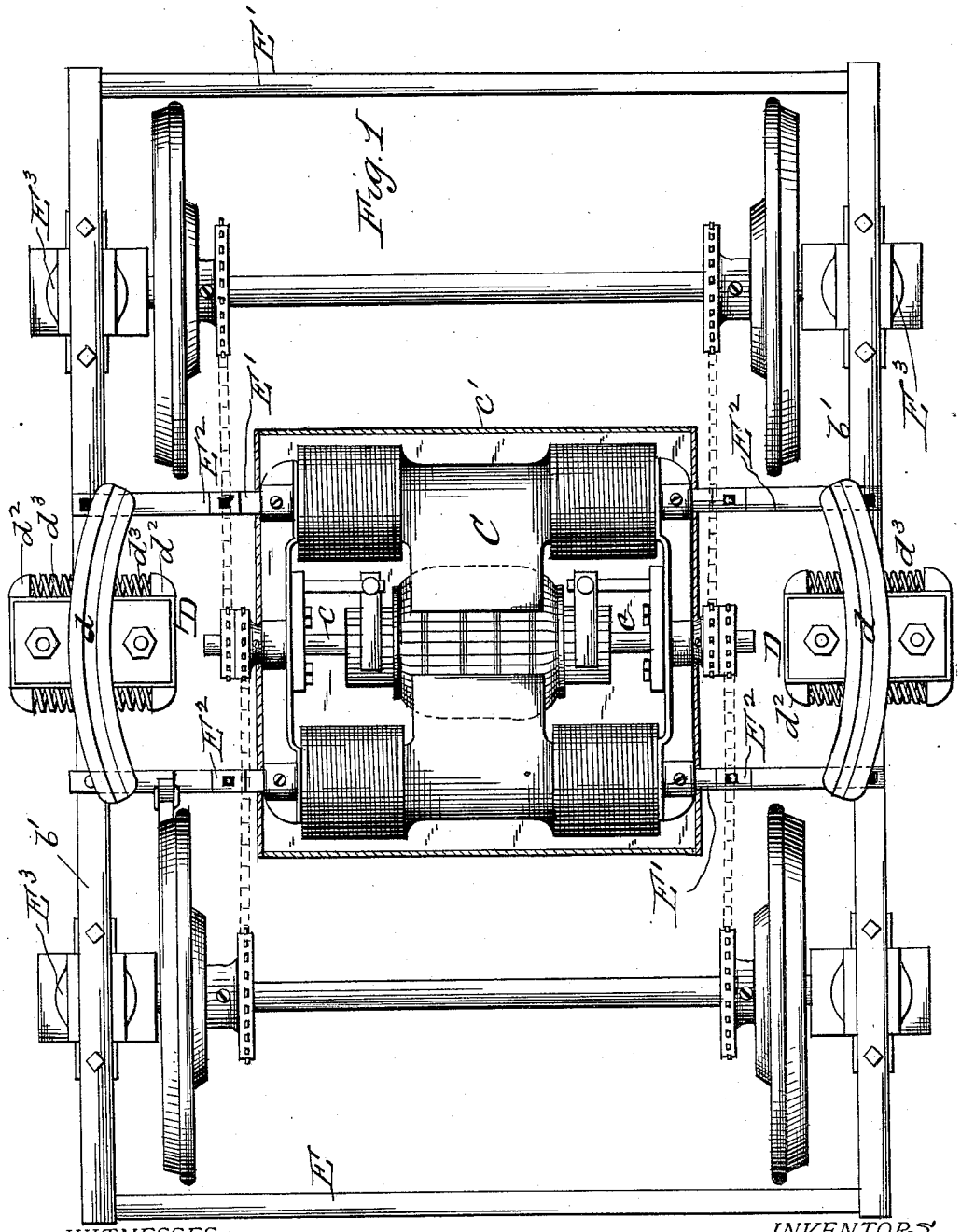
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G. M. & J. A. BRILL.

MOTOR CAR.

No. 427,966. Patented May 13, 1890.



WITNESSES:

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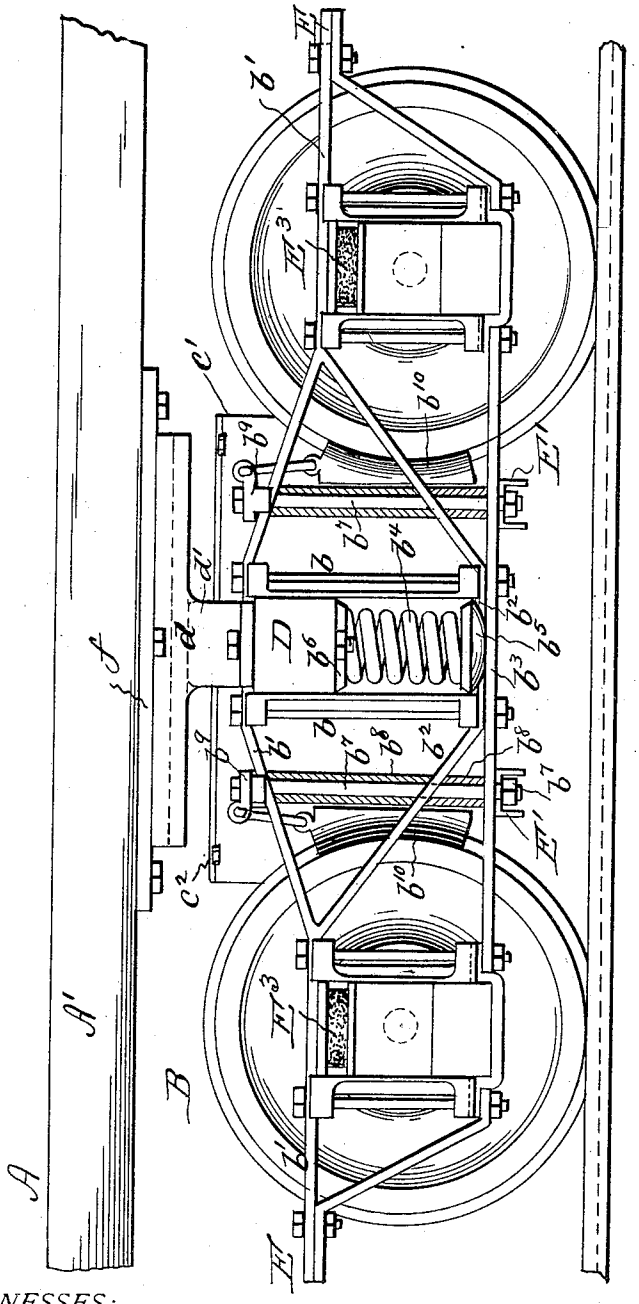


Fig. 2.

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Fig. 3

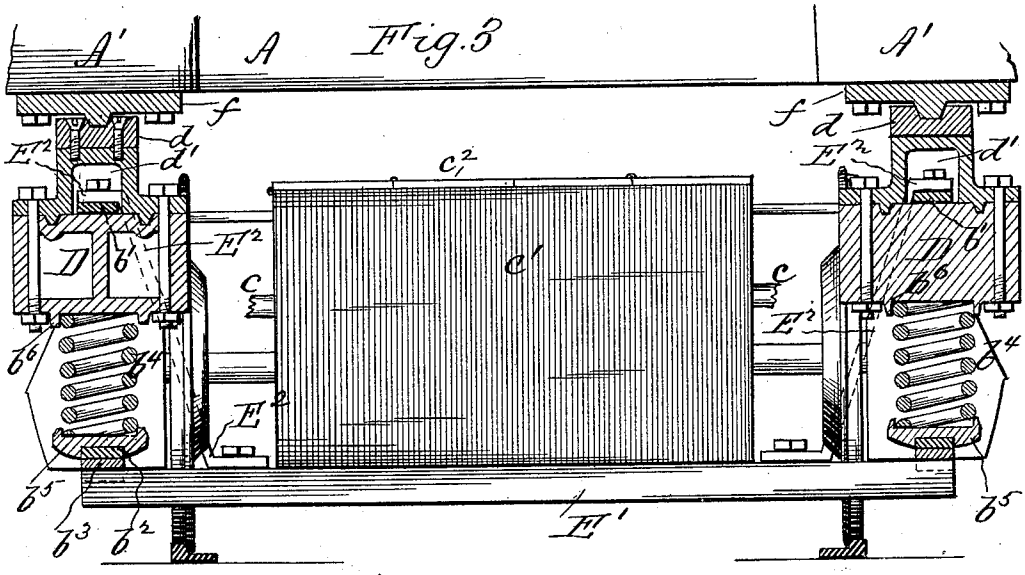
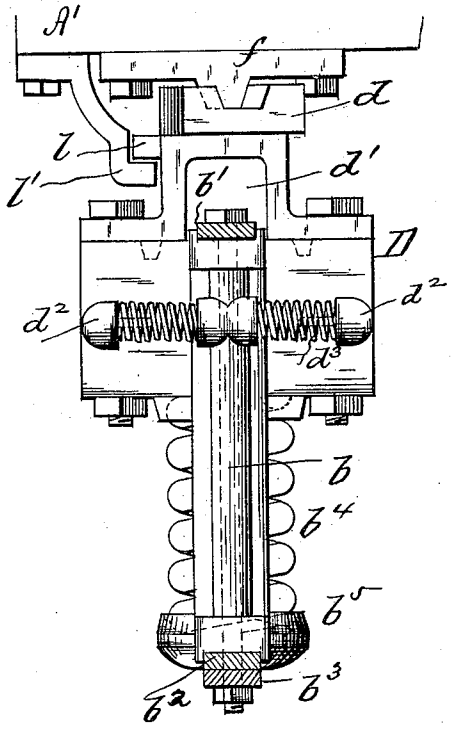


Fig. 4



WITNESSES:

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Chas. Dosamore

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MOTOR CAR.

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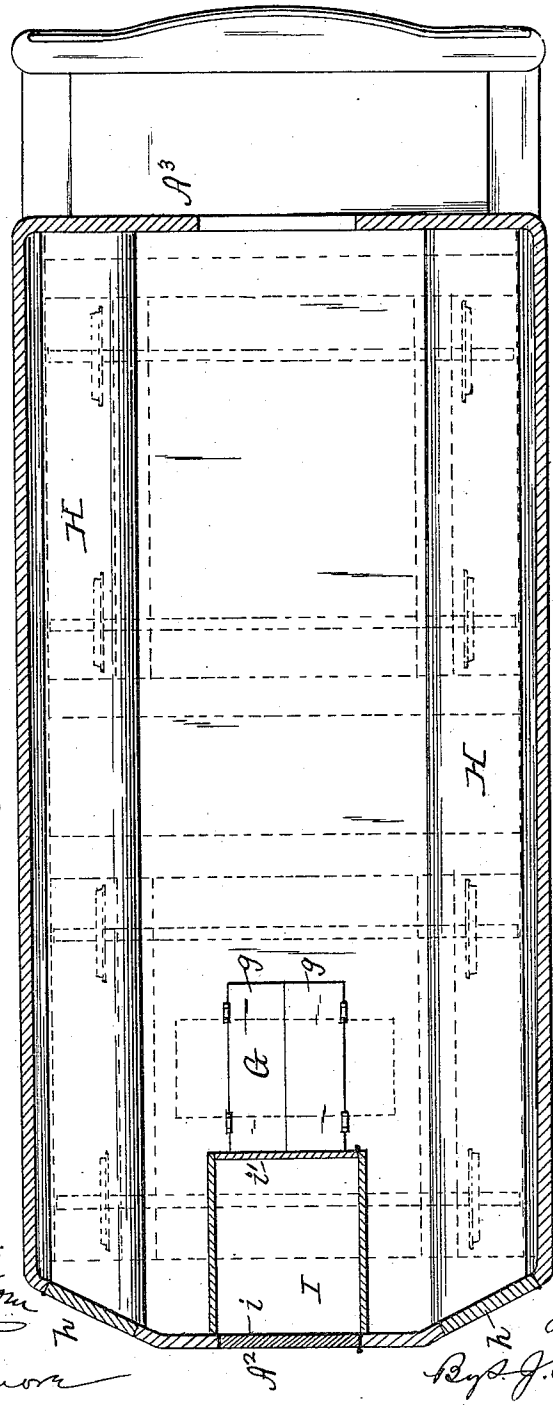


Fig. 5.

WITNESSES:

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MOTOR CAR.

No. 427,966. Patented May 13, 1890.

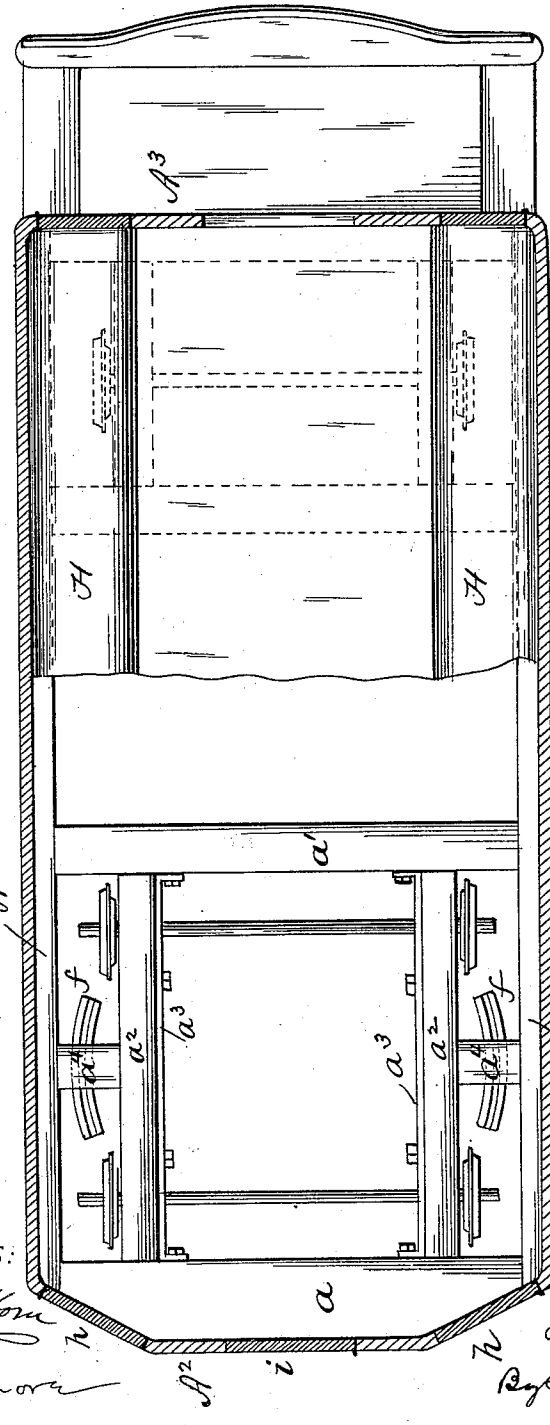


Fig. 6

WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE M. BRILL AND JOHN A. BRILL, OF PHILADELPHIA, PENNSYLVANIA.

MOTOR-CAR.

SPECIFICATION forming part of Letters Patent No. 427,966, dated May 13, 1890.

Application filed October 12, 1887. Serial No. 252,138. (No model.)

To all whom it may concern:

Be it known that we, GEORGE M. BRILL and JOHN A. BRILL, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Railroad-Cars, of which the following is a specification.

Our invention has relation to railway-cars propelled by electric motors, and more particularly to street-railway cars; and it has for its object to so locate the motor that it is readily accessible from the interior of the car, that increased seating capacity in the car is afforded, that the weight of the car-body and of the storage-batteries when used for supplying an electric current for the motor is distributed, so as to avoid undue weight at any one point of contact of the wheels with the rails, and the motor is susceptible of being incased to protect its operative parts from dust, dirt, and moisture. To accomplish these results, we place or mount the motor in the center of the car-truck, cutting away the bolster and dispensing with the usual spring-bar and bolster-transoms heretofore used.

In order to provide a clear or open vertical space in the truck between its sides and the car-axles and from the lower cross-bars thereof up to and above its pivot or king-bolt connections with the car-body, or to the bottom of the floor of the latter, in which space and resting upon said cross-bars the motor and its inclosing box or casing are located, the outer or cut ends of the bolster rest upon springs supported upon the lower arch or other side bars of the truck-frame, which bolster ends and springs are located between parallel pillars or columns, and the bolster ends or sections have connected to or formed on their upper sides segmental rub-plates having an elongated vertical recess through which the upper arch or other bars of the truck-frame pass. Said segmental rub-plates engage with corresponding rub-plates secured to the sill-pieces or cross-timbers of the car-body to form two sets of combined rub and pivotal plates—one set on each side of the car and truck—to connect them together, and the car-body has in its floor adjacent to the motor a trap-door, and contiguous thereto a small apartment at the front end of the car for the engineer, and also seats extending from the rear end of the car to its extreme front end, in which and in line with the spaces beneath the seats are doors for admitting of the insertion of storage-batteries beneath the seats and their removal therefrom.

Our invention therefore consists of the novel combination, construction, and arrangement of parts, as hereinafter described and claimed.

Reference being had to the accompanying drawings, Figure 1 represents a plan of a car-truck, an electric motor mounted or secured thereon, and a casing for the motor embodying our improvements, said casing being shown in section; Fig. 2, a side elevation, partly sectional, of same and of a part of the car-body; Fig. 3, a cross-section of same, partly in elevation, through the transverse center of the truck; Fig. 4, an end elevation, partly sectional, drawn to an enlarged scale, of one side of the truck-frame; Fig. 5, a horizontal section of the car, showing the seats running from end to end of the car, the engineer's apartment, and trap-door over the truck-frame upon which the motor is secured; and Fig. 6, a like view partly broken away to show the construction of the sill-pieces and timbers at the front end of the car above the truck-frame.

A represents the car, and B the trucks therefor. If desired, only one truck need be used, especially upon street-cars or upon cars of a short length. When one truck only is used, it is preferably located at the forward end of the car, and the pair of wheels or running-gear at the rear end of the car are then mounted in pedestals secured to sills of the car in the customary manner for street-cars.

The truck B may be of any suitable or well-known style or kind; but to obtain a large, clear, or open central space between the car-wheel axles and the sides of the truck, and from the lower cross-bars E′ E′ of the truck-frame to the bottom of the car, so that the electric motors C may be located in said space and firmly mounted or secured to said cross-bars, the usual form of spring-bar and the bolster-transoms are dispensed with, and the bolster is cut away, leaving only ends or sections D D on each side of the truck-frame. These bolster ends or sections are located be-

tween pillars or columns b b, connecting the upper arch or other bars b' and the lower arch or other bars b^2, and truss-rod b^3, if used.

Between the bottom of the bolster-sections D and the lower bars b^2 are springs b^4. These springs b^4 have lower bearing plates or seats b^5, secured to bars b^2, and upper seats b^6, formed on the bolster-sections. The latter are preferably of metal, and may be hollow or solid, as desired, and are of any suitable configuration.

Upon the top of the bolster-sections D are segmental or other suitable shaped rub-plates d, which are preferably grooved, as shown. These rub-plates may be integral with the sections D; but we prefer to make them separately therefrom and screw or otherwise fasten them to the bolster-sections, as shown or desired, so that they can be economically and readily replaced when worn out or when broken by accident or otherwise. These rub-plates are located directly over the upper arch or other bars b' of the trucks and have vertical recesses d' for the passage of bars b' and for admitting of the bolster-sections and rub-plates attached thereto, rising and falling with the movement of the springs b^4 under the variations of load or weight of the car.

The top and bottom bars b' b^2 of the truck are adjacent to the pillars b b, connected by bolts b^7, which pass through thimbles b^8, for strengthening said bars or the side frames of the truck to prevent sagging of the same. These bolts b^7 at their upper ends connect short transverse arms b^9 to the upper bars b' of the side frames of the truck, and upon these arms b^9 are hung the brake-shoes b^{10}. The side bars b b' of the truck are connected by end cross-bars E and bottom cross-bars E′ E′, the latter of which are preferably of channel-iron, and are firmly secured in position by the bolts b^7. Suitable braces or stays E^2 connect the upper bars of the side frames or the upper ends of the outside columns b b of the truck with the cross-bars E′ E′, to prevent the upper middle part of said side bars or the side frames of the truck spreading apart.

Upon the sides of the bolster-sections D are cheek-pieces or lugs d^2, between which and the pillars or columns b are springs d^3, to admit of independent lateral movement of the car-body and truck in going around curves and compensate for the shocks incident thereto.

Rubber or other springs E^3 are inserted between the top of the car-axle boxes and the upper bars b' of the side frames of the truck to cushion the journals and axle-boxes of the car and to deaden the noise of the hammering of the wheels on the tracks.

A truck-frame constructed as described possesses all the advantages of the usual form of truck-frame having the usual form of bolster, and yet it has its entire central space open from below upward to the floor of the car for the reception of the electric motor C, which is preferably secured to the cross-bars E′ E′ in any suitable manner. The armature-shaft c of the motor is in gear with said axles by means of sprocket-wheels and driving-chains, as shown, or otherwise, as desired.

Any suitable form of electric motor may be employed, and as it is located between the sides of the truck and the axles of the running-gear it can readily be inclosed in a box or casing c', secured to the cross-bars E′ E′. Said casing or box c' has a folding hinged top c^2 of any suitable kind to admit of easy access to the motor, and as the latter is secured to fixed parts of the truck-frame it is not subject to the vertical vibration of the car.

The segmental rub-plates d, affixed on the bolster-sections D, engage with corresponding rub-plates f, secured to the sills A′ or other part of the frame-work of the car A, as shown more plainly in Fig. 2. These rub-plates d and f are, as indicated, arranged in pairs or sets, one on each side of the truck or car, and are preferably male and female, as shown, and they form two sets of combined pivot and rub plates for the truck to connect the car-body to the truck. To prevent the one rising from the other, suitable lugs l are formed on preferably the outer side of the plates d or bolster-sections D for engagement with the bracket ends l' below said lugs, which bracket ends are secured to the bottom of the car, as shown more plainly in Fig. 4. As the rub and pivotal plates f and d are located at and over the sides of the truck-frame, the weight of the car and its load are distributed upon all the wheels of the truck, and said wheels are maintained upon the tracks in a better manner than would otherwise be the case if the car and truck were centrally pivoted together in the usual way.

For the purpose of gaining access to the motor from the interior of the car its cross-timbers above the truck-frame at the forward end of the car are cut away, as shown in Fig. 6, to provide an open space m between the end cross-sill a and the next intermediate cross sill or timber a', which cross-sills a and a' are connected near their ends by short longitudinal sills a^2, suitably braced or strengthened by metal bars a^3, bolted thereto and to said cross-sills a a', if desired. The short longitudinal sills a^2 and the outside car-sills A′ are connected by transverse timbers a^4, to which the car-body rub and pivotal plates f are preferably secured.

In the floor of the car directly over the motor C on the truck B is a trap-door G, preferably longitudinally arranged and composed of two parts g g, so that when each part is raised they form guards for preventing passengers stepping or falling through the open doors.

The car has no open or inclosed platform at its forward end A^2, which may be angular in outline, as shown, or otherwise configured, as desired. The body of the car is continued to said end, and the seats H extend from the rear car end A^3 to said extreme front end of the

car, as more plainly shown in Fig. 5, to give, as additional seating capacity to the car, the space heretofore utilized for the front platform.

Between the car trap-door G and the front end of the car and between the seats is a closed apartment I for the engineer. This apartment has doors *i* and *i'*, respectively, at each end, to admit of the engineer passing into and out of said apartment through the front door *i* without passing through the car when it is desirable to do so and for gaining access through the rear door *i'* to the car when necessary to raise the trap-door G in the floor of the car for inspecting or obtaining access to the motor.

The lower part of the front door *i* for apartment I is preferably made solid, and to it may be attached a head-light, if desired, and the upper part of said door has a sash or is open for lookout purposes.

In the front end of the car, near each side of the latter, and in line with the open spaces beneath the seats, are doors *h* for gaining access to said seat-openings to admit of the insertion into said spaces and withdrawal therefrom of storage-batteries, as fully shown, set forth, and claimed in a pending application filed by us on the 20th day of September, 1887, Serial No. 250,210.

As the truck upon which the motor is secured is open in the center at its top, the motor can be readily removed from the truck for repairs or replacement after the truck is unshipped from the car, and instead of laying up the car while such repairs or replacement is made another corresponding truck with a motor thereon may be connected to the car.

As it is obvious that the construction and arrangement of the details of our improvements may be greatly varied without departing from the spirit of the same, we do not limit ourselves to that herein set forth and illustrated. So, too, it is obvious that the improvements herein described may be used for cars other than electrically-propelled cars.

What we claim is—

1. A railway-car truck having its bolster divided into ends or sections disconnected from each other, spring-supports upon the sides of the truck for said bolster-sections, and pivot-plates between each said section and the car-body to provide a clear open central space between the sides of the truck and the axles for the truck running-gear, substantially as set forth.

2. A railway-car truck having separate bolster ends or blocks disconnected from one another, and each bolster-block supported upon one of the sides of the truck, and each having a pivot-plate connection with the car-body, substantially as set forth.

3. In combination with the side frames of a railway-truck, central parallel pillars or posts, separate bolster-sections D, disconnected from one another, springs located between said pillars and supported by the bottom bars of said side frames, pivot-plates secured to said bolster-sections, and running-gear axle-boxes suitably supported upon said side frames near the ends of the same, substantially as set forth.

4. In combination with the side frames of a railway-truck, centrally-located guide-bars, separate bolster-sections and springs therefor between said guide-bars and supported by the bottom bars of said side frames, pivot-plates secured to said bolster-sections, running-gear axle-boxes suitably supported upon said side frames near the ends of the same, bolt-connections passing through thimbles located between the axle-boxes and bolster-sections, laterally-projecting arms secured to the side bars by said bolt-connections, and brake-shoes depending from said arms, substantially as set forth.

5. In a railway-car truck, separate bolster-sections having separate pivot-plates located upon the side frames of the truck, in combination with axle-boxes and springs between the top of the axle-boxes and the truck-frame sides, substantially as set forth.

6. A railway-car-truck frame having lower cross-bars E' E' and side pivotal connections at the top of said frame for the car-body, a clear or open central space in said truck-frame, extending vertically from said cross-bars to and above said pivotal connections and from between the sides of the truck-frame, and the running-gear axles therefor, substantially as set forth.

7. In combination with a railway-car truck, the longitudinal bars b^3, connecting the axle-box pedestals, the lower cross-bars E' E', located intermediate of the axles of the truck-wheels, spring-supported bolsters or ends D, having separate rub or pivot plates *d*, and an electric motor secured to bars E' E', and driving-connection between the motor and axles, substantially as set forth.

8. In combination with a railway-car truck, the longitudinal bars b^3, connecting the axle-box pedestals, the lower cross-bars E' E', located intermediate of the truck-wheel axles, an electric motor mounted upon said bars, a casing for the motor, located within or between the axles and the sides of the truck-frame, a hinged or folding top for said casing, and driving-connection between the motor and axles, substantially as set forth.

9. A street-car having a rear end platform, a body extending from said platform to the front end of the car, a longitudinal seat or seats extending from the front end of the body to the rear end thereof, and a small compartment for the gripman or engineer, located within the body at the front end thereof and opposite the seat or seats, substantially as described.

10. The combination, in a railway-car truck, of the separate bolster-sections D, having separate pivot-plates *d*, lugs d^2, and springs d^3, and the guides or pillars *b* for said bolster-sections, substantially as set forth.

11. The combination, in a railway-car truck, of the separate bolster-sections D, having pivot-plates *d*, provided with recesses *d'* and bottom and lateral spring-supports, substantially as set forth.

12. A railway-car truck having separate bolster-sections D, provided with saddles straddling the top bar or bars of the side frames of the truck and having pivot-plates, substantially as set forth.

13. The combination, with a railway-car truck having free or open central space, of an electric motor located in said space and separate pivot-plates between the truck and car on each side of the same, substantially as set forth.

14. The combination, with a car and truck, of separate or unconnected intervening pivot-plates between the car and truck, located directly over the side frames of the truck, substantially as and for the purpose set forth.

15. A railway-car truck having side frames connecting the axle-box pedestals and independent of the truck or car springs, cross-bars connecting said side frames, and an electric motor supported on said cross-bars and in gear with the axles of the truck, substantially as set forth.

16. A railway-car having its axle-box pedestals connected by bars or frames which are independent of the car-springs, cross-bars connecting said frames, and an electric motor supported on said cross-bars and in gear with both axles of the car, substantially as set forth.

17. A car-body having a front end A^2, seats extending to said end, a closed apartment I, having a rear door *i'*, and a trap-door G in the floor of the car adjacent to said apartment, substantially as set forth.

18. A car-body having at its forward end an apartment I, provided with a rear door *i'*, a two-part trap-door G to the rear of apartment I, and said trap-door parts being hinged to the floor, so that when raised they form rails or guards for the sides of the trap, substantially as set forth.

19. A car having at its forward end cross-sills *a a'*, longitudinal sills a^2, connecting said cross-sills, cross-timbers a^4, and pivotal plates *f*, substantially as set forth.

20. A car-truck having sectional bolsters on each side of the frame, separate pivot and rub plates between each bolster-section and car-body, and braces E^2, connecting the top bars of the side frames with the cross-bars of the truck, substantially as set forth.

21. A car-truck having sectional bolsters on each side of the frame, separate pivot and rub plates between each bolster-section and car-body, and brackets on the car-body engaging with said bolster-sections to prevent the car-body rising from the trucks, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

GEO. M. BRILL.
JOHN A. BRILL.

Witnesses:
TH. RANDALL,
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