

(No Model.)

2 Sheets—Sheet 1.

F. M. WHITEHOUSE.  
TRAMWAY CAR.

No. 308,816.

Patented Dec. 2, 1884.

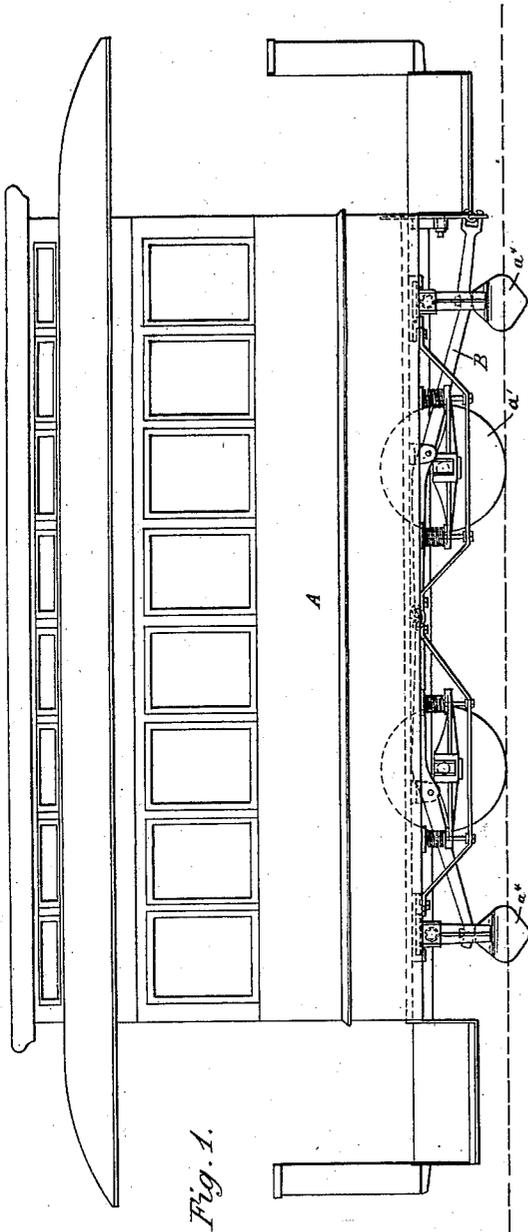


Fig. 1.

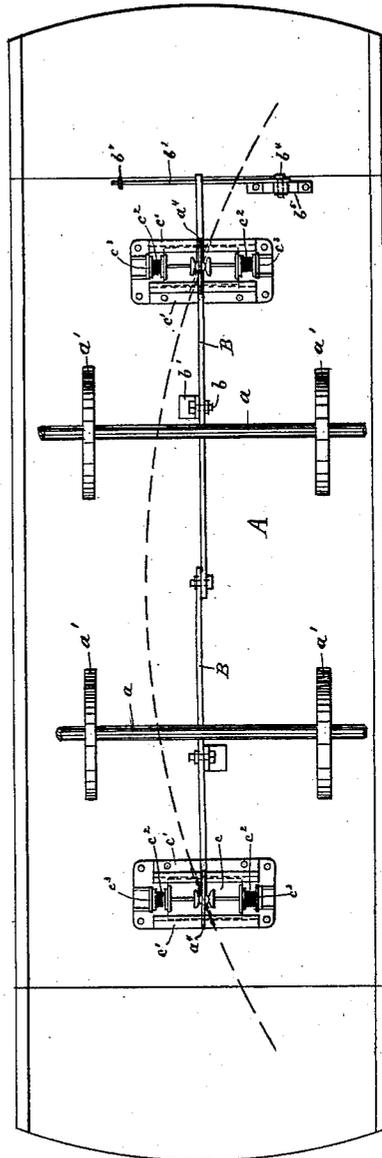


Fig. 2.

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(No Model.)

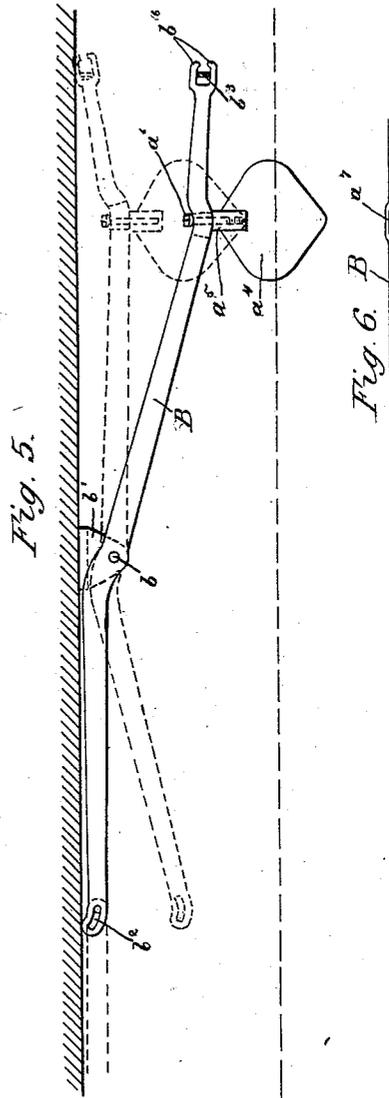
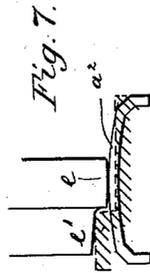
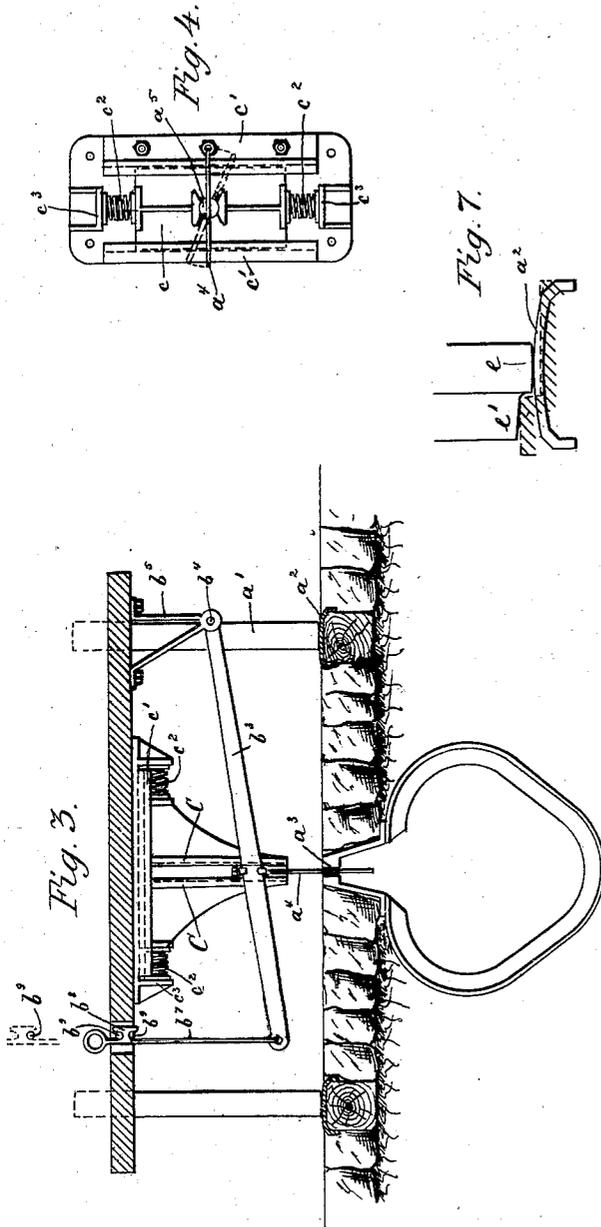
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# UNITED STATES PATENT OFFICE.

FRANCIS M. WHITEHOUSE, OF CHICAGO, ILLINOIS.

## TRAMWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 308,816, dated December 2, 1884.

Application filed May 31, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS M. WHITEHOUSE, a resident of Chicago, Cook county, State of Illinois, have invented certain new and useful Improvements in Tramway-Cars and Appliances; and I do hereby declare the following to be a full, clear, and exact description thereof, sufficient to enable others skilled in the art to which said invention appertains to make and use the same.

In ordinary systems of tram-railways the track-rails are made with flanges which guide the car-wheels and retain them in desired position upon the rails. This flange-rail as ordinarily constructed presents a troublesome obstacle to the passage of heavy wagons, drags, carriages, &c., and in narrow thoroughfares over which there is much traffic becomes highly objectionable.

The purpose of my invention is to dispense with the flanged rail, more especially along the main line of the tramway, and in lieu thereof to employ a substantially flat-face rail, which shall be practically on a level with the roadway.

To this end my invention consists of certain improvements in the construction of tramway-cars and appliances, and in the combination therewith of certain improvements in the road-bed of the railway, whereby the car may be retained and be caused to run evenly upon the flat track-rails.

In the accompanying drawings the invention is shown in connection with the underground-cable-railway system; but, as will presently appear, the same is not confined thereto, but may be practiced with equal success upon railways using horses or other motive power.

Figure 1 is a side elevation of a street-car in position with my invention applied thereto. Fig. 2 is an under side plan view of the car; Fig. 3, a cross-section view of the bottom of the car, showing also the flat track-rails, the tunnel, and slot-tube of the cable system and the guide-plate in place therein. Fig. 4 is an under side plan view in detail of the guide-plate and its bracket connections; Fig. 5, a detail view in side elevation of the guide-plate and its operating-lever; Fig. 6, a detail view of the slotted lever at point of attach-

ment with the guide-plate; Fig. 7, a detail view in cross-section, showing compound rail and wheel-tread employed on branch lines not using the underground cable, and also at curves of main line of track.

The car-body A, of well-known construction, carries the ordinary journal-boxes, in which are mounted the axles *a* of the car-wheels *a'*. The wheels *a'* are set rigidly at usual gage upon the axles; but instead of having a flanged rim may, more especially for the main line, be made of even tread or periphery, (see Fig. 3,) to run upon the flat track-rail *a''*. This rail *a''* rests on stringers, and is spiked to the cross-ties, as well understood, and being laid at level grade with the road-bed of the street offers substantially no obstruction to the passage of vehicles.

In order to retain the wheels of the car upon this flat track-rail, it is necessary to provide a suitable guide, which has been shown in drawings, Figs. 1, 3, and 5, co-operating with the slotted way or tube *a'''* at the top of the tunnel of an underground-cable railway; but if it is desired to use the invention upon tramways not employing the cable-motor system, it will be understood that by laying the slotted tube *a'''* alone between the tracks of the way and continuously the length of the road a sufficient bearing for the guide will be afforded to hold the car-wheels steadily upon the rails. It is manifest, therefore, that while the invention adapts itself to the existing construction of cable railways, it is not necessarily restricted thereto in operation. In any event the slotted way or tube *a'''* would be laid and firmly spiked at a level grade with the road-bed, and would be of sufficient depth to receive and maintain the guide steadily in place therein. This guide-plate *a''* may be of steel or other durable material, formed preferably as shown, and having cast in piece therewith at its upper end a mid-rib, *a'''*, of circular cross-section, Fig. 4.

Projecting rigidly from the mid-rib *a'''* is a bolt-shank, *a''''*, which passes through an elongated slot, *a'''''*, in the guide-lever B, and by aid of a set-nut serves to hold the guide-plate *a''* and lever together. When the guide-lever B is elevated or depressed about its pivot *b*, 100

as shown by dotted lines, Fig. 5, the slot  $a^7$  therein affords sufficient play to retaining-bolt  $a^6$  to permit the readjustment of guide-plate  $a^4$ , so that it shall rise and fall in substantially vertical alignment.

The guide-lever B, bent as shown, has its pivot  $b$  set in suitable lugs,  $b'$ , fastened beneath the car-body, and, as exhibited in Figs. 1 and 2, there are two of said levers to the car, supporting at front and rear thereof, respectively, the guide-plates  $a^4$ . Levers B at their inner slotted ends,  $B^2$ , are joined together by pin-bolt or by link or by other connection in such wise as that both of said levers shall partake equally of the same movement—or, in other words, shall rise and fall simultaneously together with their attached guides  $a^4$ , when either of said levers is operated. A simple means to accomplish this shifting of the guide-levers consists of a transverse bar,  $b^3$ , pivoted, as at  $b^4$ , to a standard,  $b^5$ , secured beneath the car-body, said bar being loosely received within the lips  $b^6$ , formed upon one of the guide-levers, and being joined at its end to a vertical shipper,  $b^7$ , passing upward through the bottom of the car. A seating-lug,  $b^8$ , on the side of said shipper engages with rest-pins  $b^9$ , located as shown, whereby the cross-bar  $b^3$ , guide-levers B, and guides  $a^4$  may be firmly retained in elevated or depressed position, as desired. It will be noticed that the pointed shape of guide-plate  $a^4$  makes it in measure self-centering—that is to say, causes said plate, when lowered into the tube or channel  $a^3$ , to set itself readily in right-line adjustment, even though, when first in contact with the guide-channel, it may stand somewhat athwart the direction of said channel.

In order that the guide-plates  $a^4$  may run true and straight in the slotted tube  $a^3$ , thus maintaining the car-wheels in proper position upon the rails, and at the same time to relieve said guides and tube from undue strain, provision is made for a limited lateral and radial shift of said guides, as may be, against sudden wrenches when in engagement with the tube, the manner whereof is now to be described. The mid-rib  $a^5$  of the guide-plates  $a^4$ , being of circular cross-section, rotates snugly within the jaws of the depending bracket C. The upper horizontal member,  $e$ , of this bracket is mounted in transverse ways or ledges formed in the base-plates  $e'$ , which latter are bolted securely beneath the car-bottom. Suitable braces or webs between the jaws and horizontal member of bracket C add strength and rigidity thereto. Coil-springs  $e^2$  are seated between offset-bearings  $e^3$  of the base-plate  $e'$  and sockets of the bracket C in such wise that under normal tension said springs tend to keep the bracket in central position, together with the guide-plate, above the line of the slotted tube or way. If, now, for any reason, the traveling car experiences a lateral jolt or thrust while the guide-plate  $e^4$  is within the slotted tube, the strain or wrench which said parts would otherwise experience is reflected upon springs  $e^2$  through

the bracket C, and these springs by a yielding compression take up the same, and so guard against the liability to breakage or disarrangement of the parts. It will be noted, moreover, that the tendency is to restore the guide-plate to its central position with respect to car-wheels and slotted tube the moment the lateral impetus ceases. In turning curves in the roadway the limited radial movement which mid-rib  $a^5$  of the guide-plate has about and within its bracket-bearings allows said plate  $a^4$  to adjust itself to the torsional strain it experiences by action of the curved slot of the tube  $a^3$  thereon. At said curved portions of the roadway and elsewhere, particularly upon lateral or branch lines not employing a cable motor, it may become desirable to provide a flanged track-rail, in which event the compound wheel having a double tread, as shown in Fig. 7, may be employed. While the car is on the main line having a flat rail, the wheel will track on that part of its periphery denoted in the drawings as  $e$ , whereas when the curves or lateral lines are reached the flanged rail will be encountered and the tread of the wheel will shift to  $e'$  of its periphery. By such expedient the invention can be easily adapted to offshoots from a main-line-cable system not using a cable-motor, and where the traffic is not sufficient to justify the laying of a slotted guide-tube.

I do not wish to be understood as limiting my invention to the several details of construction hereinbefore set forth, for although the same are deemed to be the simplest and most efficient to the ends in view, it is manifest that the skilled mechanic may resort to various expedients not shown, but equally within the scope and spirit of my invention, in accomplishment of the objects stated.

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

1. The combination, with the road-bed having the longitudinal guideway or channel, of the tram-car having the flat-tread wheels, and the movable guides to engage with the way or channel, said guides being mounted on separate lever-arms, connected together and operating in unison substantially as described.

2. The combination, with the road-bed having the longitudinal guideway or channel, of the tram-car having the flat-tread wheels, and the movable guides located near the ends of the car and engaging the way or channel, said guides being mounted on separate lever-arms, connected together substantially as described, and being operated in unison by a single controlling-arm, substantially as set forth.

3. The combination, with the slotted guideway or channel, of the tram-car, the guide engaging said channel, and mechanism, substantially as described, to sustain said guide beneath the car, and to permit the radial and lateral movement thereof within the channel, substantially as set forth.

4. The combination, with the guide-plate  $a^4$ ,

having mid-rib  $a^5$ , of the guide-lever B and the laterally-moving bracket C, substantially as set forth.

5 5. The combination, with the guide-plate  $a^4$ , having mid-ribs  $a^5$ , of the guide-levers B pivotally joined together, the yielding brackets C, and the shipper  $b^7$ , substantially as described.

10 6. The combination, with the guide-plate  $a^4$ , of the guide-lever B, having elongated slot therein to receive the fastening-bolt of said plate, substantially as described.

7. The combination, with the guide-lever B,

having the guide-plate secured thereto, of the pivoted transverse bar  $b^3$ , loosely received 15 within lips of said guide-lever, the vertical shipper  $b^7$ , having lug  $b^8$ , and the rest-pin  $b^9$ , substantially as described.

8. The combination, with the guide-plate  $a^4$ , having mid-rib  $a^5$ , of the bracket C, the base- 20 plate  $c^1$ , and the coil-springs  $c^2$ , substantially as described.

FRANCIS M. WHITEHOUSE.

Witnesses:

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L. HOLMBAR.