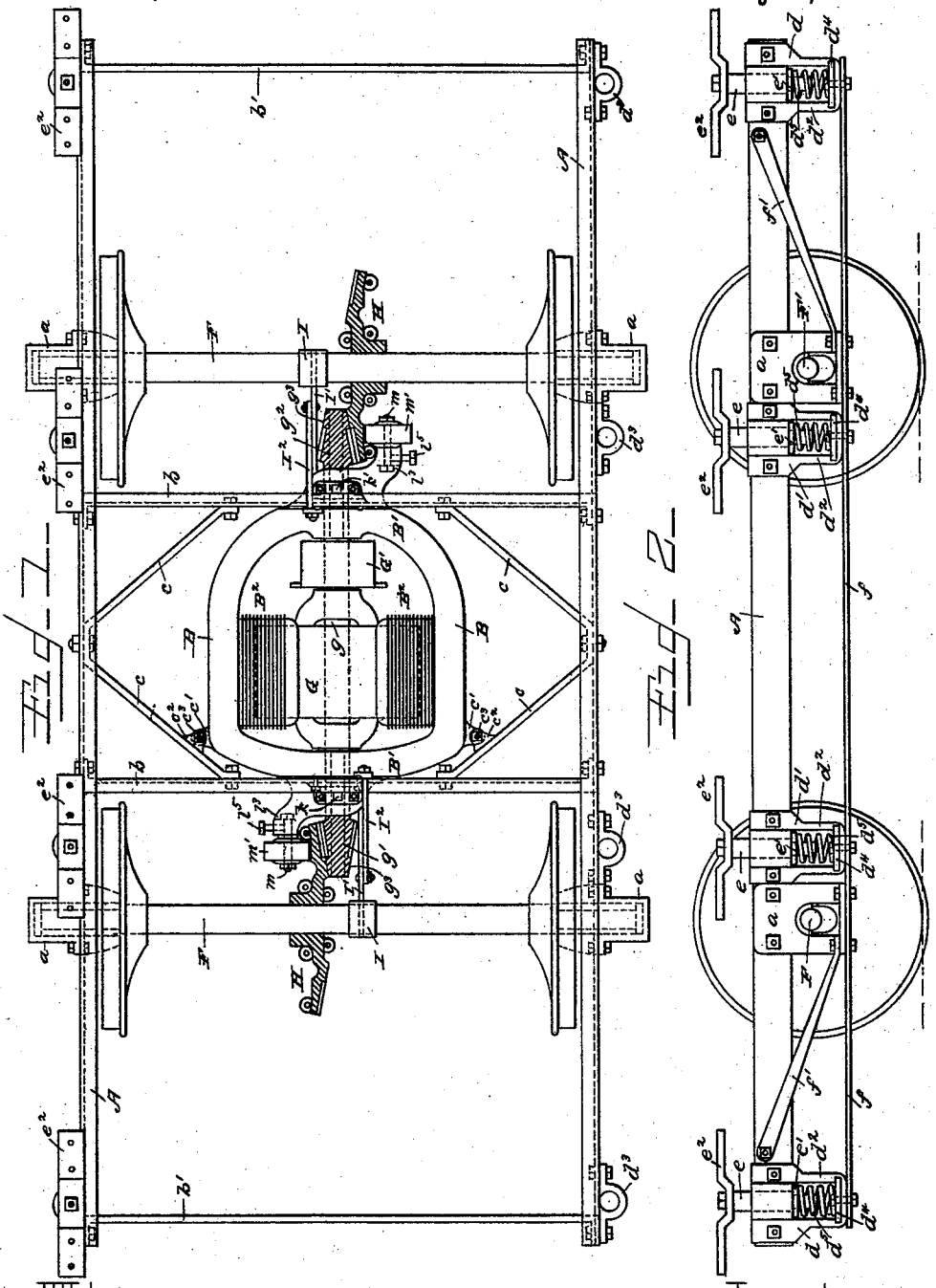
(No Model.) 2 Sheets—Sheet 1.

J. F. SEIBERLING.

ELECTRIC MOTOR CAR TRUCK.

No. 455,581. Patented July 7, 1891.



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(No Model.) 2 Sheets—Sheet 2.

J. F. SEIBERLING.

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Fig. 3.

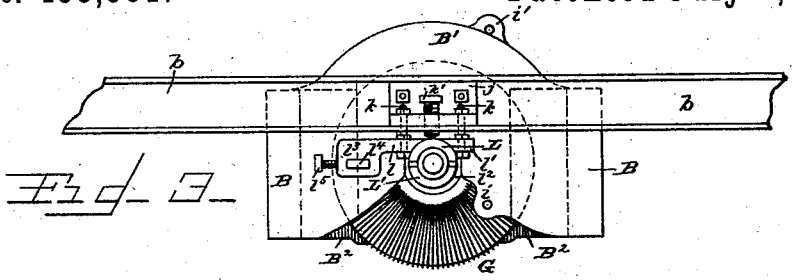


Fig. 4.

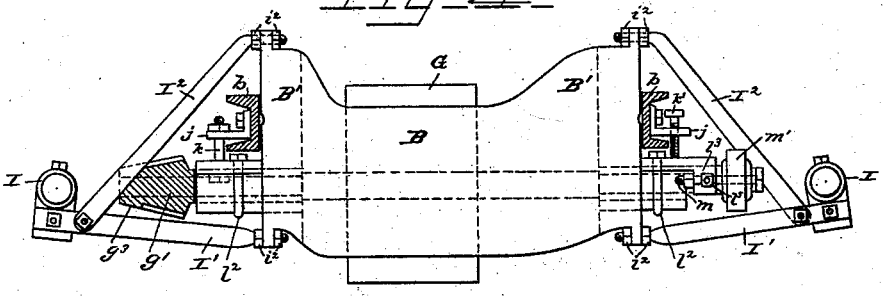


Fig. 5.

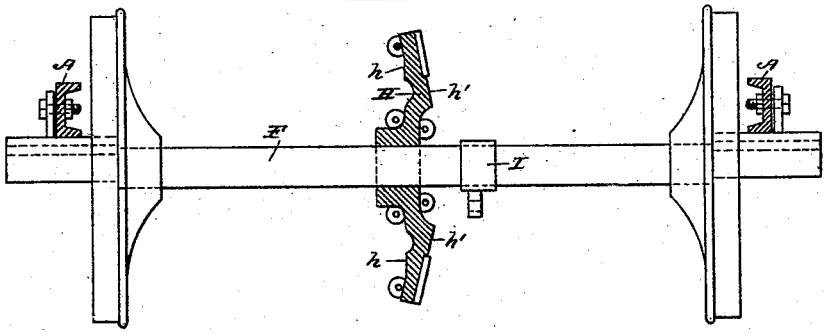
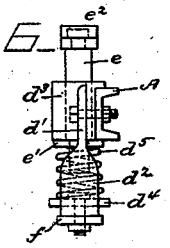


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN F. SEIBERLING, OF AKRON, OHIO.

ELECTRIC-MOTOR-CAR TRUCK.

SPECIFICATION forming part of Letters Patent No. 455,581, dated July 7, 1891.

Application filed March 9, 1891. Serial No. 384,324. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. SEIBERLING, a citizen of the United States, and a resident of Akron, county of Summit, and State of Ohio, have invented a new and useful Improvement in Electric-Motor-Car Trucks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to the manner of combining an electric motor with a street-railway-car truck, which said motor is designed to propel; and it consists in an arrangement whereby the armature-shaft is geared directly to the truck-axles, and incidentally in certain features of construction and arrangement of the truck and motor frames and parts thereof whereby the above arrangement of gearing is attained, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view of the car-truck with the motor applied, showing my improvements with the gears in section. Fig. 2 is a side elevation of the car-truck. Fig. 3 is an end view of the motor-frame, showing a part of one of the truck cross-beams to which it is attached. Fig. 4 is a side elevation of said motor-frame with the truck cross-beams and one of the armature-shaft pinions in section. Fig. 5 is an end view showing the truck-wheels in elevation and the side sills and bevel-gear in section, and Fig. 6 is an end view of one of the side truck-sills and of the spring-bracket connected therewith.

The main object of my invention is to reduce the expense and complication and to diminish the weight and wearing of the parts in the construction of electric-motor trucks as heretofore used. To this end I mount a single motor on the main truck-frame that supports the car-body, instead of employing a secondary frame for said purpose.

A A indicate the side sills or frame-pieces, preferably located outside of the truck-wheels and provided with yoke-shaped pedestals *a*, which embrace the axle-journal boxes, applied thereto in any usual manner, and *b b* are cross-beams located between the wheels adjacent thereto and sufficiently far apart to accommodate the motor-frame B between them. The side sills, and also the cross-beams *b b*, are preferably made of channeled iron, as giving the required rigidity without unnecessary weight of material, and the cross-beams *b b* are further stiffened by means of oblique braces *c c*, which connect them to the side-sills at points midway between said sills. The ends of the side sills are further connected outside of the wheels by end sills *b'*.

The outer faces of the channeled side sills are straight plane faces, and to these, adjacent to the ends and between the pedestals and adjacent thereto, are secured brackets *d d d' d'*, bifurcated in their lower pendent portions to form each a yoke d^2 to embrace the springs supporting the car-body and provided in their upper portions, which are secured to the outside of the sills, with sleeve-sockets d^3 to receive sliding standards *e*, shouldered near their lower ends, said shoulders resting on collars or washers *e'*, between which and the base-plates d^4, connecting the bifurcated lower ends of the spring yoke or brackets *d d'*, the supporting-springs d^5 are secured, surrounding the lower ends of the standards, which play loosely through said washers *e'*. The upper ends of the standards have longitudinally-arranged bars or straps e^2 secured to them, which in practice are secured also to the lower faces of the side sills of the car-body.

The lower ends of the pedestals *a* and spring-brackets *d* and *d'* are provided with foot-flanges, through which all on the same side of the truck are bolted to a connecting-bar *f*, which materially stiffens and strengthens them.

f' f' are obliquely-arranged braces connected at their lower inner ends to the pedestals *a* and at their upper outer ends to the sills A for further stiffening the pedestals and supporting the ends of the sills.

F and F' are the axles, provided each near the center of its length with a bevel-gear H. These bevel-gears face inward toward each other from opposite sides of the center of the length of the axles, sufficiently removed from such center to accommodate between them bevel-pinions *g' g²*, fast on opposite ends of the armature-shaft *g* and meshing with said bevel-gears for driving them and the axles.

The motor-frame (indicated at B) is made yoke-shaped, approximating an open ellipse in form in plan view, as shown in Fig. 1, with

its ends B′ adjacent to the cross-beams *b b* bent or crooked upward and recessed underneath to receive and permit vertical adjustment of the boxes in which the armature-shaft *g* has its bearings. This motor-frame fits snugly between the cross-beams *b b* and the ends thereof at points above the boxes are secured to said beams. The frame B is provided on its sides with lugs or ears *c′ c′*, through which it is connected by adjustable bolts c^3 to lugs or ears c^2 on the braces *c*, and is further provided at its ends with ears *i* and *i′*, one on its lower and the other on its upper face or edge, as shown, and to these ears, rods, or braces I′ and I^2 are adjustably secured by nuts i^2 i^2 on each side of the lugs, said rods extending the one I′ nearly horizontally outward and being connected rigidly with a sleeve I, in which the axle F or F′ is journaled, and the brace I^2 extends obliquely down to and connects with the bar I′ near said sleeve, as shown. By this arrangement when the motor-frame B is secured in place between the cross-beams *b b* of the truck-frame and the braces I′ and I^2 are connected therewith and properly adjusted by means of the nuts i^2 i^2 the ends of the motor-frame are adjustably supported and a strong bracing connection is made between said motor-frame and the truck-axles, which effectually prevents their relative displacement and serves to hold the pinions *g′* and g^2 always in proper working relation to the bevel-gears H on the axles. The sleeves I and their brace-connection with the motor-frame are arranged on opposite sides of the pinions *g′* and g^2 from the bevel-gears H H and as near to said pinions as practicable, as giving them the most effective relation to the gears, and in which they serve also to stiffen the cross-beams *b b* centrally of their length.

The cross-beams *b b* have a flange *j* projecting therefrom above the journal ends of the armature-shaft, said flange being perforated to receive pendent bolts *k k*, extending down through lugs on the projecting ends of the armature-frame, which bolts support the frame and connect it to said cross-beams. Between said bolts a set-screw *k′* passes down through the flange *j*, its lower end resting on the projecting half journal-box ends L of the frame B and serving to force it downward when required. By this arrangement of bolts and set-screw the motor-frame is not only firmly secured to the cross-beams *b b*, but is also rendered capable of being adjusted up and down as may be desired to bring the bevel-pinions in proper relation to the bevel-wheels. The lower half of the box L′ is connected with the upper by means of a U-shaped loop-bolt l^2, the loop of which passes under said half, the ends thereof passing up through the projecting journal-box part L′ of the ends of the armature-frame and being secured by suitable nuts, as shown. These armature-shaft boxes being located in the upwardly-crooked ends of the motor-frame in recesses in the under side thereof, as described, and projecting from said ends, by simply removing the loop-bolts l^2 and releasing the lower half-boxes L′ the armature-shaft and armature can be readily removed when required. The arm *l* of the journal-box projection L is extended on the side adjacent to the bevel-wheel H and has an outwardly-projecting arm l^3 on its end, reaching behind said bevel-wheel. This arm l^3 has a short horizontal slot l^4 formed in it, in which is secured a short longitudinally-arranged shaft *m*, on the outer end of which is journaled a smooth-faced roller *m′*, which rests and rolls in contact with a smooth rolling-surface at *h* on the back of the bevel-gear H. The shaft *m* is adjusted in the slot l^4 by means of a set-screw l^5, which presses against it and by means of which the roller *m′* can be held snugly against the bevel-wheel for preventing the latter from being thrown out of proper working relation to its actuating-pinion by the lateral thrust of said pinion thereon.

The pinions *g′* and g^2 are shown each extended beyond its toothed portion to form on the end of the armature-shaft a smooth-faced beveled roller g^3, which rests and rolls in contact with a smooth annular rolling-surface at *h′*, on the face of the bevel-wheel H inside of the teeth thereon. This prevents the teeth of the pinion from being crowded into and meshing too deeply with the teeth of the bevel-wheel, and in connection with the rollers *m′* insures the correct and easy working of the gears.

The rollers on the ends of the pinions *g′* g^2 may be made separate from said pinions and loose on the ends of the shaft, in which case they could be varied in diameter.

The roller *m′* by preference is connected to the projecting part of the motor-frame, but may have its support on any suitable part of the truck-frame, as its office is to prevent lateral thrust from being imparted to the bevel-pinion through the truck-frame.

The pole-pieces or magnets (indicated at B^2 B^2) are connected with the sides of the motor-frame, and together with the armature (indicated at G) and the commutator (indicated at G′) may be of any usual or preferred construction, as they form *per se* no part of the improvement herein claimed.

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

1. The combination of a car-truck having the frame side sills arranged outside of the wheels and connected together by two cross-beams between the wheels, and an electric motor arranged between the cross-beams and adjustable relatively thereto, means for adjusting said motor, the bevel-pinion on the armature-shaft and the bevel-wheel on the truck-wheel axle arranged to intermesh with said pinion, substantially as described.

2. A car-truck for street-railways, in combination with a single electric motor mounted

centrally on said truck, a bevel-pinion on each end of the armature-shaft of said motor, a bevel-wheel on each axle arranged to intermesh with said pinions, and the bearing-wheels m', arranged to bear on the backs of said bevel-wheels to hold said wheels and pinions in gear, substantially as described.

3. The combination of a car-truck, a single electric motor mounted centrally thereon, bevel-pinions on each end of the armature-shaft, a bevel-wheel on each axle, arranged to intermesh with said pinions, a bearing-wheel arranged on the back of each bevel-wheel, and the bearing-roller g^3 on each end of the armature-shaft, arranged to bear on the front side of said bevel-wheel, substantially as described.

4. The combination of the single-truck side sills A A, the yielding standards e, the stand-sockets d d', connected with the outside of the sills A, the spring-yoke d^2, and the spring d^5 within said yoke, substantially as described.

5. The combination of the motor-frame B, the armature-shaft g, mounted in said frame, having pinions g' g^2, one on each end thereof, the bevel-wheels H H on the axles, intermeshing with said pinions, the journal-boxes I I on the axles, and the adjustable supporting-arms I' between said motor-frame and axle, substantially as and for the purpose set forth.

6. The combination of the sills A A, having the form of a channel-bar, the stand-sockets d d', connected to the outside thereof, the spring-yokes d^2, the pedestals a, and the braces f' f', substantially as described.

7. The combination and arrangement of the sills A A, the cross-beams b b, connecting said sills, the diagonal braces c c, the motor-frame adjustably connected with said diagonal braces, substantially as described.

8. The combination, with the driving-wheel on the axle, of the bearing-wheel m', arranged to bear upon the back of said driving-wheel, the adjustable shaft m, carrying said wheel m' and supported on the motor-frame, and the screw l^4 for adjusting the position of the bearing-wheel m' and its shaft, substantially as specified.

9. The combination of the motor-frame B, the cross-beams b b, connecting the side sills of the truck, the armature-pinions g' g^2, located on either end of the armature-shaft, the bevel-wheels H H on the truck-axles, the adjusting-bolts k k, supporting said motor-frame, and the set-screw k' for holding the same in its adjusted position, substantially as and for the purpose stated.

10. The combination of the sills A A, the cross-beams b b, connecting said sills, the braces c c, connecting said sills and cross-beams, the motor-frame B, having lugs thereon, the lugs c^2 on said braces c, and the adjustable supporting-bolts c^3, connecting the motor with the truck-frame, substantially as described.

11. The combination, with the truck-axles F' F' and the motor-frame B, of the interposed supporting-arms I' I^2, substantially as described.

In testimony whereof I have hereunto set my hand this 3d day of March, A. D. 1891.

JNO. F. SEIBERLING.

Witnesses:
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JESSIE P. CURTISS.