

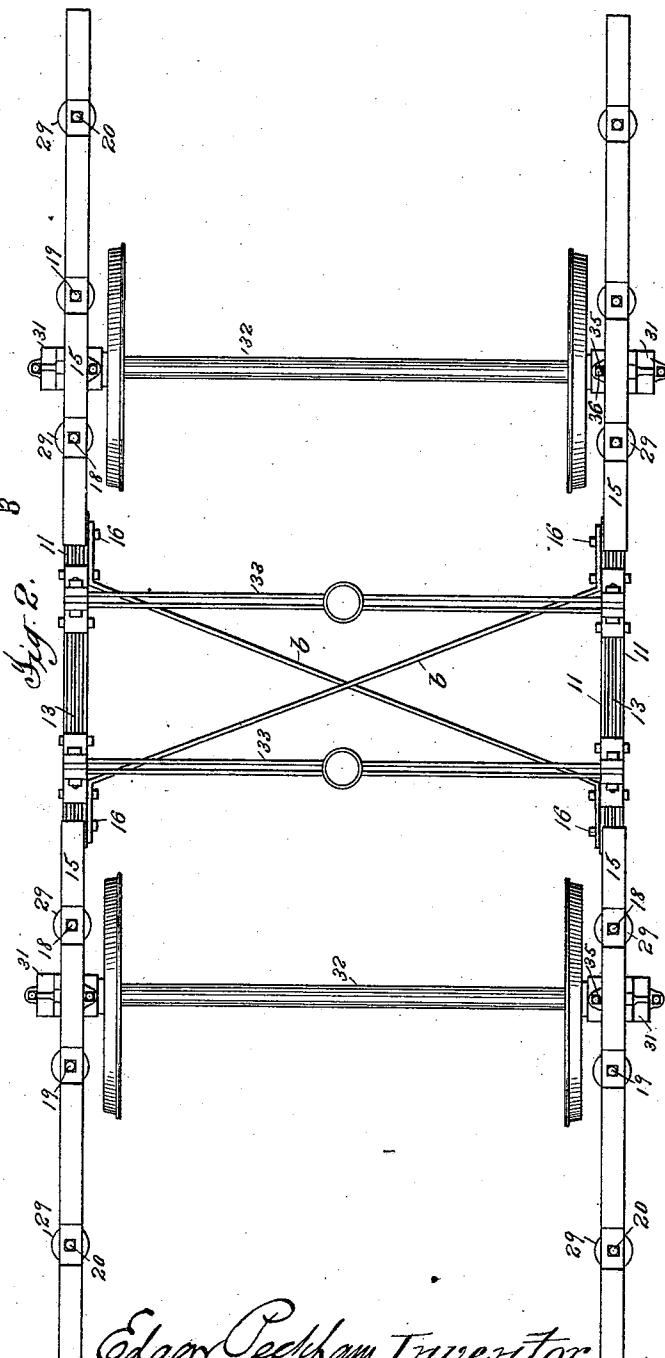
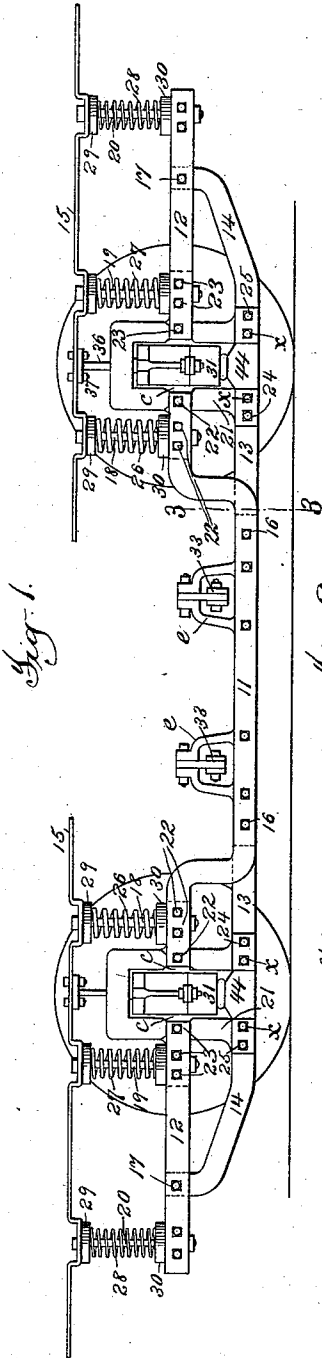
(No Model.)

2 Sheets—Sheet 1.

E. PECKHAM.
CAR TRUCK AND ITS GEAR.

No. 555,526.

Patented Mar. 3, 1896.



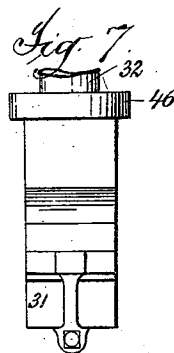
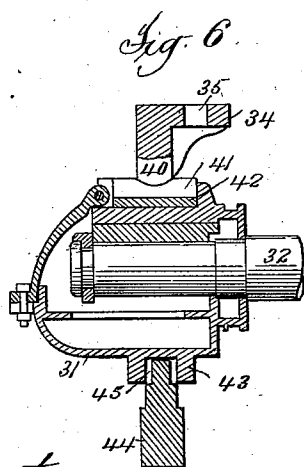
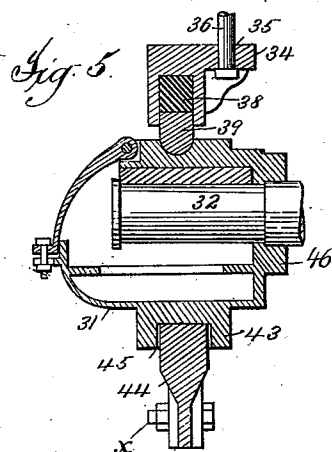
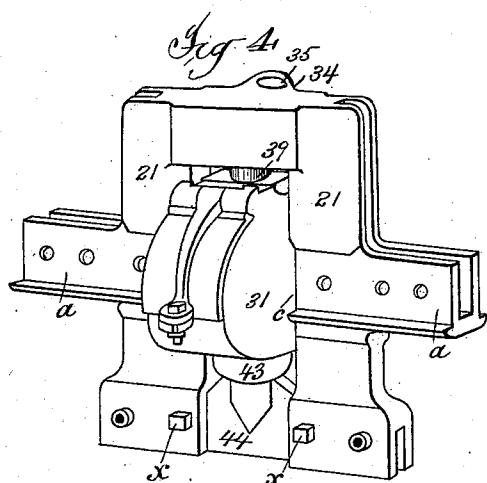
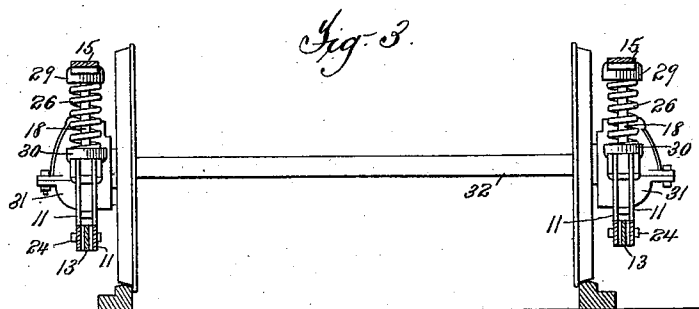
Attest:
Geo H. Potts.
J. E. M. B. new

Edgar Peckham Inventor

E. PECKHAM.
CAR TRUCK AND ITS GEAR.

No. 555,526.

Patented Mar. 3, 1896.



Attest:
Geo H. Bott
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Edgar Peckham Inventor

UNITED STATES PATENT OFFICE.

EDGAR PECKHAM, OF NEW YORK, N. Y.

CAR-TRUCK AND ITS GEAR.

SPECIFICATION forming part of Letters Patent No. 555,526, dated March 3, 1896.

Application filed August 18, 1891. Serial No. 402,999. (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 New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Car-Trucks and Their Gear, of which the following is a specification.

My invention refers to trucks, and particularly to trucks employed in connection with and for the support of electrical motors, which motors, by means of proper gearing between them and the axles of the drive-wheels, are adapted to impart motion to said wheels, so as to propel the truck.

The object of my invention is to construct a car-truck wherein end oscillation or tilting of the car-body mounted thereon will be largely if not entirely avoided, and to so construct the main frame of the truck as to impart to it sufficient strength as well as elasticity to enable it to readily resist the various strains that may be brought to bear upon it owing to the unevenness of track, changing loads, variations in grades, sudden stopping and starting of the motor, and the various other causes that tend to destroy the equilibrium within and to rack the body of such a truck.

A further object is to provide elastic connections between the main sill of the car and the part of the truck-frame supported more directly by the axle-boxes in such a manner that the elasticity of such connections is regulated and graduated in accordance with the liability of the various parts of such sill and of the platform supported by the same to have imparted to them sudden varying strains.

A still further object is to provide the truck with an extended base at both ends for supporting springs upon which the extended ends of the main sill rest and support each end of said extended base by means of a truss from beneath. Said extended spring-base is obtained by the extension of the ends of the side frames sufficiently to support the required number of springs, the length of said extensions depending upon the length of the car-body to be supported by the truck. The under trusses between the lower ends of the yokes or pedestals and said extended ends of the side frames are rendered necessary to

provide the requisite strength for supporting the weight of the car-body resting upon the springs mounted upon the extended spring-base. The said under trusses are independent of the truss connected to the bottoms of the yokes between the axles of the truck, and they may be permanently connected to or integrally formed with the pedestals or yokes. By making said end under trusses independent of the truss connected to the yokes or pedestals between the axles of the truck and providing an independent bar detachably fitted in the open bottom of the yoke I am enabled to remove the wheels and axles for repairs without disturbing the several sections of the truss.

Means by which I accomplish these objects are illustrated in the accompanying drawings and set forth in the following specification, and in the claims annexed hereto the features of novelty for which protection is desired are set out.

In said drawings, wherein like letters and numerals refer to corresponding parts, Figure 1 represents a longitudinal elevation, and Figure 2 a ground plan, of a truck constructed according to my invention, while Fig. 3 represents a vertical cross-section thereof along line 3 3 of Fig. 1. Fig. 4 shows a detached view in perspective of an axle-box and of the parts of the truck-frame immediately connecting therewith, and Fig. 5 a vertical section thereof. Fig. 6 shows a modification of Fig. 5, and Fig. 7 represents a top view of the axle-box. Figs. 4, 5, 6, and 7 are drawn on an enlarged scale.

11 indicates a longitudinal duplex beam having preferably a horizontal depression in its central part, its end parts being horizontal and connected with said central depressed part by two short upright legs. Each of the two members forming said duplex beam is made of iron or steel and of a high and narrow cross-section, thus disposing of the material therein to best advantage, so as to resist strains brought to bear upon the same in a vertical direction, as more fully mentioned hereinafter.

12 are duplex horizontal beams of the same cross-section as beams 11 and placed at the same elevation and at the same distance from the longitudinal center of the truck-

frame as the ends of beams 11. These beams 12 at each end of the truck provide an extended base, upon which are supported the springs hereinafter referred to.

5 The two members 11 11 are placed a sufficient distance apart so as to permit of passing between the same an additional metallic longitudinal beam 13, which being made of similar material and of a corresponding cross-section as beams 11 and 12, but constructed as
10 a straight bar, is placed at the same elevation as and centrally between the depressed central parts of beams 11.

14 are beams of the same cross-section as
15 beams 13, and they serve as trusses to support the extended ends of the base of the truck-frame. The beams 14 are curved and so located as to have a vertical leg and a horizontal leg, the latter at the same elevation
20 and the same distance from the center of the truck as beam 13, and 15 is a sill constructed as a metallic bar laid flatwise above beams 11, 12, 13, and 14.

The beams 11 as well as 12 are placed sufficiently far apart to not only permit of the
25 passage between the same of beams 13 and truss-beams 14, respectively, but to also leave spaces between the three beams, bolts 16 passing through and connecting beams 11 and
30 13 with each other and bolts 17 connecting beams 12 with truss-beams 14. Proper washers or other filling-pieces may be used to fill out said spaces around and in the vicinity of said bolts.

35 18, 19, and 20 are vertical bolts, 18 tying together sill 15 and duplex beams 11, and bolts 19 and 20 tying together sill 15 and duplex beams 12, the heads of said bolts being located above said sill and in suitable de-
40 pressions therein and their nuts underneath said duplex beams, the nuts in the cases of end bolts 20 resting directly against the under sides of beams 12, while in the cases of bolts 18 and 19 the nuts rest against the
45 under sides of arms *a* extending sidewise from and forming parts of a yoke 21, one side of said yoke being inserted between the ends of the two members of duplex beams 11 and attached thereto by bolts 22 and the other side
50 of said casting being inserted between the adjoining ends of the two members forming duplex beam 12 and secured thereto by bolts 23. Likewise beams 13 are secured to the lower inner corners of yokes 21 by bolts 24,
55 while the truss-beams 14 are secured to the outer corners of such yokes by bolts 25, bolts 17 serving to firmly connect beams 12 and 14. Thus yokes 21, with the aid of the bolts mentioned, serve to join together the various parts
60 of the truck-frames in a firm manner, so that each side frame of a truck practically consists of one piece. Said yokes also support the inner ends of the truss-beams 14, as shown.

26, 27, and 28 are spiral springs placed
65 around vertical bolts 18, 19, and 20, as shown. 29 and 30 are metallic shoes against which

the ends of said springs rest, the shoes 29 being attached to the under sides of sills 15 and the shoes 30 being made to rest upon and to engage with beams 11 and 12.

70 The springs located on the truck-frame between the sill 15 and those parts of the truck-frame which are supported more directly by the axle-boxes are of different degrees of stiffness, and they are so disposed with relation to the truss-frame and to the car-body to
75 be supported thereby as to insure under all conditions an easy-riding car and to distribute the load, particularly when the car is filled with passengers or otherwise heavily
80 loaded, upon such springs approximately in proportion to their stiffness, thus keeping sill 15, and with it the car-platform, substantially in a level position, notwithstanding the variations occurring in the load.

85 The greater part of the load on a car will normally come on that part of it placed between the yokes, and the least part of it will come near its extreme ends, where in passenger-cars the platforms are located.

90 If all the springs were made of the same stiffness, springs 26 26, receiving the greater load, would be compressed first and would become set before the others, while springs 28
95 would be the last ones thus affected. On this account and because any shock imparted to the truck owing to obstructions on the track will be imparted first and principally to the springs nearest to the yoke and in only a
100 slight measure to the end springs 28 28, I give to springs 26 26 the greatest and to springs 28 28 the least stiffness and thereby insure, under the conditions normally existing with
105 reference to the loads on electric cars, a simultaneous uniform play of all the springs and an easy motion of the car-body.

The stiffness of springs 26, 27 and 28 may be graduated so that springs 26 possess the least and springs 28 the greatest degree of
110 elasticity. When thus arranged, all these springs serve to counteract shocks imparted vertically either to sill 15 or to the trusses underneath the extended base; but as the tendency of the body of the car-truck to oscillate or vibrate increases toward the ends of said
115 trucks this system of graduating the vertical supporting-springs counteracts such tendency in exact proportion to the liability of the various parts of the truck to so vibrate.

120 The advantage of forming the upper longitudinal member 15 of the truck-frame (herein designated the "sill") with depressions in its top surface at the points where the bolts 18, 19 and 20 pass through the said sill, so that the nuts by which said bolts are secured are
125 brought below the upper surface of the sill, is that the said nuts may be readily removed to permit the removal of the bolts and the springs surrounding the latter without jacking up the car.

130 31 are axle-boxes placed at the ends of the axles 32 in the usual manner, proper bearings

made of metal being provided between said axles and the interior of the boxes, as is common in trucks, so as to transfer the weight of the truck and of the load which it is supporting upon such axles.

The yokes 21 in their general outlines are constructed to straddle such axle-boxes and to extend downward to the lower edges of horizontal parts of beams 13 and truss-beams 14, as mentioned above.

33 are cross-girders for supporting electrical motors, the same being suspended in brackets mounted on the truck-frames and together with the diagonal braces *b* extending between said frames serve to tie together the two side frames forming the main body of the truck. The flat ends of braces *b* are bolted to the inside of the side frames near the points where the motor-supporting girders 33 rest on said frames, the object being to afford lateral strength to that part of the structure affected most directly by the operation of the motors and to stiffen the truck and keep it in line with the car-body.

From the upper inner part of each yoke 21 a bracket 34, forming part of such casting, extends toward the center of the truck. The upper horizontal flange of said bracket contains a hole 35, adapted to receive a vertical pin 36, which pin extends upward into and connects with a shoe 37, attached to the under side of sill 15. Said pin, while fitting said hole, is free to move within it and acts similar to a plunger and as a vertical stay and guide, so as to maintain sill 15 and yoke 21 in their proper relative vertical positions. The upper horizontal part of yoke 21, as illustrated in Fig. 5, contains on its under side a recess for receiving an elastic cushion 38, which cushion is preferably made of rubber. Instead of this cushion a suitable form of spring may be used. Against the under side of such cushion a metallic stud 39 is made to rest, the lower extremity of which stud serving as a bearing-piece extending laterally in the direction of the truck-frame farther than its main body and being made in the form of a longitudinal section of a cylinder. (See Fig. 4.) The upper part of axle-box 31 directly underneath said stud 39 is hollowed out and made to correspond closely in its configuration to the bearing-surface at the lower end of said stud, the two together forming a joint capable of adjusting itself to the varying positions which the axle-box may assume with reference to yoke 21.

In the modified form of a joint between yoke 21 and axle-box 31, as illustrated in Fig. 6, the upper bearing-piece is made a part of yoke 21 and indicated by 40, and instead of having such bearing-piece rest directly on the top of the axle-box an interchangeable bearing-piece 41, supported by a rubber cushion 42, is inserted in a socket on the top of the axle-box. On the under side of axle-box 31 a socket 43 is provided, which is preferably

elongated in a direction transverse of the truck-frame.

44 is a detachable connecting-piece between the lower extremities of yoke 21, attached to suitable sockets therein by bolts *x*. At its upper end a pin 45 fitting loosely into socket 43 is provided, so that in combination with the joint on top of the axle-box it will maintain the box in its proper position with reference to the yoke and the truck-frame, while permitting of readily detaching such axle-box from the truck after the two bolts *x*, holding said piece 44 in its position, have been removed. The elongated shape of the socket 43, as described, permits of sufficient lateral play between the connecting-piece 44 and the axle-box, so as to prevent undue strain upon those parts.

From the above description it will be seen that when the several beams of the truck-frame are riveted to the yokes 21 in the manner described the whole forms practically one piece, and this construction enables the side frames to be placed upon or taken from the axle-boxes without taking said frames apart. The trucks may thus be shipped in a knocked-down condition, and as all the parts are interchangeable the truck may be put together at its destination by ordinary workmen.

It will also be seen that by the described construction of the yokes 21, which are so bolted or riveted to the side frames as to form parts of such frames with the detachable member at its bottom, the axles-boxes may be removed from the axles with facility and ease, to remove the entire set of axle-boxes it being only necessary to take out two bolts *x* from each yoke.

The axle-box 31 is provided at its back with a collar 46 somewhat larger in diameter than the width of the axle-box, the purpose of which is to strengthen the box at that point. To facilitate the removal of this axle-box from between the yoke the latter is formed with depressions, as at *c*, corresponding in their elevation and size with those parts of collar 46 projecting beyond the sides of the axle-box, or the yoke may be made of sufficient width compared with the greatest width of the axle-box to permit of the easy displacement of said box when the detachable piece at the bottom of the yoke has been removed. This construction of side frames embracing the yoke as an element, besides having the merit of simplicity, permits the employment of the novel gear-bearings between the axle-boxes and said frames, through the medium of which the side frames are relieved from shocks and the wheels and axles are permitted to adjust themselves to all unevenness of the way, thus relieving the trucks and car-bodies from all strain incident to the employment of the usual rigid axle connections.

The ends of the motor-frames are supported on the transverse beams 33, which are suspended from suitable brackets *e* on the side

frames or trusses. When beams 33 are thus suspended they may freely move sidewise. The motor-frames are thus relieved from all side strains.

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

1. In a car-truck frame, the combination with a horizontal beam as 12, forming an extended spring-base, of under truss-beam as 14, connected to said horizontal beam and terminating at the side of the yoke nearest the end of the frame at which point it is bolted in place, and springs of varying degrees of stiffness located between said extended base and the car-sill, and decreasing in stiffness toward the ends of such sill, substantially as set forth.

2. In a car-truck, the combination with the side supporting-frames including extended end beams, yokes with outer and inner legs, trusses between such beams and the outer legs of the yokes, and the car body or sill, of a series of springs interposed between the car body or sill and said frames and graduated to decrease in stiffness toward the ends of the truck, substantially as set forth.

3. In a car-truck, the combination with the yokes of the side frames, the said yokes provided with brackets 34 extending toward the center of the truck and having holes 35 therein, of the upper chord or sill 15 and pins or bolts secured to said sill and playing through holes 35, substantially as set forth.

35 4. In a car-truck frame, the combination

of two side structures connected laterally, each containing yokes 21, supported on axle-boxes, such yokes inserted between and fastened to the members of duplex beams 11, and 12, and also made to form shoes for the ends of beams 13 and truss-beams 14, substantially as set forth.

5. In a car-truck, the combination with the axles, axle-boxes, side supporting-frames having end extensions with springs mounted thereon and also including yokes, 21, supported on said axle-boxes, of detachable retaining-pieces as 44, secured to the yokes and entering sockets in the axle-boxes for supporting the latter at their bottoms and confining them in position with reference to the side supporting-frames, substantially as set forth.

6. In a car-truck, the combination of two frames, one supported upon the running-gear and the other movable and adapted to receive the car-body, or forming the car-sill, and springs placed in pairs so as to bring one spring on each side of the connection of the running-gear, and additional springs of less stiffness placed nearer the ends of the car-body or car-sill, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 7th day of August, A. D. 1891.

EDGAR PECKHAM.

Witnesses:

M. D. PECKHAM,
A. E. BUTTS.