(No Model.) 5 Sheets—Sheet 1.

E. PECKHAM.

CAR TRUCK.

No. 563,685. Patented July 7, 1896.

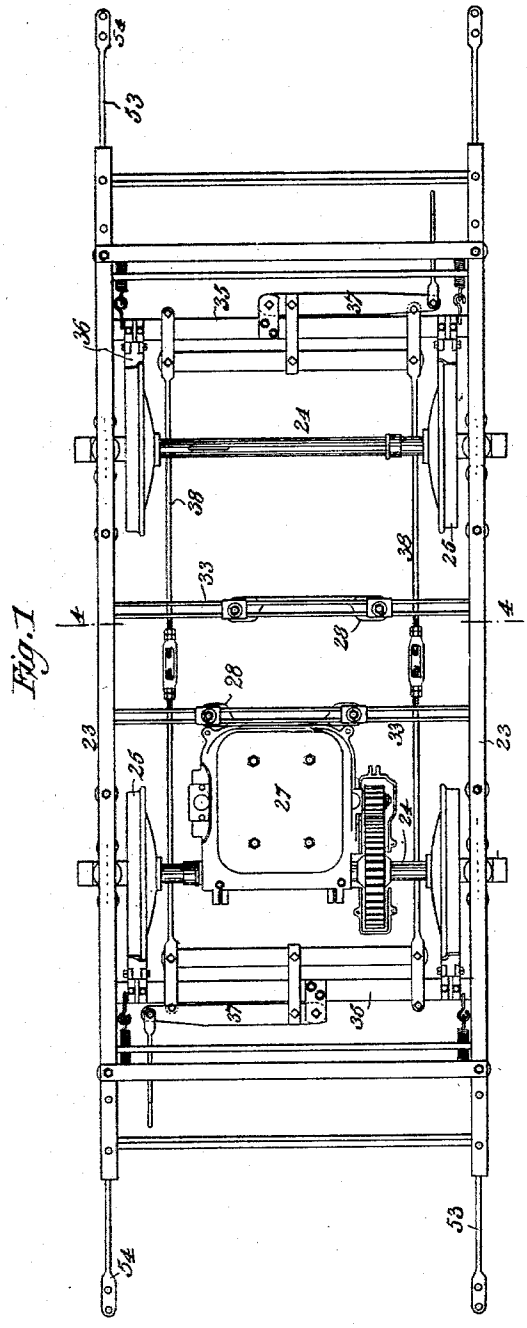

Fig. 1

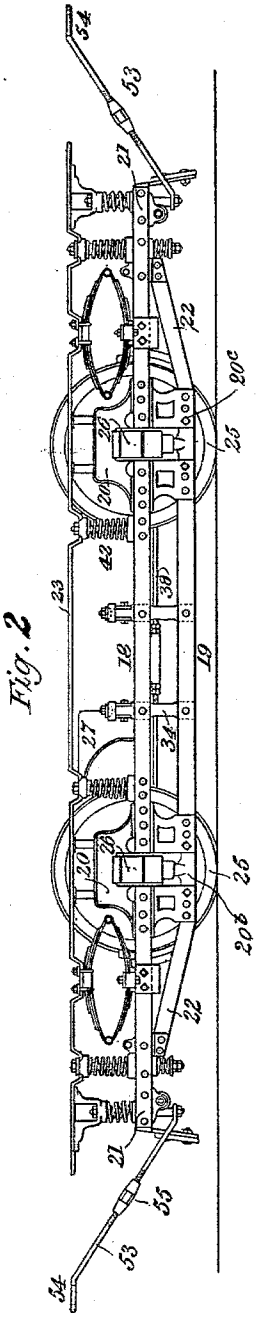

Fig. 2

WITNESSES:

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(No Model.) 5 Sheets—Sheet 2.

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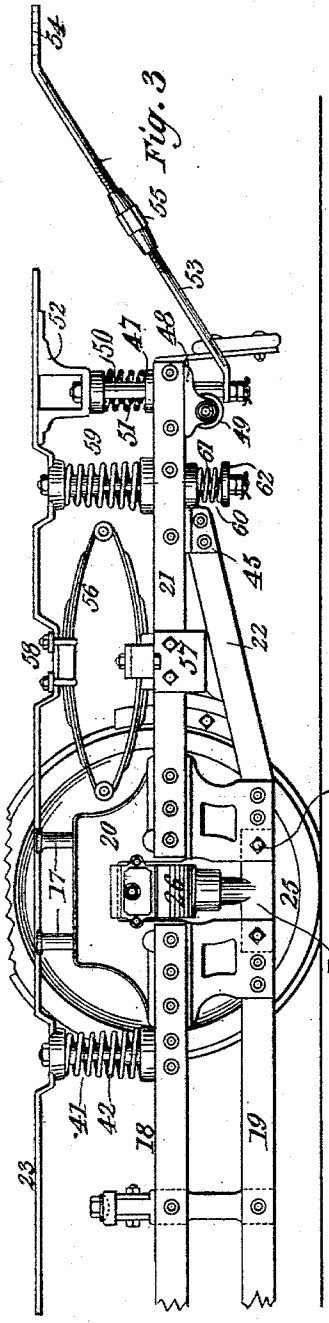

Fig. 3

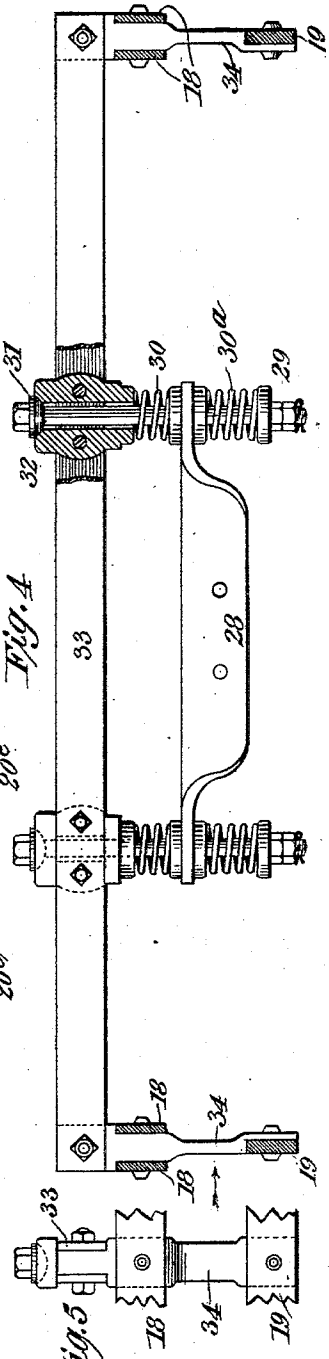

Fig. 4

Fig. 5

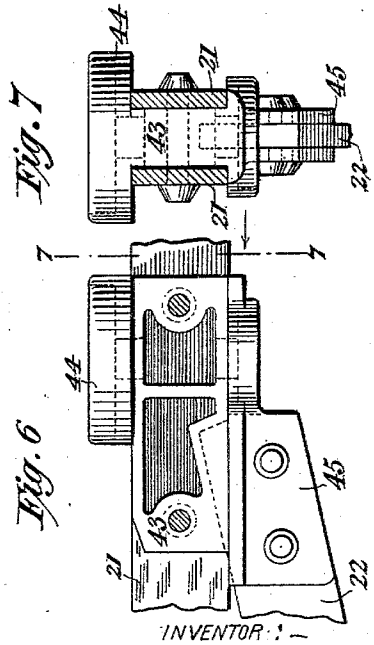

Fig. 7

Fig. 6

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(No Model.) 5 Sheets—Sheet 3.

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Fig. 8.

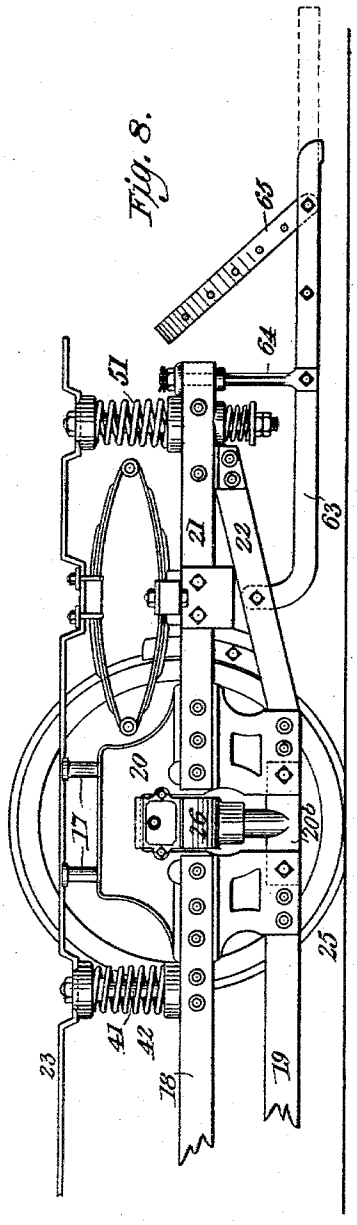
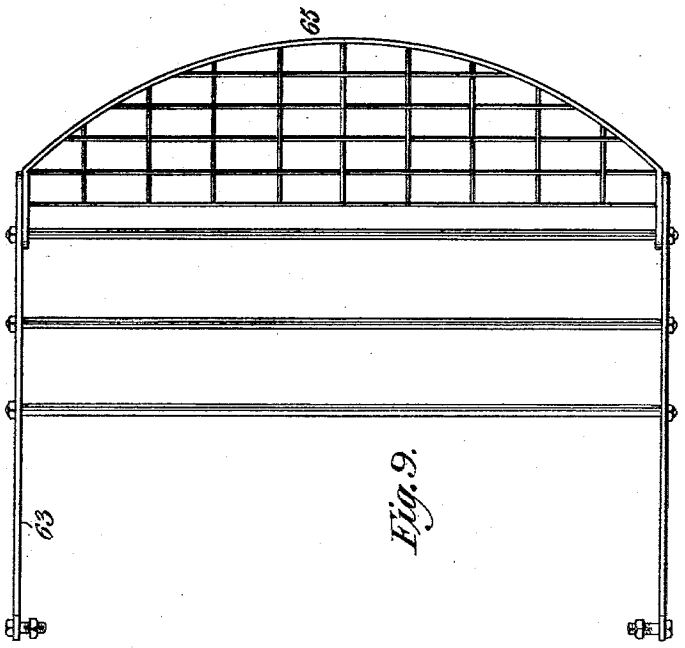


Fig. 9.



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CAR TRUCK.

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Fig. 11.

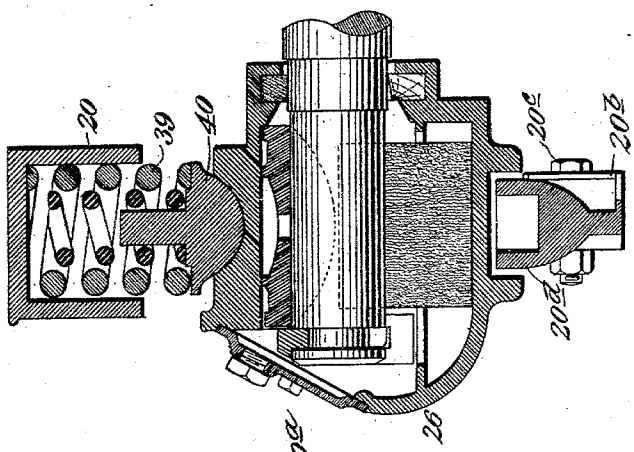
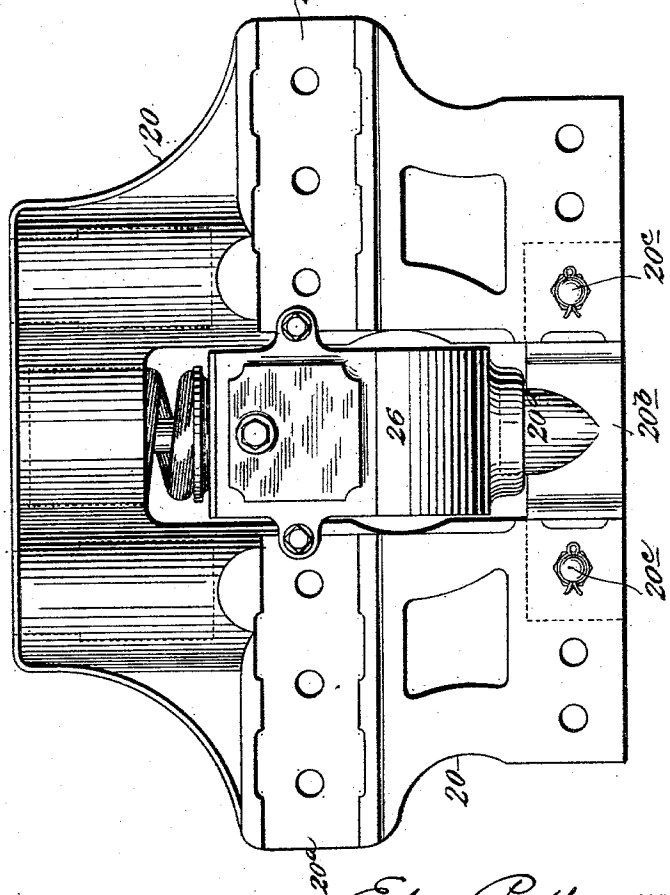


Fig. 10.



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No. 563,685. Patented July 7, 1896.

Fig. 13.

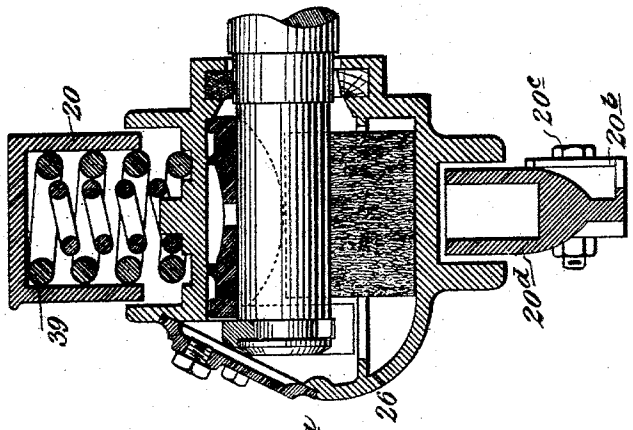
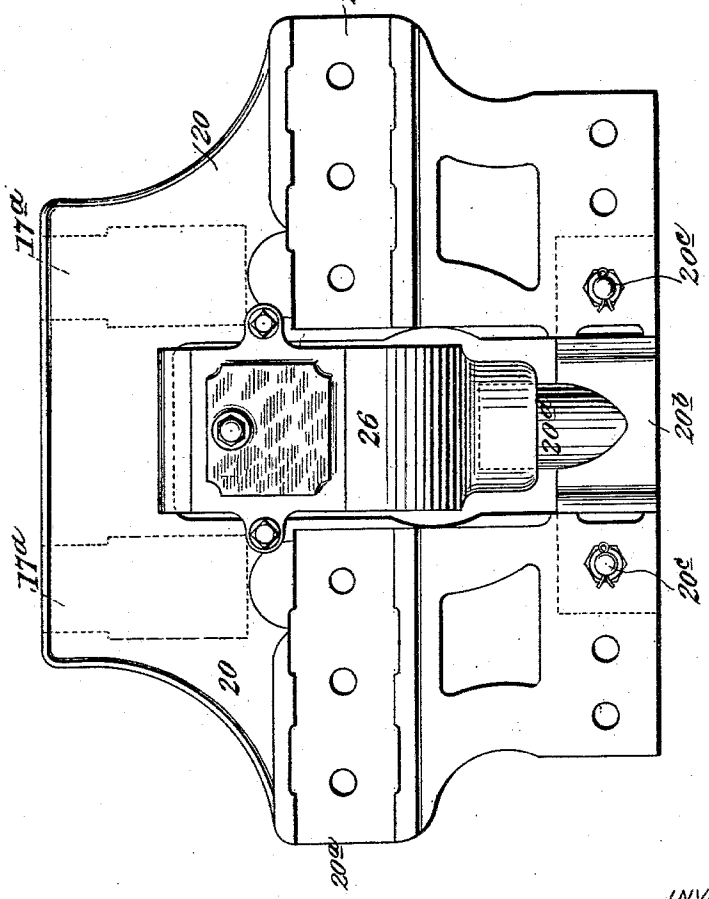


Fig. 12.



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UNITED STATES PATENT OFFICE.

EDGAR PECKHAM, OF KINGSTON, NEW YORK.

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 563,685, dated July 7, 1896.

Application filed March 12, 1894. Serial No 503,353. (No model.)

To all whom it may concern:

Be it known that I, EDGAR PECKHAM, a citizen of the United States, and a resident of Kingston, in the county of Ulster and State of New York, have invented certain new and useful Improvements in Car-Trucks, of which the following is a specification.

This invention relates to car-trucks, and particularly to such as are adapted to support an electric motor by which the truck is propelled.

The invention is hereinafter described in connection with the accompanying drawings, and its object is to relieve the truck-frame from shocks or concussion and to prevent the oscillation of the car when in motion, and this object I accomplish by the means set forth in the following description.

In the accompanying drawings, which form part of this specification, and wherein like features are indicated by like numerals of reference in the several views, Figure 1 represents a plan view of an electric-car truck embodying my invention. Fig. 2 is a side elevation of Fig. 1. Fig. 3 is an enlarged elevation of one end of the truck. Fig. 4 is a cross-section on the line 4 4 of Fig. 1, the brake mechanism being omitted. Fig. 5 is an end view looking in the direction of the arrow of Fig. 4. Fig. 6 is a detail view showing the mode of attachment of the under truss at one end of the truck to the upper longitudinal beam. Fig. 7 is a section on the line 7 7 of Fig. 6. Fig. 8 is an elevation of one end of the truck-frame, showing, besides the arrangement of the elliptic and spiral springs, likewise shown in Figs. 2 and 3, the life-guard and mode of attachment of the same to the truck-frame. Fig. 9 is a plan view of the life-guard. Fig. 10 is a front view of the axle-box and yoke. Fig. 11 is a central vertical section through Fig. 10. Fig. 12 is a front view of a modification of the axle-box as combined with the yoke, and Fig. 13 is a central vertical section through Fig. 12.

Referring to the drawings, 18 represents the upper longitudinal beam, which is preferably duplex, as seen in Fig. 4, and 19 the bracing-beam. These beams on each side of the truck-frame connect the yokes 20 together, the said beams being riveted to the yokes, as indicated. To the outer sides of the yokes 20 there are riveted longitudinal beams 21, which afford support for springs, as shown, and which beams will be of greater or less length, according to the proportions desired of the spring-base extension. The springs mounted on beams 21 are supported from below by truss-beams 22, riveted to the lower part of the yoke and inclined upward to the beams 21, to which they are suitably riveted, the preferred mode of connecting the truss-beams 22 being shown in Figs. 6 and 7 and described hereinafter. Suitably supported on standards rising from the longitudinal beams 18 is a sill or top chord 23, which coacts with the springs on beams 18 and 21, and also with elliptical springs arranged as hereinafter mentioned, and upon this sill 23 the car-body is adapted to be placed.

The respective sides of the truck-frame are connected together by suitable transverse bars, and the truck-frame is mounted, as usual, upon the axle-boxes, which coöperate with the yokes of the frame.

In the drawings, 24 indicates the axles, 25 the wheels, and 26 the axle-boxes.

The truck-frame as above described does not differ essentially from the truck-frames shown in several of my Letters Patent heretofore granted, the distinguishing characteristics of which being the extended spring-base and under truss-beams for supporting said spring-base. The particular combination of elliptical and spiral springs and tension appliance hereinafter described is, however, one of the improvements forming the subject of this application.

The electric motor 27, which coöperates with gearing on the axles 24 in a manner well understood, is supported by the axles and on motor-hangers 28, which latter are suspended upon rods 29 between spiral springs 30 30^a, encircling said rods, as shown in Fig. 4. The rods 29 are provided at their upper ends with ball-bearings 31, operating within sockets 32, which are bolted between the duplex transverse beams 33, which are supported by standards 34 at each side of the truck-frame and which are bolted between the longitudinal beams 18 and also to the longitudinal truss-beam 19, as shown in the drawings. By this construction of motor-support the requisite flexible connection is secured for the heel of

the motor. I do not in this application make any claim, however, to this construction of motor-support, and any other desirable construction may be substituted for it.

A brake mechanism which may be used with any truck is shown in the plan view Fig. 1, but any other suitable brake mechanism may take its place. In said Fig. 1 the numerals 35 indicate the brake-bars, 36 the brakes, 37 the operating-levers of the brakes, and 38 the connecting-rods by which the brakes at both ends of the truck are operated simultaneously from either end of the truck through suitable instrumentalities.

The yoke 20 is an independent structure riveted to the frame and is provided at its respective sides with openings 20^a to receive the ends of the beams 18 and 21, which, as explained, are riveted to the yoke. At its bottom the yoke is also provided with holes to receive the rivets which connect the beams 19 and under truss-beams 22 thereto. 20^b indicates a detachable connecting-piece between the lower extremities of yoke 20, held in place by bolts 20^c. This connecting-piece 20^b is provided with the projection 20^d, which is adapted to enter an opening or socket in the bottom of the axle-box 26 and thus furnish a loose connection between the bottom of the axle-box and the detachable piece 20^b, and by this means, in connection with the joint at the top of the axle-box, the latter is maintained in its proper position with reference to the yoke and the truck-frame. By removing the bolts 20^c the pieces 20^b may be readily removed from the yoke structure and thus permit the axle-box to be detached from the truck-frame.

To relieve the truck-frame from shocks and concussion and insure the easy riding of the car, I arrange between the top of the axle-box 26 and the yoke 20 a spiral spring 39, the yoke being hollowed out, as shown, to receive the spring and maintain it in operative position. In Figs. 10 and 11 the axle-box is provided in its top surface with a semispherical depression within which operates a guide-piece 40 for the spring 39, said guide-piece having a semispherical bottom which coöperates with the depression in the top of the axle-box, thus forming a ball-joint partaking of a universal motion. The spring 39, Fig. 11, is mounted on the guide-piece 40, whose stem projects partly through the spring, as shown, and as the spring is fitted into the opening in the yoke it is thus suitably guided and prevented from becoming displaced. The spring 39 is duplex, consisting of an inner and outer spiral, which I find to be a desirable form of construction for the present purposes. In Figs. 12 and 13 the top of the axle-box is provided with a depression having a central vertical stud to receive the spring 39 and assist in maintaining it in position. This construction does not possess the quality of a universal joint, but in many ways is quite as well adapted for the purposes intended. Attached to the sill 23 are guide-rods 17, which enter sockets 17^a in the tops of the yokes 20.

Upon the longitudinal beams 18, between the yokes, there may be mounted upon suitable standards 41, whose upper ends pass through depressions in the sill 23, as shown, (whereby the nuts which secure said standards to the sill are below the plane of the sill,) spiral springs 42 for affording support to the car-body centrally.

The improvements which I have applied to the ends of the car-truck will now be described. The beams 21, which serve as the extended spring-base, are duplex, as shown, and the outer upper ends of the truss-beams 22 are secured to the same, as indicated in Figs. 6 and 7. In these views 43 indicates a casting having a collar 44 at its top and a lateral projection 45 at the bottom. This casting is riveted between the members of the duplex beam 21 (see Fig. 7) with the collar 44 resting on the upper edges of the beam, the lateral projection 45 being below the lower edges of said beam. The lateral projection 45 is provided with a central opening which receives the upper and outer end of the under truss-beam 22, which is riveted to the casting, as shown, the interior of the casting furnishing a rigid abutment for the end of said truss-beam, as shown in Figs. 6 and 7.

At the extreme end of the duplex longitudinal beam 21 there is riveted between its members a casting with a collar 47, which rests upon the upper edge of said beam, and with a depending bracket 48 below the under edge of the beam. In bracket 48 there is journaled a roller 49, with which rod 50, supporting a preferably duplex spiral spring 51, above the collar 47, and passing through an opening in the bracket, coöperates. The spiral spring 51 abuts at its upper end against a collar on said rod and the extreme upper end of the rod is secured by a nut within a bracket 52, affixed to the sill 23. To the lower end of rod 50 there is suitably secured an end truss 53, extending outwardly and upwardly and having at its extreme end a horizontal portion 54 and adapted to be maintained by means of a turnbuckle device 55 in the same plane as the top of the sill 23. The end truss 53 may be formed integral with the rod 50, and I prefer to so make it. The object of the extended end truss 53 is to prevent the teetering or oscillation of the car and also to support the ends of car-bodies of unusual lengths. It will be noticed that said end truss (whether its vertical member 50 is integral with member 53, as in Fig. 12, or connected thereto, as in Figs. 1 and 3) connects with the upper chord 23 of the truck-frame by means of bracket 52, and at its opposite end or extension is adapted to extend under the car-body and support the same at its outer end. By this arrangement the requisite flexible support is afforded at the extreme ends of the car-body, which is an important consideration when car-bodies of unusual length are employed.

Next to the yoke 20 I arrange an elliptical spring 56, supported in a bracket 57, riveted to the duplex beam 21 and connected by a suitable clamp 58 to a depressed portion of the sill 23, as shown. The elliptical springs 56—there being four to each truck, one near each end of each side frame—thus firmly unite the horizontal end beams 21 with the upper chord 23 of the truck structure. In combination with this elliptical spring, located as shown, I employ a spiral spring 59. The said spiral spring is arranged in advance of the elliptical spring and is mounted upon a rod having its upper end connected to a depression in the sill 23, as shown, and having its lower end extending through the bracket 43, riveted as explained between the members of the duplex beam 21. The lower end of this rod, which is indicated by 60, extends beneath the bracket 43 a sufficient distance and is provided with a spiral tension-spring 61, which is held in place between the bracket and an adjustable nut 62. The function of the under tension-spring 61 is to take up lost motion of spiral spring 59 and to keep the same in proper tension, thereby providing at this point of the truck structure what I term a "tension" appliance.

By locating the elliptical springs adjacent to the yokes and the spiral springs in advance of the elliptical springs I overcome serious objections heretofore encountered when making use of elliptical springs in truck structures, as I am enabled to bring the weight of the car-body more directly upon the elliptical springs than upon said spiral springs and thus provide against oscillation of the car-body that would otherwise take place; and by this disposition of the springs I am also enabled to combine advantageously with the spiral spring 59 the lower tension-spring 61, thus providing an effective tension device serving to prevent breakage of the elliptical springs by up-thrusts of the truck, the said tension device also relieving the car from shocks by cushioning the nut 62 at the bottom of the rod or bolt 60.

The spiral springs 59 51, located as explained, also afford a more extended spring-support for the car-body and assist in preventing the oscillation or teetering of the car. The elliptical spring 56, arranged next to the yoke, as constructed, is made stiffer than the said spiral springs. There are four of these elliptical springs in the truck structure, two at each end of the truck, and it is upon these four elliptical springs that dependence is placed to sustain the car when not loaded, and as the weight of the car is increased the spiral springs come into play to reinforce the elliptical springs.

The elliptical springs 56 are rigidly secured to the top frame or upper chord 23 of the truck and also to the horizontal end extension-beams 21. Thus secured, said springs serve to brace the truck and give it the necessary strength to resist side and end thrusts when starting and stopping and rounding curves. When only one spiral spring is used in combination with the elliptic spring, as shown in Fig. 8, the spiral spring is preferably provided with an inside buffer-spring, as shown, the inside spiral spring being a little shorter than the outside spiral spring to allow for the weight of the car-body before it comes into action.

To the under supporting-truss 22 there are bolted the bars 63, which project outwardly beyond the end of the truck and are supported by the hangers 64, suitably connected to the duplex beams 21. These bars 63 have connected to them near their outer ends the life-guard 65, the connection between the bars 63 and life-guard 65 being a hinged one, whereby the life-guard may be turned upward, as shown in Fig. 8 in full lines, or turned downward on a plane with the bars 63, as shown in dotted lines in said view.

In this application I show a truss-bracing at the ends of the car-truck comprising a diagonal brace, a vertical supporting-bolt connected to the car-sill or the top chord of the truck-frame, and also to the lower end of said diagonal brace, and a roller coöperating with said truss-bracing at or near the juncture of the diagonal brace with the supporting-bolt, but I do not claim the same herein, as it is claimed in a division of the present application, said divisional application having been filed February 29, 1896, Serial No. 581,391.

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

1. In a car-truck, the combination with the yoke of the truck, an extended end beam and a spiral spring mounted on said end beam, of an elliptical spring likewise mounted on said end beam between the said spiral spring and yoke and contiguous to the yoke, substantially as set forth.

2. In a car-truck, the combination with the yoke of the truck, an extended end beam, a truss therefor, and a spiral spring mounted on the upper side of said end beam, of an elliptical spring likewise mounted on said end beam and between said spiral spring and the yoke, substantially as set forth.

3. In a car-truck, the combination with the yoke of the truck, an extended end beam and a duplex spiral spring mounted on said end beam, of an elliptical spring made stiffer than said spiral springs and likewise mounted on said end beam, between said duplex spiral spring and yoke and contiguous to the yoke, substantially as set forth.

4. In a car-truck, the combination with the yoke of the truck, an extended end beam and a series of spiral springs mounted on said end beam, of an elliptical spring made stiffer than said spiral springs and likewise mounted on said end beam between said yoke and spiral springs and contiguous to the yoke, substantially as set forth.

5. In a car-truck, the combination with the

side frames including the yokes, and spiral springs mounted on said frames near their ends, of four elliptical springs mounted on the side frames between the yokes and said spiral springs and contiguous to the yokes, substantially as set forth.

6. In a car-truck, the combination with the side frames including yokes and end beams, 21, and spiral springs mounted on said end beams, of upper chord or frame 23 and four elliptical springs secured to the said end beams, between the yokes and said spiral springs, and also firmly secured to said upper frame or chord 23, substantially as set forth.

7. In a car-truck, the combination with the side frames including yokes, and end beams, 21, and trusses under said end beams, of an upper frame or chord 23, spiral spring between the end beams and the upper chord, and elliptical springs secured to the end beams 21, between the yokes and said spiral springs, and also secured to the upper frame or chord 23, substantially as set forth.

8. In a car-truck, the combination with the yoke of the truck, an axle-box and a spiral spring located between the top of the yoke and the axle-box, of an extended end beam, a spiral spring mounted on said end beam and an elliptical spring made stiffer than said last-mentioned spiral spring and likewise mounted on said end beam between the yoke and spiral spring on the end beam and contiguous to the yoke, substantially as set forth.

9. In a car-truck, the combination with the yoke, end extension-beam 21, upper chord 23, and an elliptical spring mounted on said end beam and connected to said upper chord and arranged contiguous to the yoke, of a spiral spring on the end beam in advance of the elliptical spring, bolt as 60 connected to said upper chord and extending through said spiral spring and beneath the end extension-beam, a spiral tension-spring 61 on the lower end of said bolt and cushioning-nut 62, substantially as set forth.

10. In a car-truck, the combination with the yoke of the truck, an extended end beam and an elliptical spring mounted on said end beam near the yoke, of a spiral spring likewise mounted on said end beam in advance of the elliptical spring and a spiral tension-spring arranged on the rod or spindle of said spiral spring beneath the under surface of said extended beam, substantially as set forth.

11. In a car-truck, the combination with the yoke of the truck, an extended end beam and an elliptical spring mounted on said end beam contiguous to the yoke, of a spiral spring likewise mounted on said end beam in advance of the elliptical spring and having its rod or spindle extended below said end beam and provided with a tension-spring, and a supporting-truss at the end of said end beam, connected to the sill or upper longitudinal chord of the truck-frame, extending downward beneath the said end beam and projecting outward and upward beneath the car-body, substantially as set forth.

12. In a car-truck, the combination with an extended end beam, a yoke, a bracket as 43 secured to said extended end beam and an under truss as 22 riveted or bolted at one end in contact with the bottom of the yoke and having its other end socketed in the aforesaid bracket, of an elliptical spring mounted on said extended end beam contiguous to the yoke, a spiral spring likewise mounted on said beam in advance of the elliptical spring and having its spindle projecting through said bracket beneath said end beam and provided with a spiral tension-spring beneath the end beam, substantially as set forth.

13. In a car-truck, the combination with the extended end beams as 21 and the under supporting-trusses 22, of the bars 63 rigidly secured to said under supporting-trusses and connected to the end extension-beams 21 by hangers 64, and the life-guard as 65 pivoted near the outer ends of the bars 63, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 8th day of March, A. D. 1894.

EDGAR PECKHAM.

Witnesses:
J. E. M. BOWEN,
M. C. PINCKNEY.