

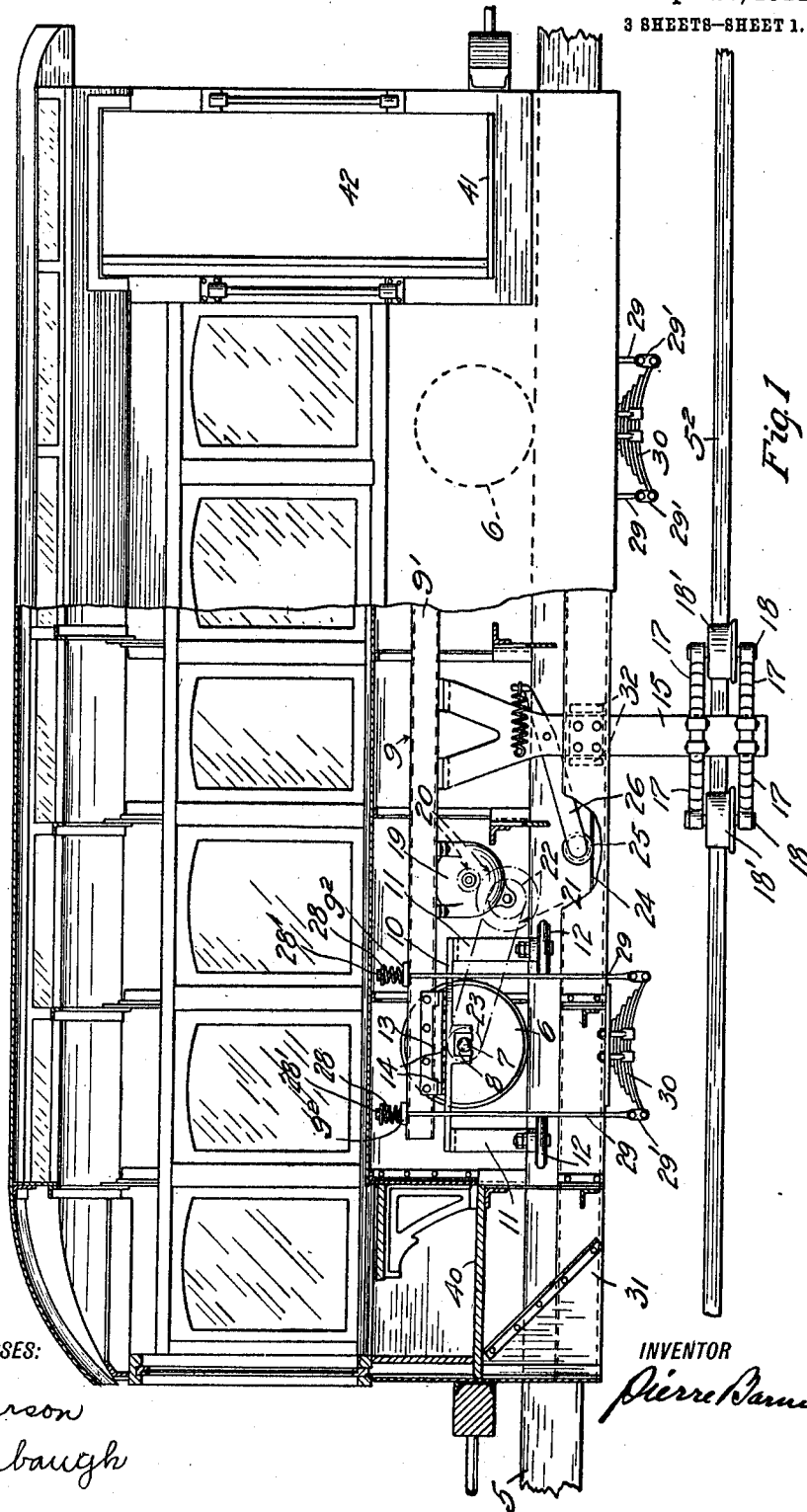
P. BARNES.
MONORAIL CAR.

APPLICATION FILED JUNE 26, 1911.

1,004,135.

Patented Sept. 26, 1911.

3 SHEETS-SHEET 1.



WITNESSES:

E. Peterson
L. J. Zeebaugh

INVENTOR

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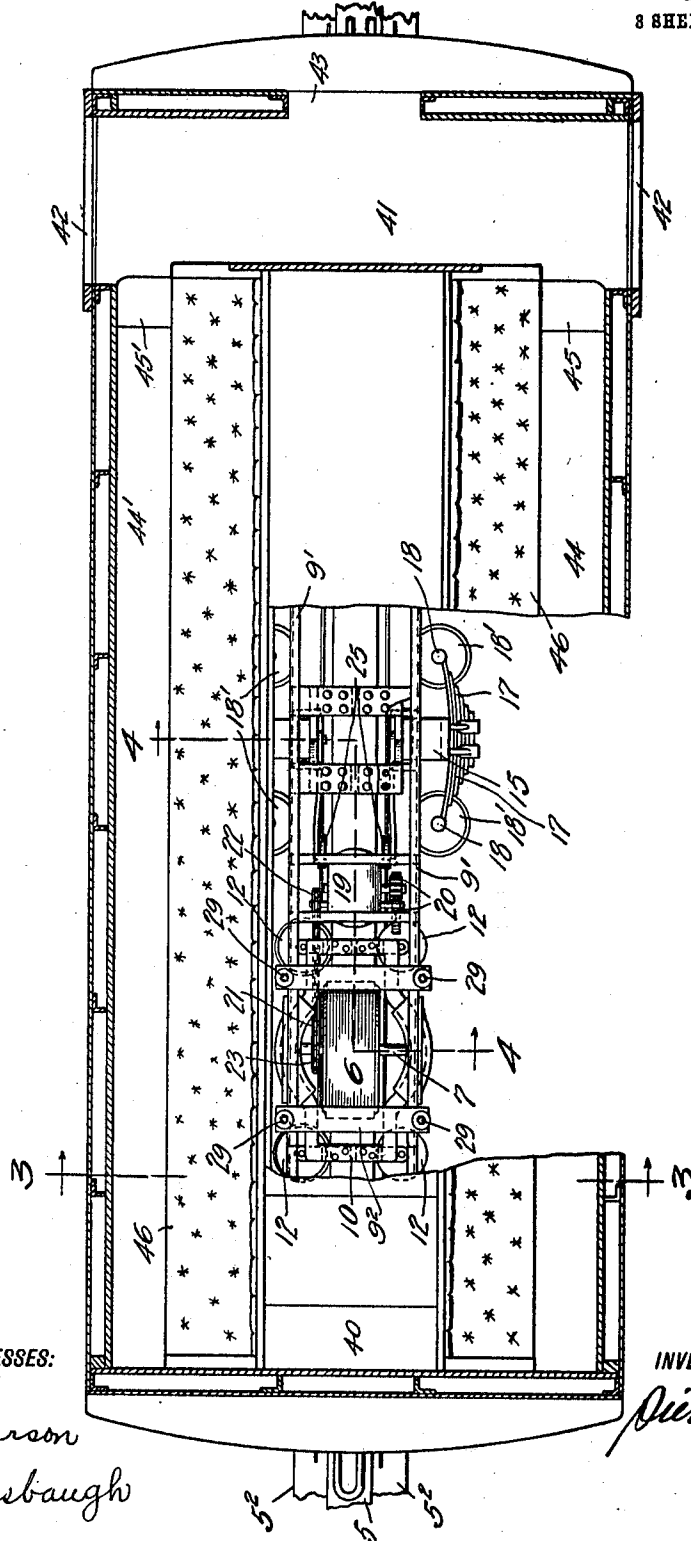


Fig. 2

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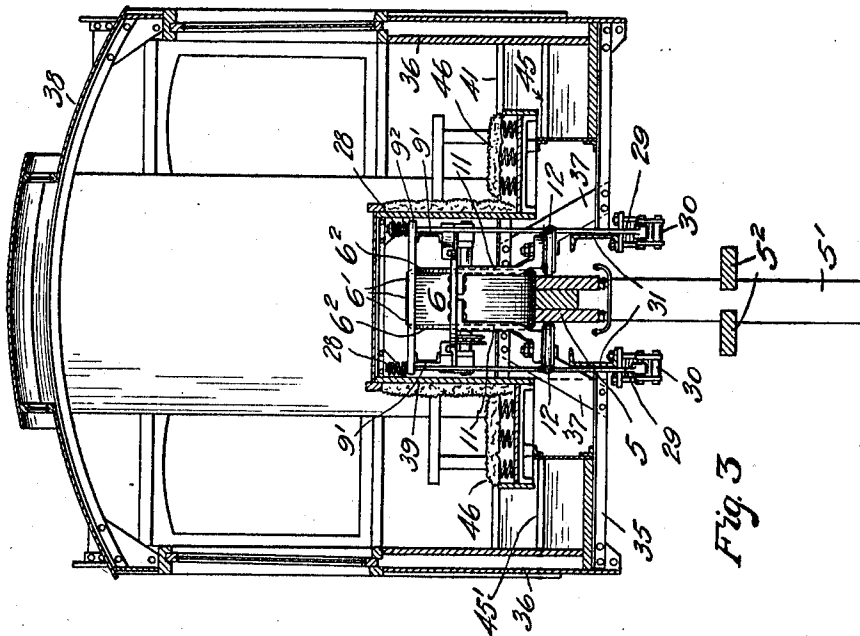


Fig. 3

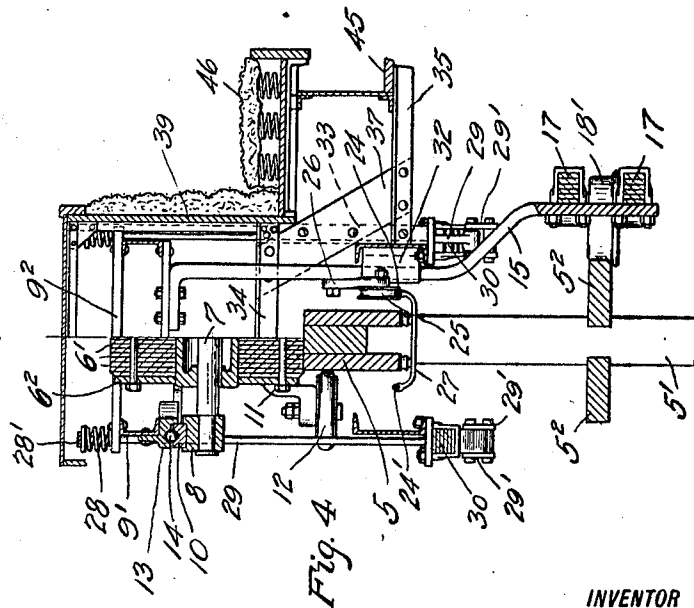


Fig. 4

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UNITED STATES PATENT OFFICE.

PIERRE BARNES, OF SEATTLE, WASHINGTON, ASSIGNOR TO INTERNATIONAL MONO-RAIL CO., OF SEATTLE, WASHINGTON, A CORPORATION OF WASHINGTON.

MONORAIL-CAR.

1,004,135.

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To all whom it may concern:

Be it known that I, PIERRE BARNES, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Monorail-Cars, of which the following is a specification.

This invention relates to that class of railway cars in which the car bodies straddle a single track-rail; and its object is the perfecting of such cars whereby they will better accommodate the traffic conditions for which the monorail systems are peculiarly adapted.

According to this invention the car body is of relatively light construction and is supported by a truck provided with swiveled wheels which are controlled by guide wheels so as to adjust themselves to both the curved and straight portions of the track.

The car body is suspended from the truck to afford independent vertical and lateral movements and springs are utilized to obviate shocks to the car body and prevent the "pitching" or longitudinal rocking of the latter as well as diminishing the strains to which the track structure is subjected from a car moving thereover at a high speed.

The truck is maintained in a substantially upright position through the instrumentality of spring pressed rollers operating against opposing guide rails which are provided in the track structure.

The invention also includes a novel construction of car-body.

The invention still further consists in the novel construction and combination of the various elements constituting the above mentioned features as well as ancillary ones which will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a view partly in section of a monorail car embodying my invention. Fig. 2 is a view in horizontal section through the car body which is shown partly broken away. Figs. 3 and 4 are transverse vertical sections taken through 3—3 and 4—4 of Fig. 2.

The reference numeral 5 designates a track-rail which is supported on posts such as 5' and which also supports parallel guide rails 5² at a distance below said track rails.

Mounted on the track rail 5 near each end of the car is a wheel 6. These wheels are desirably comprised of a plurality of an-

nular pieces 6', of paper, sheet rubber or other suitable material, clamped between end disks 6². Each of the wheels is keyed or otherwise secured to an axle 7 which is journaled in boxes 8 seated in recesses provided in the underside of a frame 10. Secured to said frame and extending downwardly from the front and rear ends thereof to within close proximity of the track rail are hangers 11 carrying at the lower end of each a roller 12 which tracks against the adjacent side of the rail 5. Two of these hangers and rollers are provided for a frame upon each side of the rail and by reason of the rollers tracking against the rail a frame 10 is caused to turn and correspondingly regulate the associated wheel 6 to run fairly upon the track. Supported by said frames is a truck-frame 9 comprising two longitudinal reaches 9' which are rigidly connected by transverse tie-bars 9². As illustrated, the wheel carrying frames 10 are connected to the truck-frame 9 by flanged arcuate plates 13 secured to the frame 9 and having balls, as 14, Fig. 4, between the frames 10 and such plates to serve as anti-friction bearings. These plates and balls are disposed concentric to a vertical line extending diametrically through the respective wheels and medially of their width.

Extending downwardly from about the mid-length of the frame 9 and at opposite sides of the track are bars 15 having connected to the lower end of each, pairs of spaced arms 17 which project forwardly and rearwardly from the respective bar. These arms are desirably formed of laminated plates (see Fig. 2) and constitute spring members.

The outer ends of the arms 17 are formed with bearings for axles 18 of wheels 18' which track against the guide rails 5² as best shown in Figs. 1 and 4.

19 represents an electric motor carried by a truck-frame 9 and is operatively connected with the axle 7 of the adjacent wheel 6 through suitable power transmission devices such, for example, as gear wheels 20 and a chain 21 passing about driving and driven sprocket wheels 22 and 23, illustrated diagrammatically in Fig. 1 and also shown in Fig. 2. The electric current for actuating the motor may be supplied by storage batteries carried on the car, but preferably from a power station through the medium

of circuit wires 24, 24' (Fig. 4) and trolley wheels, as 25, carried by levers, as 26, which are fulcrumed to the bars 15. Said circuit wires are supported from the track by bracket arms 27. Positioned on the frame bars 9² in proximity to the wheels 6 are spiral springs 28 which support plates 28' wherefrom depend rods 29. These rods are connected from their lower ends by links 29' to the ends of laminated plate carriage-springs 30 which yielding support the car body by bearing against the undersides of longitudinal bars 31 thereof. The purpose of the springs 28 is to provide for up and down motions of the car body while the other springs 30 act as equalizers to minimize the fore and aft rocking motions of the car body when in transit.

'32 are guides secured to the car body by bars 31 and coöperating with the truck frame bars 15 to obviate any longitudinal swinging motion of the car body.

The car body is provided with a rigid frame having as members thereof the above mentioned longitudinal bars 31, bars 33 extending upwardly therefrom and connected in pairs from their upper ends by transverse bars 34 disposed a short distance above the top of the track. The framing 35 for the floor of the body at each side of the car is connected at its inner edge with the adjacent bars 31 and at the outer edge of the floor framing the latter is connected with the framing of the walls 36 of the body. To prevent any lateral distortion of the car body, braces 37 are employed, as best shown in Fig. 4, to tie the bars 33 and 34 with the floor framing 35.

The car body is illustrated as having a roof 38 which is connected in any suitable manner to the walls 36 by which it is sustained. The car body is formed at its mid-width with a casing 39 of sufficient length to inclose the truck frame 9 and between this casing and the ends of the car are platforms 40 and 41 disposed at a distance above the track-rail so as to allow of a downward movement of the car body without encountering the rail.

The platform 40, at the front end of the car is designed for the use of the motorman. The other platform, 41, furnishes the floor of a vestibule, so to speak, from which communication is had by entrances or exits 42 in the sides of the cars and by a similar opening 43 in the adjacent end of the car. The passengers are accommodated on floors 44 and 44' at opposite sides and which floors are disposed at a lower level than that of the platform 41 to which access is had by steps 45 and 45'. 46 represents longitudinally arranged seats for the passengers and, as shown, extend from the rear platform 41 to the front end of the car.

In operation, the wheels 6 serve for sup-

porting the car body and for traction purposes and are individually driven by electric motors as will be understood.

When the car is traveling on the track the guide rollers 12 direct the wheels so that they are retained on the rail 5. The truck is maintained in an upright position through the agency of the wheels 18' which are yieldingly held against the rails 5² by the spring arms by which they are carried. By disposing the wheels 18' at about the mid-length of the car it is feasible to utilize a relatively long truck to afford an extended wheel base and allow of the truck passing about curved portions of the track without undue strains on the wheels or the frames thereof.

Attention is directed to the manner of supporting the car body by utilizing one type of springs to cushion the shocks derived from the travel of the car, and another type of springs to serve as equalizers to overcome the "pitching" motions obtaining in cars, principally when starting. Furthermore, by the provision of a vestibule platform at the rear with passageways opening therefrom at both sides of the car body, passengers are enabled to quickly enter or leave the car from a station platform at either side of the track and this arrangement also makes it convenient to step down or up from the car floors at either side, so that the car may not only be quickly loaded but the passengers distributed so as to have car as nearly balanced as practicable.

What I claim, is—

1. The combination with a single track-rail of a car comprising a truck having a wheel adjacent each end thereof for travel on said track-rail, means for supporting the truck in a substantially upright position, a car body, rods for suspending the car body from the truck, springs connecting the rods with the truck, and springs connecting the rods with the car body.

2. The combination with a single track-rail, of a truck frame, a wheel adjacent to each end of the frame and mounted to travel on said track rail, connection between the frame and each of the wheels whereby the latter are rotatable about vertical axes, and means engaging with the side faces of said track-rail for regulating the rotation of said wheels with respect to the aforesaid vertical axes.

3. The combination with a single track-rail and two guide rails subjacent thereto, of a truck frame, a wheel adjacent to each end of the frame and mounted to travel on said track rail, connection between the frame and each of the wheels whereby the latter are rotatable about vertical axes, means engaging with the side faces of said track rail for regulating the rotation of said wheels with respect to the aforesaid vertical axes,

wheels operating against said guide rails, and supports depending from the truck frame for carrying the last named wheels.

5 4. The combination with a single track rail, of a truck frame, a frame swiveled to the truck frame for rotation about a vertical axis, a wheel for said track rail and having its axle journaled in bearings provided in the second named frame, and rollers carried
10 by the latter and tracking against the opposite sides of said track rail whereby the referred to frame is guided and also serving to prevent any lateral displacement of the wheel.

15 5. A monorail car formed with a body having two longitudinal bars, floor frames secured to said bars, and frame work connecting the bars, a truck, and means depending from the truck and engaging said longitudinal bars for suspending the car-body.
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6. The combination with an elevated track rail, a truck-frame, frames swiveled to

the truck-frame, axles journaled in the second named frames, wheels mounted on the axles and adapted to travel upon said track 25 rail, a car body, and means connected with the car body below the level of the track rail for suspending the body from said truck frame.

7. The combination with an elevated track 30 rail, a truck-frame, frames swiveled to the truck-frame, axles journaled in the second named frames, wheels mounted on the axles and adapted to travel upon said track rail, a car body, means connected with the car body 35 below the level of the track rail for suspending the body from said truck frame, and means to prevent longitudinal swinging movements of the car body.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."