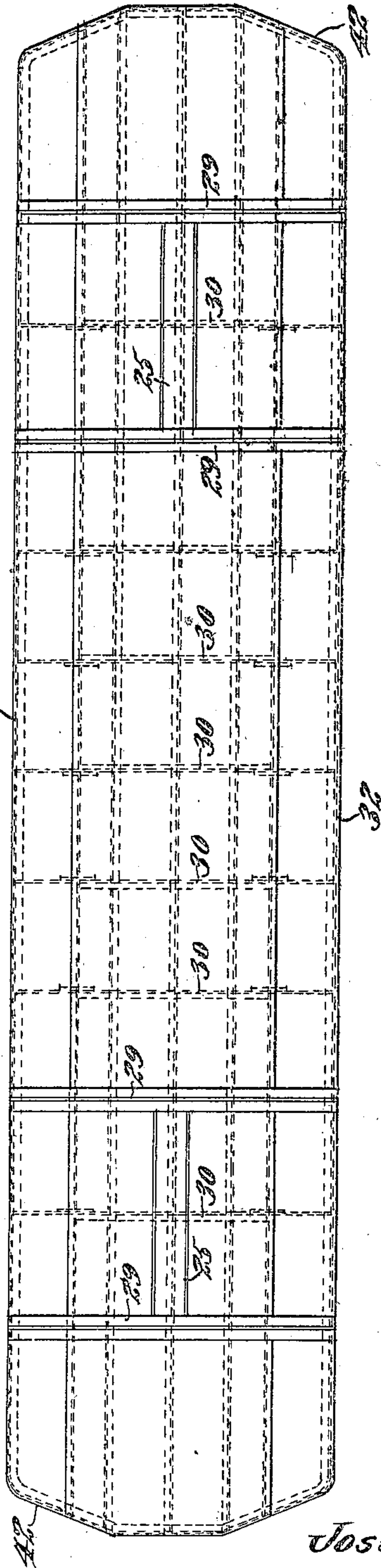
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

Fig. 5.

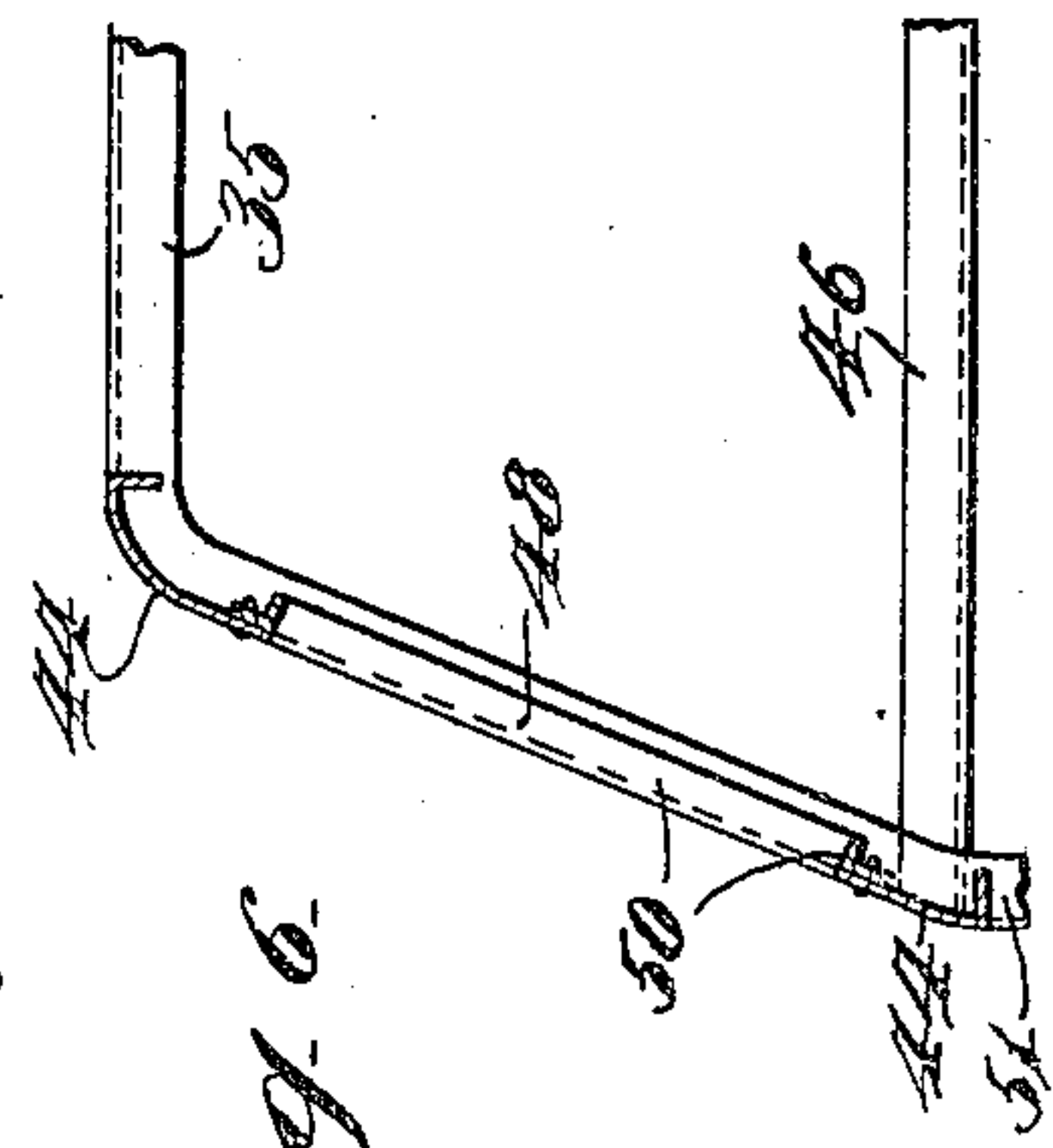
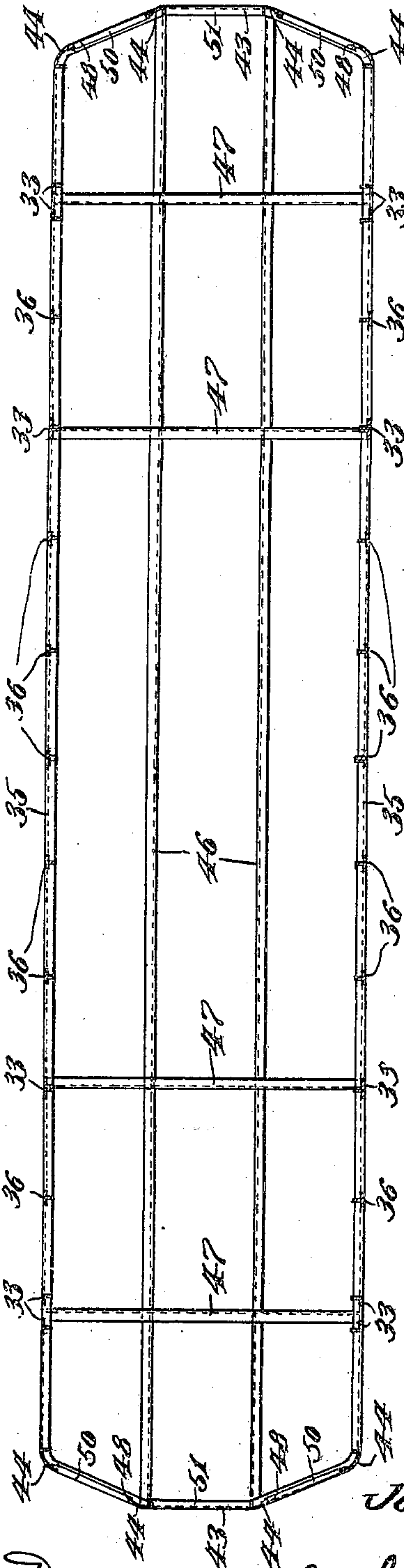


Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

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SUSPENSION-RAILWAY-CAR FRAME AND SUPPORTING-TRUCK THEREFOR.

953,352.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed June 16, 1909. Serial No. 502,510.

To all whom it may concern:

Be it known that I, JOSIAH H. SMITH, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Suspension-Railway-Car Frames and Supporting-Trucks Therefor, of which the following is a specification.

My invention relates to an improved construction of car frame, and improved construction of car trucks especially adapted for operation with the improved construction of car frame.

A further object is to provide an improved car frame having longitudinal roof beam sections arched or bowed upwardly at points adjacent the ends of the car frame, and supporting the car upon bowed springs, the latter secured pivotally to the trucks.

A further object is to provide an improved car frame with an arched longitudinal beam or beams elastically supported upon improved trucks especially constructed and adapted to receive said arched beams, and which will permit of slight lateral movement of the car frame, and slight vertical movement of the car frame, but prevent separation of the car frame from the trucks, even though the springs or their pivotal supporting devices become broken.

A further object is to provide an improved construction of suspension railway car frame and car trucks supporting the same, that will permit the car the necessary movement in the ordinary operation of a railroad of this kind, but which provides safety devices, which come into operation in the event of injury to normally operating parts, so as to preclude any possibility of a separation of the car from its trucks.

A further object is to provide an improved construction of car frame, composed entirely of metal, and the several bars and plates constituting said frame being securely tied together, whereby an extremely strong and well braced structure is secured, and one enabling a car to be made attractive and ornamental in appearance, and yet capable of withstanding the greatest of strains and stresses, and practically rendering it impossible for one car to telescope another in the event of a collision, as the car is strengthened throughout, above and below

by longitudinal bars or girders, and above and below by transverse bars or girders rigidly secured to the longitudinal bars or girders, and effecting a frame work tied securely in all directions, and resulting in a car of maximum strength and durability.

With these and other objects in view, the invention consists in certain novel features of construction, and combinations, and arrangements of parts as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1, is a view in side elevation illustrating my improvements. Fig. 2, is an enlarged view partly in elevation and partly in section showing one end of the car frame and its supporting truck. Fig. 3, is a view in cross section through the car frame, and partly in section and partly in end elevation of the truck illustrating the structure of the truck and the manner of supporting a car thereon. Fig. 4, is a top plan view of the car frame. Fig. 5, is a view in horizontal section taken on the line 5—5 of Fig. 1, and Fig. 6, is an enlarged fragmentary view in horizontal section showing a portion of the front end and corner of the frame taken at the same position as the section 5.

1, 1, represent the side frames of the truck, having yokes 2 secured at their ends, and elastically supported upon the journal boxes 3 by means of coiled springs 4.

5 represents the axles fixed to wheels 6, the latter adapted to run upon any approved suspension railway structure. The trucks are precisely alike, and the following description of one will of course apply alike to both.

To the inner face of the side frames 1, angle bars 7 are securely riveted, and cross channel bars 8 are secured at their ends to the angle bars 7 as shown, and a casting 9 is secured to these cross channels 8 at the center of the truck, and is provided with a socket to receive a journal 10^a on a block 10 having depending flanges 10^b at its ends, for a purpose which will more fully hereinafter appear.

The side frames 1 are made with downwardly projecting extensions 11, which are connected by parallel channel bars 12, the latter secured at their ends to the side frame extensions 11 by means of angle brackets 13

securely riveted to the frame and the channel bars 12. These channel bars 12, near their ends, support brackets 14, and the latter provide bearings for pins 15, on which depending links 16 are pivotally supported. There are two pairs of these links at both ends of channel bars 12, and the links of each pair are connected by cross pins 17, on which nested bow springs 18 are secured, and project at their center through an opening 19 in a pocket block 20, supporting the block, and the latter is adapted to move vertically between bars 12, but is enlarged at its upper end as shown at 21, to limit the downward movement of the pocket. This block 20 is adapted to receive a depending journal 22 on a pillow block or casting 23, said block 23 is provided at its sides with upwardly projecting flanges 24 corresponding with the depending flanges 10^b of bracket 9, and said flanges 10^b and 24 secured to parallel arched channel bars 25, strengthened by plates 26 and 27 at the sides and bottom respectively, forming in effect, an arched longitudinal girder or beam of the car frame, as will be hereinafter pointed out more in detail. These longitudinal arched beam or girder sections are secured at their ends by angle brackets 28 with transverse girders 29 in the upper portion of the car frame. There are four of these main transverse girders, which are heavier and longer than the others, being made up of plates and angles as illustrated, and at points between these main girders 29, shorter and lighter transverse girders 30 are located as illustrated. These main transverse girders are connected by gusset plates 31 with longitudinal angle bars 32, and with vertical posts or columns 33, and the lower ends of these columns 33 are connected by gusset plates 34 with longitudinal channel bars 35 of the floor frame.

The longitudinal bars 32 and the outside longitudinal bars 35 of the floor frame are connected at regular intervals by posts or columns 36, and a plate 37 is secured to all of these posts at the side of the car, and extends from the lower edge of the car to a point about midway the height of the side of the frame, so as to provide a series of window spaces between the bar 32, the upper edge of plate 37, and the posts or columns 33 and 36. This plate is strengthened at its upper edge by means of angle bars 38 and 39, and by inclined sill plates 40, and constitutes in effect a longitudinal girder, which adds materially to strengthen the frame.

The top portion of the car frame is given a shape such as ordinarily given to passenger coaches, to provide a series of ventilator spaces 41. The ends of the car frame are formed by parallel curved upper and lower channel bars 42 and 43 respectively, secured by the forward gusset plates 31 to the bars 32 and 37 and posts or columns 33, and are

braced and strengthened by vertical bars 44 and plates 45 as clearly illustrated, particularly in Fig. 3.

The floor frame as shown most clearly in Fig. 5, comprises the bars 35 and bars 46 parallel therewith, extending throughout the length of the car frame. These longitudinal bars 35 and 46 are braced and strengthened by lateral bars 47, located at suitable intervals throughout the frame. The posts or columns 44 at the ends of the car frame are slightly curved in cross section as shown most clearly in Fig. 6, to give to the car a neat and finished appearance, and dispenses with sharp angles at the corners of the structure. This Fig. 6, also illustrates a window frame 48, secured to the posts or columns 44, and a front plate 45, which is secured to the columns or posts and the bars 42 and 43, and cut out to form window openings 50, and leaving door openings 51 at the sides and both ends of the car as shown in Figs. 2 and 3. With a car frame of this character, it will be noted that the longitudinal beam sections 25, which are connected to the main transverse girders 29, and the latter connected by gusset plates 31 with the vertical columns or posts 33, and these latter to the floor frame, insure an extremely strong frame work, which with the parts above described, constitute, in effect, cradles, whereby the entire weight of the car is supported upon the arched longitudinal beam sections 25, and these latter are supported upon pillow block 22. These pillow blocks 22 are mounted in the pockets 20, and the latter are supported upon the springs 18, so as to elastically support the car and allow it vertical movement within certain limits. A little vertical movement is desirable, but only such as to provide a slight cushioning action to take up vibrations, but this movement must be very slight, and it will be observed that bracket 9 will limit the upward movement of girder 25, while the contact of block 29 with cross bars 12 will limit the downward movement.

It will further be observed that as the springs 18 are supported at their ends upon hanging or pivoted links 16, the spring is permitted to bow and straighten, the contraction and expansion of the ends of the springs toward or away from each other being compensated for by the pivoted links. If one of these links or the spring at one end should become broken or disconnected, the pocket 20 would be supported directly upon the cross girders 12, and there could be no possibility of the car separating from the truck and falling to the ground. In fact, it will be observed particularly by reference to Fig. 2, that in order for the car to leave the truck, it would be necessary for the longitudinal girder to break through the bars 12, in addition to some breakage in the

spring or its supporting links, and as these bars 12 are short and may be made of any desired strength, it can be readily understood that a structure of this kind would be extremely safe.

Emergency wheels 52 are revolubly connected to the outside of the truck side frames, and are disposed so as normally not to engage the rails of the track, but are positioned slightly above the rails, so that in the event of the breakage of an axle or a truck wheel, these auxiliary wheels will come into action and ride upon the rails to prevent tumbling of the trucks.

Various slight changes might be made in the general form and arrangement of parts described without departing from my invention, and hence I do not restrict myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In combination with a suspension railway truck, a car, and an arched longitudinal beam forming a part of the car frame, and supported on said truck.

2. In combination with a suspension railway truck, a car, and an arched longitudinal beam forming a part of the car frame, and elastically supported on said truck.

3. In combination with a suspension railway truck, a car frame, an arched longitudinal beam on the car frame, and a laterally projecting spring on said truck, and supporting said arched beam.

4. In combination with a suspension railway truck, a car frame, an arched longitudinal beam on the car frame, cross bars on the truck extending below said arched beam, and a spring on said truck supporting said arched beam above the cross bars.

5. In combination with a suspension railway truck, a car frame, a longitudinal arched beam constituting a part of the car frame, a spring disposed transversely on the truck, and supporting said beam, and pivoted links or hangers on said truck supporting the ends of said spring.

6. In combination with a suspension railway truck, cross bars on the truck, pivoted links on the cross bars, a bow spring connected at its ends to said pivoted links, and extending transversely of the truck, a car frame, an arched longitudinal beam on said car frame, supported upon said spring.

7. In combination with a suspension railway truck, side frames on the truck having depending extensions thereon, and an arched longitudinal beam forming a part of a car frame, and supported on said side frame extensions.

8. In combination with a suspension rail-

way truck, side frames on the truck having depending extensions thereon, a car, and an arched longitudinal beam forming a part of a car frame, and elastically supported on said truck.

9. In combination with a suspension railway truck, side frames on the truck having depending extensions, a car frame, an arched longitudinal beam on the car frame, and a transversely extending spring on said truck extensions, supporting said arched beam.

10. In combination with a suspension railway truck, side frames on the truck having depending extensions, a car frame, an arched longitudinal beam on the car frame, cross bars secured to the depending extensions of the side frames, and located below the arched beam, and a spring on said truck supporting said arched beam above the cross bars.

11. In combination with a suspension railway truck, side frames on the truck having depending extensions, a car frame, a longitudinal arched beam constituting a part of the car frame, a spring disposed transversely on the truck extensions and supporting said beam, and pivoted links or hangers on said truck supporting the ends of said spring.

12. In combination with a suspension railway truck, side frames on the truck having depending extensions, cross bars secured to the depending extensions, pivoted links on the cross bars, a bow spring connected at its ends to said pivoted links, and extending transversely of the truck, a car frame, and an arched longitudinal beam on said car frame supported on said spring.

13. The combination with a suspension railway truck, side frames having depending extension thereon, and transverse bars connecting the side frame extensions, of a bow spring pivotally supported at its ends on said bars, a block having an opening therein to receive the spring, enlargements on said block projecting over the bars, and an arched longitudinal beam constituting a part of a car frame and supported on said block.

14. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting the side frame extensions, of depending pivoted links on said bars, a bow spring pivotally supported at its ends on said links, a block having an opening therein to receive the spring, enlargements on said block projecting over the bars, and an arched beam on the car frame supported on said block.

15. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting the side frame extensions,

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of brackets on the bars near the side frame extensions, pins in said brackets, depending pivoted links on said pins, cross pins at the lower ends of said links, a bow spring pivotally supported at its ends on said cross pins, a block supported centrally on said spring, and having an opening to receive the spring, enlargements on said block projecting over the bars, and an arched beam on the car frame supported on said block.

16. The combination with a suspension railway truck, side frames on the truck having depending extensions, transverse bars connecting the side frame extensions, of brackets on the bars near the side frame extensions, pins in said brackets, depending pivoted links on said pins, cross pins at the lower ends of said links, a bow spring pivotally supported at its ends on said cross pins, a block supported centrally on said spring, and having an opening to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, upwardly projecting flanges at the sides of said pillow block, cross bars secured to the side frames and disposed above and parallel with the first mentioned transverse bars, of a bracket secured to and depending from said last mentioned bars, and disposed above the pillow block, depending flanges on said bracket, and a longitudinal arched beam forming a part of a car frame supported on said pillow block.

17. The combination with a suspension railway truck, side frames on the truck having depending extensions thereon, of transverse bars connecting the side frame extensions, a bow spring pivotally supported at its ends on said bars, a block supported at its center on said spring, and having an opening to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, and a longitudinal arched beam on a car frame supported on said pillow block.

18. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting said extensions, of a bow spring pivotally supported at its ends on said bars, a block supported centrally on the spring and having an opening to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, upwardly projecting flanges at the sides of said pillow block, and an arched beam on a car frame supported on said pillow block, and between the upwardly projecting flanges thereof.

19. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting the extensions, of a bow spring pivotally supported at its ends on said bars, a block supported at the center on said spring, and having an opening therein to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, cross bars se-

cured to the side frames, and disposed above and parallel with the first mentioned transverse bars, a bracket secured to and depending from said last mentioned bars, and disposed above the pillow block, and an arched beam on a car frame supported between the pillow block and said bracket.

20. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting the extensions, of a bow spring pivotally supported at its ends on said bars, a block supported at its center on said spring, and having an opening to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, upwardly projecting flanges at the sides of said pillow block, cross bars secured to the side frames and disposed above and parallel with the first mentioned transverse bars, of a bracket secured to and depending from said last mentioned bars, and disposed above the pillow block, depending flanges on said bracket, and a longitudinal arched beam forming a part of a car frame, supported on the pillow block and disposed between the flanges of the pillow block and said bracket.

21. In combination with a suspension railway truck, a car, and an arched longitudinal beam forming a part of the car frame, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars, and supported on said truck.

22. In combination with a suspension railway truck, a car, and an arched longitudinal beam forming a part of the car frame, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars, and elastically supported on said truck.

23. In combination with a suspension railway truck, a car frame, an arched longitudinal beam on the car frame, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars, and a laterally projecting spring on said truck, and supporting said arched beam.

24. In combination with a suspension railway truck, a car frame, an arched longitudinal beam on the car frame, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars, cross bars on the truck extending below said arched beam, and a spring on said truck supporting said arched beam above the cross bars.

25. In combination with a suspension railway truck, a car frame, a longitudinal arched beam constituting a part of the car frame, and comprising parallel channel bars spaced apart and having inwardly project-

ing flanges on said bars, a spring disposed transversely on the truck, and supporting said beam, and pivoted links or hangers on said truck supporting the ends of said spring.

26. In combination with a suspension railway truck, cross bars on the truck, pivoted links on the cross bars, a bow spring connected at its ends to said pivoted links, and extending transversely of the truck, a car frame, an arched longitudinal beam on said car frame, supported upon said spring, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

27. In combination with a suspension railway truck, side frames on the truck having depending extensions thereon, and an arched longitudinal beam forming a part of a car frame, and supported on said side frame extensions, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

28. In combination with a suspension railway truck, side frames on the truck having depending extensions thereon, a car, and an arched longitudinal beam forming a part of a car frame, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars, and elastically supported on said truck.

29. In combination with a suspension railway truck, side frames on the truck having depending extensions, a car frame, an arched longitudinal beam on the car frame, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars, and a transversely extending spring on said truck extensions, supporting said arched beam.

30. In combination with a suspension railway truck, side frames on the truck having depending extensions, a car frame, an arched longitudinal beam on the car frame, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars, cross bars secured to the depending extensions of the side frames, and located below the arched beam, and a spring on said truck supporting said arched beam above the cross bars.

31. In combination with a suspension railway truck, side frames on the truck having depending extensions, a car frame, a longitudinal arched beam constituting a part of the car frame, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars, a spring disposed transversely on the truck extensions and supporting said beam, and pivoted links or hangers on said truck supporting the ends of said spring.

32. In combination with a suspension railway truck, side frames on the truck having depending extensions, cross bars secured to

the depending extensions, pivoted links on the cross bars, a bow spring connected at its ends to said pivoted links, and extending transversely of the truck, a car frame, and an arched longitudinal beam on said car frame supported on said spring, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

33. The combination with a suspension railway truck, side frames having depending extensions thereon, and transverse bars connecting the side frame extensions, of a bow spring pivotally supported at its ends on said bars, a block having an opening therein to receive the spring, enlargements on said block projecting over the bars, and an arched longitudinal beam constituting a part of a car frame and supported on said block, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

34. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting the side frame extensions, of depending pivoted links on said bars, a bow spring pivotally supported at its ends on said links, a block having an opening therein to receive the spring, enlargements on said block projecting over the bars, and an arched beam on the car frame supported on said block, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

35. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting the side frame extensions, of brackets on the bars near the side frame extensions, pins in said brackets, depending pivoted links on said pins, cross pins at the lower ends of said links, a bow spring pivotally supported at its ends on said cross pins, a block supported centrally on said spring, and having an opening to receive the spring, enlargements on said block projecting over the bars, and an arched beam on the car frame supported on said block, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

36. The combination with a suspension railway truck, side frames on the truck having depending extensions, transverse bars connecting the side frame extensions, of brackets on the bars near the side frame extensions, pins in said brackets, depending pivoted links on said pins, cross pins at the lower ends of said links, a bow spring pivotally supported at its ends on said cross pins, a block supported centrally on said spring, and having an opening to receive the spring, enlargements on said block projecting over the bars, said block having a

pocket therein, a pillow block having a journal in said pocket, and an arched longitudinal beam on a car frame supported on said pillow block, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

37. The combination with a suspension railway truck, side frames on the truck having depending extensions thereon, of transverse bars connecting the side frame extensions, a bow spring pivotally supported at its ends on said bars, a block supported at its center on said spring, and having an opening to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, and a longitudinal arched beam on a car frame supported on said pillow block, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

38. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting said extensions, of a bow spring pivotally supported at its ends on said bars, a block supported centrally on the spring and having an opening to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, upwardly projecting flanges at the sides of said pillow block, and an arched beam on a car frame supported on said pillow block, and between the upwardly projecting flanges thereof, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

39. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting the extensions, of a bow spring pivotally supported at its ends on said bars, a block supported at the center on said spring, and having an opening therein to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, cross bars secured to the side frames, and disposed above and parallel with the first mentioned transverse bars, a bracket secured to and depending from said last mentioned bars, and disposed above the pillow block, and an arched beam on a car frame supported between the pillow block and said bracket, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

40. The combination with a suspension railway truck, side frames on the truck having depending extensions, and transverse bars connecting the extensions, of a bow spring pivotally supported at its ends on said bars, a block supported at its center on

said spring, and having an opening to receive the spring, enlargements on said block projecting over the bars, said block having a pocket therein, a pillow block having a journal in said pocket, upwardly projecting flanges at the sides of said pillow block, cross bars secured to the side frames and disposed above and parallel with the first mentioned transverse bars, of a bracket secured to and depending from said last mentioned bars, and disposed above the pillow block, a block having rotary mounting in the bracket, depending flanges on said last mentioned block, and a longitudinal arched beam forming a part of a car frame, supported on the pillow block and secured between the flanges of the said blocks, and comprising parallel channel bars spaced apart and having inwardly projecting flanges on said bars.

41. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, arched beams secured to said transverse girders, and supported on said trucks.

42. In combination with suspension railway trucks, of a car frame, transverse girders secured in the upper portion of the car frame, arched beams secured at their ends to said transverse girders, and supported on the car trucks, longitudinal bars at the upper and lower portions of the car frame, said upper bars secured to the transverse girders, and posts or columns connecting said longitudinal bars.

43. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, arched longitudinal beams supported between their ends on said trucks, angle brackets securing the ends of said beams to said transverse girders, longitudinal bars at the upper and lower portions of the car frame, said upper bars secured to the transverse girders, posts or columns, and gusset plates connecting said longitudinal bars and posts or columns.

44. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, longitudinal arched beams supported between their ends on said trucks, angle brackets securing the ends of said beams to said transverse girders, longitudinal bars at the upper and lower portion of said frame, the upper bars secured to said transverse girders, vertical posts or columns, gusset plates connecting said longitudinal bars, and posts or columns, and horizontal curved bars at the ends of the frame secured to the end columns, and longitudinal bars, and located in line with the latter.

45. The combination with suspension railway trucks, of a car frame, transverse girders secured in the upper portion of the car

frame, longitudinal arched beams supported between their ends on said trucks, and secured at their ends to said transverse girders, longitudinal bars at the upper and lower portions of the car frame, the upper bars secured to the transverse girders, vertical columns or posts, gusset plates connecting said columns or posts with said longitudinal bars, horizontal curved bars at the ends of the frame secured to the end columns, and to the longitudinal bars and in line with the latter, columns connecting said curved bars, and longitudinal plates secured to the lower portions of said columns, and said lower longitudinal bars.

46. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, arched longitudinal bars connected at their ends to said girders and supported between their ends on said trucks, longitudinal parallel upper and lower bars at the sides of the car frame, the upper bars secured to the transverse bars, vertical columns or posts, gusset plates connecting said columns or posts, and said longitudinal bar, parallel longitudinal bars located between the lower longitudinal bars of the frame, and transverse bars securing said lower bars together.

47. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, arched longitudinal girders secured to the transverse girders and supported on the trucks, parallel longitudinal upper and lower bars on the car frame, the upper bars secured to the transverse girders, vertical columns or posts connecting said longitudinal bars, and plates at each side of the car frame secured to said lower longitudinal bars and to said columns or posts.

48. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, arched longitudinal girders secured to the transverse girders and supported on the trucks, parallel longitudinal upper and lower bars on the car frame, the upper bars secured to the transverse girders, vertical columns or posts connecting said longitudinal bars, and plates at each side of the car frame secured to said lower longitudinal bars and to said columns or posts, and angle bars secured to opposite sides of said plate at its upper edge.

49. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, longitudinal arched beams secured at their ends to said girders, and supported between their ends on said trucks, parallel longitudinal bars on both sides of the car frame, the upper bars secured to the transverse girders, vertical columns or posts connecting said parallel bars, a longitudinal plate at each

side of the car frame connecting all of said longitudinal posts or columns, and extending from the lower longitudinal bar to a point approximately midway between the bars.

50. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, longitudinal arched beams secured at their ends to said girders, and supported between their ends on said trucks, parallel longitudinal bars on both sides of the car frame, the upper bars secured to the transverse girders, vertical columns or posts connecting said parallel bars, a longitudinal plate at each side of the car frame connecting all of said longitudinal posts or columns, and extending from the lower longitudinal bar to a point approximately midway between the bars, and angle bars secured to opposite sides of said plates at their upper edges.

51. The combination with suspension railway trucks, of a car frame, transverse girders in the upper portion of the car frame, longitudinal arched beams secured at their ends to said girders, and supported between their ends on said trucks, parallel longitudinal bars on both sides of the car frame, the upper bars secured to the transverse girders, vertical columns or posts connecting said parallel bars, a longitudinal plate at each side of the car frame connecting all of said longitudinal posts or columns, and extending from the lower longitudinal bar to a point approximately midway between the bars, and angle bars secured to opposite sides of said plates at their upper edges, and inclined sill plates secured at right angles across the upper edge of said plate and to said angle bars.

52. The combination with a suspension railway truck, of a car frame, and an arched longitudinal beam on said frame supporting said car frame on the truck.

53. The combination with suspension railway trucks, side frames on the trucks having depending extensions, two pairs of parallel bars on each truck connecting the side frames and the side frame extensions, and disposed one pair above the other, of a car frame, arched longitudinal beam sections forming part of the car frame, and devices elastically supporting said beams between the side bars of the truck.

54. The combination with suspension railway trucks, side frames on the trucks having depending extensions, two pairs of parallel bars on each truck connecting the side frames and the side frame extensions, and disposed one pair above the other, of a car frame, arched longitudinal beam sections forming part of the car frame, and devices elastically supporting said beams between the side bars of the truck, and journals secured to the upper and lower portions of

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said beams, and blocks receiving said journals, and providing swiveled connection for the trucks.

5 55. The combination with a suspension railway truck, blocks supported by said truck spaced apart, and having opposed
10 pockets or recesses, of a car frame, an arched longitudinal beam on said car frame, and blocks secured to the upper and lower faces
of said arched beam, and journals on said
last mentioned blocks mounted in the pockets
15 or recesses in the first mentioned block.

56. The combination with a suspension railway truck, blocks supported by said
15 truck spaced apart, and having opposed

pockets or recesses, of a car frame, an arched longitudinal beam on said car frame, and blocks secured to the upper and lower faces of said arched beam, and journals on said last mentioned blocks mounted in the pockets
20 or recesses in the first mentioned block, and a bow spring elastically supporting the lower of the first mentioned blocks.

In testimony whereof I have signed my name to this specification in the presence of
25 two subscribing witnesses.

JOSIAH H. SMITH.

Witnesses:

R. H. KRENKEL,

J. A. L. MULHALL.