

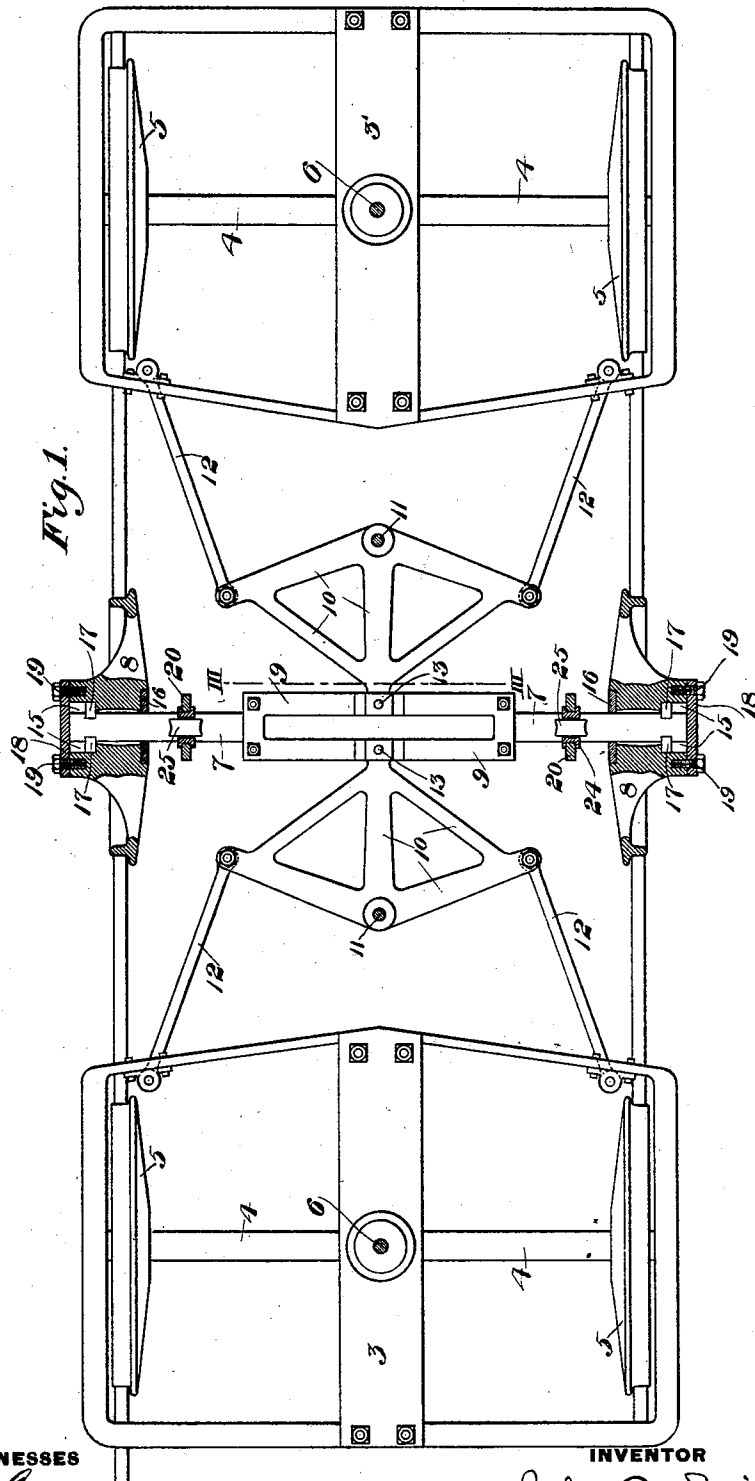
(No Model.)

2 Sheets—Sheet 1.

J. B. SMITHMAN.
CAR TRUCK.

No. 513,835.

Patented Jan. 30, 1894.



WITNESSES

H. M. Corwin
W. W. Swartz

INVENTOR

John B. Smithman
by his Attorneys
W. B. Caldwell & Sons

(No Model.)

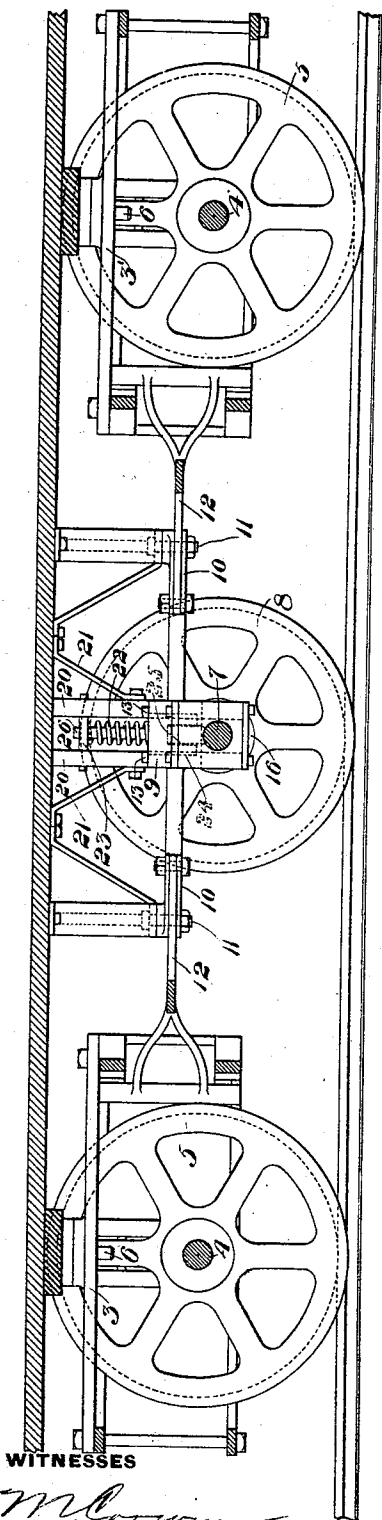
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Fig. 2.



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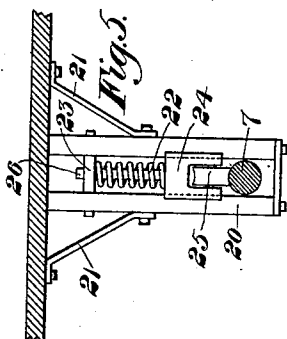


Fig. 4.

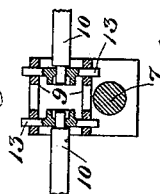


Fig. 3.

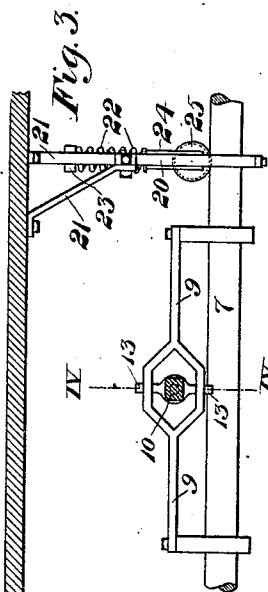


Fig. 6.

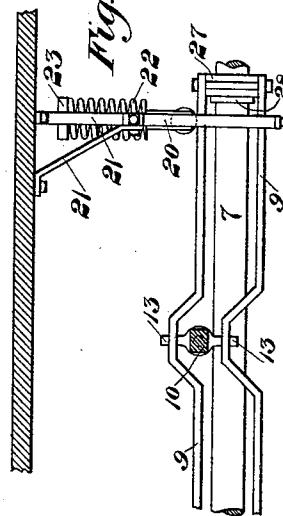
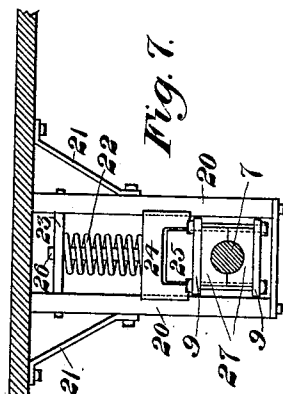


Fig. 7.



INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN B. SMITHMAN, OF OIL CITY, PENNSYLVANIA.

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 513,835, dated January 30, 1894.

Application filed May 29, 1893. Serial No. 475,820. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. SMITHMAN, of Oil City, in the county of Venango and State of Pennsylvania, have invented a new and
5 useful Improvement in Car-Trucks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a plan view of the trucks of a car embodying my invention, the middle wheels being shown in horizontal central section. Fig. 2 is a side elevation thereof, partly in vertical section. The other figures show
15 details of parts. Fig. 3 is a transverse section on the line III—III of Fig. 1, showing a part of the middle axle in elevation. Fig. 4 is a vertical section on the line IV—IV of Fig. 3. Fig. 5 is an end view of Fig. 3. Fig. 6 is
20 a view similar to Fig. 3, but showing a modified construction; and Fig. 7 is an end view of Fig. 6.

Like symbols of reference indicate like parts in each view.

25 The object of my invention is to provide improved means for automatically forcing the axles of street-cars and other cars into the line with the radii of curves while the car is passing around the same. I effect this irre-
30 spective of the distance of separation of the axles, and thus render the turning of the curves easy, economize motive power, and avoid that destructive jarring and grinding of the wheels upon the track which occurs
35 when the ordinary street-car with rigid trucks passes a curve.

My improvement also makes it possible to provide the cars with a wide wheel base for the purpose of avoiding oscillation of the car-
40 body.

Fig. 1 shows the car provided with two end trucks 3, 3', each having an axle 4, and wheels 5 which are fixed to the axle and adapted to be driven by electric motors. Each truck is
45 connected with the car-body by a king-bolt 6, which may be arranged in the usual manner, and permits the trucks to swivel horizontally. The car has also a middle axle 7 provided with wheels 8, and carrying at its middle portion,
50 permanently fixed thereto, a truss or frame 9.

10, 10, are three-armed levers pivoted to the

car-body upon vertical bolts 11, between the trucks 3, 3', and the axle 7. Each of said levers has two of its arms connected by rods 12, 55 with the outer portions of the truck 3 or 3' next to it; and the third arm of each lever is connected with the truss 9 by a pin 13, which is adapted to turn on its vertical axis, and also to slide vertically in its bearings in the 60 truss, to provide for vertical motion of the car, (Figs. 3 and 4.) The wheels 8 are preferably set loosely on the axle 7, so as to avoid the sliding action of the wheels in turning curves. The thickness of each wheel at the hub 65 along the line of the axle is preferably made equal to about one-fourth or more of the diameter of the wheel, so as to afford two widely separated bearings at the ends of the hub. These wheels may be set on the axle in vari- 70 ous ways, but they are preferably arranged as shown in Fig. 1, having semi-circular journal-boxes 15 on the outer end of the hub, and boxes 16 at the inner end thereof. The wheel is held in place upon the axle by check-plates 17, 75 shaped conformably to the boxes 15, and fitted into grooves which surround the axle near its ends. The check-plates are held by the journal-boxes 15, and both are confined by a cap 18, which may be screwed to the hub, but is pref- 80 erably held thereto by bolts 19. The axle 7 is prevented from moving lengthwise of the car and kept at right angles to the car-body by stays or posts 20 which project from the bottom of the car-body and are held rigidly thereto by braces 35 21, or otherwise, (Figs. 2, 3 and 5.) The stays are slotted so as to permit vertical motion of the axle, and the axle has a smooth, evenly finished bearing for a short distance on each side of the stays, so as to permit it to move 90 freely in the direction of its length.

A part of the weight of the car may be placed upon the middle axle by means of springs 22, one of which is placed in each of the stays. The upper end of each spring bears 95 against a plate 23 at the upper end of the stay, and at its lower end it bears upon a shoulder of a slide 24 which is mounted so as to be capable of moving vertically in a slot in the stay, and has a wheel or roller 25, which 100 engages and bears upon the axle, (Figs. 3 and 5.) The slide 24 has a vertical guide stem 26, which passes up through the coil of the spring 22, and fits in a hole in the plate 23. The con-

sequence is that the axle 7 can move vertically against the springs 22, while the wheels 25 enable it to move freely in the direction of its length.

5 Instead of using a non-rotatory axle 7 as above described, the axle may be adapted to rotate and both the wheels fixed rigidly thereto, or one wheel may be fixed and the other journaled upon the axle so as to prevent sliding of the wheels at curves. In the construction just mentioned, I arrange the parts as shown in Figs. 6 and 7, making the truss 9 longer than otherwise, and providing it at its ends with journal-boxes 27, which encircle the axle, and are held in proper position thereon by collars 28 formed on or fixed to the axle within the journal-boxes. I also place the stays 20 farther apart, and adapt the wheels 25 to bear upon the upper surface of the truss instead of bearing upon the axle.

The operation of the apparatus is as follows:—When the car is running upon a straight track, the levers 10, being connected with the end trucks and with the truss upon the middle axle, hold said end trucks so that the axles shall be at right angles to the track and to the car-body. When the car reaches a curve, the wheels of the middle axle impinge at their flanges against the sides of the rails, and move the axle 7 in the direction of its length and transversely of the car-body toward the outer side of the curve. The axle carries with it the truss 9 which, being connected at 13 with the levers 10, turns said levers on their fixed centers 11, and by means of the rod 12, they turn the trucks 3 and 3' upon their king-bolts 6, forcing the trucks apart at the outer side of the curve and drawing them together at the inner side. In this manner the axles of the trucks are forced automatically in line with the radius of the curve and when the car leaves the curve they are forced back again to their normal position.

When the parts are so constructed that the distance from the middle axle 7 to each of the outer axles is the same as the width of the track, then the three arms of the lever 10 should be made of equal length or nearly so, but when the distance between said axles is greater than the width of the track, the middle arm should be made proportionately longer than the other two arms, the proper proportion being easily determined by calculation, so that when correct dimensions are arrived at for a given wheel base, the device will force the axle into radial line, no matter what the radius of the curves may be.

The advantages of my invention have been generally indicated above, and will be appreciated by those skilled in the art.

Within the scope of my invention as defined in the following claims, modifications in the form and general arrangement of the parts may be made, since

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

1. The combination of a pair of swiveled trucks, bell-crank-levers, and connecting rods extending between the levers and trucks; substantially as described.

2. The combination of a pair of swivelled trucks, bell-crank-levers pivoted to the body of the car, and connecting rods extending between the levers and trucks; substantially as described.

3. The combination of a pair of swiveled trucks, bell-crank-levers, and connecting rods extending between the levers and trucks, and a transversely movable axle to which the bell-crank levers are pivoted; substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN B. SMITHMAN.

Witnesses:

W. B. CORWIN,
H. M. CORWIN.