# E. J. MARSTERS & R. A FISHER.

## Car-Truck.

**No. 202,737.** **Patented April 23, 1878.**

*Fig. 1*
Scale ⅛ in. = 1 ft.

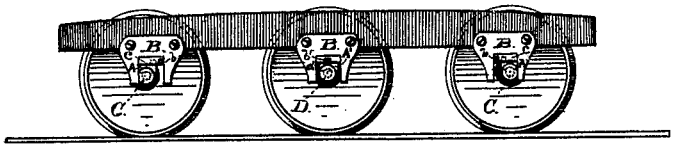
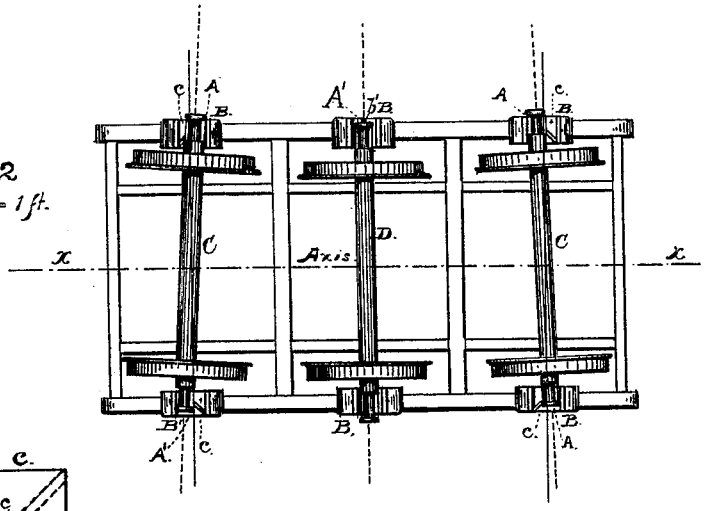



*Fig. 2*
⅛ in = 1 ft.



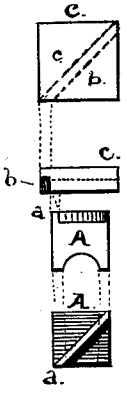




*Fig. 4.*
Scale 1 in. = 1 ft.

*Fig. 3.*
Scale ½ in. = 1 ft.

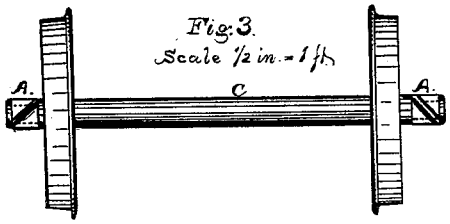
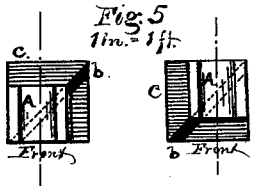



*Fig. 5*
1 in. = 1 ft.




Witnesses:
Edward C. Osborn
A. T. Tutty

Inventors:
Enoch J. Marsters
and Robert A. Fisher
By C. W. M. Smith their Atty

# UNITED STATES PATENT OFFICE.

ENOCH J. MARSTERS, OF STOCKTON, AND ROBERT A. FISHER, OF SACRAMENTO, CALIFORNIA; SAID FISHER ASSIGNOR TO SAID MARSTERS.

## IMPROVEMENT IN CAR-TRUCKS.

Specification forming part of Letters Patent No. **202,737**, dated April 23, 1878; application filed November 7, 1877.

*To all whom it may concern:*

Be it known that we, ENOCH J. MARSTERS, of Stockton, in the county of San Joaquin, and ROBERT A. FISHER, of Sacramento, in the county of Sacramento, both in the State of California, have invented a new and useful Improvement in Railway-Car Trucks, which invention is fully set forth in the following specification and accompanying drawings.

In the drawings herein referred to, Figure 1 is a side elevation of our new car-truck, showing the application of the invention to a six-wheeled truck. Fig. 2 is a bottom view of the truck. Fig. 3 is a top view of one of the outer axles and its wheels and boxes. Fig. 4 is a detail view, showing front and top views of the boxes and bearings. Fig. 5 is a bottom view of the bearings and sliding boxes, showing the two positions of the boxes, forward and back.

Our invention has for its object to provide a railway-car truck in which the wheels shall at all times be caused to conform to the curve or the line of the rails, to take automatically a proper radial position when they strike and are running upon a curve, and to move in the same manner into their first position when the straight track is reached.

To this end our invention consists in a novel manner of constructing and moving the axle-boxes, so that each box of an axle shall have a separate independent movement within its pedestal in an oblique horizontal direction, in addition to its usual vertical motion, whereby the axle is caused to take automatically a diagonal and, with respect to the curve on which the car is running, a radial position, the proper shifting or moving of the boxes being produced by the action of the rails against the flanges of the wheels, all which will be more fully set forth.

The truck, as shown in the accompanying drawings, is of the usual construction; but the boxes A A are caused to have a lateral movement transversely across the truck, and in a diagonal direction within their pedestals B B, in addition to the usual motion produced by the action of the gum springs; and the axle C, when held in the boxes, is at liberty to take a diagonal position with respect to the axis of the car-truck, and thus conform to the radius of the curve of the track. This action of the axle-box is produced by constructing the same with a projecting rib, *a*, placed diagonally across the top face of the box, and working within a corresponding diagonal groove, *b*, formed in the housing *c* of the oiler-box, or in that part with which the top of the box A is in contact.

The rib and groove of one box are inclined in a direction opposite to that of the others on the same axle, so that as one end of the axle is thrown forward the other end is moved backward; and the manner of holding these boxes against diagonal ribs or guides and grooves causes the lateral movement given to the boxes by the side pressure of the curve-rails against the wheels to resolve itself into an oblique movement, thereby throwing one box inward and forward and the other one of the same axle outward and backward. This action and the position of the axle resulting therefrom will be more clearly understood by reference to Fig. 2 of the drawings.

The parts *a b* that control the movements of the boxes A A have a different position and inclination or direction in the boxes of the front axle A from those of the hind axle of the truck; for, as the object of our invention is to cause the two axles to take a radial position when running on a curve, it is evident that the two axles will have a different position with respect to the longitudinal axis *x x* of the truck. The ribs *a* and grooves *b* in the boxes of one axle are thus formed in an oblique direction, directly opposed to those of the other axle; and by this construction, as the car-wheels strike a curve, the outer ends of the axles are moved away from each other, while the inner ends, nearer the center of the curve, are thrown toward each other, and a radial position is the result.

The space left for lateral movement between the boxes and the sides of their pedestals will vary with the degree of the curves on which the car is to run, as the greater the curve the more lateral play or movement must be given to the boxes. In the truck represented in Figs. 1 and 2 of the drawings the space left for lateral motion of the boxes is sufficient to

allow the car to run on any curve laid down at the present time.

In applying our invention to a six-wheeled truck, we construct the boxes A′ with a straight rib and groove, *a′ b′*, whereby this axle D has only a lateral movement beneath the truck, without the diagonal motion of the other axles. As this axle occupies a position midway between the two axles C C′, it is always perpendicular to the longitudinal axis *x x* of the truck, and therefore bisects the angle formed by the radial position of the two axles C C′ when on a curve.

Our invention, as thus constructed, obviates in a simple and inexpensive manner the difficulties and dangers of running cars upon curves, for the wheels of the truck are caused to take at all times a perfect position with respect to the rails, and thus work without grinding upon the rails or the bearings and running-gear of the truck.

Having thus fully described our invention, we claim therein as new and desire to secure by Letters Patent—

1. In a car-truck, the front and rear axles, in combination with the pedestals, boxes, and means, substantially as described, whereby such axles are adapted to move bodily in the pedestals on diagonal lines.

2. The combination of the axle-boxes A, having diagonal ribs *a*, and the diagonal grooves *b* in the housings, substantially as described and shown.

3. In a six-wheel car-truck, the combination, with the front and rear axles, moving bodily in the direction of their length on diagonal lines, of the central axle D, moving on a straight line, substantially as described and shown.

In testimony that we claim the foregoing we have hereunto set our hands and seals this 20th day of October, 1877.

E. J. MARSTERS. [L. S.]
R. A. FISHER. [L. S.]

Witnesses:
OSCAR T. SHUCK,
C. W. M. SMITH.