

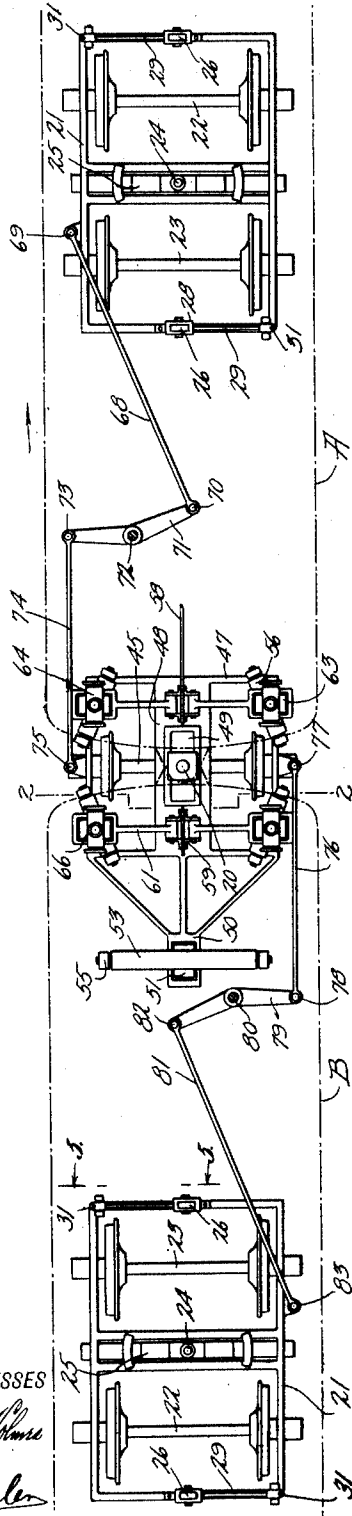
S. B. BRILHART.
RAILWAY TRUCK.
APPLICATION FILED MAR. 27, 1920.

1,388,508.

Patented Aug. 23, 1921.

6 SHEETS—SHEET 1.

Fig. 1.



WITNESSES
Oliver H. Adams
Wm. H. Butler

Fig. 2.

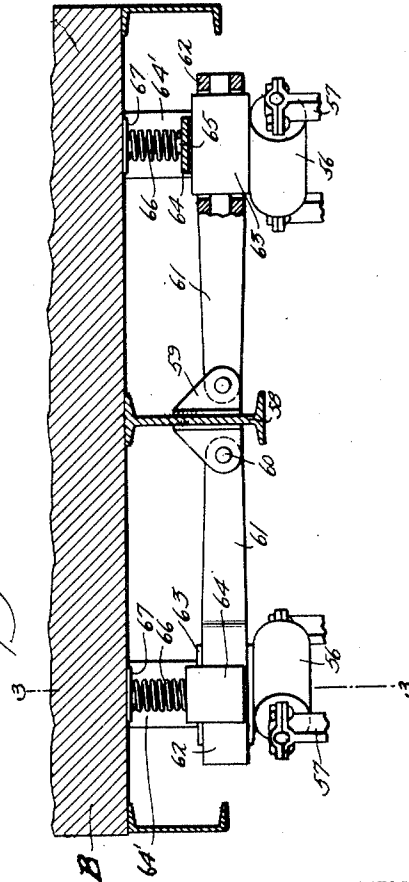
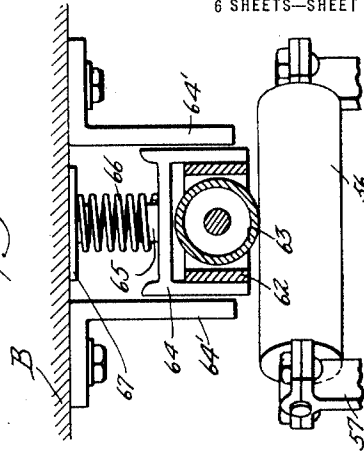


Fig. 3.



INVENTOR
S. B. BRILHART
BY *Mum & Co.*
ATTORNEYS

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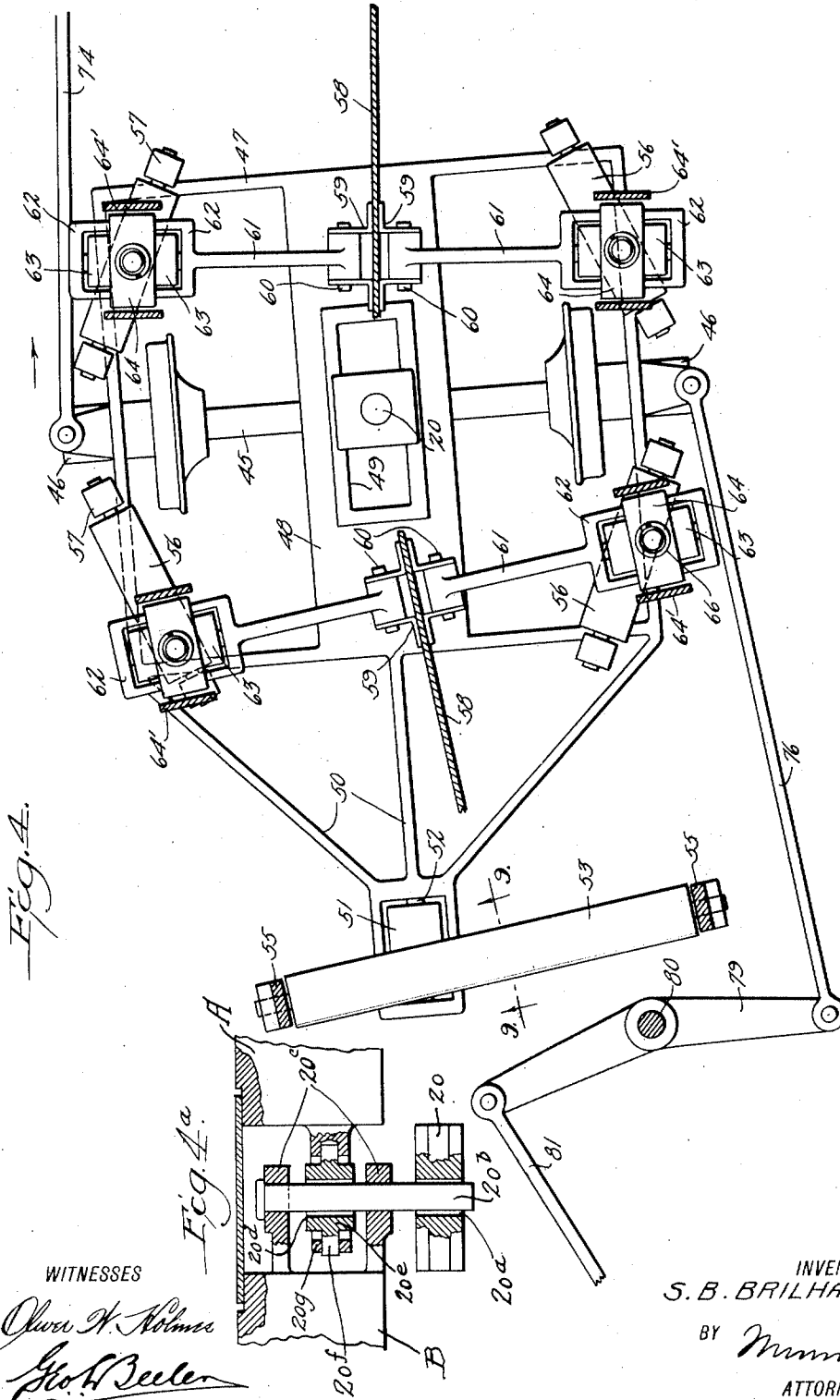


Fig. 4.

Fig. 4a.

WITNESSES

Oliver H. Holmes
Geo. H. Beeler

INVENTOR
S. B. BRILHART

BY *Mum & Co*
ATTORNEYS

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Fig. 5.

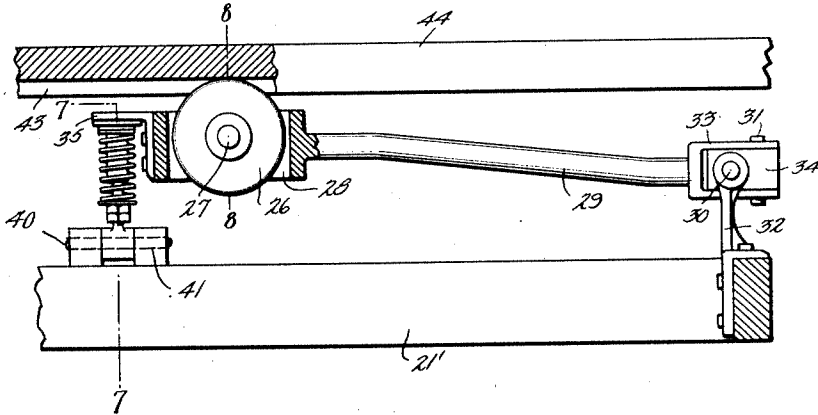


Fig. 6.

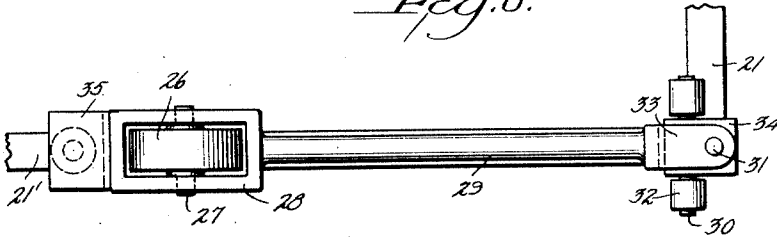


Fig. 7.

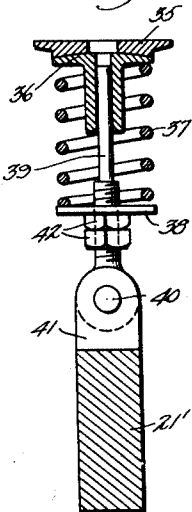


Fig. 8.

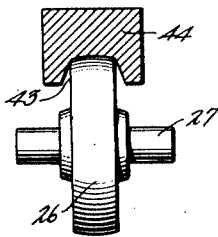
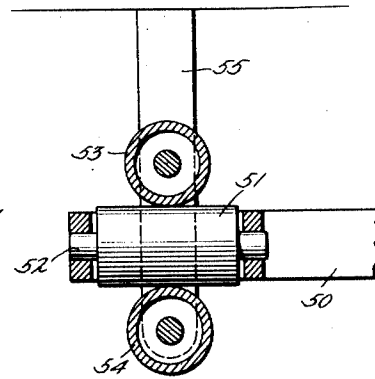


Fig. 9.

WITNESSES

Oliver H. Holmes
Geo. L. Seiler

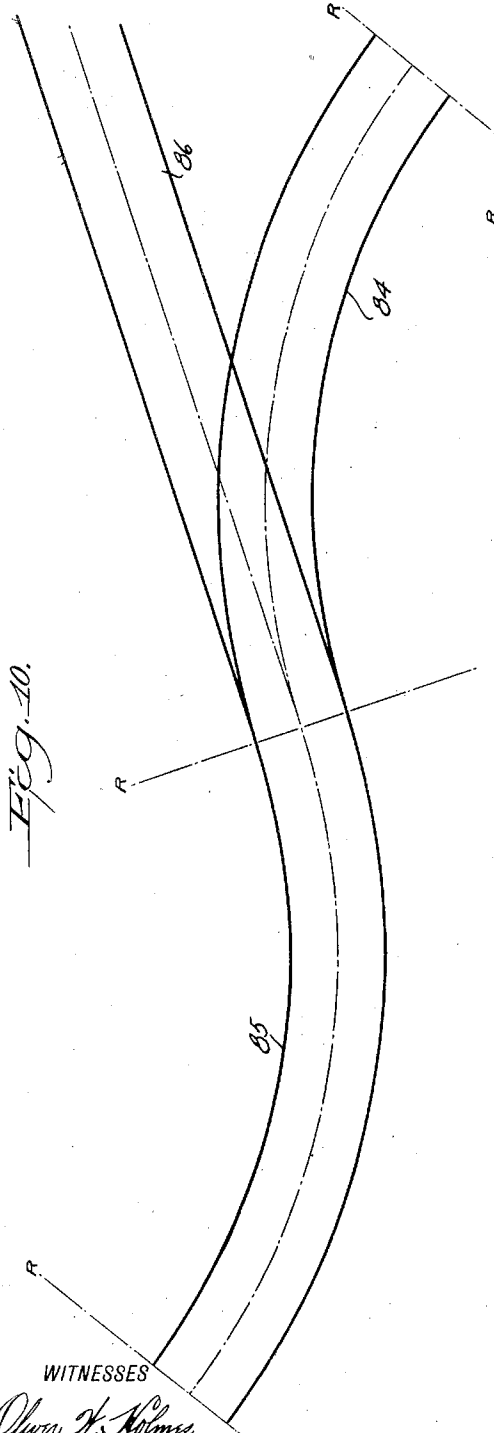
INVENTOR
S. B. BRILHART

BY *Mumford*
ATTORNEYS

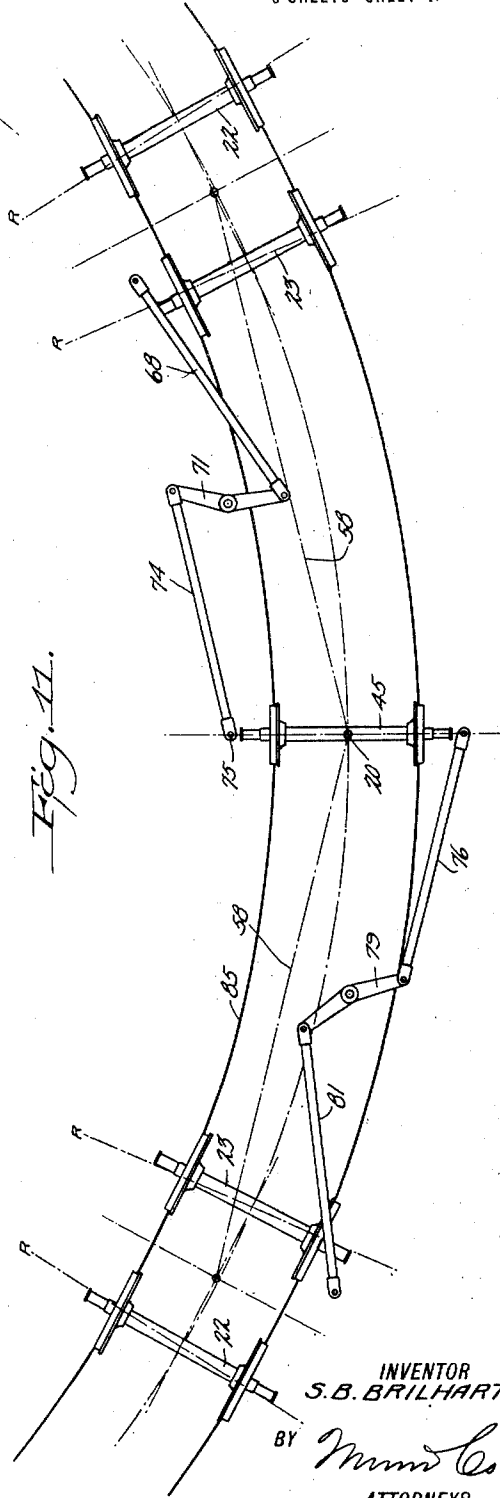
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6 SHEETS—SHEET 4.

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WITNESSES
Oliver H. Holmes
Geo. H. Beeler



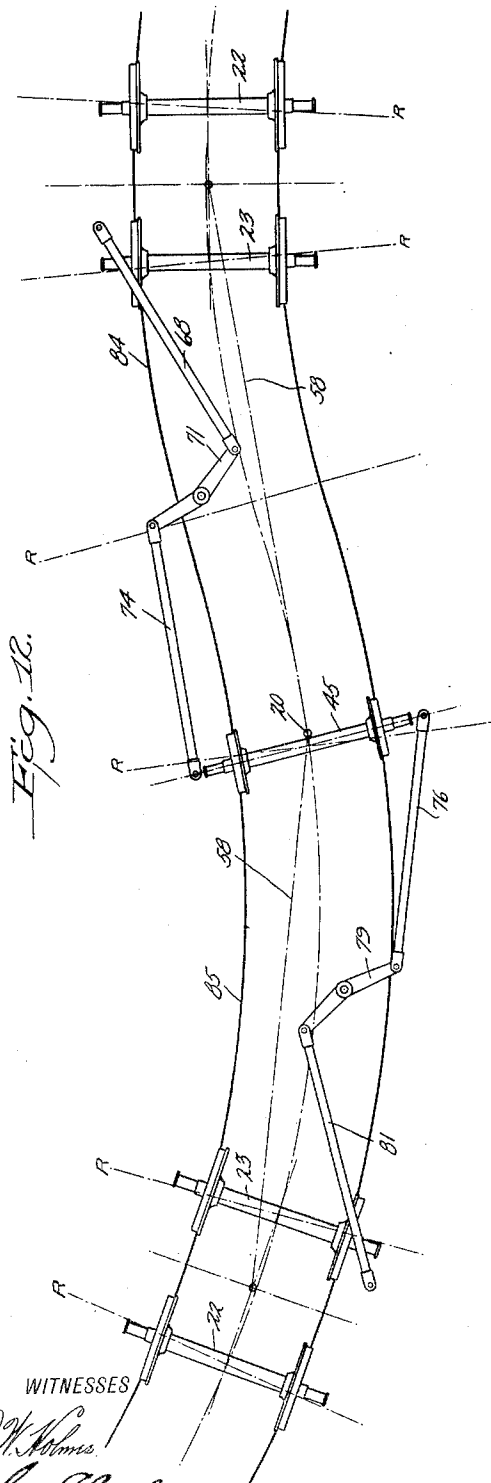
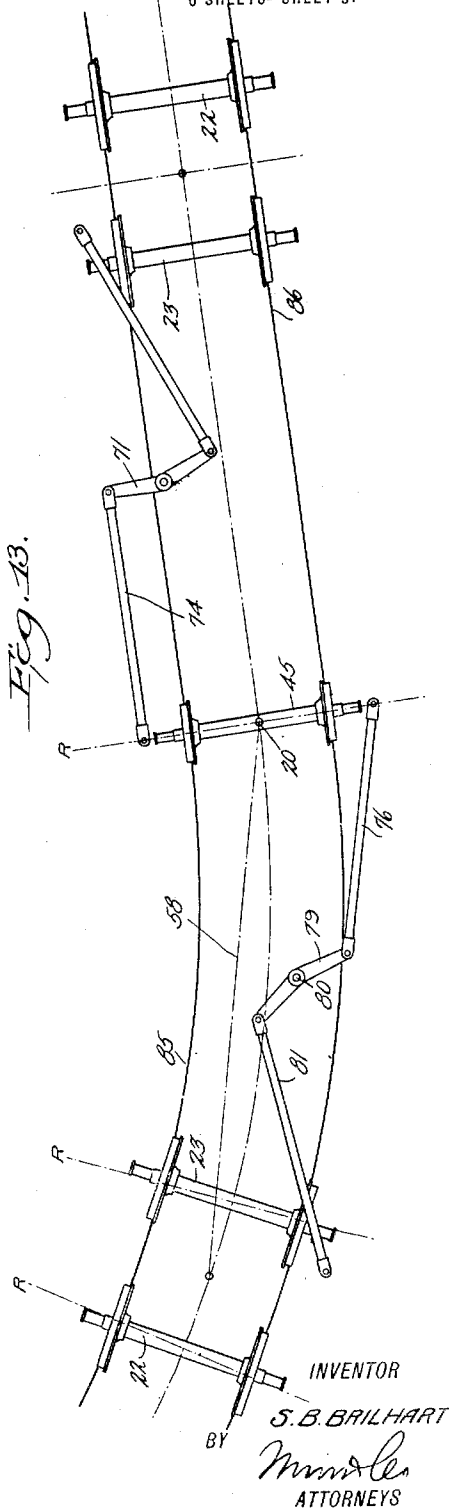
INVENTOR
S. B. BRILHART
BY *Munn & Co.*
ATTORNEYS

S. B. BRILHART.
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6 SHEETS—SHEET 5.



S. B. BRILHART.
RAILWAY TRUCK.

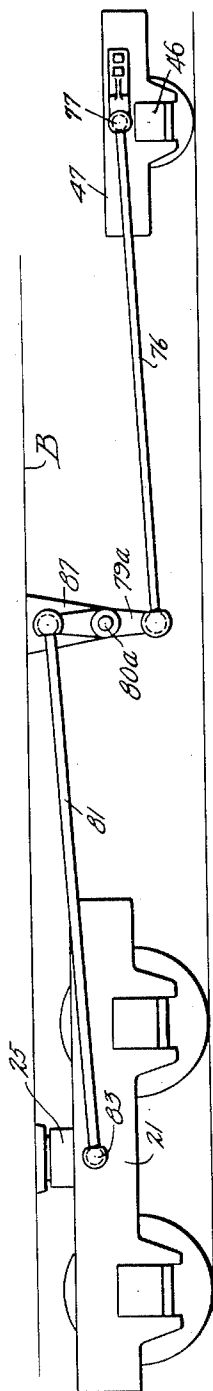
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6 SHEETS—SHEET 6.

1,388,508.

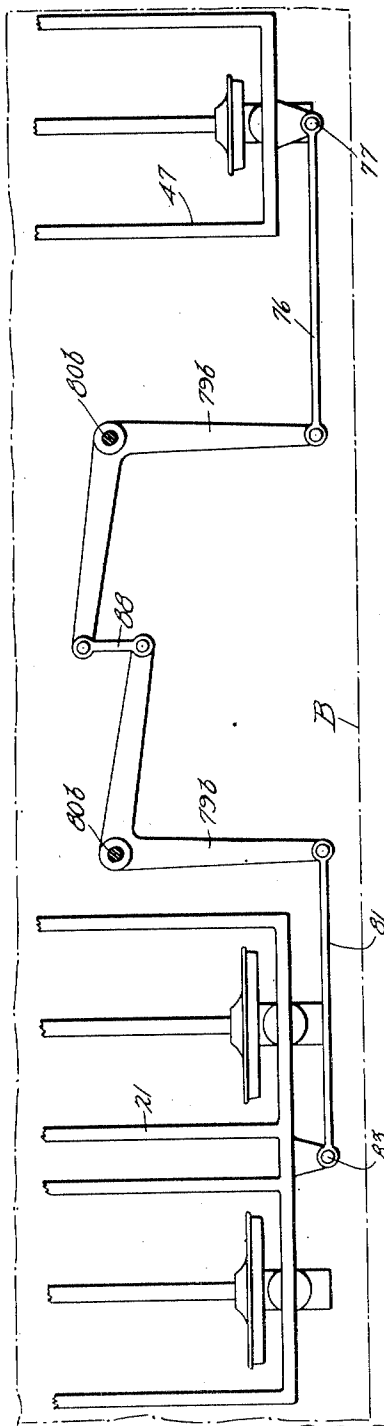
Fig. 14.



WITNESSES

Oliver H. Holmes
Frank Beeler

Fig. 15.



INVENTOR

S. B. BRILHART
BY *Mumfles*
ATTORNEYS

UNITED STATES PATENT OFFICE.

SAMUEL B. BRILHART, OF NEW YORK, N. Y.

RAILWAY-TRUCK.

1,388,508.

Specification of Letters Patent. Patented Aug. 23, 1921.

Application filed March 27, 1920. Serial No. 389,196.

To all whom it may concern:

Be it known that I, SAMUEL B. BRILHART, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Railway-Truck, of which the following is a full, clear, and exact description.

This invention relates to railway rolling stock and has particular reference to railway cars of the jointed type.

Among the objects of the invention is to provide for a jointed car a novel structure of supporting trucks with operative connections between truck portions which serve to control the alinement of the several truck portions with the rails under all service conditions.

Another object of the invention is to provide for each car section a two axle truck at any convenient location adjacent to one end of the car section remote from the other section, and a special truck, shown as of a one axle type, located beneath and to support the articulated ends of the two car sections, there being provided rod and lever connections between each of the main trucks and said center truck whereby the swinging of either main truck due to its taking a curve will cause a certain swinging movement of the center truck.

Another object of the invention is to provide improved truck frames for the accommodation of the aforesaid axles and wheels.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings, in which like reference characters designate the same parts in the several views, and in which—

Figure 1 is a plan view of the three inter-connecting trucks and showing in dotted lines the location of the car sections thereon.

Fig. 2 is a vertical transverse section on the line 2—2 of Fig. 1.

Fig. 3 is a vertical section on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged plan view of the central portion of Fig. 1 and indicating a

relative lateral movement between the car sections.

Fig. 4^a is a detail vertical longitudinal section of means for linking the car sections together.

Fig. 5 is an elevation partly in section on the line 5—5 of Fig. 1.

Fig. 6 is a plan view of the truck portions of Fig. 5.

Fig. 7 is a vertical section on the line 7—7 of Fig. 5.

Fig. 8 is a vertical section on the line 8—8 of Fig. 5.

Fig. 9 is a vertical section on the line 9—9 of Fig. 4.

Fig. 10 is a diagram of a portion of track having a single and reverse curve.

Figs. 11, 12 and 13 are diagrams indicating the action of my improved truck members on various portions of the track shown in Fig. 10.

Fig. 14 is a side elevation of a modified form of rod and lever connections.

Fig. 15 is a plan view of another modification.

Referring now more particularly to the drawings I indicate in Fig. 1 two car sections A and B jointed together so that either may swing laterally with respect to the other as a result of the curvature of the track. Beneath the end of each car section at any suitable point beneath the end remote from the other section is a truck comprising a frame 21 of any suitable type or construction, but shown as having journaled therein two axles 22 and 23 parallel to each other. The truck has a center bearing 24 and any suitable M. C. B. standard swing bolster structure 25. At the diagonally opposite corner portions of the frame are located devices including a roller 26 at each end of the frame and at about its center. This roller 26 is journaled around a horizontal axis 27 in a yoke 28 carried rigidly by an arm 29 connected by a universal joint to the corner of the frame. This joint comprises a horizontal pivot 30 and a vertical pivot 31. The horizontal pivot is journaled in a bracket 32 fixed to the corner of the frame and the vertical pivot constitutes a connection between a yoke 33 at the outer end of the arm 29 and a block 34 common to both of the pivots. The inner end of the yoke 28 carries a bracket 35 with a concave bearing surface on its under side with which co-operates a thimble 36 having a complemen-

tal convex upper surface. A spring 37 is fitted between the upper end of the thimble and a loose washer 38 surrounding a stem 39 pivoted at 40 upon a bracket 41 carried by the end crossbar 21' of the truck frame. One or more nuts 42 are threaded upon the lower portion of the stem 39 for adjusting the tension of the spring 37. The upper end of the stem is guided in said thimble 36. The nature of the joint between the bracket 35 and the thimble 36 as well as the joint at 40 serves to accommodate the roller 26 and its supporting means in all movements with respect to the universal joint at the corner of the frame. The roller 26 operates in a groove 43 formed in the lower surface of an arc shaped sill member 44 of the car body.

The center truck is shown as comprising a single axle 45 below the center bearing 20. The ends of the axle 45 are journaled in any suitable bearing boxes 46 movably associated with the side rails of a center frame 47. The central portion of the frame includes a longitudinal plate or bar 48 having a central slot 49 through which the center bearing 20 operates. The bearing 20 is shown as consisting of a block slidable longitudinally in the slot 49. This block is provided with a vertical hole 20^a into which is projected loosely the connecting pin 20^b which passes through one or more ears or lugs 20^c connected to one car section and loosely through a hole 20^d formed in a block 20^e swiveled along a longitudinal axis 20^f in a lug 20^g fixed to the other car section. The looseness in the holes 20^a and 20^d provides ample vertical tilting of either car with respect to the other while the longitudinal axis 20^f provides ample lateral swing or sway of one car section with respect to the other. The rectangular frame 47 and the block and slot connection between it and the means for connecting the car sections together, while permitting some endwise movement between the frame 47 and the section connecting means, prevent the lateral shifting of either car section or both of them with respect to the frame 47. At one end the center frame 47 has an extension 50 in the end of which is journaled an anti-friction roller 51 on a longitudinal horizontal axis 52. This roller 51 coöperates with upper and lower parallel rollers 53 and 54 journaled in a bracket 55 depending from the car body B. These rollers are located as close as possible to the car body. The rollers 53 and 54 are long enough to accommodate the roller 51 while the center frame is swinging laterally to the maximum extent, the roller 51 bearing upon one or the other of the longer rollers during this action. While, however, the center frame may be making relative longitudinal movements with respect to the center bearing 20 as contemplated in the use of the slot 49 the

roller 51 may move longitudinally over the longer rollers.

At each of the four corners of the rectangular portion of the frame 47 is journaled a horizontal roller 56 the same being arranged diagonally across the corner of the frame but more nearly parallel to the sides than to the ends thereof. These rollers are journaled in brackets 57 connected to the frame. Each of the car sections has a longitudinal center sill or beam 58 the end of which adjacent to the center bearing has connected to it on opposite sides a pair of brackets 59 between each pair of which is journaled at 60 an arm 61 extending laterally over the adjacent diagonal roller 56. The outer end of the arm constitutes a yoke 62 in which is journaled a roller 63 the axis of which coincides with the longer axis of the arm 61 (see Figs. 2 and 3). The yoke 62 is fixed within a housing 64 having a crossbar in the center of which is fixed a lug 65 constituting a seat for a spring 66, the upper end of which bears against a plate 67 on the bottom of the car body. The side portions of the housing 64 are guided between vertical guide brackets 64' likewise fixed to the bottom of the car body. The arms 61 are adapted to pivot around the horizontal pivots 60 but are held from lateral movement with respect to the guides 64'. In other words the guides serve to insure that the arms will swing in a horizontal plane with the car body. The arms however are free to tilt up and down in accordance with the tilting or swaying of the car body. When either section of the car swings laterally upon taking a curve there is a certain amount of relative movement between the car sections and the center frame, and hence the coaction between the rollers 63 and 56 provides for this relative movement without much friction.

To one side of the forward frame 21 of the section A indicated herein as the left side is pivoted a rigid straight bar 68 at the point 69. The rear end of this bar is pivoted at 70 upon a lever 71 pivoted at a point 72 fixed beneath the body of section A. Extending from the point 73 at the other end of the lever 71 is a straight bar 74 whose rear end is attached at 75 to the left side of the center frame 47, while the bars 68 and 74 are indicated as being straight so as to function properly with thrusts as well as pulls. The lever 71 may be bent or offset if desired in order to accommodate the several connections.

Associated with the other car section B is a similar arrangement of bars and levers including a bar 76 pivoted at its front end at 77 to the end of the axle 45 opposite the connection 75 and at its rear end at 78 to a lever 79 pivoted at 80 beneath the bottom of the body of section B. A bar 81 is pivoted at

82 to the other end of the lever 79 and extends thence rearward to its point of attachment 83 with the side of the main or end truck frame 21.

5 The meeting ends of the car sections are supported resiliently by means of the springs 66 upon the center frame 47 and yet these meeting or adjacent ends of the car sections are adapted to float within certain limits in
10 any direction horizontally over said frame to accommodate the structure to any irregularities in the track. The main truck frames 21 likewise are adapted to oscillate laterally within certain limits by virtue of the center
15 bearings 24, swing bolsters 25, and the anti-friction rollers 26. The bars 68, 74, 76, and 81 together with their connecting levers 71 and 79 constitute a compensating means whereby all three of the trucks are main-
20 tained in a certain correlation throughout all operating conditions.

In the diagram of Fig. 10 I show a section of railway track showing curves 84 and 85 reverse to each other and also indicating at
25 86 a straight run of track leading from the point of connection between the curves 84 and 85. Referring now to Fig. 11 I indicate diagrammatically the relation of the axles and connections to one another and the rails
30 of the track on the curve 85 or just as the front section A of the car is about to reach one of the track sections 84 or 86. The center bearing 20 is shown midway between the rails, and the center axle 45 coincides
35 with the radius R of the curvature of the track. The left wheels of both of the main trucks being on the inside rail of the curve the car truck structure may be said to be cramped on the left side and therefore the
40 lever 71 is given a clockwise rotation considering the point 75 as a fixed point. Likewise the lever 79 is given a counter clockwise rotation to a similar extent and for the same reason. It will be observed that be-
45 cause of this cramping of the car and the rotation of the levers 71 and 79 the axles of the front and rear trucks will be parallel to the radius lines midway between them.

In Fig. 12 I indicate the position of the
50 car as a result of the compound curvature of the track between the curves 84 and 85. In this figure the center bearing 20 is indicated in the center of the tracks but in advance of the center of the axle 45. In this figure
55 both levers 71 and 79 are given a counter clockwise rotation; but as before described the axles of the main trucks are parallel to the radius lines midway between them. In these figures dotted lines drawn between the
60 point 20 and the centers of the main trucks indicate the center lines of the car sections as indicated at 58.

In Fig. 13 the front car section is presumed to have entered the straight track 86
65 and hence the axles 22, 23 and 45 are all

perpendicular to the straight track and the lever 71 is in its normal position.

Whereas in Figs. 1 and 4 I indicate the compensating levers mounted on vertical pivots, in Fig. 14 I show a lever 79^a mounted
70 on a pivot 80^a extending horizontally from a bracket 87 depending from the car body B. Extending forward and rearward from this lever 79^a are bars 76 and 81 respectively
75 having the same functions as the similarly numbered connections in Fig. 1. In Fig. 15 in place of a single lever 79 or 79^a I provide two bell cranks 79^b pivoted on vertical pivots
80 80^b and from the outer ends of these bell cranks extend forward and rearward bars 76 and 81 respectively to the respective center and main frames, and the other or adjacent ends of the bell cranks are con-
85 nected to each other pivotally by means of a link 88. The pivots 80^b are connected to 85 the car body and so are held at a fixed distance apart, but the bell cranks and the bars attached thereto are adapted to move freely within the limits intended.

I claim:

1. In railway truck construction, the combination with two car sections and means linking them together, of a truck for each car section remote from the point of connection, a single axle truck beneath the point
90 of connection, and means connecting all of the trucks and serving to cause the transverse axis of each truck to operate in a position substantially in the radius of every track curve. 100

2. In railway truck construction, the combination with two car sections, means linking the car sections together and a main car section supporting truck beneath each section remote from the point of connection,
105 a third truck located beneath the point of connection and comprising a single axle and a frame movable with relation to the axle, a lever pivoted upon each car section, bars extending from said levers to the opposite sides
110 of the third mentioned truck, and other bars extending from the levers to the opposite sides of the main trucks.

3. In car truck construction, the combination with two car sections, means linking
115 them together for relative lateral movement, a main truck under each section remote from the point of connection between the sections, a truck beneath the point of connection including a frame upon which the adjacent
120 ends of the sections are supported, the last mentioned truck including an axle between which and the frame is relative movement, and means connecting the opposite sides of said frame with the sides of the main trucks,
125 substantially as set forth.

4. A construction such as set forth in claim 3 in which the supporting means between the adjacent ends of the car sections and the third truck frame include arms mov- 130

ably connected to the bottoms of the car sections, and anti-friction connection between the arms and said frame.

5 5. A construction of the nature covered by claim 4 in which said arms are arranged in pairs, the pair for each car section being pivoted adjacent to the center sill.

6. A structure such as set forth in claim 4 in which the pivoted arms extend laterally from the center sill of each car section, each of the arms having an open yoke at its outer end in which one of the anti-friction means is pivoted, and the cooperating anti-friction means comprises a roller journaled on a horizontal axis diagonally across the adjacent corner of the third truck frame.

7. The herein described center truck structure for jointed cars, the same comprising an axle, a rectangular frame movably associated with the axle, anti-friction rollers mounted on horizontal axes extending diagonally across the corners of the frame continually regardless of the position thereof, and means to limit the tilting of the frame with respect to said axle, said limiting means being beyond one end of the rectangular frame.

8. A center truck structure of the nature set forth in claim 7 in which the means to limit the tilting of the frame includes anti-friction rollers carried respectively by the frame and one of the car sections.

9. A center truck structure of the nature set forth in claims 7 and 8 in which the anti-friction means to limit the tilting of the frame comprises a pair of vertically spaced rollers journaled transversely of and beneath one of the car sections, and an anti-friction roller carried by the frame projecting between the aforesaid rollers.

10. The combination with a pair of car sections and means connecting them together, of a center truck supporting structure for the adjacent end of the car sections, said center truck comprising an axle, a frame associated with the axle but movable with respect thereto, anti-friction rollers carried by the corner portions of the frame, a pair of arms pivotally attached to each car section and movable vertically, anti-friction means carried by the arms cooperating with the aforesaid anti-friction rollers on the truck frame, and spring supports for the car sections extending between the bottoms of the sections and the end portions of said arms.

11. A structure of the nature set forth in claim 10 in which the points of application of the springs to the arms coincide substantially with the points of contact between the anti-friction means of the arms and frame.

12. In railway truck construction, the combination with two car sections and means connecting them together, of a center truck beneath the point of connection, a main

truck beneath each of the sections remote from the center truck, means connecting all of the trucks providing for relative movement between the car sections and the trucks, and anti-friction supporting means between the car sections and all of the trucks.

13. A construction such as set forth in claim 12 in which the anti-friction means for the main trucks consists of a pair of arms connected by universal joints to diagonally opposite corners of the frame thereof, and an anti-friction roller journaled on a horizontal axis at the free end of each arm and at about the center line of the car section, said roller cooperating with the bottom of the car section.

14. A construction of the nature set forth in claim 13 in which the free end of said anti-friction roller arm is supported resiliently upon the crossbar of the truck frame.

15. A supporting means for the anti-friction roller structure of claim 14 comprising a stem pivoted upon the truck crossbar and extending upward, a thimble carried by the upper end of the stem, a bearing plate for the anti-friction roller arm cooperating with said thimble, and an adjustable extension spring surrounding the stem and bearing upward upon the thimble.

16. A bearing structure of the nature set forth in claim 15 in which the meeting surfaces between the thimble and the bearing plate are respectively convex and concave to accommodate the movement of the parts with respect to the pivot of the stem.

17. In a center truck structure for jointed railway cars, the combination with two car sections and means connecting them together, of a truck frame of rectangular form and having a longitudinal slot therein, a slidable bearing block mounted in said slot and movable endwise of the frame, and means between the car sections and said block serving to prevent the lateral shifting of the car sections with respect to the block and frame.

18. The herein described center truck frame for jointed cars, said frame being arranged approximately horizontal and having at one end a longitudinally extended lever to prevent extensive vertical tilting thereof around a transverse axis, a roller journaled in said lever on an axis parallel to the rails, and anti-friction means cooperating with said roller.

19. In a car truck, a truck frame, anti-friction rollers journaled on said frame, a car body above the frame and anti-friction rollers carried by the car body and having rolling contact with the frame rollers, the car rollers and truck rollers being arranged at an angle to each other.

20. A device as set forth in claim 19 in which the rollers of each pair are arranged at an oblique angle to each other.

21. In a center truck structure for jointed railway cars, the combination with two car sections and means connecting them together, of a truck frame beneath the connected portions of the car sections, and means between the car connections and the frame serving to prevent lateral shifting of the car sections with respect to the frame.

22. A device as set forth in claim 21 in which the means for preventing the lateral shifting comprises a member pivotally connected to the frame and to the car section connecting means.

23. In a jointed railway car, the combination of two car sections and means to couple them together, the coupling means comprising a pair of lugs carried by one car section and having holes in vertical alinement, a lug carried by the other car section and projecting into the space between the first mentioned lugs, a bearing block carried by the lug between the pair of lugs, and a coupling pin extending downward through the lugs and bearing block.

24. A device as set forth in claim 23 in which the bearing block is provided with a hole sufficiently larger than the pin to provide for vertical tilting relatively between the car sections.

25. A device as set forth in claim 23 in which the bearing block is journaled for rotation around a horizontal axis.

26. A device as set forth in claim 25 in which the horizontal axis of the bearing block is longitudinal of the car providing for free lateral tilting of one car section with respect to the other.

27. In a coupling for the sections of a jointed car, the combination of a pair of vertically spaced lugs connected to one section, a single lug connected to the other section projecting between the spaced lugs, a coupling pin extending downward through all of the lugs, and means to prevent lateral shifting of the coupling parts with respect to the supporting frame.

SAMUEL B. BRILHART.