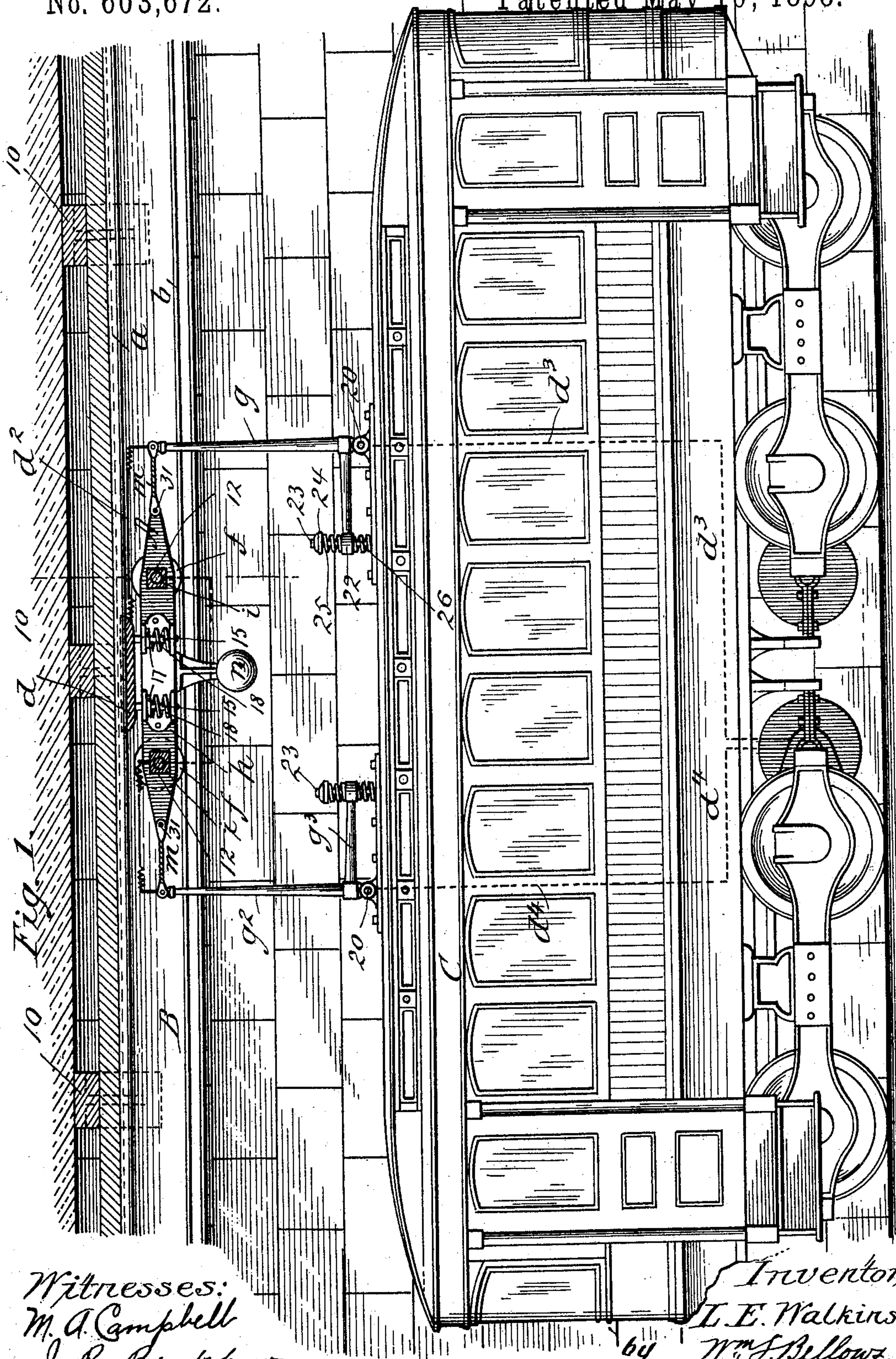


2 Sheets—Sheet 1.

TROLLEY DEVICE FOR ELECTRIC RAILWAY CARS.

No. 603,672.

Patented May 10, 1898.



Witnesses:
M. A. Campbell
J. R. Bradshaw.

Inventor,
L. E. Walkins
Wm. J. Bellows.
Atty.

(No Model.)

2 Sheets—Sheet 2.

L. E. WALKINS.

TROLLEY DEVICE FOR ELECTRIC RAILWAY CARS.

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Fig. 2.

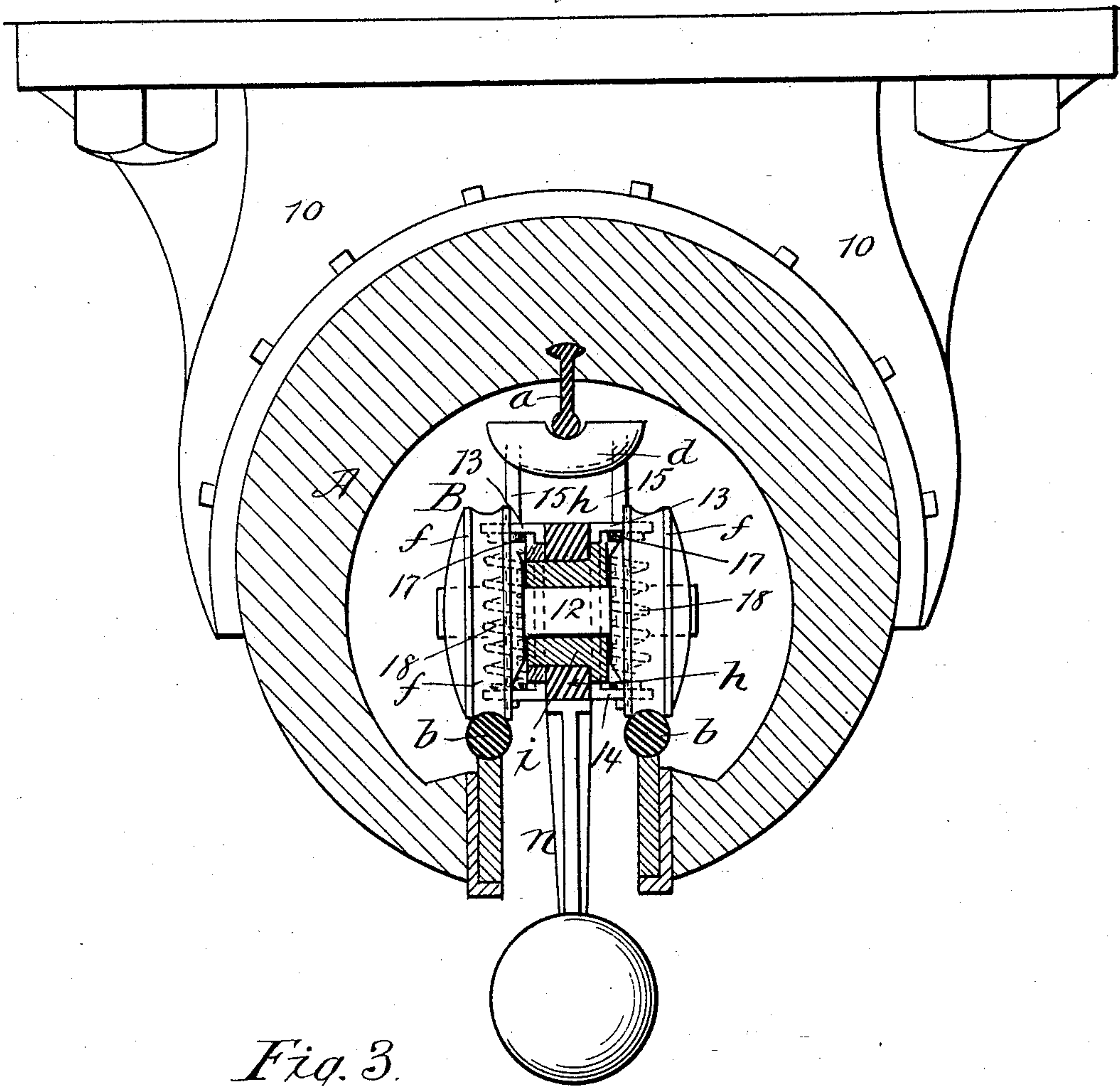
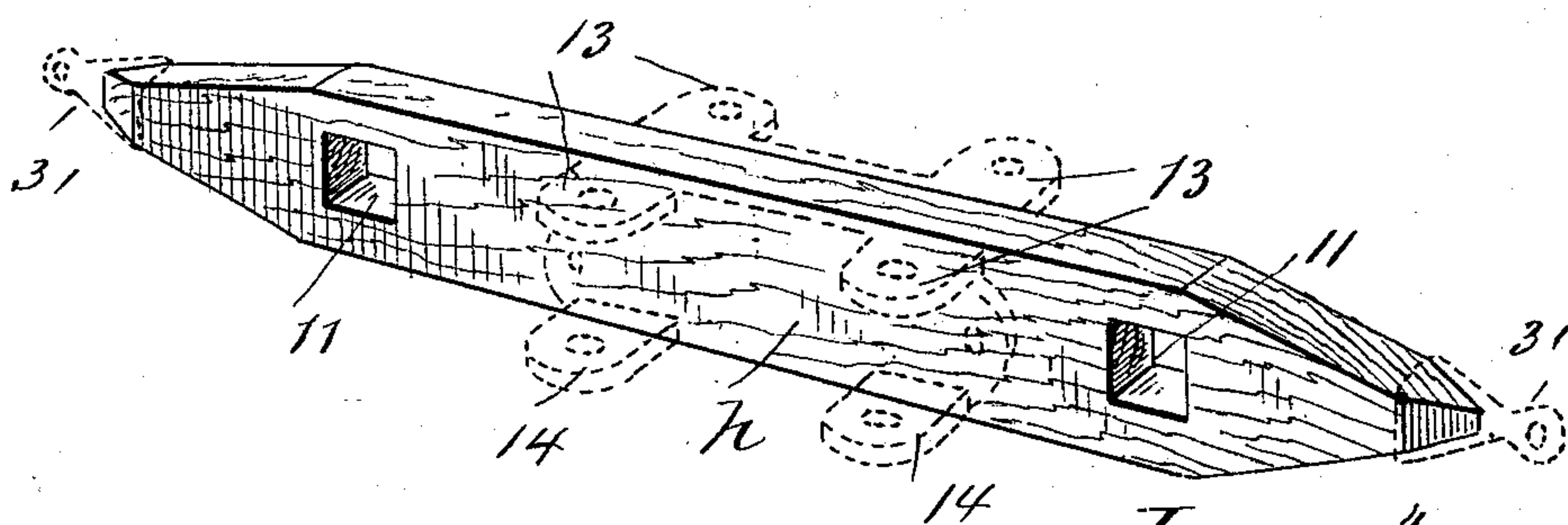


Fig. 3.



Witnesses:
M. A. Campbell
J. R. Bradshaw.

Inventor,
L. E. Walkins,
by W. S. Bellmont
Attorney.

UNITED STATES PATENT OFFICE.

LOUIS E. WALKINS, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO FRANCKE W. DICKINSON, OF SAME PLACE.

TROLLEY DEVICE FOR ELECTRIC-RAILWAY CARS.

SPECIFICATION forming part of Letters Patent No. 603,672, dated May 10, 1898.

Application filed April 14, 1897. Serial No. 632,116. (No model.)

To all whom it may concern:

Be it known that I, LOUIS E. WALKINS, a citizen of the United States, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Trolley Devices for Electric-Railway Cars, of which the following is a specification.

This invention relates to trolley devices for electric-railway cars, and is more particularly applicable in situations where the trolley is to run along and have bearings upon electrical conductors both above and below the contact-bearing members thereof, all located above the car.

The objects of the invention are to provide constructions and arrangements whereby the trolley, impelled through connections with the car and having contact bearing above and below as it runs along and in contact with upper and lower electrical conductors therefor, will run evenly and smoothly without tendency to jump or to bind or buckle, and whereby at the time of starting or stopping the car the trolley will correspondingly start or stop without violence or jerks, and also whereby the trolley may serve as a medium of electrical connection for the transmission therethrough both of the feed-current from the feed-wire, on which the trolley runs to the motor, and of the return-current from the motor to the return-wire, on which a suitably-insulated part or parts of the trolley also runs.

The invention consists in constructions and combinations of parts, all substantially as will hereinafter fully appear, and be set forth in the claims.

Reference is to be had to the accompanying drawings, in which the present improvements are illustrated, and in which—

Figure 1 is a side elevation of the trolley, a portion of the railway-car, which has a draft or propulsive connection with the trolley, and the overhead conduit, in which are upper and lower parallel-running electrical conductors, along, on, and between which runs the trolley. Fig. 2 is a cross-sectional view through the conduit and across the trolley. Fig. 3 is

a view illustrating in detail certain features of construction of the body of the trolley.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the trolley.

B represents the conduit, having the conductors *a* and *b b* therein and supported thereby, along and in contact with which run the shoe *d* and paired wheels *f f* of the trolley, and C represents the electric car, having the two arms *g g*² supported upon the top thereof and extending upwardly within the inverted overhead conduit B and having connections with the body of the trolley at either end of the latter for draft upon the trolley by the one or the other of said upright arms *g g*², accordingly as the car is running in the one direction or the other.

It will be here stated that the conductor *a* is the feed-conductor, corresponding to the line-wire of the electric-railway system, and that the conductors *b b*, here indicated as in the form of somewhat bulky wires, are the return wires or conductors for the system. The body of the conduit B is of itself an insulating substance or composition, so that the conductors *b b* are insulated from the one *a*.

The current for the propulsion of the car passes from the feed-conductor *a* down through the shoe *d* and by a wire connection *d*² through the one upright arm *g*, which is wired, as indicated at *d*³, to the motor, through the latter returning through the other upright arm *g*², which is wired from the motor, as indicated at *d*⁴, and in electrical connection with the wheels *f f* of the trolley, and through the latter to the return-wires *b b*.

The conduit is shown as in the form of a longitudinally-running slotted overhead tube, the slot-opening thereof being in the median longitudinal line, the same being supported in the top of the tunnel or subway by brackets at suitable intervals above the center of the railway-track, and the feed-conductor *a*, which is here shown as in the form of a double T, is in part embedded within what may be regarded as the roof of the conduit and is thereby supported.

The conductors $b\ b$ are supported in parallelism along the portions of the conduit which constitute the opposite internal margins of the slot and serve as the tracks for the trolley-wheels, of which, as here shown, there are two pairs, one in advance of the other, each pair being journaled in boxes or bearings therefor at or near the end of the body h of the trolley, which is of wood or other insulating material or substance.

The body h has transverse apertures therethrough at its end portions, in which are fitted the journal-boxes $i\ i$ for the axles 12 of the trolley-wheels, which are metallic and in electrical contact or connection with the boxes, to which boxes the return-wire from the motor is in electrical connection through the arm g^2 .

The body h of the trolley has upon each side, at its middle part, the top and bottom laterally-extending lugs or flanges 13 14, having the vertical apertures in alinement, serving as guides for the depending stems 16 of the shoe d . Each stem below the upper flange has a shoulder 17, between which and the lower flange is a spring 18, exerting an upward pressure on the stem and through it upon the shoe.

The shoe d as here represented is substantially in the form of a metallic trough spring-supported at or near the four corners thereof, and the shoe and its stems, springs, and the guide-flanges for the stems are never in electrical connection with the trolley-wheels and their journals.

The arms $g\ g^2$ are pivoted at 20 upon the top of the car at points in a longitudinal line centrally thereof, the one suitably in advance of the other, and each of these upright arms $g\ g^2$ has the angular extension g^3 adjacent the pivot, and the extremity of each of these arms is apertured vertically or constructed in the form of an eye 22. A vertical rod or stem 23, having a suitable base-support and connection upon the top of the car under the apertured extremity of the arm g^3 , projects vertically upward through and beyond the eye, being provided at its upper end with a nut or shoulder 24, between which and the upper side of the arm g^3 is the cushioning-spring 25, while a similar spring 26 is applied under the arm and between the latter and the base-support for the rod, all whereby any force or shock applied at the upper end of the upright arm g or g^2 in the line of travel will be yieldingly resisted and cushioned, the said arms having a degree of vibration against the cushions. The upper end of each arm has connected thereto a wire cable m , or a chain may be substituted, or even a rod, which also connects at the eyes 31 with the front and rear end of the body of the trolley, this medium of connection being preferably a good electrical conductor.

It will be perceived that the hereinabove-

described devices constitute what may be termed a "draw-pull" trolley, for no matter in which way the car travels one or the other of the arms g or g^2 exerts a draft upon the trolley through the connection m in the line of travel for most efficient results, as will be manifest, and the whole arrangement is such that as the car starts the trolley will receive its motion in unison therewith after an initial yielding at the connections, as assured by the cushion-springs 25 26, and there is at no time tendency to cause a distortion, twisting, binding, or buckling of the trolley, which has bearings in part by gravity and in part by spring-pressure against the conductors a and $b\ b$, which, considered in their mechanical aspect, constitute tracks or ways for the trolley, as well as factors in a system of electrical distribution.

The shoe d may have wheels or rollers to run over conductor a for avoidance of friction, as evident. The body of the trolley has at its middle the pendent weighted arm n , which tends to maintain the trolley the more effectually in bearing-contact, all of its four wheels on the track-wires $b\ b$.

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

1. The combination with an overhead support or conduit having upper and lower ways or conductors, of a trolley having a wheeled body running on the lower conductor or way and having a spring-supported shoe to run with an upwardly-bearing pressure on and along the upper conductor, the car having the upright arms $g\ g^2$, one in advance of the other, each pivotally connected on the car for a fore-and-aft vibration, and each having adjacent its pivot an angular arm g^3 , cushions above and below said arms g^3 and the connections m between the arms $g\ g^2$ and the ends of the trolley-body, substantially as described.

2. The combination with the body of the trolley having the journals for the trolley wheels or trucks which are mounted therein and having at its sides the upper and lower laterally-extending apertured flanges 13, 14, the shoe d having the stems 16 playing through said flanges and each provided with a shoulder and the springs encircling the stems and exerting an upward pressure against said shoulders, substantially as described.

3. The combination with a motor-car, of an overhead inverted conduit A composed of insulated material, provided at its under central portion with the longitudinal slot, provided therewithin, adjacent the opposite margins of said slot, with the upstanding conductor-tracks, $b\ b$, and provided at its central upper wall with the longitudinal depending conductor, a , the trolley or carriage having wheels running on, and in electrical connection with, said track conductors, $b\ b$, and carrying at its top the spring-supported shoe, d , insulated

from the wheels of the trolley, and in bearing
contact with an upward pressure on said up-
per central conductor, *a*, the arms, *g g*², up-
wardly extended above the car and entering
5 through said conduit-slot into the conduit in
advance and to the rear of said trolley, and
horizontal connections, *m m*, between said
arms and the front and rear ends of the trol-
ley-carriage, substantially as described.

In testimony that I claim the foregoing as to
my invention I have signed my name, in pres-
ence of two witnesses, this 9th day of April,
1897.

LOUIS E. WALKINS.

Witnesses:

WM. S. BELLOWS,
M. A. CAMPBELL.