

(No Model.)

4 Sheets—Sheet 1.

J. STEPHENSON.
CABLE CAR.

No. 421,628.

Patented Feb. 18, 1890.

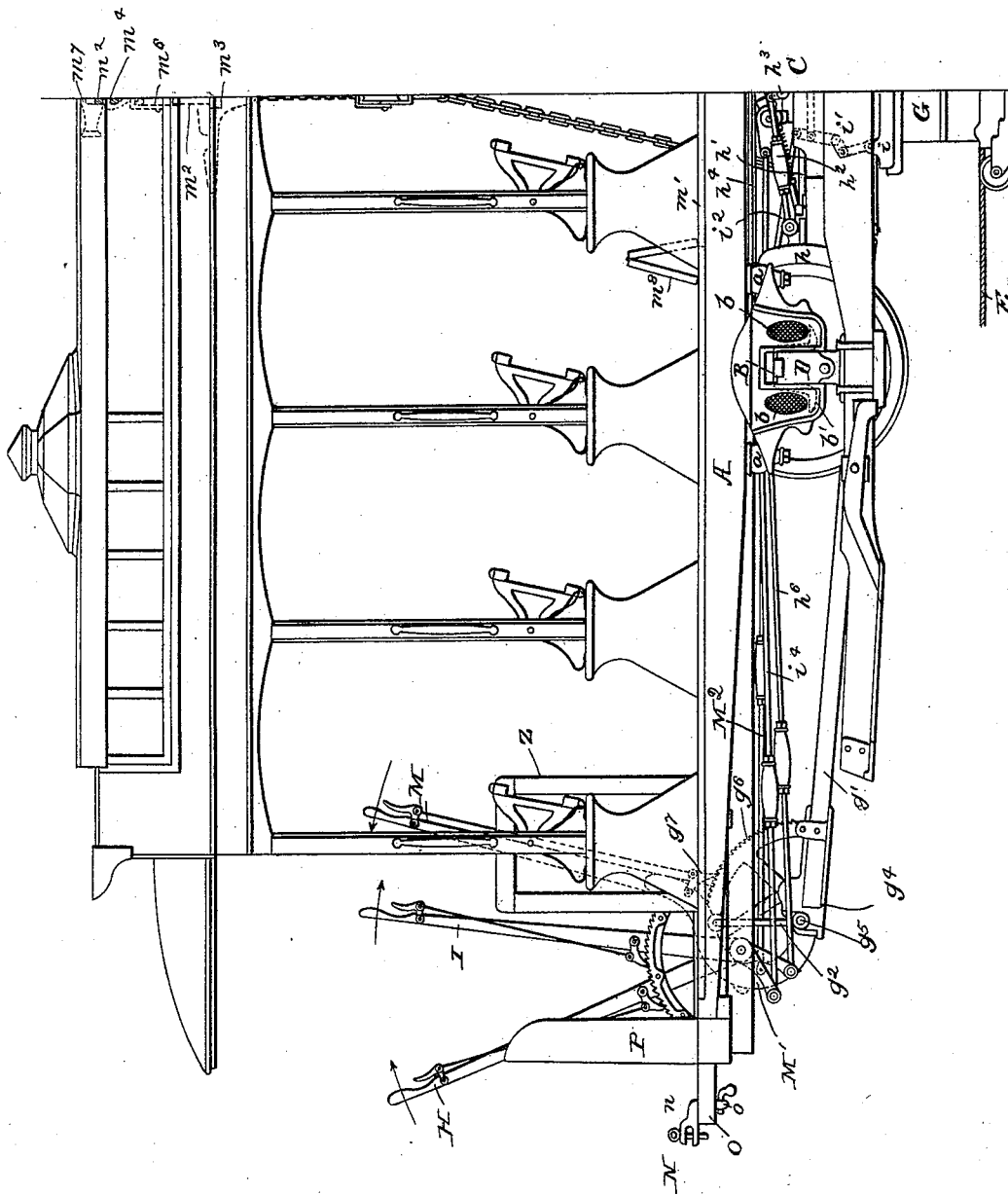


Fig. 1.

Witnesses
Prof. Hinkel Jr.
Georgia P. Kramer.

Inventor
John Stephenson
By his Attorneys
Foster Freeman

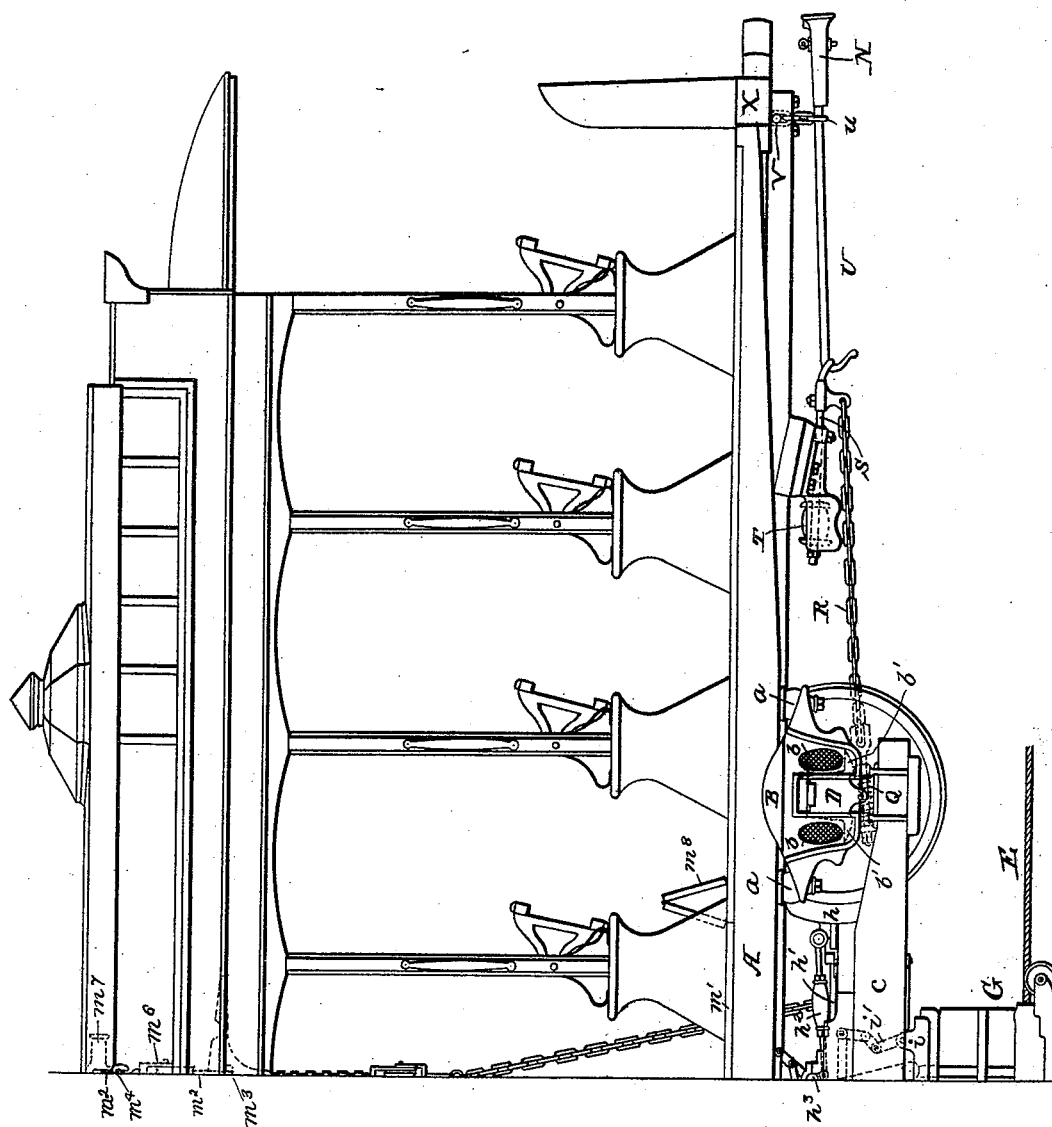
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Witnesses,

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Jno G. Hinkel, Jr.
Georgia P. Kramer.

Fig. 1.

Inventor,

Inventor,
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(No Model.)

4 Sheets—Sheet 4.

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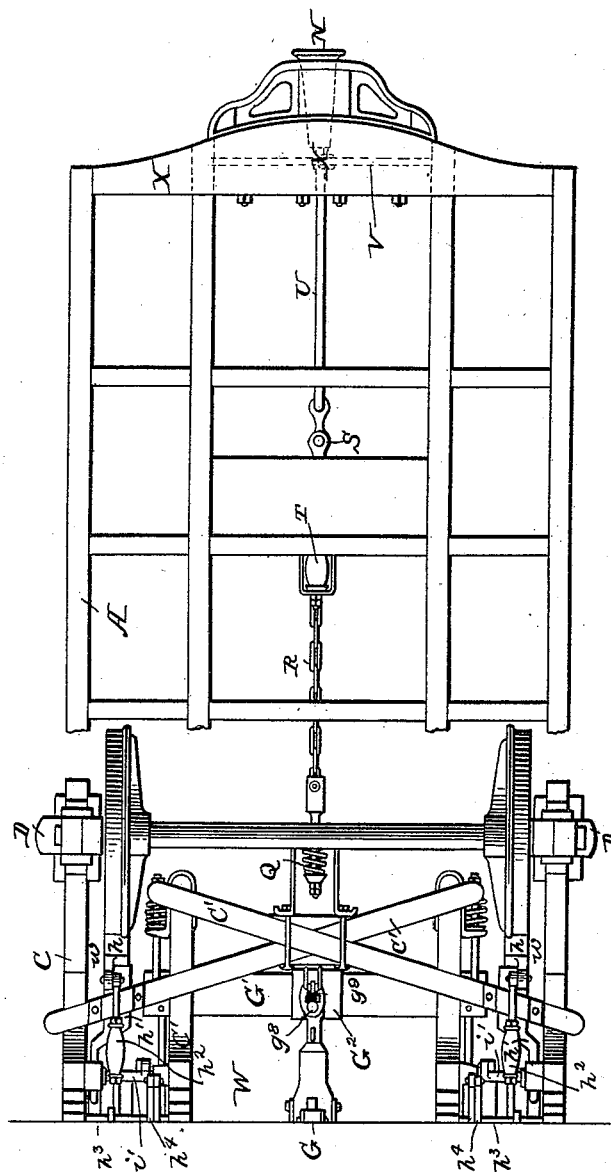


Fig. 2a.

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UNITED STATES PATENT OFFICE.

JOHN STEPHENSON, OF NEW YORK, N. Y.

CABLE CAR.

SPECIFICATION forming part of Letters Patent No. 421,628, dated February 18, 1890.

Application filed September 7, 1889. Serial No. 323,248. (No model.)

To all whom it may concern:

Be it known that I, JOHN STEPHENSON, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Cable Cars, of which the following is a specification.

My invention relates to cars adapted to be propelled by cable, and more particularly to what is known as the "improved open summer car," which is provided with seats for passengers extending across the car, without being broken by aisle or passage-way, and all facing forward, the sides of the car being provided with spring-roller curtains and fender-steps extending along the car from end to end for the use of passengers, conductor, and gripman. The front portion of the car is arranged for the gripman with his grip and brake levers.

My invention consists in a cable car having a combination of parts possessing certain features of construction and the arrangement thereof, substantially as hereinafter more particularly pointed out.

Referring to the accompanying drawings, forming a part of this specification, Figure 1 ^{1^a} is a side elevation of an open summer car embodying my improvements; and Fig. 2 ^{2^a} is a plan view showing the truck and the mechanism connected therewith, the bottom frame-work of the car and its various attachments being shown at the ends, but cut away at the center portion of the figure to display the truck.

The car-body A rests upon cushions *a* between the body and the running-gear, making contact therewith only by the way of india-rubber or other flexible non-conducting substance, operating to take up the jars and jolts and prevent them from being transmitted to the car-body.

Except the hand-levers and connections, all the grip and brake mechanism is attached to or borne by the truck, which consists, essentially, of a frame secured at or near its four corners to the four axle-box shells within the jaws or pedestals secured to the car-body through rubber or other non-conducting substances. A further refinement which is illustrated in the present instance is to have the

car-body A cushioned on four pedestals or axle-box guides B, resting on eight bearing-springs *b*, sustained by eight pendent swinging limbs of four saddles *b'*, supported astride the four axle-boxes, which construction is adapted to allow the car-axle, with its wheels, to be moved transversely of the car without the car-body being materially affected. The front seat of the car is cut away or provided with an indent Z, having three inclosed sides, forming a space for the gripman to swing the grip and brake levers without danger of contact with the passengers.

The truck C is formed of two sills *c*, fitting pendants of the axle-box shells D, to which the sill ends are secured, the sills being connected by two composite cross-rails, each cross-rail being made of two pieces, with one end of each piece framed into a sill *c* and crossing each other at an outward projection midway between the sills, the loose ends uniting with the ends of the cheek-sills C', which, with the cross-rails, inclose a well or space W of irregular diamond form adapted to hold the grip mechanism G and its carrier G', extending to the end of the car-body, by which it is supported.

The grip-mechanism carrier borne by the truck has an extension *g'* reaching to the front end of the car, and is there suspended to the car-bottom by a link motion or flexible hanger *g''*, which allows the extension freedom to move in any direction in accord with the grip-mechanism carrier as it is impelled by the moving cable E. The extension of the grip-mechanism carrier hung from the car-floor has at its front end a housing *g'⁴*, in which the grip-lever M is fulcrumed at *g'⁵* below the car-floor, and the housing carries also the ratchet-toothed sector *g'⁶* for the pawl *g'⁷* of the grip-lever M, connected with the grip mechanism.

All the elements of the combination between and including the grip mechanism and its operating-lever and connections are adapted to be controlled as to their location by the slotted rail. When passing curves or for other purposes the slot varies from the middle line between the tram-rails, the slot-rail obliges the grip mechanism to conform to the deviations. Therefore the grip-carrier must

also submit to such deviations, which sometimes are so great that the construction of the usual form of truck will not permit so much side motion; but this difficulty is here overcome by providing the transverse bars G' of the grip-mechanism carrier with sliding sleeves G^2 , to which the grip-machine G is connected, the sleeves having standing posts g^3 , holding the grip-machine and adapted to slide sidewise on the transverse bars, as the slot-rail may require. The sleeve-posts g^3 are adapted to sockets at the upper corners of the grip-machine, which sockets drop easily on the posts and are there locked.

The tendency of the cable when gripped is to lift the front corner of the grip-machine from its posts, which is prevented by the grip-post lock g^4 .

When the car is required to leave the cable track, it is necessary for the car to be detached from the cable-grip mechanism and leave it in the slot-rail or to lift the cable-grip machine out of the slot-rail. The latter course is adopted in this car.

The grip-carrier G' and its extension are adapted to carry the grip-machine G at the car center, with its operating-lever M at the car front in the housing m , suspended from the car-floor, the operator's lever being in a properly-adjusted position to be preserved, though the carrier is subjected to the change of position by control of the slot-rail and cable. The operating-lever M is bent outward above the fulcrum to form a crescent or angle M' for the head of the energy-rod M^2 to connect with the lever outside of a direct line between the foot and the head of the lever, and adapted, with the energy-rod, when the lever is pushed forward, to form a knee-joint, and thereby intensify the energy of the grip-operator when seizing the cable.

The grip-machine is adapted to be lifted up and out of the well W of the truck, where it is supported upon the grip-carrier, through an opening m' in the car-floor, which operation is facilitated by a metal arch-bar m^2 overhead conforming to the shape of the car-ceiling, with each end of the arch-bar united by hooks and eyes m^3 or tenon and mortise or other known method to a metal plate secured to the side walls of the car-body.

At the center of the arch-bar is an eye m^4 or a receptacle fitted with a tackle m^5 or other device for lifting the grip-machine up and out of its place, and secured to the rafters of the car-body roof is a brace m^7 , with limbs astride the crown of the arch-bar, adapted to steady and stiffen the arch-bar.

The opening in the car-floor is closed by each half of a cover-door m^8 , hinged to the car-floor at the forward edge of the opening, and each half-door is subdivided and couple-hinged at the under side, so that when lifted each half-section will support itself in vertical position at the end of the floor-opening.

In addition to the central well W , adapted to the needs of the grip-machine and its

holder, there is on each side of the truck a smaller well w , of four sides, formed by the sill c , cheek-sills C' , and the two composite cross-rails. Each side of each of the small wells is adapted to receive and afford support for a half-section of the wheel-brake mechanism and a half-section of the track-brake mechanism, for two halves of each mechanism being joined to its own union rock-shaft supported by the car-bottom, and each union rock-shaft connected by an articulated rod with the operator's lever or handle of each system of wheel-brake and track-brake, as hereinafter described.

The wheel-brake mechanism has in each of the smaller wells w of the truck a half-section consisting of the following parts, viz: Two wheel-brake shoes h on the ends of two shoe-bars h' , connected by two articulated bars h^2 in union with the arms of one wheel-brake rock-shaft h^3 , which wheel-brake rock-shaft has also the ends of one wheel-brake coupler-rod h^4 connected with the wheel-brake union rock-shaft h^5 , attached to the under side of the car-body floor. This wheel-brake union rock-shaft secured to the car-body floor unites the two parts of the wheel-brake mechanism located in the smaller wells at the truck sides and is connected by the wheel-brake energy-rod h^6 with the operator's lever H at the car end.

Each half of the track-brake mechanism consists of one track-brake shoe i , connected with two rock-shafts i' coupled, and with the rod-connection i^2 with the track-brake union rock-shaft i^3 (attached to the bottom of the car-body) is located beneath the wheel-brake mechanism in the truck, and is adapted to receive the energy of the operator at lever I , located at the car front, by means of an articulated rod i^4 , connected to the union rock-shaft secured to the car-floor, and combines the parts of the track-brake mechanism located in the smaller wells of the truck.

Though a cable is the motive power used in this kind of a car, it is necessary sometimes to apply horses, and also to provide that the car moved by the cable may haul after it other cars; and it is therefore necessary to provide draw-heads N , adapted to such kinds of service. The car carries at the front end of the car-body a dead-block O , forming a bunter. The upper surface of the dead-block is level and projects several inches in front of the dash-board P . In this dead-block is a vertical hole adapted to receive the vertical shank o of a draw-head N , above which shank are open jaws, forming a jaw-pull, with its open mouth forward, and a vertical pull-pin n , passing through the jaws, is adapted to hold the pole or whiffletrees for horse service. When not thus in use, this draw-head may be swung round toward the dash and the lower end of the draw-pin n inserted into a hole n' in the dead-block adapted to retain the draw-head from casual contact.

Objections exist against trammeling the car-

body by connecting with it cars to be hauled behind it. Therefore this car has a truck with a grip-machine carrier which can be put in motion before the car-body is moved, and the pulling apparatus of the car is by a spring Q 5 secured to the end bar of the truck and connected by a chain R with the sliding bar S of the spring T, housed in the car-bottom, from which sliding bar a stiff bar U extends to the 10 car end and terminates in the bunter-head N, with a suitable device to couple and move a rear car without jerking the motive car.

To facilitate the passing of curves, the outward section of the rear pulling apparatus is 15 a stiff bar with a suitable head N for connecting the car behind it, and this stiff bar is sustained by a short chain v, loosely hung on a metal bar V below the nose-piece X of the rear platform, and it is adapted to allow 20 transverse or vertical motion of the draw-head.

What I claim as new, and desire to secure by Letters Patent, is—

1. A cable car having in the floor of the 25 car-body a well-hole, a truck beneath the well-hole having a well, and a grip-machine carrier supported in the well and extended to the car-front and there linked to the car-body floor, as and for the purpose described.

2. A car with truck having its grip-machine 30 carrier extended to the car-front, the grip-machine being in the carrier, and the operating-lever fulcrumed in a housing linked to the car-body bottom, the grip-machine and its operating-lever connected by the energy-rod and adapted to preserve the adjusted 35 distance between the operating-lever and the grip-machine while the latter changes position in the truck as controlled by the cable and slot-rail, substantially as and for the purpose described.

3. A car with cable-grip machine at the 40 middle of the car-truck and an energy-rod connecting the machine with its operating-lever fulcrumed at its lower end and linked to the car-body near its front, the lever above the fulcrum being bent outward to form a 45 crescent or angle for the head of the energy-rod to connect with the lever outside of a direct line between the foot and the head of the lever, and adapted, with the energy-rod, when 50 the lever is pushed forward, to form a knee-joint and intensify the energy of the grip-operator when seizing the cable, substantially 55 as and for the purpose described.

4. A car with half portions of the operating 60 mechanisms of the wheel-brake located in the upper part of each of the smaller wells at the sides of the car-truck, the shoe ends of each shoe-bar resting on a diagonal cross-rail connected by plunger-rod with the wheel-brake 65 rock-shaft, having an arm and articulated rod-connection with the wheel-brake-coupling rock-shaft secured to the under side of the car-body floor and energy-rod connection with the operator's lever or handle, attached directly or indirectly to the car-floor at the

front end of the car-body, from which place the described mechanism is adapted to apply 70 the intensified energy of the operator simultaneously to the four brake-shoes against four car-wheels, substantially as and for the purpose described.

5. A car with half portions of the operating 75 mechanism of the track-brake located below the mechanism of the wheel-brake in each of the smaller wells at the sides of the car-truck, with an arm of one rock-shaft of each section connected by a coupler-rod with an arm of the track-brake-coupler rock-shaft attached 80 to the car-body floor and having energy-rod connection with the operating lever or handle, also attached to the car-floor at the front end of the car-body, from which place the described mechanism is adapted to apply the 85 intensified energy of the operator to the track-brake shoes simultaneously at each side of the car, substantially as and for the purpose described.

6. A car with draw-head attached to the 90 dead-block by a vertical member in a hole or socket of the dead-block and capable of being swung around sidewise from the front toward the dash, substantially as and for the purpose described.

7. A car with draw-head attached to the 95 car-body dead-block by vertical member in a hole or socket of the dead-block, the jaws of the draw-head being open-mouthed with vertical hole through both jaws befitting a 100 pull-pin adapted to hold within the jaws a pole or whiffles, substantially as and for the purpose described.

8. A car with open-jaw draw-head and a 105 pull-pin vertically through the jaws, the rear part of the draw-head being in a vertical hole of the dead-block, adapting the draw-head to be turned around sidewise toward the dash with the point end of the pull-pin in a second 110 hole of the dead-block adapted to retain the draw-head and pull-pin in a safe position when out of service, substantially as and for the purpose described.

9. A car with its draw apparatus consisting 115 of a chain connecting the truck with the sliding bar of a double-acting spring secured to the bottom of the car-body, and a stiff bar extending from the sliding bar to the car end and supported by a short chain pendent 120 on a transverse bar under the platform nose-piece, adapted to allow the draw-head free motion as controlled by the annexed car, substantially as and for the purpose described.

10. A car with draw-head apparatus adapted 125 to act as a cushioned bumper and cushioned draw-head, the bumper draw-head suspended by a link or chain on a transom-bar secured to the car-bottom, and a stiff bar connection with a housed spring secured also to the car-bottom, the stiff bar having a chain or flexible 130 connection with a draw-spring attached to the car-truck, the combination being adapted to relieve the truck and car-body from violent shocks received by the draw or bunter head,

and also to relieve the car-body and its truck from rude jerks or concussions of cars which may be trailed behind the motor-car, substantially as and for the purpose described.

5 11. A car with pulling apparatus having attached to the end of the car-truck a spring adapted to be crushed by a chain-connection with the sliding bar of a spring housed to the floor of the car-body, the sliding bar having
10 connection with a stiff bar whose farther end is fitted for coupling to another car, this farther end being loosely hung on a transverse bar below the nose-piece of the platform with freedom for vertical and transverse motion,
15 substantially as and for the purpose described.

12. A car the truck of which bears all the mechanism of the track-brake, wheel-brake, grip-machine, and grip-machine carrier with its extensions, except the operating levers or
20 handles with their connecting rods and union rock-shafts, which are directly or indirectly attachments of the car-body, substantially as and for the purpose described.

13. A car with its body resting on cushions
25 between the body and pedestals, the pedestals being flexibly secured to the body and astride the axle-boxes, which are firmly secured to the truck-sills, the pedestals being controlled by the axle-boxes, and the car-body being controlled in a limited degree by the pedestals,
30 as and for the purpose described.

14. A car with its body supporting at its end an extension of the grip-carrier, the car-body with its extension-support cushioned on four pedestals or axle-box guides, the pedestals resting on eight bearing-springs sustained by eight pendent limbs of four saddles astride four axle-boxes, whereby the car-
35 axle, with its wheels, may be moved transversely of the car without the car-body being materially affected, substantially as and for the purpose described.

15. A tram cable car of the open or summer class having seats with backs adapted to permit passengers all to face the front end of the
45 car, at which is the place for the operator with the hand-levers, the front seats having an indent with three sides inclosed some distance above the floor, adapted to secure space for the operator to swing the grip-lever and protect passengers from contact, substantially as
50 and for the purpose described.

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

JOHN STEPHENSON.

Witnesses:

JOS. B. STEPHENSON,
S. A. STEPHENSON.