No. 727,919. PATENTED MAY 12, 1903.

R. L. ELLERY.

RADIAL CAR TRUCK.

APPLICATION FILED JUNE 7, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

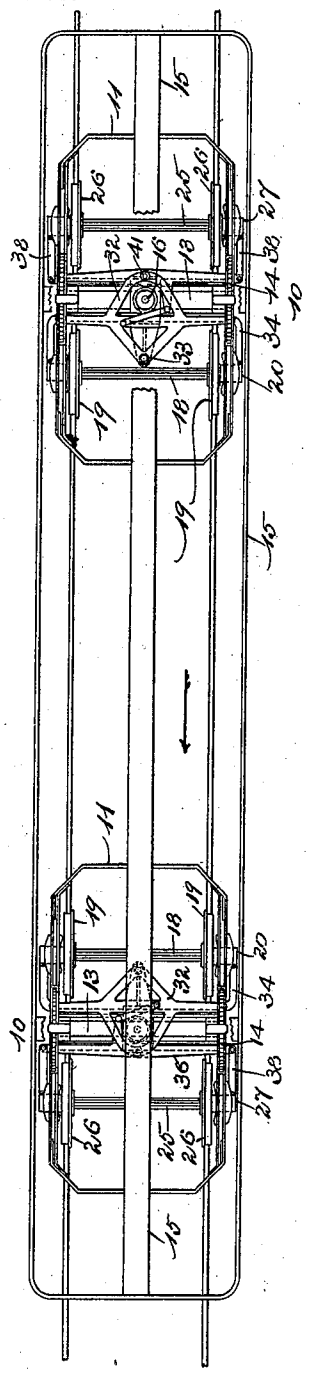


FIG-1-

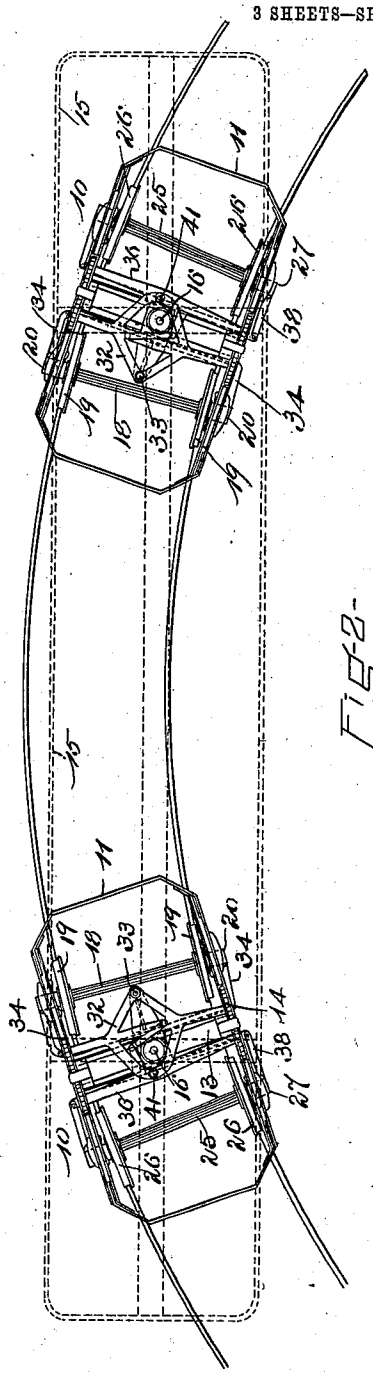


FIG-2-

WITNESSES:

Franklin E. Low.

Sydney E. Taft.

INVENTOR:

Robert L. Ellery.

by his Attorney Charles V. Gooding.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 3 SHEETS—SHEET 2.

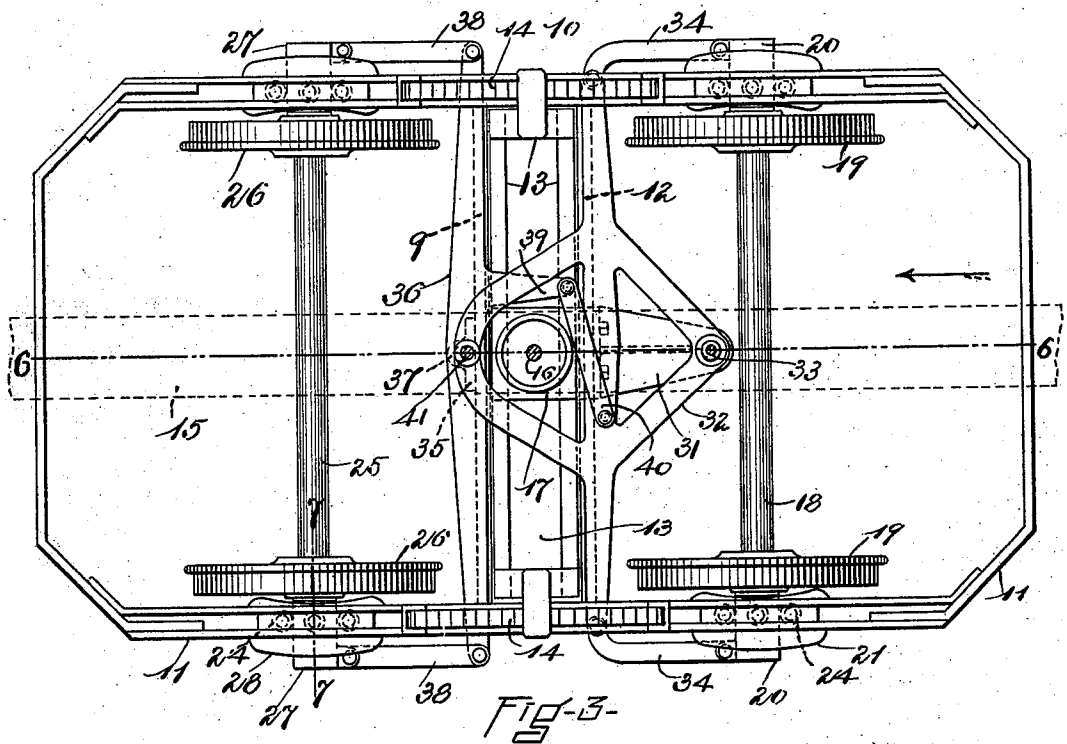


Fig-3-

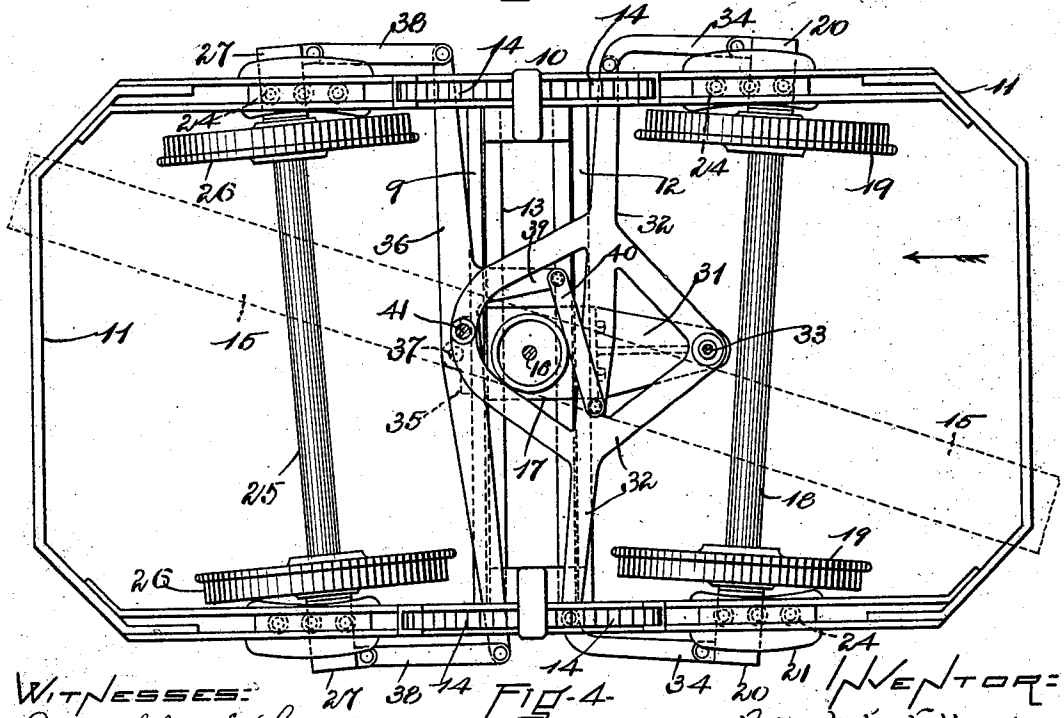


Fig-4-

WITNESSES:

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INVENTOR:

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NO MODEL. 3 SHEETS—SHEET 3.

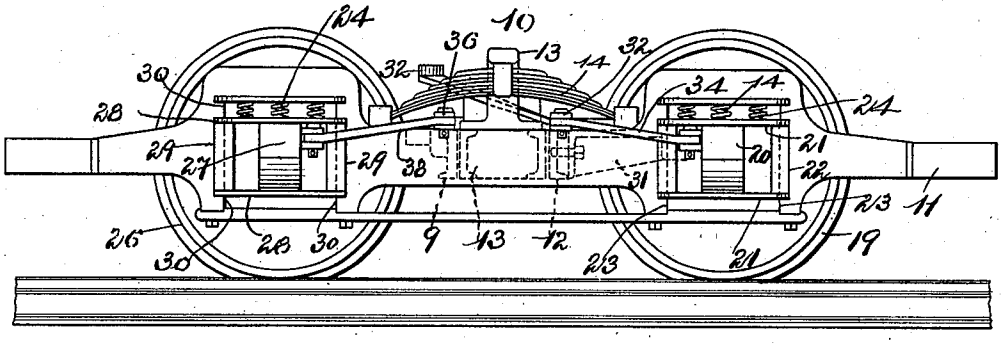


Fig-5-

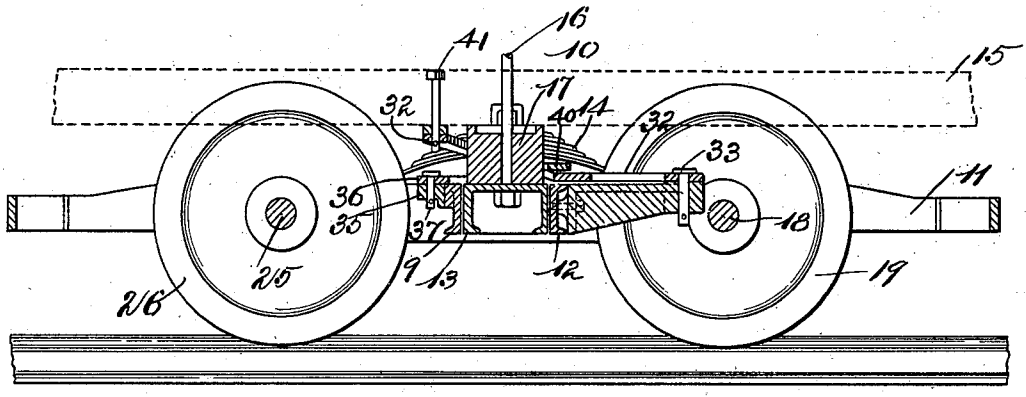


Fig-6-

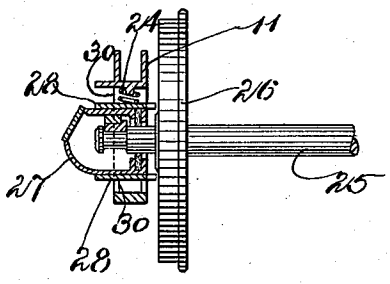


Fig-7-

Witnesses:
Franklin C. Low
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Inventor:
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by his Attorney,
Charles S. Gooding.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 727,919. Patented May 12, 1903.

UNITED STATES PATENT OFFICE.

ROBERT L. ELLERY, OF PORTSMOUTH, NEW HAMPSHIRE, ASSIGNOR TO SHERBURN M. MERRILL, TRUSTEE, OF BOSTON, MASSACHUSETTS.

RADIAL CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 727,919, dated May 12, 1903.

Application filed June 7, 1902. Serial No. 110,605. (No model.)

To all whom it may concern:

Be it known that I, ROBERT L. ELLERY, a citizen of the United States, residing at Portsmouth, in the county of Rockingham and State of New Hampshire, have invented new and useful Improvements in Radial Car-Trucks, (Case B,) of which the following is a specification.

This invention relates to railway car-trucks, and is particularly adapted to car-trucks for electric railways in which the motor is supported partly upon the axle and partly upon the truck-frame.

The object of the invention is to provide a car-truck which is so constructed that the axles will readily adjust themselves to a radial position as the truck and the car-body supported thereon are passing around a curve, thus greatly diminishing the amount of friction between the car-wheels and the track.

The invention consists in a car-truck, of a frame, ways provided in said frame, and an axle journal-box arranged to move horizontally upon said frame in said ways.

The invention again consists in a car-truck, of the combination of a frame, a slide arranged to move vertically in said frame, and an axle journal-box arranged to move horizontally in said slide.

The invention still further consists in a car-truck, of a frame, a slide arranged to move vertically in said frame, an axle journal-box arranged to move horizontally in said slide, a lever pivoted to said frame, and a link connecting said lever to said journal-box and operating to move said box horizontally in said slide.

The invention further consists in the instrumentalities hereinbefore set forth in combination with a car-body pivotally supported upon said truck-frame and pivotally connected to said lever.

The invention finally consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a plan view of two of my improved car-trucks with a portion of a body of a car supported thereon, the same being shown in the position assumed thereby when passing along a straight track. Fig. 2 is a plan view of said trucks as the same appear in rounding a curve, the car-body being shown in dotted lines. Fig. 3 is an enlarged plan view of my improved radial car-truck, a portion of the body of the car being illustrated in dotted lines, the truck being shown in the position assumed thereby when passing along a straight track, the king-bolt and the pin by which one of the levers is pivotally connected to the car-body being shown in section. Fig. 4 is a plan view of the truck, similar to Fig. 3, except that the truck is illustrated as rounding a curve, the relative position of the car-body being shown in dotted lines, as in said Fig. 3, and the king-bolt and pin in section. Fig. 5 is a side elevation of the truck when in the position shown in Fig. 3 on a straight track. Fig. 6 is a central longitudinal section taken on line 6 6 of Fig. 3. Fig. 7 is a detail transverse section taken through one of the journal-boxes on line 5 5 of Fig. 3, a portion of the car axle and wheel being shown in elevation in position in their relation thereto.

In the drawings, 10 is the truck as a whole, consisting of a main frame 11, provided with two parallel cross-braces 9 and 12, rigidly fastened to the frame 11 and having a bolster 13 located therebetween, said bolster resting upon springs 14 14, supported upon the frame 11. The car-body 15 is pivoted, by means of a king-bolt 16, to the center plate 17, fast to the bolster 13.

The axle 18 is provided with a pair of wheels 19 19 and is arranged to rotate at each end in a journal-box 20, said journal-box being arranged to move in horizontal ways 21 21, formed upon a slide 22. The slide 22 is arranged to move vertically upon ways 23, provided upon the frame 11. Above the slide 22 springs 24 are interposed between the frame 11 and slide 22, so that the frame 11 is spring-supported upon said slide 22 through the journal-boxes 20 upon the axle 18. The axle 25 has fast thereto wheels 26 26 and is arranged to rotate at each end in a journal-box 27, said journal-box being arranged to move in horizontal ways 28 28, formed upon a slide 29. The slide 29 is arranged to move vertically upon ways 30, provided upon the frame 11. Above the slide 29 springs 24 are inter-

posed between the frame 11 and slide 29, so that the frame 11 is spring-supported upon said slide 29 through the journal-boxes 27 upon the axle 25.

To the cross-brace 12 is fastened a bracket 31, and to this bracket a lever 32 is pivoted by means of a pin 33. Each end of the lever 32 is connected by a link 34 to one of the journal-boxes 20. To the cross-brace 9 is fastened a bracket 35, to which is pivoted a lever 36 by means of a pin 37, said lever 36 being connected at each end to one of the journal-boxes 27 by a link 38. The lever 36 has an arm 39 integral therewith and connected by a link 40 to the lever 32. The car-body is pivotally connected to the lever 32 by means of a pin 41.

The general operation of my improved truck is as follows: When in its normal position, as shown in Figs. 1 and 3, the axles 25 and 18 of each of the trucks are parallel to each other and the longitudinal median line of the car coincides with the longitudinal median line of the truck 10, said longitudinal median line passing through the pivotal king-bolt 16 and also through the pivotal pin 33 and through the pin 41, as shown in Figs. 1 and 3; but as the trucks, together with the car-body, pass around a curve the median line of the car-body stands at varying angles with the median line of the truck, as seen in Figs. 2 and 4, the effect being the same as to suppose the truck to remain stationary and rotate the car-body upon the king-bolt 16. This relative rotation of the car-body to the truck-frame moves the pin 41 to one side or the other of the median line of the truck, or, in other words, rotates said pin around the king-bolt 16 as a center, thus rotating the lever 32 upon its center 33 and through the links 34 moving the axle 18 into a position radial with the curve around which the truck is passing. It is evident that as the axle 18 is moved into radial position, as hereinbefore described, the axle 25 will also be moved into a radial position with relation to the curve around which the truck is passing, being moved into said position by said lever 32, the link 40, the lever 36, and the links 38 38, as shown in Figs. 2 and 4. Thus it will be seen that the angle of the car-body to the truck is changed in passing around a curve and the relative position of the axles 25 and 18 is changed from a position parallel to each other to a position in which they converge toward each other, the angles which said axles assume placing them in a radial position in relation to the curve around which the truck is passing. Assuming the truck to be moving in the direction of the arrow, Figs. 1 and 3, the leading truck will be rotated upon its pivotal king-bolt 16 by reason of the flanges upon the leading pair of wheels 19 being guided by the curve of the track, and as said truck is swung upon its pivot the axles will be thrown into a radial position with relation to the curve by means of the links and levers connecting the car-body to the journal-boxes, and thus to the axles, as hereinbefore described. As the leading truck passes around a curve the car-body is carried therewith and is rotated upon the rear truck, thus bringing the median line of said car-body at an angle with the median line of said rear truck, causing the axles upon the rear truck to assume a position radial to the curve around which said truck is passing. By reason of the median line of the car-body assuming an angle to the median line of the truck and through the levers and links upon the rear truck the axles are caused to assume a radial position with relation to the curve around which the truck is passing.

It will be noted that the front and rear trucks are exact duplicates in their construction, but are reversed in position with relation to each other.

By the particular manner in which I construct my improved truck and attach the car-body thereto it will be seen that there is an undisturbed space provided between each of the axles and the end of the truck wherein a motor may be conveniently placed, a portion of the weight of the motor resting upon the axle 18 or 25 and the remainder of the weight upon the truck-frame.

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

1. In a car-truck, a frame, slides arranged to move vertically in said frame, an axle journal-box in each of said slides arranged to move horizontally thereon, an axle journaled to rotate in said boxes, a lever pivoted to said frame, links connecting said lever to said journal-boxes, a bolster extending transversely of said frame and spring-supported thereon; in combination with a car-body pivoted to said bolster and pivotally connected to said lever, whereby, when said car-body rotates upon its pivot with relation to said frame in passing around a curve, said lever is rocked and said axle moved to assume a position radial to said curve.

2. In a car-truck, a frame, slides arranged to move vertically in said frame, an axle journal-box in each of said slides arranged to move horizontally thereon, a pair of axles journaled to rotate in said boxes, a pair of levers pivoted to said frame, links connecting each of said levers to one of said axles by means of said journal-boxes, and a link connecting said levers one to the other.

3. In a car-truck, a frame, slides arranged to move vertically in said frame, an axle journal-box in each of said slides arranged to move horizontally thereon, a pair of axles journaled to rotate in said boxes, a bolster spring-supported upon said frame between said axles, a pair of levers pivoted to said frame, links connecting each of said levers to one of said axles by means of said journal-boxes, and a link connecting said levers one to the other; in combination with a car-body pivotally supported upon said bolster

and pivotally connected to one of said levers, whereby, when said car-body rotates upon its pivot with relation to said frame in passing around a curve, said axles are moved to assume positions radial to said curve.

4. In a car-truck, a frame, horizontal ways provided in said frame, a pair of axle journal-boxes arranged to move horizontally between said ways upon said frame, an axle journaled to rotate in said boxes, a horizontal lever pivoted to said frame, links connecting said lever to said journal-boxes, a bolster extending transversely of said frame and spring-supported thereon; in combination with a car-body pivoted to said bolster and pivotally connected to said lever, whereby, when said car-body rotates upon its pivot with relation to said frame in passing around a curve, said lever is rocked and said axle moved to assume a position radial to said curve.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT L. ELLERY.

Witnesses:
CHARLES S. GOODING,
ANNIE J. DAILEY.