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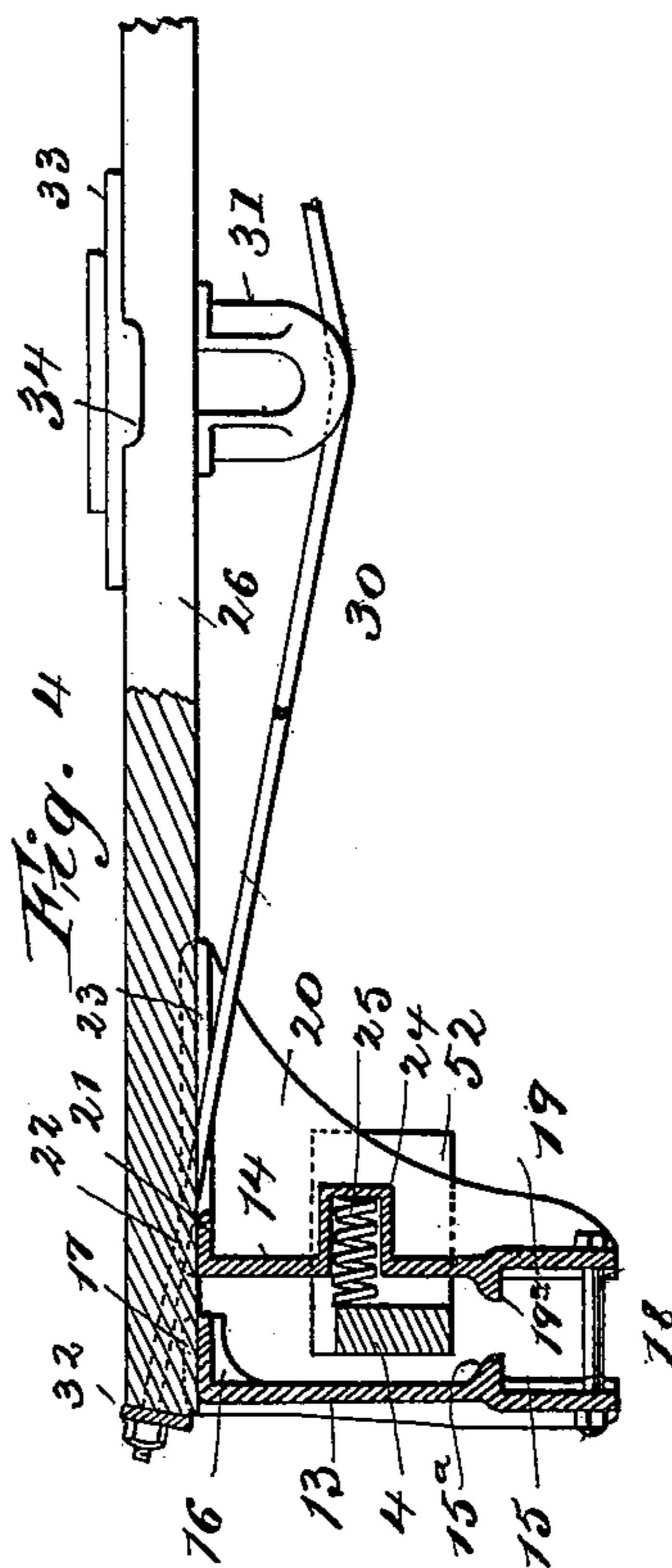
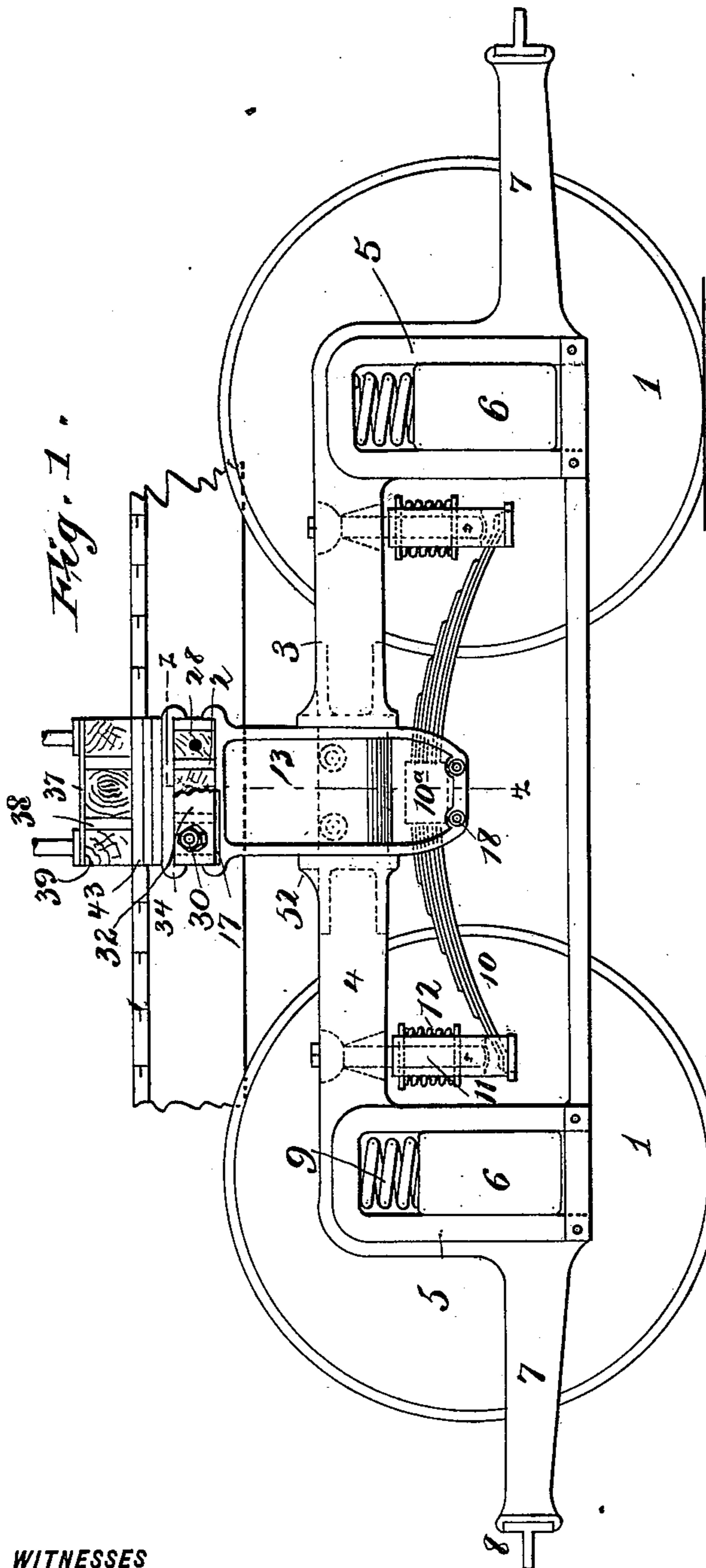
Patented Oct. 17, 1899.

G. M. BRILL.  
PIVOTAL CAR TRUCK.

(Application filed May 6, 1898.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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No. 635,274.

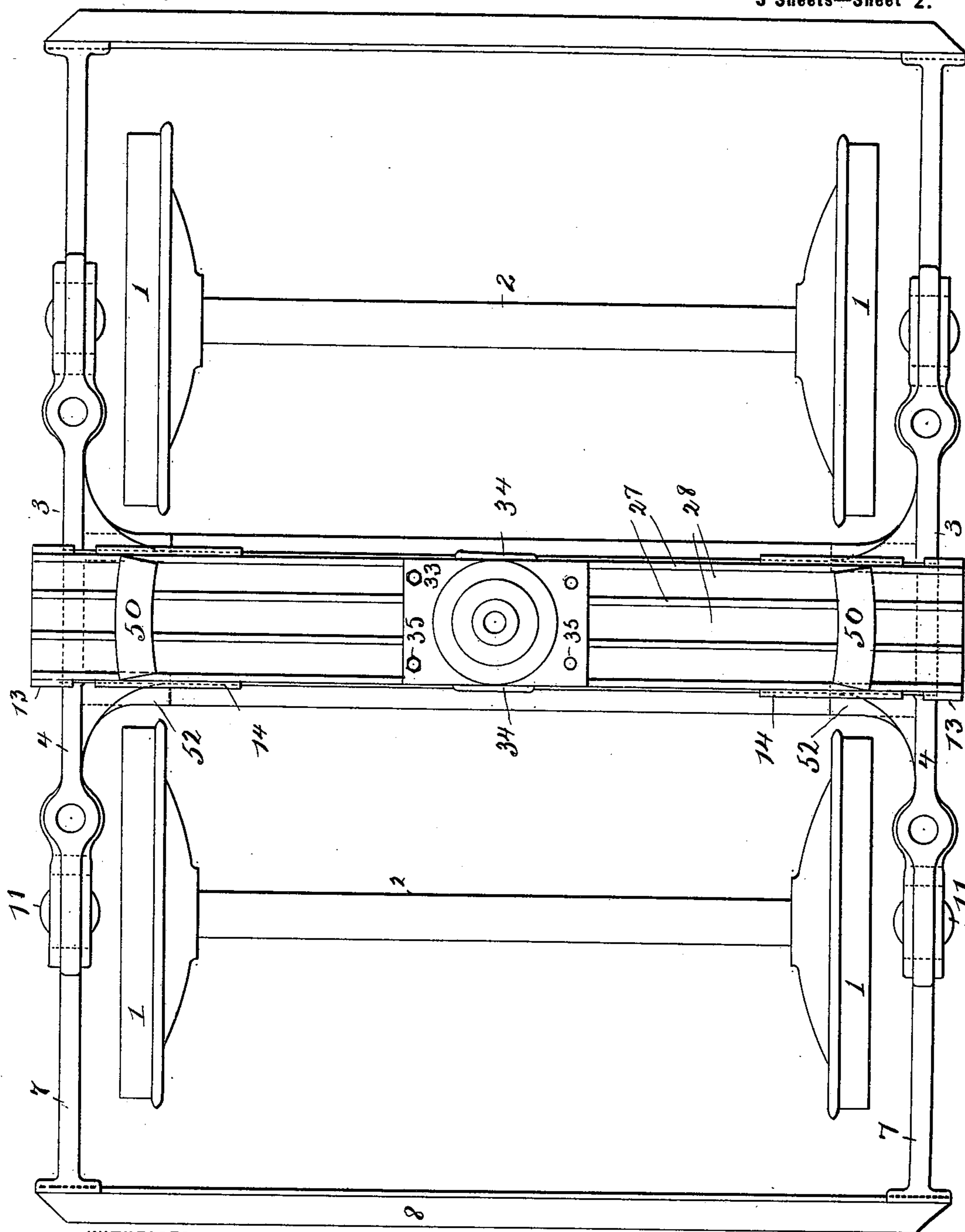
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3 Sheets—Sheet 2.



WITNESSES

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*Fig. 2.*

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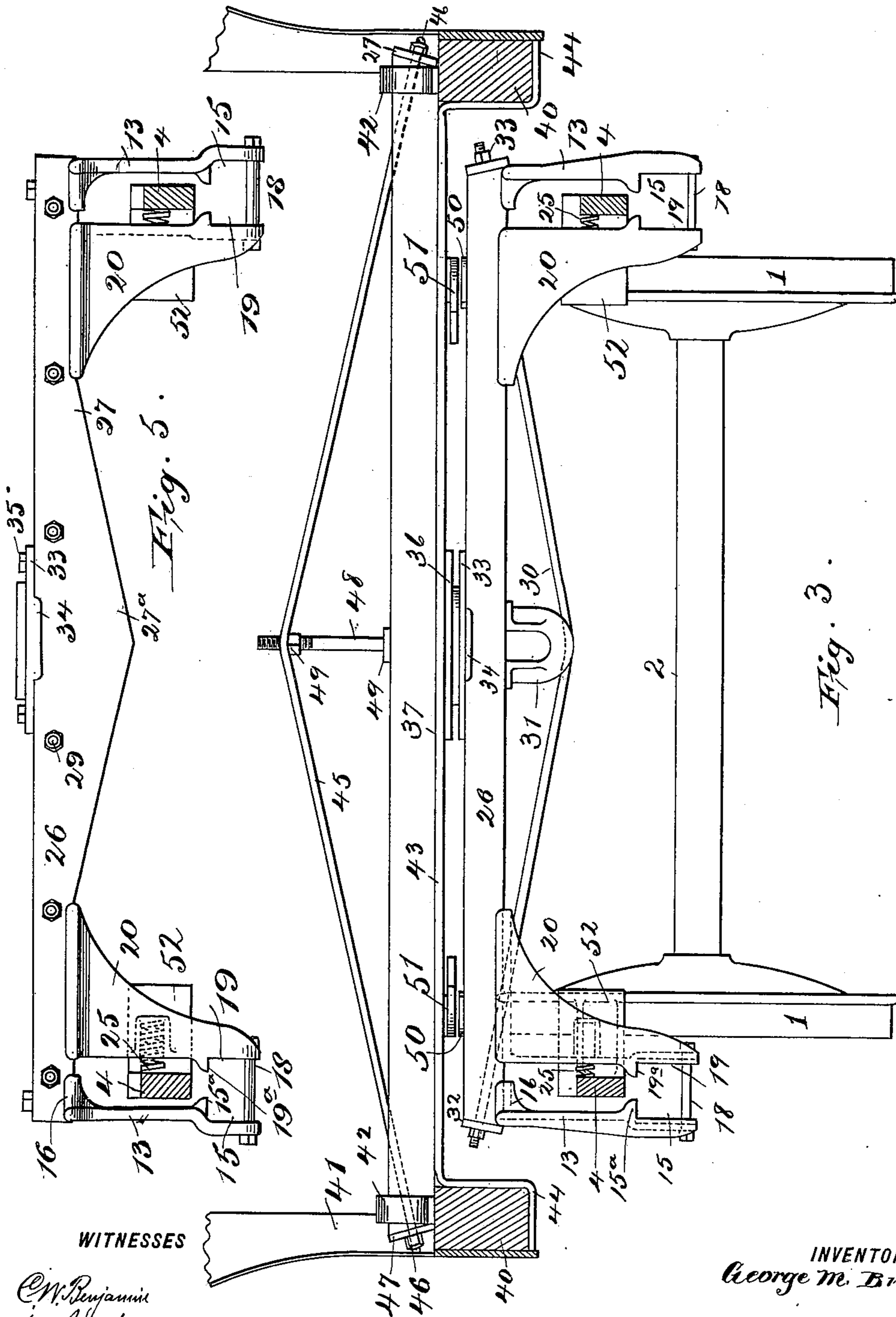
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3 Sheets—Sheet 3.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

GEORGE MARTIN BRILL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
JOHN A. BRILL, OF SAME PLACE.

## PIVOTAL CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 635,274, dated October 17, 1899.

Application filed May 6, 1898. Serial No. 679,880. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE MARTIN BRILL, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have made certain new and useful Improvements in Pivotal Car-Trucks, of which the following is a specification.

My present invention relates to the construction of pivotal car-trucks, and especially to that class of truck adapted for use in modern passenger traffic where electric propulsion is employed; and the object of my invention is to provide a pivotal truck especially adapted for employment in connection with open cars, although it may be employed on closed cars as well.

In open cars as now constructed the longitudinal sills of the car extend from end to end—that is to say, instead of the platform being built below the level of the main longitudinal sills by platform-knees, as in closed cars, which provides one step from the ground to the platform and one step from the platform to the car-floor, the platforms are built directly on the longitudinal sills. With trucks of the usual construction the conditions are such as to require plenty of room under the car for radiation, and when used on summer-cars constructed as above outlined the employment of either two steps from the ground to the platform or one very high step is necessitated.

Previous to my invention, so far as I am informed, the pivotal connection between the car-body and the car-truck in vehicles where pivotal trucks were employed was made through the instrumentality of a casting rising appreciably above the truck-bolster for the side bearings and a built-up center bearing or a down-built body-bearing, the result being that the bolster (where it is connected with the side frames) being much below the truck-wheels the truck radiates in a plane entirely below the level of the longitudinal sills of the car-body. An illustration of said construction may be found in the truck illustrated in my application for patent for a car-truck filed July 3, 1897, Serial No. 643,339, Patent No. 627,898, dated June 27, 1899, wherein the truck-bolster lies below the plane of the top of the wheels, and connection is

made for swiveling purposes between the truck-bolster and the car-body by upwardly-extending yokes on the ends of the bolster, which support side bearings, and a built-up truck and a down-built body-bolster for the center bearings. In that construction the body-bolster is built below the car-flooring, the body rub-plates and the body center bearing lying below the plane of the longitudinal car-sills, this construction being necessitated in order to allow the truck to freely move under the car. In my present construction provision is made for allowing the truck and its bolster to swivel in a plane within and above the lower plane of the longitudinal sills, and the body-bolster, instead of being built downwardly from the car-flooring, so that the body-bearings are located below the cross and longitudinal sills, is built up above the longitudinal car-sills of the car, which allows of the location of the truck well up into the car, or, reversely, allows the car to be placed very low on the truck, bringing the tops of the wheels well within the plane of the longitudinal sills, thereby reducing the height or number of the steps employed. Incident to this feature are the improvements in the body-bolster and the particular location and construction of the truck-bolster and its association with other parts of the truck, hereinafter to be described, the latter greatly increasing the facility of handling and supporting the motor.

My invention, therefore, specifically resides in the construction and combination of parts hereinafter described, and further pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side view of a truck and a portion of a superposed car embodying my improvements. Fig. 2 is a plan view of the truck with the car removed. Fig. 3 is an enlarged transverse sectional elevation taken on a plane immediately on one side of the truck and body bolsters. Fig. 4 is an enlarged sectional elevation of one end of the truck-bolster and its associated truck parts, and Fig. 5 is an enlarged side elevation of a truck-bolster of modified construction.

Similar numerals of reference indicate corresponding parts throughout the several views.

The particular class of truck to which I have

applied my improvements is shown and described in my application for patent above mentioned; but it will be apparent that my particular improvements have application to trucks of a construction differing from that therein shown and described.

The truck is constructed substantially as follows: At 1 and 2, respectively, are the wheels and axles; 3, the side frames comprising the top side bar 4, the inverted-U-shaped axle-box yokes or pedestals 5, embracing the axle-boxes 6, forming part of the side frames, from which yokes extend arms 7, connected transversely by T-iron cross-bars 8, and within the pedestals are the usual axle-boxes 6, between which and the pedestals extend the usual pedestal or journal springs 9.

One of the features of the truck described in my application before mentioned is the employment of the longitudinally-disposed semi-elliptic springs 10, located under each of the side bars, the semi-elliptic springs being supported from the side bars by links 11, which links are movably suspended from the side bars, so as to allow of a transverse swing thereof, the links being separable or extensible in the direction of their length, the ends of the semi-elliptic springs being supported by one element of the links, which in its turn is supported upon spiral springs 12, included in said links, which springs oppose the separation of the parts composing the links and resiliently support the semi-elliptic springs from the side bars.

In the before-mentioned application provision was made for tying the semi-elliptic springs transversely, which consisted in a cross-bar secured upon the semi-elliptic springs and extending between them and below the side bars, and yokes embracing the side bars extending upwardly from the cross-bar, which yokes supported the truck side bearings. In my present construction I have rearranged these parts to the end of securing a low-placed car-body, at the same time transversely securing the semi-elliptic springs together and allowing of their swinging transversely in unison with the truck-bolster and superposed car. Instead, however, of supporting the truck-bolster on the semi-elliptic springs equalizing-bars such as described in an application filed by Samuel M. Curwen and myself on the 3d day of November, 1896, Serial No. 610,902, can be employed. To carry out this portion of my invention, I provide the separable yokes, comprising two parts or plates 13 14, the outer plate extending upwardly from the semi-elliptic springs below the side bar on the outside thereof and provided with a flanged recess 15 at the bottom, the flange 15<sup>a</sup> extending inwardly, and an inwardly-extending bracket 16, in the top of which bracket is formed a recess 17, the end of said plate being apertured to receive bolts 18. The other element of the yoke comprises the plate 14, having at its lower end a flanged recess 19, the flange 19<sup>a</sup> of which ex-

tends outwardly toward the flange of the plate 13, and apertures alining with the apertures in the outer plate 13 for the reception of the bolts, this plate having upwardly and inwardly extending side webs 20, connected by a top cross plate or web 21, recessed, as at 22, and provided with a central slot 23, for a purpose hereinafter described. The upright and intermediate web of the plate 14 is provided with an inwardly-extending barrel 24 for the reception of a spiral thrust-spring 25. The semi-elliptic springs 10 are provided with a central strap or band 10<sup>a</sup>, as is usual, and this band, together with the spring, is located within the jaw-like receptacle formed by the flanged recesses 15 19 in the two plates 13 14, the bolts 18 bringing the plates together about the band, the flanges 15<sup>a</sup> 19<sup>a</sup> of the plates confining the springs in place in one direction, the bolts 18, which lie below the bands, confining the springs in place in the other direction. The opposing webs of each of the sets of plates composing the yokes embrace between them the side bars 4, as clearly shown in Figs. 3 and 4, and rise separable above them, the recesses or seats 17 22 in the top webs of the plates 13 14 alining and lying about in the same plane as the tread of the wheels, in this way confining the location of the truck-bolster 26, the truck-bolster in either of the forms or constructions hereinafter described lying on top of the plates and being secured at its ends to each of the sets of plates comprising the yokes, thus firmly securing the bolster at its ends upon the semi-elliptic springs through the intervention of the plates 13 14 and tying each of the sets with the plates securely together to form the yokes, which act in a measure as a guide for the movements of the semi-elliptic springs up and down by embracing the side bars. The springs 25 abut against the side bars 4. (See Fig. 4.)

The specific construction of the truck-bolster apart from its particular relationship to or combination with other portions of the truck may be either of the forms shown herein or any other desired form.

The form shown in all the figures comprises transverse series of plates or bars 27, set on the edge and suitably spaced apart by interposed filling-pieces of wood 28, the plates and filling-pieces being tied together transversely by bolts 29, passing therethrough, as indicated in Fig. 5, the lower edges of the plates and filling-pieces resting in the recesses in the top webs of the yoke-plates 13 14. This form of bolster provides an efficient and light construction, and for the purpose of strengthening the same centrally I provide the thrust-bars 30, which engage a saddle 31, depending from the central portion of the bolster, and pass upwardly through the slot 23 in the top web of the yoke-plate 14, through holes formed in the wooden spacing-blocks 28, and outwardly through the end of the bolster, which end is inclined to receive an anchoring-plate, through which the end of the truss-rods pass

and are secured in place by the nuts, as clearly shown in Figs. 1, 3, and 4.

In the modification shown in Fig. 5 the plates or bars 27 of the bolster 26 are shown 5 increased in depth in substantially V form at 27<sup>a</sup> to serve the same purpose as the thrust-bars 30 and the saddle 31, whereby the central portion of the bolster is materially strengthened. In this case also the inter- 10 posed filling-pieces 28 are used in manner similar to that shown in Fig. 1. The center bearing 33 for the car-body bolster is mounted upon the bolster 26, and for this purpose said center bearing is shown provided with de- 15 pending webs 34, that embrace the outermost plates of the bolster 26, and said bearing is shown secured to said bolster by bolts 35. (See Fig. 2.) The center bearing 33 receives the bearing 36, that is carried by the car-body 20 bolster 37. The car-body bolster 37 is shown composed of a plurality of bars 38, turned on edge, and a plurality of parallel wooden filling-pieces 39, interposed therebetween and all bound together by bolts or otherwise into a 25 solid structure. The ends of the bolts 37 rest upon the side sills 40 of the car-body 41 and are secured thereto by straps 42 or otherwise. Beneath the bolster 37 is a plate 43, that extends longitudinally to near the ends 30 of said bolster, where it is bent down in substantially L form at 44, the bent portion of said plate 43 receiving the sills 40, to which they are secured, as clearly shown in Fig. 3. To further strengthen the bolster 37 centrally, 35 I provide thrust-bars 45, which pass through apertures in the ends of said bolster and project from the latter, where they are provided with nuts 46, that rest against thrust-plates 47, located at the ends of the bolster, the ex- 40 tremities of the bolster being shown beveled downwardly and inwardly to receive said plates, so that said plates may be at right angles to the thrust-bars 45. At the central portion of the thrust-bars 45 is a standard 48, 45 (shown in the form of a screw-rod,) having a nut 49 to screw up under the thrust-rod 45 to put tension upon the latter, the standard 48 being shown provided with a head 49, that rests upon the sill 37 and may be secured 50 thereto in suitable manner. 50 are side bearings or rub-plates carried by bolster 26, and 51 are corresponding side bearings or rub-plates carried by bolster 37, which may all be of usual form adapted for the purpose. It 55 will be seen that the bolster 37 is substantially parallel to the bolster 36 throughout, is placed low down on the latter, and it will be understood that its brace or thrust-bar 45 may pass up into the car-body directly under 60 a cross-seat within the latter. By this means the car-body can be brought low down upon the truck. The truck and car side bearings 50 51 may be located as shown or anywhere along the length of the truck and body bolster 65 without necessitating a building up of the truck-bolster or a building down of the body-bolster, so that (should it be desired to have

the side bearings take the weight of the car at all times, in which case the center bearing would be used merely as a drawing-point) the 70 side bearings could be located farther away from the wheel-gage than as shown in Fig. 3 and placed directly over the side springs, so that the weight of the car in such a case or the bearing could be taken on the truck side 75 springs outside of the wheel-gage, and the arrangement further affords not only a low-placed car-body, thereby reducing the height of the car and a consequent reduction in the number of steps to be employed or their 80 height, but provides a free and clear space within the body of the car, in which the truck can bodily rotate.

Restraining plates or transoms 52 for the yokes 13 14 are formed by providing the side 85 bars 4 of the truck with inwardly-extending brackets, which may extend above or below the top or bottom of the side bars, against which the side webs of the inner plates 14 of the yokes may strike during the evolutions 90 of the truck, which transoms can be continued across the truck between the side frames by angle-irons or otherwise secured to the brackets.

Having described my invention, I claim— 95

1. A car-truck, comprising a frame having side bars, the yokes resiliently supported therefrom, embracing, and extending above said side bars, a bolster transversely secured to said yokes above the side bars, and means 100 allowing the bolster-support and bolster to swing transversely of the side bars, substantially as described.

2. A car-truck, comprising a frame having side bars, yokes embracing and adapted to 105 move perpendicularly and transversely relatively to the side bars, laterally-swinging supports for the yokes secured to the side bars, and a bolster resting on said yokes above the side bars, substantially as described. 110

3. The combination with a car-body having side sills, a body-bolster extending between the sills and located above the bottom of said sills, and a truck, a frame therefor having side bars, a bolster extending across the truck 115 above the side bars, and between, and above the bottom of said sills, means for movably supporting the ends of the truck-bolster about the side bars, center and side bearings on both bolsters, the truck-bolster being adapted 120 to lie and bodily pivot within the said sills, substantially as described.

4. The combination with a car-body having side sills, a body-bolster resting on and lying above said sills, and a truck, a frame there- 125 for having side bars, a truck-bolster extending across the truck above the side bars and above the bottom of said sills, means for movably supporting the ends of the truck-bolster about the side bars, and center and side bear- 130 ings on both bolsters, the truck being adapted to lie and bodily pivot within the said sills, substantially as described.

5. The combination with a car-body having

side sills, a body-bolster extending between the sills, and located above the bottom of said sills, and a truck, a frame therefor having side bars, a truck-bolster extending across the truck above the side bars and between and above the bottom of said sills, means for movably supporting the ends of the truck-bolster about the side bars, center bearings on both bolsters, and side bearings between the bolsters located adjacent the wheel-gage of the truck, substantially as described.

6. A car having a body-bolster extending between and above the side sills, a car-truck having a frame and a bolster parallel with the body-bolster, and lying over the truck-frame, center bearings and side bearings between the bolsters, the stated relation of the bolsters allowing of the location of the side bearings, adjacent the wheel-gage, substantially as described.

7. A car-truck comprising a frame having side bars wheels and axles, springs resiliently supported by said bars, a truck-bolster, and yokes depending from said bolster and secured to said springs, substantially as described.

8. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported by said bars, a truck-bolster, and yokes depending from said bolster and secured to said springs, said yokes embracing the side bars of the truck-frame, substantially as described.

9. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported by said bars, a truck-bolster, yokes depending from said bolster and having recesses provided with flanges, the springs being located in said recesses, and flanges engaging said springs, substantially as described.

10. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported by said bars, a truck-bolster, yokes depending from said bolster and having recesses provided with flanges, the springs being located in said recesses, the flanges engaging said springs, said yokes respectively embracing the side bars of the truck-frame, substantially as described.

11. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported by said bars, yokes comprising plates arranged in pairs and connected with said springs, said yokes having top recesses, and a bolster located in said recesses and secured to said yokes, substantially as described.

12. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported from said side bars, a truck-bolster, yokes depending therefrom and comprising plates having opposed recesses and opposed flanges at their lower ends, said springs being located in said recesses and the flanges resting upon said springs, and means for holding said springs in said recesses, substantially as described.

13. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported from said bars, a bolster, yokes depending from said bolster and comprising plates having opposed recesses and opposed flanges, said springs being located in said recesses and the flanges resting upon said springs, and bolts connecting said plates beneath said springs, substantially as described.

14. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported from said bars, a bolster, yokes depending from said bolster and comprising plates having recesses at their upper ends in which said bolster rests, said plates also having opposed recesses and flanges at their lower ends in which recesses said springs are located, the flanges resting upon said springs, and bolts connecting said plates beneath said springs, substantially as described.

15. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported from said bars, a bolster, yokes depending from said bolster and connected with said springs, said yokes embracing said bars, and springs interposed between the yokes and the side bars for resisting lateral play of the truck relatively to the bolster, substantially as described.

16. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported from said bars, a bolster, yokes depending from said bolster, and comprising plates having means for connection with said springs, the inner of said plates each having a barrel or recess, and a spring located in each barrel or recess and acting against the corresponding side bar of the truck-frame to resist lateral motion of the frame relatively to the bolster, substantially as described.

17. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported from said bars, a bolster, yokes depending from said bolster and connected with said springs, and restraining plates or transoms carried by said side bars and acting against said yokes, substantially as described.

18. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported from said bars, a bolster, yokes depending from said bolster and embracing said bars, said yokes being connected with said springs, and restraining plates or transoms consisting of brackets projecting inwardly from the corresponding side bar and embracing the inner portion of the corresponding yoke, substantially as described.

19. A car-truck comprising a frame having side bars, wheels and axles, springs resiliently supported from said bars, a bolster, a thrust-bar and saddle secured to said bolster, yokes carried by said bolster and comprising plates arranged in pairs, the inner plates having slots to receive the thrust-bar, said yokes being connected with said springs and embracing the side bars of the frame, substantially as described.

20. In a car-body the combination of side sills, a bolster secured to said sills, and a plate extending along the under side of said bolster and having its edges bent in L form to receive  
5 said sills, substantially as described.

21. In a car-body the combination of side sills, with a bolster resting upon and secured to said sills, a thrust-bar and standard connected with said bolster and extending up-  
10 wardly therefrom, and a plate extending along the bottom of said bolster and having its ends bent in L form and receiving said sills, substantially as described.

22. In a car-truck, having a frame and bolster, of yokes for movably supporting the bolster above the frame, comprising separable and vertically-disposed companion parts secured to the bolster, and means for supporting the yokes secured to the frame, substan-  
20 tially as described.

23. The combination in a car-truck having side bars, of the yokes having upwardly-extending parts embracing the side bars intermediate of their height, a bolster securing the  
25 tops of the yokes together transversely and located above the side bars, means for pivotally supporting the yokes on the side bars so as to allow of a transverse swing of the bolsters and yokes, and a thrust-spring interposed between the inner members of the yokes and the side bars, substantially as described.

24. In a car-truck having side bars, the combination with the upwardly-extending yokes embracing the side bars intermediate of their  
35 length, a bolster securing said yokes together above the side bars, means for pivotally supporting said yokes from the side bars and lugs extending inwardly from the side bars to form transoms for the inner members of the  
40 said yokes, substantially as described.

25. A car-truck comprising a frame having side bars and axle-box pedestals, yokes embracing and adapted to move perpendicularly and transversely relative to the side bars, laterally-swinging supports for the yokes secured to the side bars closely adjacent the pedestals, and a bolster resting on said yokes above the side bars, substantially as described.

26. A car-truck, comprising a frame having  
50 side bars, yokes embracing and adapted to move perpendicularly and transversely relatively to the side bars, horizontally-disposed equalizers located below the plane of the side bars, and swing-links securing the equalizers  
55 to the side bars, the yokes bearing on the equalizers, substantially as described.

27. A car-truck comprising a frame having side bars, yokes embracing and adapted to move perpendicularly and transversely relatively to the side bars, horizontally-disposed  
60 equalizers located below the plane of the side bars, the yokes bearing on the equalizers, swing-links for supporting the equalizers from the side bars, and thrust-springs interposed between said yokes and the side bars, sub-  
65 stantially as described.

28. A car-truck, comprising a frame having side bars, yokes embracing and adapted to move perpendicularly and transversely relatively to the side bars, horizontally-disposed  
70 equalizers located below the plane of the side bars, the yokes bearing on the equalizers, swing-links supporting the equalizers from the side bars and weight-carrying springs combined with said links, and a bolster resting  
75 on said yokes above the side bars, substantially as described.

29. A car-truck, comprising a frame having side bars, yokes embracing and adapted to move perpendicularly and transversely rela-  
80 tively to the side bars, semi-elliptic springs horizontally disposed below the plane of the side bars, the yokes bearing on said springs, swing-links securing the semi-elliptic springs to the side bars, and a bolster resting on said  
85 yokes above the side bars, substantially as described.

30. A car-truck, comprising a frame having side bars, yokes embracing and adapted to move perpendicularly and transversely rela-  
90 tively to the side bars, horizontally-disposed semi-elliptic springs located below the plane of the side bars, the yokes bearing on said springs, spring-links secured to the ends of the semi-elliptic springs and pivotally con-  
95 nected with the side bars, and a bolster resting on said yokes above the side bars, substantially as described.

31. In a car-body, the combination of side sills, with a body-bolster resting upon and se-  
100 cured to said sills, a thrust-bar, and a standard connected with said bolster and thrust-bar, and extending upwardly from said bolster, substantially as described.

Signed at the city and county of Philadel-  
105 phia, State of Pennsylvania, this 2d day of May, 1898.

G. MARTIN BRILL.

Witnesses:

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SAML. M. CURWEN.