2 Sheets—Sheet 1

G. VINCENT.

Car-Truck.

No. 208,215. Patented Sept. 17, 1878.

Fig. 1.

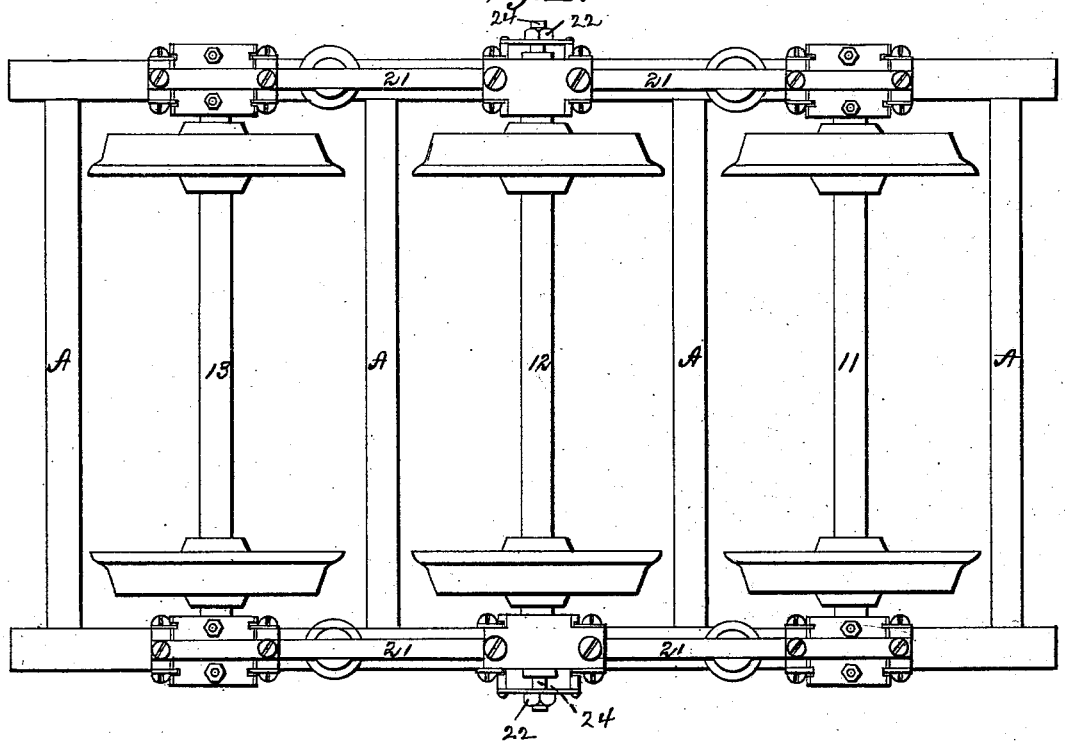
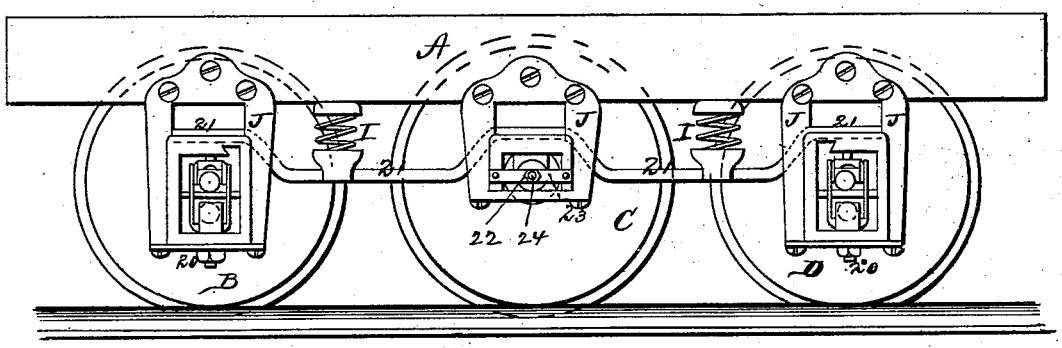


Fig. 2.



WITNESSES.

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2 Sheets—Sheet 2

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Fig. 3.

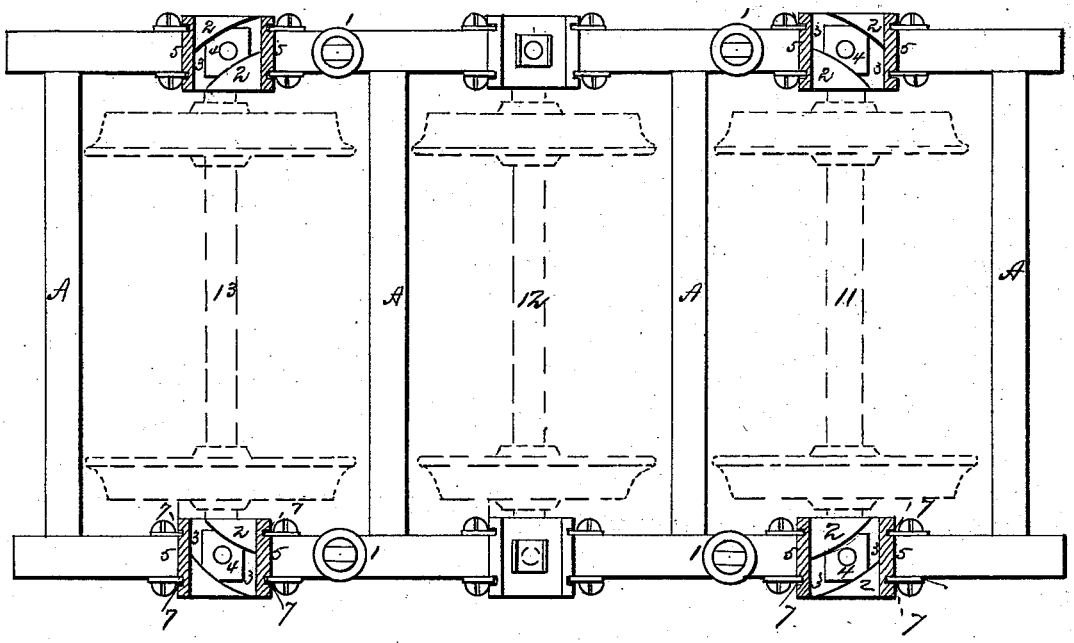


Fig. 4.

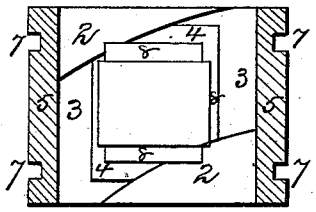


Fig. 5.

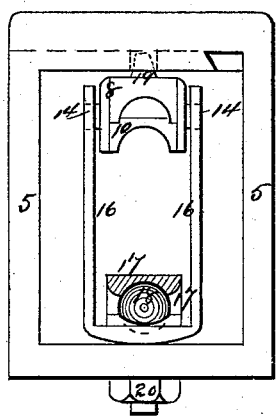
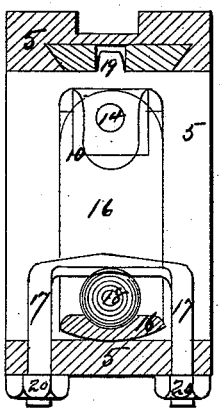


Fig. 6



WITNESSES

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UNITED STATES PATENT OFFICE

GEORGE VINCENT, OF STOCKTON, ASSIGNOR TO THE VINCENT FLEXIBLE TRUCK COMPANY, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN CAR-TRUCKS.

Specification forming part of Letters Patent No. **208,215**, dated September 17, 1878; application filed March 7, 1878.

To all whom it may concern:

Be it known that I, GEORGE VINCENT, of Stockton, and in the State of California, have invented certain new and useful Improvements in Flexible Railroad-Trucks; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, making a part of this specification.

My present invention consists in the combination of anti-friction devices, by which I am enabled to get rid of most of the objectionable friction that interferes to some extent with the easy working of flexible railroad-trucks, as will be hereinafter more fully set forth.

In the drawings, Figure 1 is a bottom view of a truck containing my invention. Fig. 2 is a side view of the same. Fig. 3 is a bottom view of a truck-frame, showing a portion of the details of my invention. Fig. 4 is an enlarged bottom view of the circular slot with the circular slide fitted in it and a pivoting axle-box connected with the circular slide. Fig. 5 is a side sectional elevation, showing a large case that slides up and down in the pedestal, a beveled edge of one side of the circular slide, the axle-box, suspending-stirrup, with attachments, and anti-friction devices. Fig. 6 is an end sectional elevation of what is shown in Fig. 5.

The general principle upon which my flexible railroad-trucks operate is shown in former applications for patents, assigned by me to the Vincent Flexible Truck Company, of California.

The circular grooves and slides, with their pivoting axle-boxes and co-operating devices and mode of operation, are shown in an application for a patent made by myself jointly with Milton A. Wheaton, which application is also assigned to the Vincent Flexible Truck Company.

In the drawings, similar letters and figures refer to corresponding parts.

A is a main truck-frame. B and D are the end sets of truck-wheels, and C is the middle set of truck-wheels. J are the pedestals. I are the carrying-springs. 2 2 is a metal plate, having in it circular groove 3. 4 is a circular slide, fitted to slide in the circular groove 3. The edges of the groove 3 and slide 4 are beveled, as shown at Fig. 6, so as to prevent the slide from dropping out of the groove. 5 is an outer box or case, having vertical grooves 7, by means of which it is held in its position by the vertical edges of the pedestals acting as guides. 8 is a case, made of cast-steel or other hard material, for holding the Babbitted axle-box 10, and 19 is a pivoting-journal, extending upward from the case 8, and penetrating the circular orifice in the middle of the slide 4. This journal should be a little tapering, being smaller at its outer or upper end. 11, 12, and 13 are the three axles. 14 are round lugs upon each end of the axle-box case 8. Upon these lugs are suspended the sides of the stirrups 16. In the bottom of the stirrup a small ball, 18, is seated in a shallow socket. A second stirrup, 17, receives the upper apex of the ball in a shallow socket. The sides of the stirrup 17 bend downward, and their ends pass through holes in the bottom of case 5, and are secured firmly in their position by nuts 20. 21 are equalizing-bars.

In the flexible truck here described it is important to prevent, as much as possible, any movement endwise of the middle axle. In order to prevent such end motion, I place bars 23 across the ends of the axle, fastening the bars to the outer case, 5, so they will not follow the up-and-down motion of the car and pedestals, which the yielding springs permit, but will constantly maintain the same relative position to the ends of the axle. Through each of the bars 23, immediately opposite the center of each end of the axle, I screw an iron or steel bolt far enough to come in contact with the flat end of the axle; or a small socket may be made in the axle, and the end of the bolt 24 made to fit and penetrate the socket. Jam-nuts 22 may be screwed upon the outer ends of the bolts 24, to prevent the possibility of their being accidentally moved in their position.

By these devices I prevent any perceptible end-play of the axle with very little or no increase of friction. Indeed, it is probable that

there is less friction when these devices are used than there would be if they were not used.

In order to make the wheels upon each side of the trucks follow each other easily in the line of the curve around which the truck may be passing, it is necessary that the axles should be in line with the radii of the curve; and in order that the axles may conform to the various lines of the different radii of changing curves when the middle axle has no lateral movement in the truck, it is necessary that the end axles should each respectively swing horizontally around a point that is central between each end axle respectively and the middle axle. The circular slots or grooves 3 are therefore made in the line of the periphery of a circle having its center at a point that is central between an end axle and the middle axle.

The operation is as follows: When the truck passes from a straight track upon a curved one, the curve of the track presses the forward wheels laterally out of a straight line with the truck. This pressure is resisted by the middle wheels, which act as a fulcrum and impart the pressure to the hind wheels. Both the forward and hind wheels yield to this pressure, and move laterally in the truck and out of a straight line with the middle wheels, carrying their axles with them. The ends of the axles and the motion of the boxes being controlled and directed through the medium of the journals 19 by the circular grooves 8 and slides 4, the ends of the axles are compelled to follow the circular direction of the grooves 3, which direction is in the line of the periphery of a circle having its center at a point central between the end axle and the center axle. By these means, when the trucks are passing a curve, the axles are always kept in line with the radii of the curve, and the wheels on each side respectively of the truck follow each other naturally in the line of the curve.

In the applications for patents before mentioned, made by me alone or jointly with Milton A. Wheaton, the weight of the car-body, with its load, rested upon the parts in such a manner that when the end axles vibrated horizontally, in order to change from parallel lines with each other to lines forming the radii of a curve and back again to parallel lines, some of the parts had to slide under other stationary parts, upon which was bearing a large part of the weight of the car-body and its load. This placed great pressure, and consequently great friction, upon the sliding surfaces, and thereby interfered with their freedom of action.

The one great object of my present invention is to get rid of such friction as much as possible, and this I accomplish by means of the stirrup 16, hung upon the lugs on the axle-box case 8 with the ball 18, and the second stirrup, 17, with its fastenings.

The operation of these devices is as follows: The weight of the car-body, with its load, rests upon the equalizing-bars through the medium of the coil-springs I, in the usual manner. The end of the equalizing-bar rests upon the top of the case 5, as shown in Fig. 2. A recess in the top of the case 5, for receiving the end of the equalizing-bar, is shown in Fig. 6. The weight is thus thrown upon the case 5. The case 5 is held up by the second stirrup, 17, which rests upon the top of the ball 18. The ball 18 is, in turn, carried in the first stirrup, 16, and the stirrup 16 is hung to the lugs of the axle-box case 8, which, through the medium of the axle-box, is carried by the axle.

No part of the load rests upon the slide 4, which, in my present arrangement, merely acts as a guide.

The lugs 14 and journal 19 act as a universal joint at one end of the stirrup 16, while the ball 18, with its sockets, acts as another universal joint at the other end of the stirrup 16. As the weight is transmitted from the end of the equalizing-bar to the axle through these universal joints and the stirrup 16, and as these parts work freely, the end of the axle and slide 4 moves back and forth in the circular groove 3 without any considerable friction.

Any mechanic skilled in the art of building railroad-trucks will know the size and proportions and materials proper to be used in my invention, and will also know how to substitute other forms of stirrups and universal joints for those herein specifically described.

The circular grooves and slides may be dispensed with, and any suitable frame used in their stead which will pivot upon the central point between an end axle and the middle axle, and extend to and connect with the movable axle-boxes 10, so as to guide them in the periphery of a circle, as described.

The bolts 24 can be used to prevent lateral play in any of the axles desired.

My present invention is designed to apply to any form of flexible railroad-trucks, both car-trucks and locomotive-trucks, and to trucks in which the lateral motion is in the middle axle, as well as where such lateral motion is in the end axles.

The stirrups, with the universal joints, can be applied to the leading and trailing wheels of locomotives. In such case the driving-wheels, whether there are two, four, or six of them, should be under the middle of the locomotive, half-way between the leading and trailing wheels, and the stirrups, universal joints, and connecting devices should be applied, as herein described, to the leading and trailing wheels, which may be of any desired size.

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

1. The combination, in a flexible railroad-

truck, of the case 5, stirrups 16 and 17, ball 18, lugs 14, and journal 19, substantially as and for the purposes specified.

2. The combination, with the middle axle of a flexible car-truck, of the outer case 5, bar 23 across the end of the axle, and bolt 24 through the bar and against the end of the axle, for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of February, 1878.

GEO. VINCENT.

Witnesses:
J. M. MASON,
C. M. ALEXANDER.