No. 814,409. PATENTED MAR. 6, 1906.

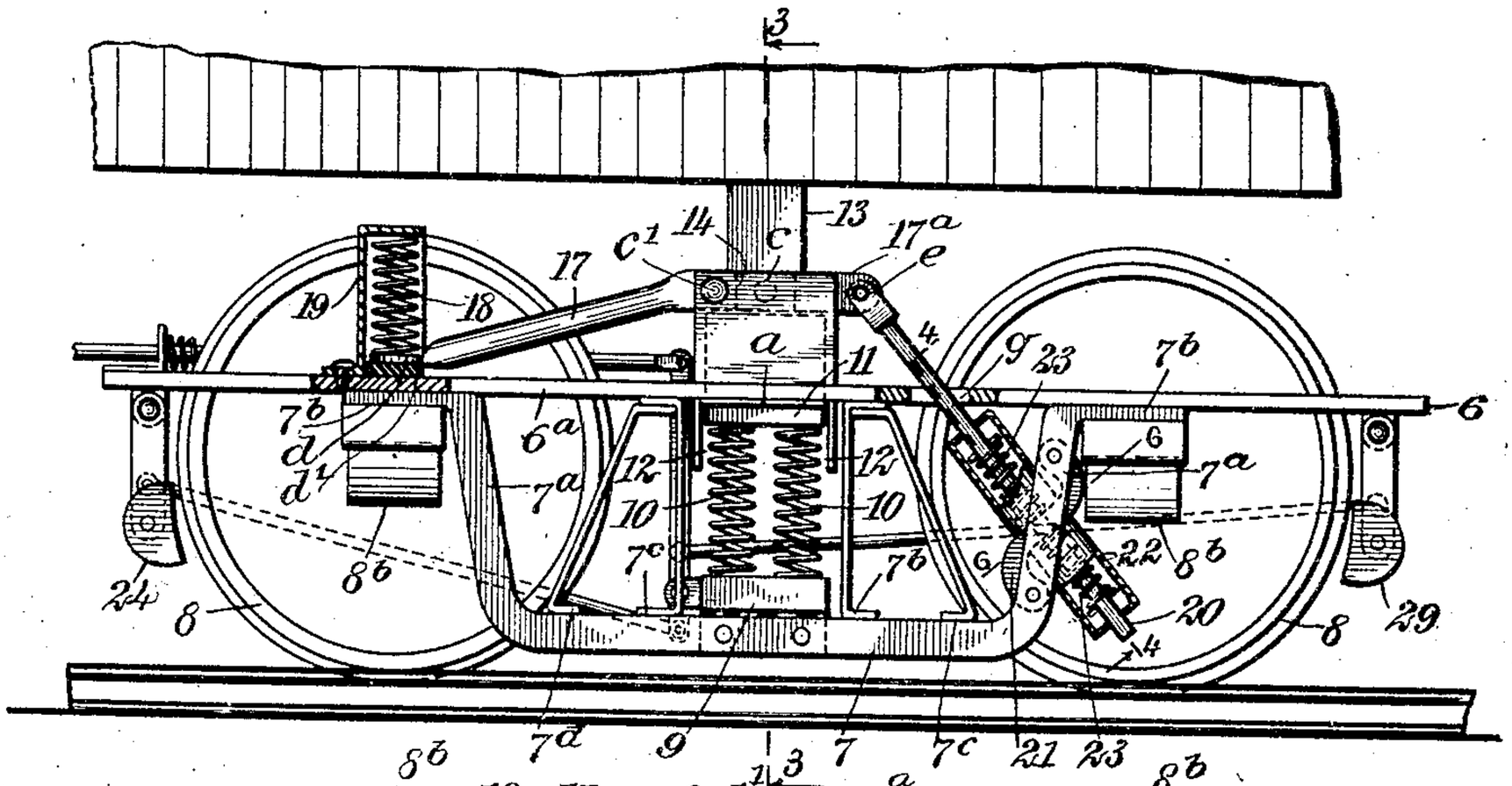
G. C. STEWART.

RAILWAY CAR TRUCK.

APPLICATION FILED OCT. 27, 1905.

2 SHEETS—SHEET 1.

Fig. 1



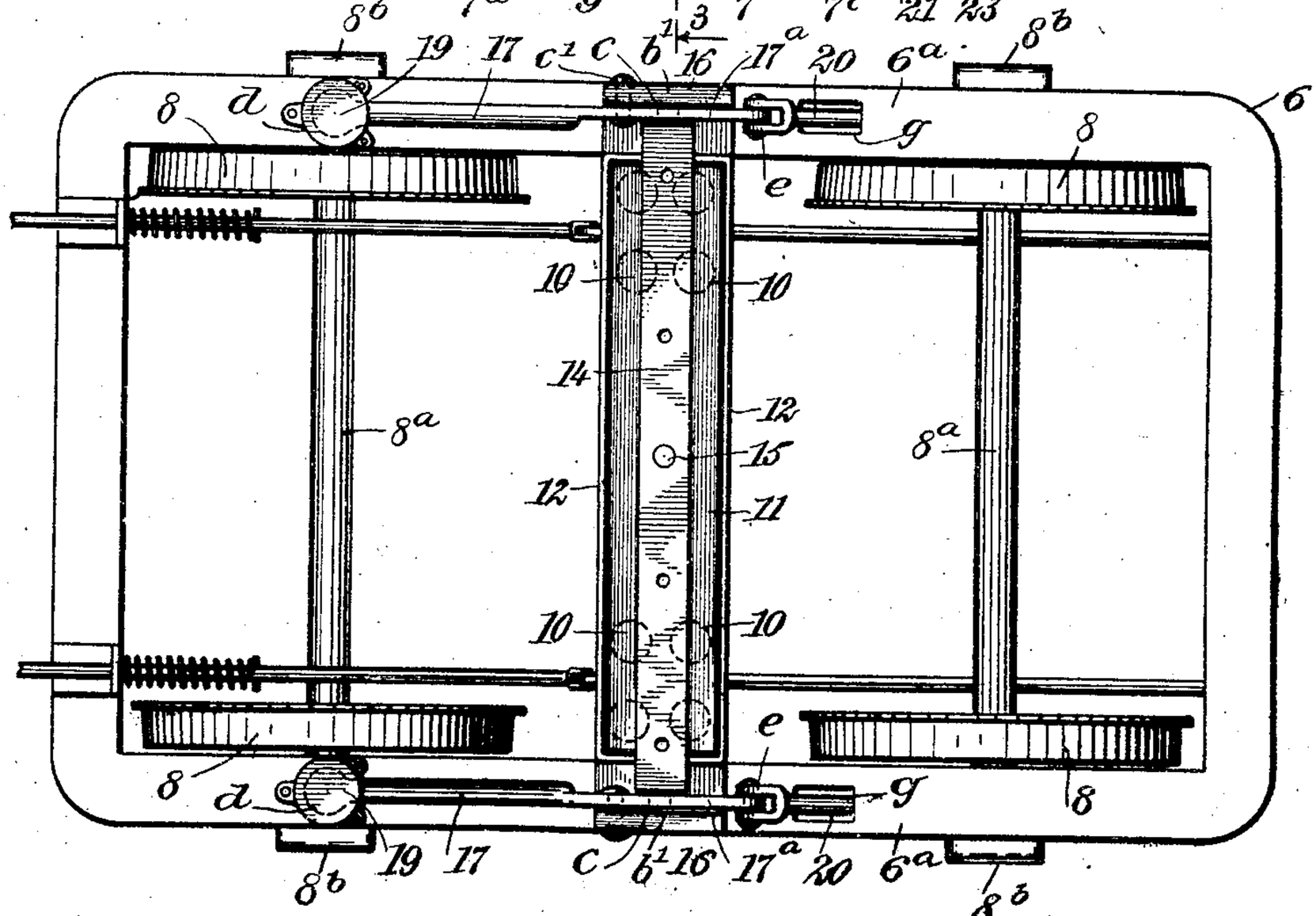


Fig. 2

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Fig. 3

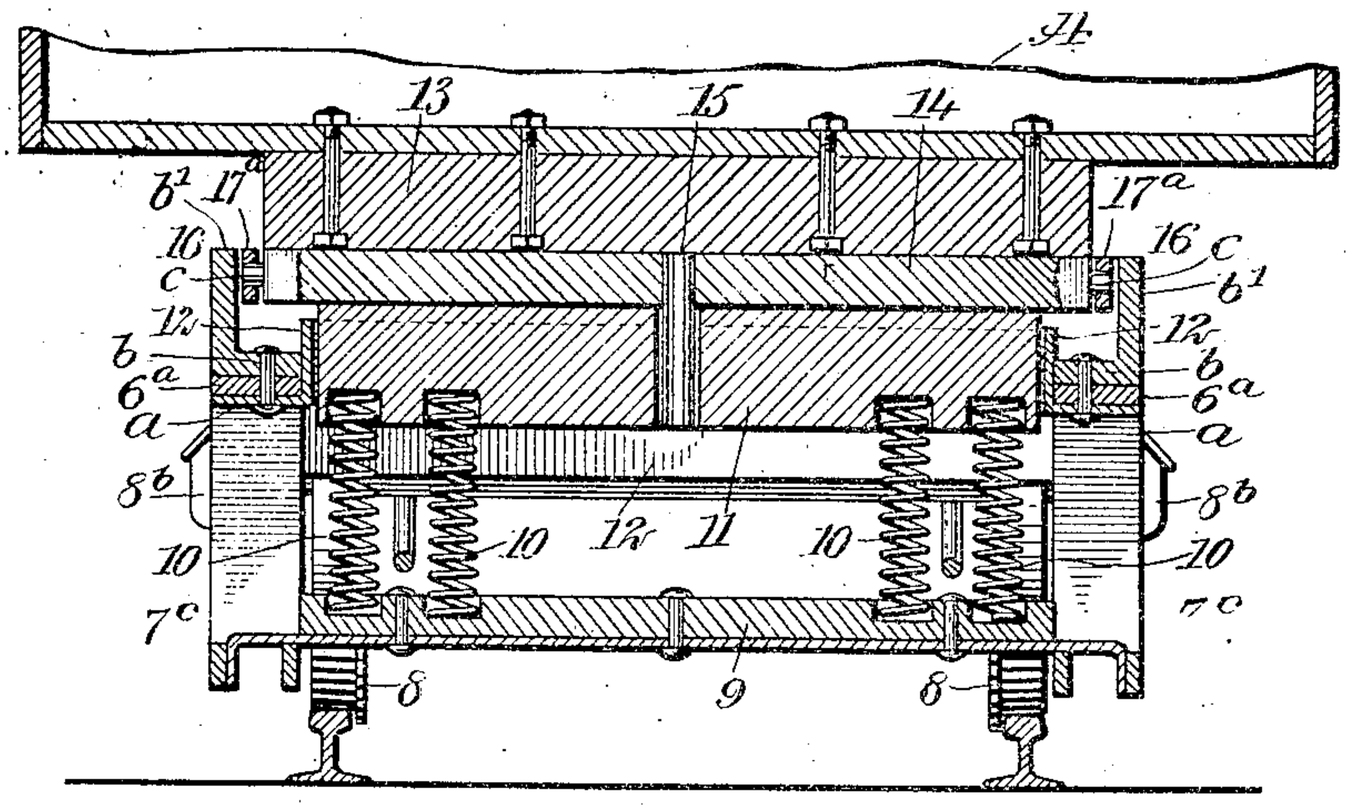


Fig. 4

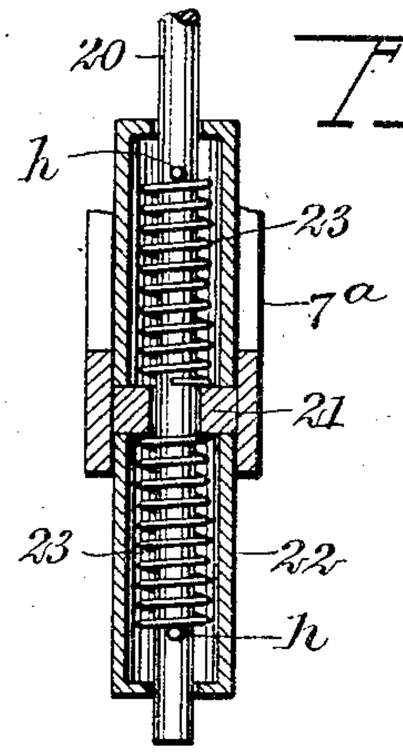


Fig. 5

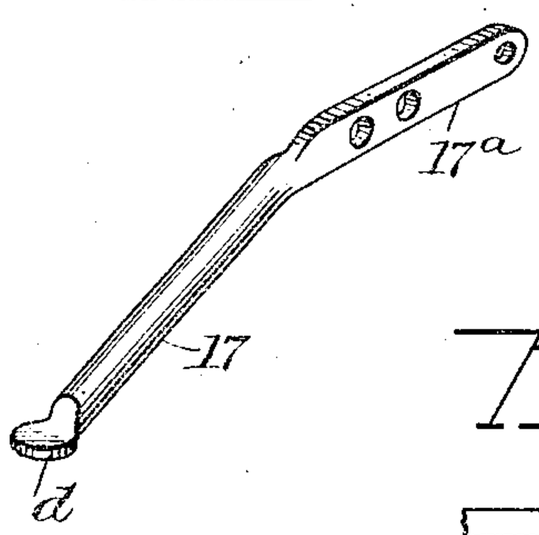
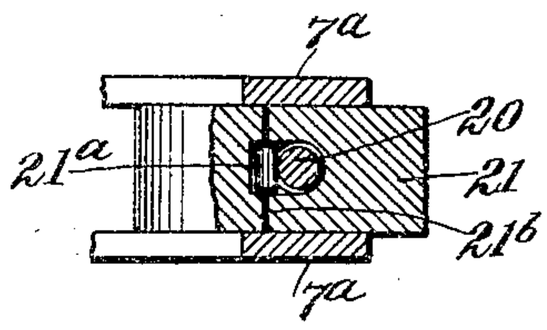


Fig. 6



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UNITED STATES PATENT OFFICE.

GEORGE CLAUDE STEWART, OF MARENGO, INDIANA.

RAILWAY-CAR TRUCK.

No. 814,409. Specification of Letters Patent. Patented March 6, 1906.

Application filed October 27, 1905. Serial No. 284,653.

To all whom it may concern:

Be it known that I, GEORGE CLAUDE STEWART, a citizen of the United States, and a resident of Marengo, in the county of Crawford and State of Indiana, have invented a new and Improved Railway-Car Truck, of which the following is a full, clear, and exact description.

This invention more particularly relates to the trucks of running-gears for street-railway cars propelled by motors actuated by electricity.

Ordinarily a street-railway car is provided with trucks that have as supports for the body of the car a plurality of vertically-arranged springs engaging a transverse bolster and also engaging axle-boxes that work in pedestals. In the operation of electrically-actuated cars having their bodies carried on upright springs the inertia of the car-body and its load tends to resist a sudden onward impulse, which causes the car-body to lurch rearward and when the car is suddenly stopped the body will lurch forward. This objectionable jerking movement of the car-body is largely due to the lateral yielding of the spring-supports of the car-body in a forward or rearward direction.

The object of my invention is to provide novel details of construction for a car-truck that will counteract the lateral yielding movement of the car-body on its spring-supports, either forward, rearward, or sidewise, and by cushioning such a lurching movement obviate in a large degree the objectionable jerking motion incidental to the operation of cars having running-gear of ordinary construction.

The invention consists in the novel construction and combination of parts, as is hereinafter fully described, and defined in the subjoined claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a partly-sectional side view of a car-truck embodying details of the invention and a portion of a car-body carried by the truck. Fig. 2 is a plan view of the improved car-truck. Fig. 3 is a transverse sectional view of the same, taken substantially on the line 3 3 in Fig. 1. Fig. 4 is an enlarged longitudinal sectional view of novel details, taken substantially on the line 4 4 in Fig. 1. Fig. 5 is a detached perspective view of a rock-arm employed, and Fig. 6 is an enlarged transverse sectional view taken substantially on the line 6 6 in Fig. 1.

In the drawings, 6 represents the frame of the truck, consisting of an oblong ring, quadrangular in form and preferably rounded at the corners. The side members 6^a of the frame 6 are reinforced by substantially U-shaped depending carrier-bars 7, that are located centrally and have upturned legs 7^a thereon furnished with longitudinal flanges 7^b, which are secured on the lower sides of said side members, as shown, for one carrier-bar in Fig. 1. The frame 6 is mounted upon wheels 8 on the ends of axles 8^a, the journals of which have bearings in boxes 8^b, secured upon the frame below the flanges 7^b, thus disposing the wheels inside of the frame, and it will be noted that the boxes 8^b are devoid of spring-supports, being rigid with the frame. A bearer-beam 9, mounted and secured at its ends on the U-shaped carrier-bars 7, affords a seat for a plurality of coiled springs 10, upon which rests a bolster-beam 11. A guide-box 12, that loosely receives the bolster-beam 11, is secured by flanges *a* at its ends upon the side members of the frame 6 and serves to prevent the bolster-beam from rocking sidewise or turning so as to swing it laterally on the springs 10. Said guide-box is claimed as an advantageous feature of the invention. Between the legs 7^a and bearer-beam 9 braces 7^c 7^d are introduced and are secured at their upper ends upon the lower sides of the frame members 6^a and at their lower ends are affixed upon the carrier-bars 7, these braces stiffening the connections between the frame 6 and the carrier-bars.

Coacting with the guide-box 12 are the main details of the invention for preventing longitudinal and lateral swaying movement of the car-body constructed, essentially, as follows: The car-body A is provided with a transverse timber 13, secured thereon at the longitudinal center of its lower portion, and the lower side of the timber 13 is seated upon an equalizing-bar 14, as shown in Fig. 3, said bar having a pivotal connection 15 at its center between it and the center of the bolster-beam 11, as also appears in Fig. 3. Upon the side members 6^a of the frame, opposite the ends of the bolster-beam 11, two bracket-stands 16 of like form are mounted, each consisting of a knee-block having two flange members *b b'*, the members *b* being seated upon and secured to the side members 6^a

of the main frame 6 and the flanges b' projected upwardly therefrom, as is clearly shown in Fig. 3. A rock-arm is provided for engagement with each end of the equalizing-bar 14, and, as shown in Fig. 5, each rock-arm is in the form of a heavy metal bar, having a straight cylindrical body portion 17 and a flat member 17^a thereon extended at an obtuse angle from one end of the body portion 17, and, as appears in Figs. 1, 2, and 5, the cylindrical body 17 exceeds in length the flattened portion 17^a. Near the center of the rock-arm member 17^a of each arm a transverse perforation is formed therein for the reception of a trunnion c on a corresponding end of the equalizing-bar 14. Each rock-arm member 17^a is also pivoted upon an adjacent upright flange b' of a respective bracket-stand 16 near the junction of said member with a corresponding section 17, as shown at c'. The cylindrical body portion 17 of each rock-arm trends downward and away from a respective bracket-stand 16, terminating at the lower end thereof in a flat flange d, preferably seated upon a flat gum-spring d', seated upon the frame member 6^a, above which said rock-arm is disposed. A coiled spring 18 is seated upon each flange d and is maintained in an upright position by a spring-case 19, closed at the upper end and flanged at the lower end, said circumferential flanges on each spring-case being secured upon the main frame, as shown in Figs. 1 and 2. Each spring-case 19 is open at the side toward the body of a respective rock-arm 17, and the cylindrical portion thereof is adapted for vertical play in the opening of the case. The flat member 17^a of each rock-arm projects across a respective end of the guide-box 12, and upon said projected portion the upper end of a plunger-rod 20 is jointed, as shown at e in Figs. 1 and 2. Each plunger-rod 20 is in the form of a cylindrical bar that extends diagonally downward through an opening g in the side member 6^a of the frame 6 and likewise through a perforated guide-block 21, secured in a slot in an appropriate leg 7^a of an adjacent carrier-bar 7. As shown in Fig. 6, each perforated guide-block 21 supports an anti-friction-roller 21^a on a pivot-rod 21^b in such a relative position that the periphery of the roller has contact with the plunger-rod 20 and prevents said rod from bearing on the guide-block, thus reducing friction between said working rod and its support. A spring-case 22 is also extended through a respective leg 7^a, concentric with a corresponding plunger-rod 20, and in said spring-case for each plunger-rod two coiled springs 23 are placed on the plunger-rod, one spring above the guide-block 21 and the other below it. Two abutment-pins h are inserted through each plunger-rod 20 at the ends of the springs 23 farthest from the guide-block 21, with which they have contact at opposite sides thereof; and it will be seen that a longitudinal sliding movement of the plunger-rods downwardly will be cushioned by the upper springs 23, that are then compressed upon the upper sides of the respective guide-blocks 21. Furthermore, if an upward pull is given to the plunger-rods 20 in a like manner the lower springs 23 in the cases 22 will be pressed against the lower sides of the guide-blocks 21, and the compression of said springs will counteract the pull on said rods in a degree proportioned to the dormant force of the springs.

As hereinbefore stated, the preferred use of the improvement is to obviate the longitudinal jerking of a car-body propelled by an electric motor. In such a construction the motor, as usual, is mounted upon the frame 6 at a selected end and by provision of gearing of any preferred construction transmits power and progressive motion to the truck and car-body thereon when the motor is energized by electricity, and as this means for propelling a car is not a feature of the invention it is omitted from the drawings. It may here be explained that the brake device shown and that is adapted for forcing the ordinary brake-blocks 24 against the wheels 8 is not claimed as a novel feature, and any other brake appliance may be employed, if preferred.

In operation when the car receives a propelling impulse, which in many cases is sudden, due to a careless handling of the controller for the electric motor, the inertia of the car-body and its load will cause a rearward swaying movement of the car-body. This sway of the car will, through the equalizing-bar 14, be communicated to the rock-arms 17 and through their members 17^a to the plunger-rods 20, and it will be observed that the jolt given to the body will act downwardly and rearwardly on the equalizing-bar and parts directly connected with it, as just described. The plunger-rods 20 will be pressed endwise by the described swaying action of the car-body, but will travel only a slight distance, owing to their support by the upper springs 23, and the rocking movement of the arms 17 and 17^a will be counteracted by the springs 18, that resist an upward movement of the lower ends d of the rock-arms, the downward thrust of the arms 17 being absorbed by the cushion-springs d'. Obviously the resistance to the jerking movement of the car-body will be imperceptible, owing to the springs 18 and 23 absorbing the jolt, so that the car will start without jar should the motor be energized suddenly. As the exigencies of the service on electric-motor-propelled cars frequently necessitate the almost instant stoppage of the car, such abrupt arrests of forward movement causes the car-body to recoil, due to its momentum, and a heavy jolt forwardly results. When such an action is sustained by a car having the improvement, the jerking of the car-body is

neutralized by transmission of the abrupt jolt to the springs 23 and the downthrust of the rods 17 to the cushion-springs *d'*. It is well known that on an undulating trackway a light car rocks endwise, and when a car is running on a sharp curve the car-body has a tendency to sway outwardly, or toward the high side of the track. By the employment of the improvement the longitudinal rocking movement of the car will be arrested without jar, and the side sway of the car-body will be checked, this being due to the fact that the swaying movement that rocks the car-body sidewise tends to depress the spring-supported bolster-beam 11 at its outer end, which will be directly opposed by the springs 18 and 23, their expansive force being adapted to support the bolster-beam and prevent a lateral rocking movement of the car-body.

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

1. The combination with the car-body, of a car-truck frame, a spring-supported bolster-beam carried transversely of the frame, a guide-box laterally inclosing the bolster, an equalizing-bar pivoted centrally on the beam and secured to the car-body, and oppositely-arranged flexible connections between the equalizing-bar and the car-truck frame at each end of said bar.

2. The combination with a car-body, of a car-truck frame having parallel side members, a bearer-beam hung from the side members, springs mounted on the bearer-bar, a bolster-beam seated upon the spring, a guide-box laterally incasing the bolster-beam, the ends of the guide-box being secured on the side members of the frame, an equalizing-bar pivoted centrally on the beam and secured to the car-body, and oppositely-arranged flexible connections between the equalizing-bar and the car-body frame at each end of said bar.

3. In a car-truck, the combination with a frame having parallel side members, two carrier-bars having upturned legs secured on said side members, a bearer-beam secured at its ends on level portions of the carrier-bars, and springs on the bearer-beam, of a bolster-beam mounted upon the springs, an equalizing-bar centrally pivoted on the bolster-beam, and spring cushioning means carried on the frame and loosely engaging the ends of the equalizing-bar.

4. In a car-truck, the combination with a frame, and a spring-supported bolster-beam mounted transversely thereon, of a cushioning device on each side of the frame, comprising a rock-arm pivoted on a projection from the frame, a spring on the frame pressing on one end of the rock-arm, a trunnioned bar on the bolster-beam whereon the rock-arm is loosely mounted, a plunger-rod pivoted at one end on the other end of the rock-arm, a guide-block carried on the frame, through which the plunger-rod works, a roller on the guide-block on which the rod bears, and a spring mounted upon the plunger-rod and bearing at one end on the guide-block and pressing at the opposite end on a projection from the plunger-rod.

5. In a car-truck, the combination with a frame having parallel side members, an essentially U-shaped carrier-bar depending from each of said frame members, and a spring-pressed bolster-beam supported on the carrier-bars, of a cushioning device on each side member of the frame, each comprising a bent rock-arm, an equalizing-bar pivoted centrally on the bolster-beam and having a trunnion at each end, whereon the rock-arms are respectively mounted to rock, said arms being respectively pivoted near their bends upon a projection from the frame, a pressure-spring bearing upon a flattened end on each rock-arm, a plunger-rod pivoted at its upper end on the remaining end of a corresponding rock-arm, a guide-block carried on a leg of each carrier-bar and through which a respective plunger-rod works, and cushioning-springs mounted upon the plunger-rods, having one end of each spring seated on the adjacent guide-block, and the other end thereof bearing on a projection from the plunger-rod.

6. The combination with a car-body, a car-truck frame, a spring-supported bolster-beam carried transversely on the frame, and an equalizing-bar centrally pivoted on the beam and secured on the car-body, said bar having trunnions on its ends, of a cushioning device mounted on the frame at each side thereof, and comprising a bent rock-arm pivoted near the bend on a bracket-stand erected from the frame, and also loosely mounted near said pivot on a respective trunnion end of the equalizing-bar, a spring on the frame pressing one end of a respective rock-arm, a plunger-rod pivoted upon the remaining end of each rock-arm, a guide-block carried on the frame and through which the plunger-rod works, and a spring mounted upon each plunger-rod, pressing at one end on a guide-block and at the opposite end on a projection from the plunger-rod.

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

GEORGE CLAUDE STEWART.

Witnesses:

HARRY C. MURPHY,

ELISHA L. JONES.