No. 776,303. PATENTED NOV. 29. 1904.

W. DALTON.

ELECTRIC CAR TRUCK.

APPLICATION FILED JUNE 11, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

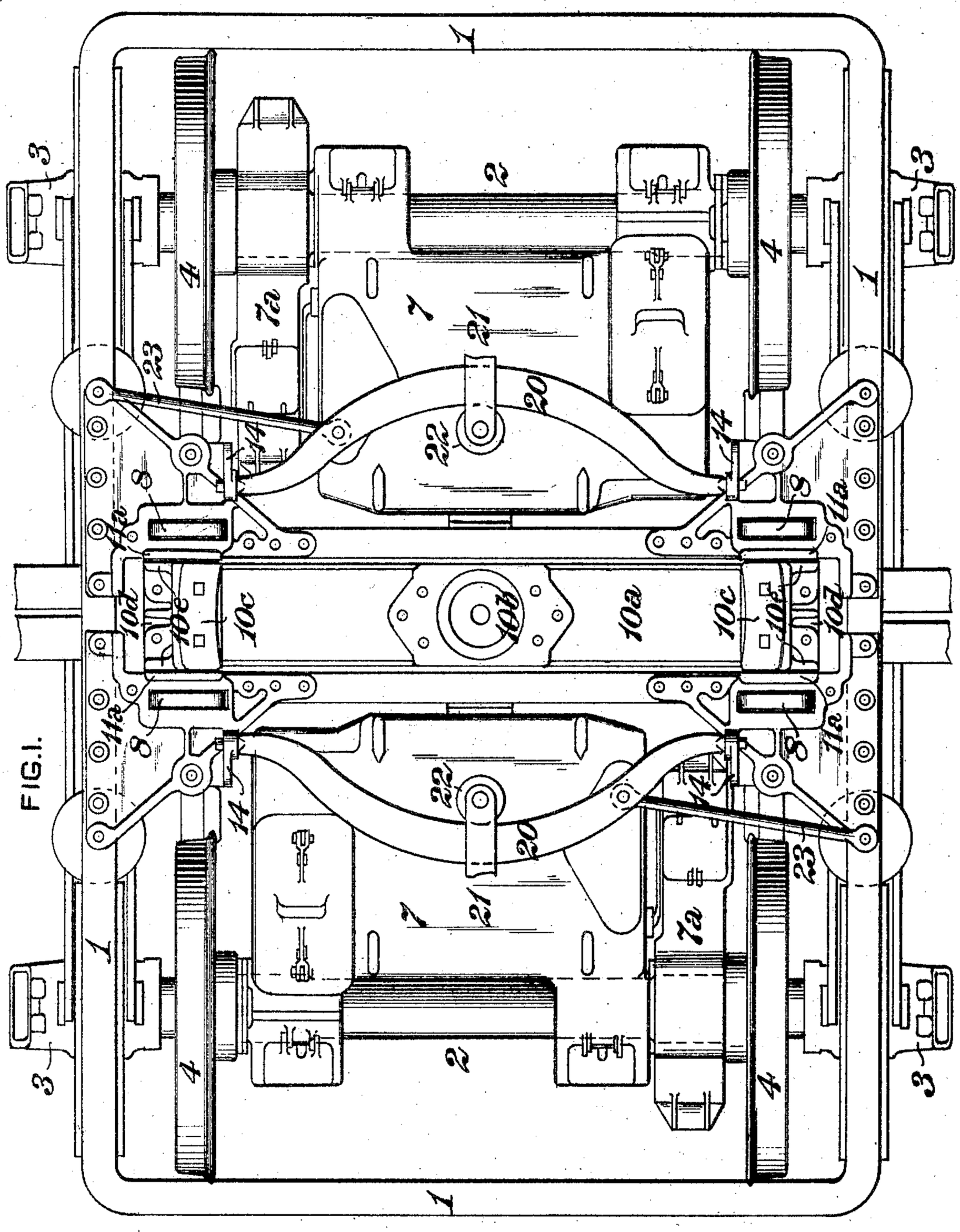

FIG. I.

WITNESSES

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NO MODEL. 3 SHEETS—SHEET 2.

FIG. 2.

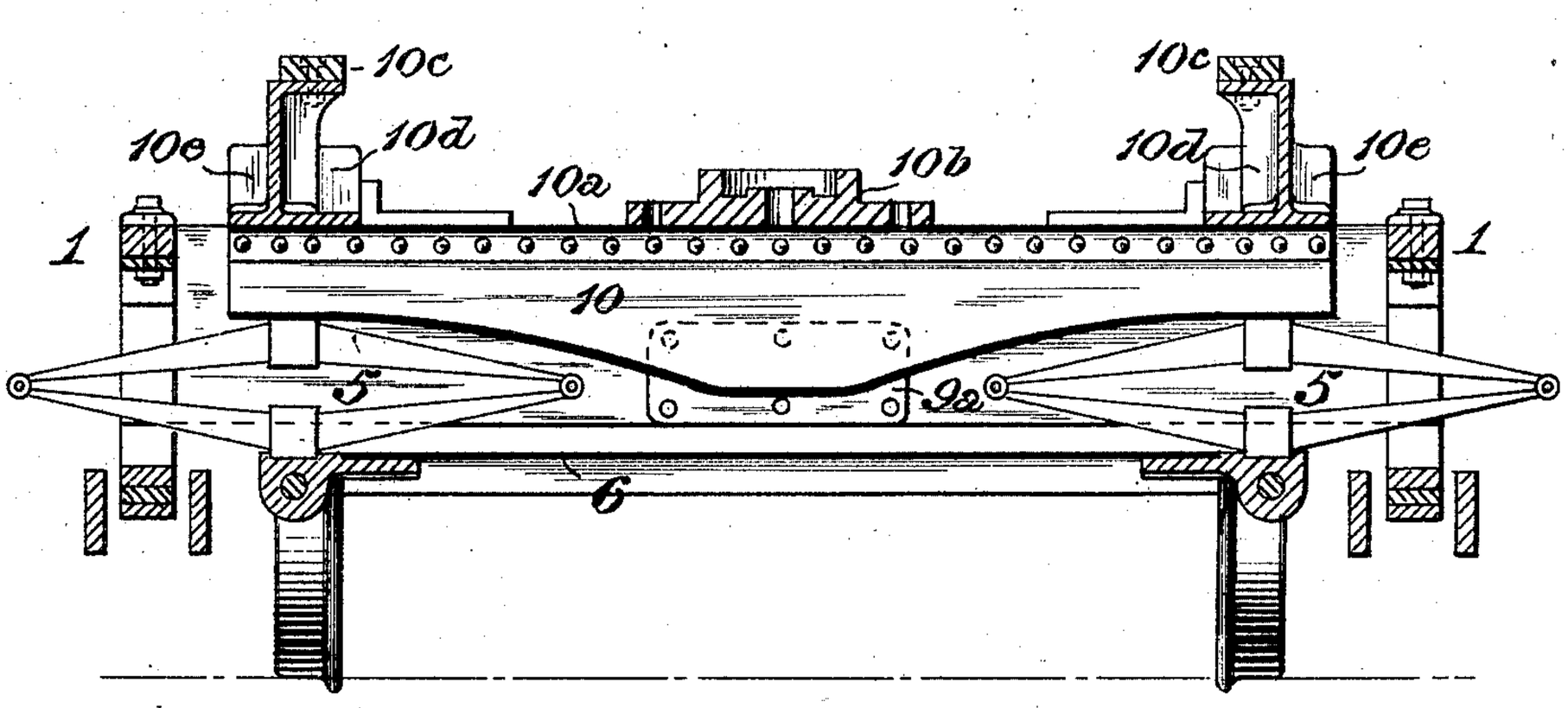
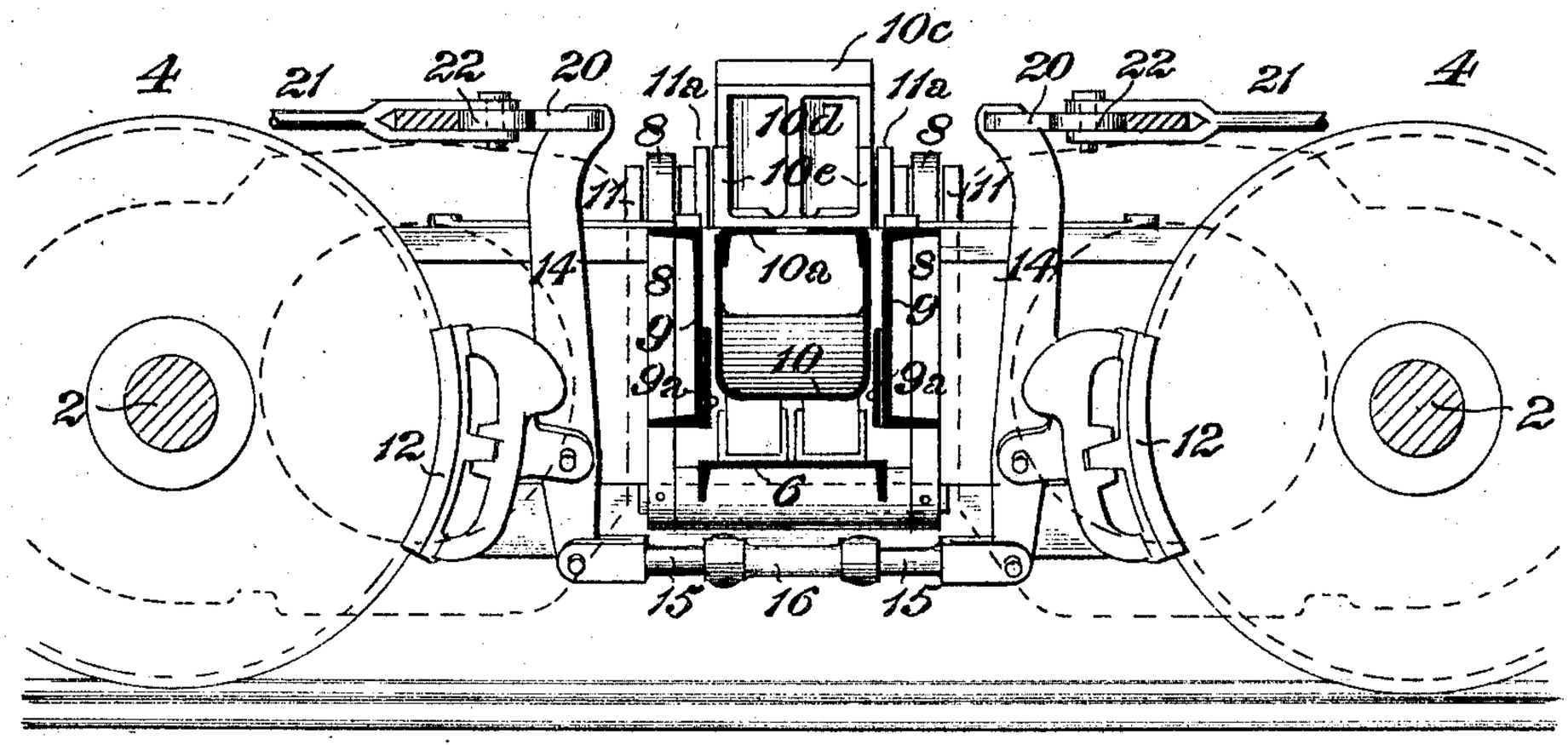


FIG. 3.



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NO MODEL. 3 SHEETS—SHEET 3.

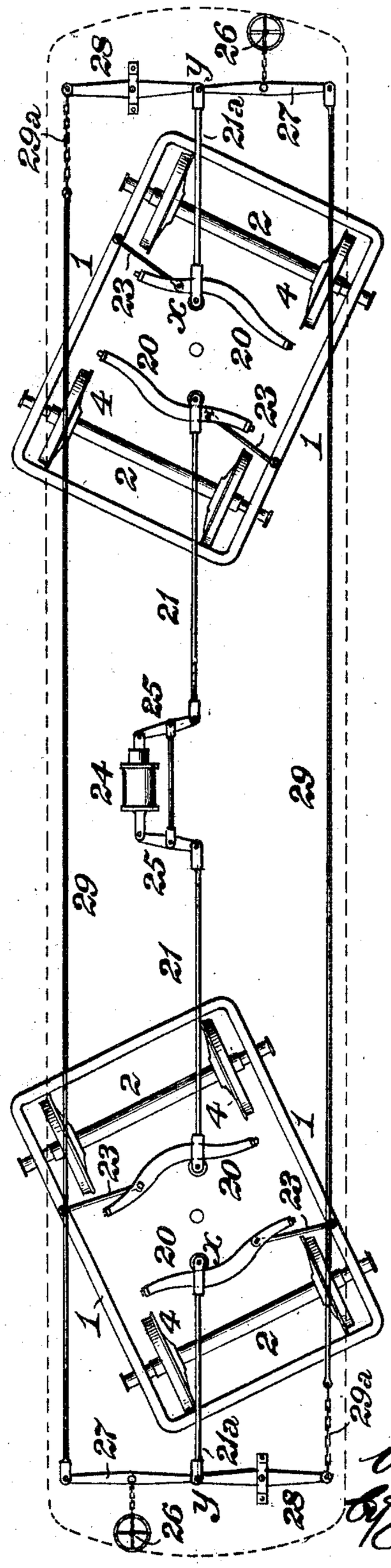

FIG. 4.

WITNESSES

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No. 776,303 Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM DALTON, OF SCHENECTADY, NEW YORK, ASSIGNOR TO AMERICAN LOCOMOTIVE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ELECTRIC-CAR TRUCK.

SPECIFICATION forming part of Letters Patent No. 776,303, dated November 29, 1904.

Application filed June 11, 1904. Serial No. 212,093. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DALTON, of Schenectady, in the county of Schenectady and State of New York, have invented a certain new and useful Improvement in Electric-Car Trucks, of which improvement the following is a specification.

The object of my invention is to so construct and combine the foundation brake-rigging with the truck of a car as to prevent the imposition of side strain upon the former when the truck is on a curve and to enable the brakes to be operated by either hand or power mechanism, as desired, through separate systems of rods, so that the disabling of one system will not prevent the operation of the other.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a plan or top view of an electric-car truck, illustrating an application of my invention; Fig. 2, a vertical transverse central section through the same; Fig. 3, a vertical longitudinal central section through the same with the center-casting removed; and Fig. 4, a plan or top view of the brake mechanism and of the trucks of an electric car embodying my invention in the positions assumed in passing short curves.

My invention is herein illustrated as applied in connection with an electric-car truck having a rectangular frame 1, which is provided with jaws or pedestals of any suitable form for the reception of the journal-boxes 3, in which the axles 2 rotate, the wheels 4 being secured upon the axles in the usual manner. Each axle is rotated by an electric motor 7, supported thereon and on the frame, through the intermediation of gearing inclosed in a case 7^a, the driving mechanism not being herein set forth in detail, as it does not in and of itself form any part of my present invention and may be of any known and preferred construction.

In the practice of my invention I provide a bolster which is supported on springs 5, seated on a spring-plank 6, which is hung on swing-hangers 8, pivoted on transoms 9, connecting the side members of the truck-frame 1. The bolster, which is fitted with the capacity of vertical movement between the transoms 9, is composed of a plate-metal body 10 of trough or U section and an inverted-channel top plate 10^a, which is riveted to the sides of the body at its top. The body of the bolster is dished or downwardly inclined from each of its ends to its middle portion, thereby presenting an increase of depth and strength, decreasing the wear on the bearing-surfaces of the transoms and enabling the bolster to move more easily between them. A center-casting 10^b, having a hole for the reception of a center-pin, is fixed upon the top plate 10^a, and side bearings 10^c are fixed upon side-bearing castings 10^d, secured to the top plate near its ends.

In motor-trucks of the ordinary construction having a center-pin above the bolster the strains on the center-pin, due to the tractive effort of the motor, tend to rack the bolster and cramp it between the transoms. In order to relieve the thrust upon the center-pin resultant upon the tractive effort, I provide thrust-bearings 10^e at each end of the bolster, which project above the center-pin and abut against bearing-faces 11^a on the corner-plates 11, which are fixed to the frame 1 opposite the ends of the bolster. The thrust-bearings 10^e are preferably, as shown, formed integral with the side-bearing castings 10^d. The strains of the tractive effort are taken up by the thrust-bearings and bearing-faces and by wearing-plates 9^a, riveted to the middle portions of the inner sides of the transoms 9, against which the adjacent outer surfaces of the lower middle portion of the body of the bolster abut. It will be seen that under this construction the strains on the center-pin are relieved, and the transmission of strain from the transoms to the bolster is such that the bolster moves freely and without binding tendency between the transoms.

The application of braking force to the wheels 2 of the truck is effected when and as required by brake-shoes 12, which are suspended by hangers in the usual manner from

the truck-frame 1 and are coupled to brake-levers 14, the lower ends of which on each side of the truck are connected by two-part or divided links 15, fitted with turnbuckles 16, by which the total length of the links may be adjusted as may from time to time become necessary.

By reason of the sharp curves which exist on electric railroads difficulty is encountered by the undesired setting of the brakes and the exertion of side strain on the brake-rigging due to the swinging of the truck and the resultant angularity of the brake-rods on the car-body in passing curves of comparatively short radius. In ordinary practice rods leading from the tops of the brake-levers pass through bearings on the truck-frames and are connected to curved tracks near the ends of the frames, to which tracks the pull-rods are connected. This construction is objectionable in the particular that it involves considerable side pressure on the mechanism, which causes the rods to wear and sometimes to break. For the purpose of obviating this objection the brake-levers of each pair of wheels of the truck are coupled at their tops to a transverse connecting member, in this case a sector-bar 20, against the inner faces of which the pull-rods 21 of the brake mechanism abut through rollers 22, journaled in their jaws. The sector-bars are coupled to the truck-frame by radius-bars 23, which are located at the sides of the frame nearer the gear-casings 7^a, so that sufficient clearance is allowed for the radius-bars over the tops of the motors. Under this construction the sector-bars are maintained in such relation to the truck-frame that, as indicated in Fig. 4, their arc of traverse does not depart substantially from the center line of the truck throughout the entire travel of the brake-shoes.

In the applications of both hand and power brake mechanism to electric-car trucks as ordinarily heretofore made the construction and connections are such that the breakage of any of the rods leading to the brake-levers will disable both the hand and power brake mechanism. The weight of electric motor-cars is now as high as seventy thousand and eighty thousand pounds, and these cars operate on very steep grades, in descending which the speed of the car is usually controlled by the hand-brake. It is therefore of material importance that the brake mechanism should be entirely reliable and that there should be more than one, so that another may be available in the event of its failure. To this end I provide an electric car which is carried on two swiveling motor-trucks with three independent brake mechanisms, one of which is operated by power, as, preferably, compressed air, and the other two operated by hand from opposite ends of the car and at opposite ends of the trucks from the power-brake-mechanism connections. Referring to Fig. 4, which shows in plan the trucks and brake mechanism of an electric motor-car with my invention applied, the piston of an air-brake cylinder 24, secured upon the car-frame, the outline of which is indicated in broken lines, is connected, through levers 25, with two pull-rods 21, the opposite ends of which are connected, as hereinbefore described, with the sector-bars 20 of the brake-levers which actuate the brake-shoes of the inner axle of each truck or that which is nearer to the middle of the car. The brake-shoes of the other or outer axle of each truck are actuated as desired from either of two hand-brake shafts 26, which are located at opposite ends of the car and are connected to floating levers 27, one end of each of which is coupled by a pull-rod 21^a to the sector-bar of the brake-levers of the outer axle of the adjacent truck and is also coupled to a double-armed lever 28, which works on a fulcrum fixed to the car-frame. Each of the floating levers 27 is coupled by a pull-rod 29 with the fixed fulcrum-lever 28 at the opposite end of the car. Short sections of chain 29^a are interposed between the pull-rods 29 and levers 28 to prevent strains of compression being imposed upon the pull-rods. The floating levers 27 equalize the pull of each brake-shaft between the two trucks, and the fixed fulcrum-levers 28 reverse the motion through the pull-rods 29 to the brakes of the opposite truck. It will be seen that the two hand brake systems are wholly independent of the power brake mechanism and, while both may be simultaneously operated from either end of the car, that they are substantially independent one of the other.

I claim as my invention and desire to secure by Letters Patent—

1. In an electric-car truck, the combination of a frame, an axle journaled in bearings thereon, wheels fixed on the axle, brake-shoes suspended from the frame in position to be applied to the wheels, brake-levers, each coupled to a brake-shoe, a transverse connecting member coupled to the upper ends of the brake-levers, a radius-bar coupled to the transverse connecting member and to the frame, and a brake-applying rod coupled to the transverse connecting member.

2. In an electric-car truck, the combination of a frame, an axle journaled in bearings thereon, wheels fixed on the axle, brake-shoes suspended from the frame in position to be applied to the wheels, brake-levers, each coupled to a brake-shoe, a sector-bar coupled to the upper ends of the brake-levers, a radius-bar coupled to the sector-bar and to the frame, a brake-applying rod, and a roller journaled on said rod and abutting on the sector-bar.

3. The combination of a car-frame, two motor-trucks fitted to swivel relatively thereto, brake-shoes suspended from the truck-frames in position to be applied to the wheels

of the inner truck-axles, or those nearer the middle of the length of the car, brake-levers, each coupled to one of said brake-shoes, transverse connecting members coupled to said levers on each truck, means for maintaining said transverse connecting members in normal relation to the truck-frames during swiveling movement of the trucks, and a power brake mechanism coupled to said transverse connecting members.

4. The combination of a car-frame, two motor-trucks fitted to swivel relatively thereto, brake-shoes suspended from the truck-frames in position to be applied to the wheels of the truck-axles, brake-levers, each coupled to one of said brake-shoes, transverse connecting members, each coupled to the brake-levers of a pair of wheels, means for maintaining said transverse connecting members in normal relation to the truck-frames during swiveling movement of the trucks, a power brake mechanism coupled to the transverse connecting members of the brake-levers of the inner truck-axles, and hand brake mechanisms, operable from the ends of the car and coupled to the transverse connecting members of the outer truck-axles.

5. The combination of a car-frame, two motor-trucks fitted to swivel relatively thereto, brake-shoes suspended from the truck-frames in position to be applied to the wheels of the truck-axles, brake-levers, each coupled to one of said brake-shoes, transverse connecting members, each coupled to the brake-levers of a pair of wheels, means for maintaining said transverse connecting members in normal relation to the truck-frames during swiveling movement of the trucks, a power-brake mechanism coupled to the transverse connecting members of the brake-levers of the inner truck-axles, hand brake mechanism located at each end of the car and coupled to the transverse connecting members of the adjacent outer truck-axles, and connections coupling said hand brake mechanisms for simultaneous operation from either end of the car.

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Witnesses:
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S. J. BENNER.