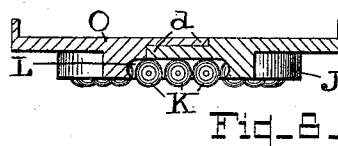
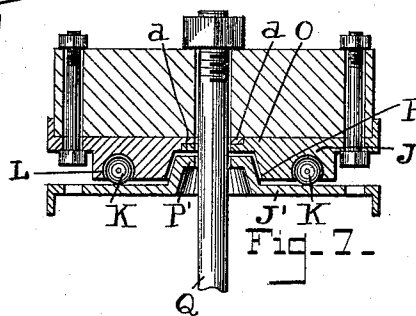
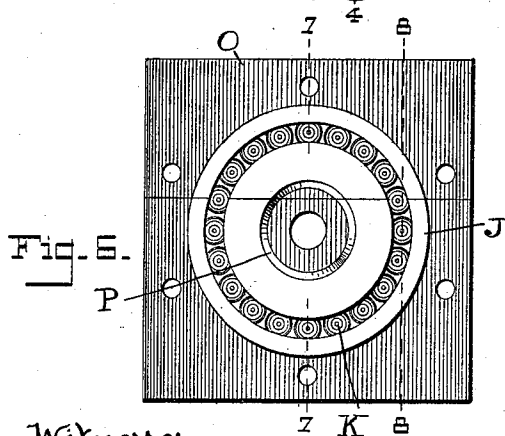
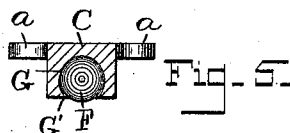
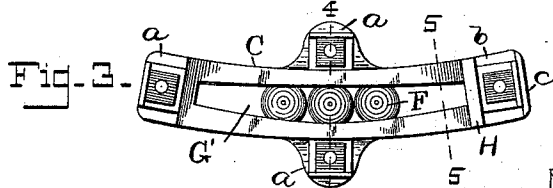
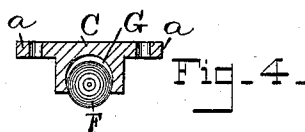
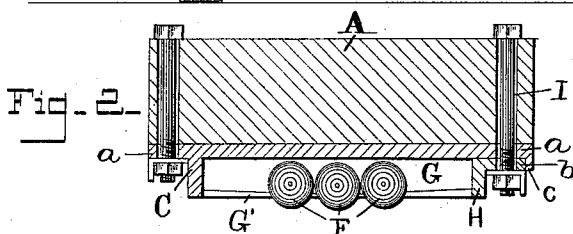
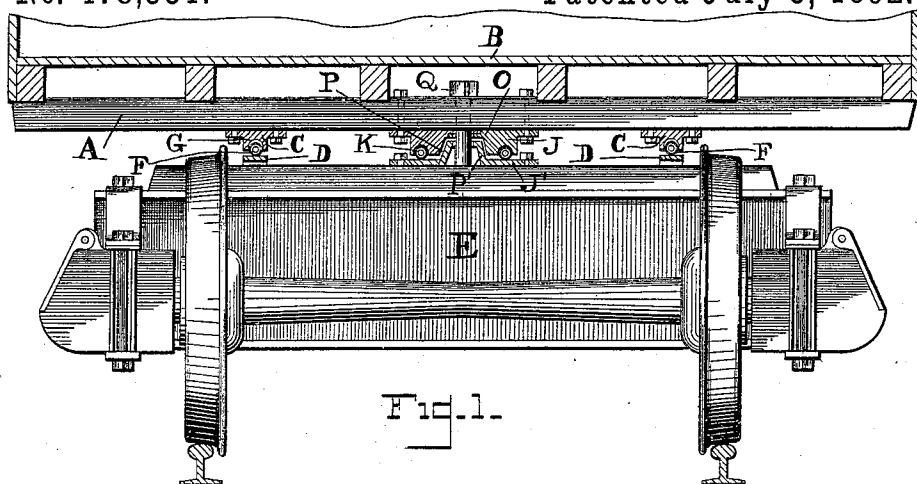


(No Model.)

J. E. NORWOOD.  
BALL BEARING FOR RAILROAD CARS.

No. 478,351.

Patented July 5, 1892.



Witnesses:

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Frank P. Davis.

Inventor:

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# UNITED STATES PATENT OFFICE.

JOHN E. NORWOOD, OF SYKESVILLE, MARYLAND.

## BALL-BEARING FOR RAILROAD-CARS.

SPECIFICATION forming part of Letters Patent No. 478,351, dated July 5, 1892.

Application filed October 3, 1891. Serial No. 407,604. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. NORWOOD, a citizen of the United States, residing at Sykesville, in the county of Carroll and State of Maryland, have invented certain new and useful Improvements in Ball-Bearings for Railroad-Cars, of which the following is a specification.

This invention relates to an improvement in ball-bearings for railroad-cars.

In heavily-loaded freight-cars the friction between the bearing-plates on the body and truck in turning curves and switches is so great as to cause a lateral strain on the rails, which grinds and wears them and sometimes results in spreading them. I propose to so mount the body on the truck as to overcome all such friction and permit the trucks to ride easily around curves.

To this end the invention may be said to consist in the novel features of construction and combinations of parts which will be described and claimed hereinafter.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a cross-section through the body and truck; Fig. 2, an enlarged longitudinal section of the box containing the anti-friction-balls with the bolster-beam of the car-body to which it is secured, shown in cross-section; Fig. 3, a bottom face view of the same; Fig. 4, a cross-section through the middle of the box, showing the position of the balls at this point; Fig. 5, a cross-section through the end of the box, showing the position the balls occupy here; Fig. 6, a bottom face view of the upper center plate; Fig. 7, a cross-section through the center of the same, and Fig. 8 a cross-section through said plate on the line 8 8 of Fig. 5.

In carrying out my invention I secure to the bolster-beam A of the car-body B a pair of boxes C, one to have position over each bearing-plate D on the truck E, which plates are on opposite sides of the center plates. Each of the said boxes comprises a casting having ears *a* at the middle and ends, by which ears it is bolted to the bolster-beam and cored out longitudinally to form an elongated channel or groove G, which contains metal anti-friction-balls F, the said channel or groove being

circular in cross-section and open on its under side, the opening being wider at the middle than at its two ends—i. e., tapered in width from the middle to the ends. Throughout its entire length, however, the sides of the channel are sufficiently contracted at the lower part to hold the balls and prevent them from dropping out. One end of the box is left open, so that the balls may be inserted through it into the channel G. After the balls have been thus inserted the channel is closed by an end piece H, which fits against the end of the box. This end piece has an ear *b*, which fits up against the end ear *a* of the box, and the bolt I, which extends through the latter ear and secures the box to the bolster-beam, also extends through the ear of the end piece and secures the latter in position. To hold this end piece more firmly, the ear *a* of the box has a downward-extending flange *c* across its end and the ear of the end piece fits behind this flange. The balls protrude through the slot or opening G' in the lower side of the box, and it will be observed that when they are free to move in the channel of the box they will roll to the center by reason of the fact that the said slot or opening widens toward the middle, as previously explained.

The ball-boxes have position over the bearing-plates on the truck, as before stated, and in turning curves the balls travel over the said plates and also travel from the middle of the channel in the box to the end of the same, the said channel being of sufficient length to allow this without grinding of the balls one against the other or against the end of the box. The slight tilting movement which the car-body has relieves the balls from pressure and allows them to roll to the center of the boxes again, so that when the next curve in the road is reached the balls will be in position to again travel to the end of the box.

The object of arranging so that the balls will return to the middle of the box is to prevent them from grinding against each other and against the end of the box, as they would if they remained in one end of the box and a curve should be turned which would require them to roll toward that end.

By my arrangement of ball-bearings as above described it will be seen that I over-

come friction and so arrange that the truck will ride easily around curves, and thus avoid grinding and wear on the rails.

A further advantage of mounting the car on ball-bearings is that the engine's labor is lessened in pulling around curves, and should the car be heavily loaded on one side it cannot lock the truck and cause derailments.

The boxes have a slight curve in the arc of a circle, as shown, to correspond to the movement of the truck around the center bolt Q. This prevents binding of the balls in the channel against the sides of the same.

In further carrying out my invention I provide ball-bearings at the center also, as follows: The upper center plate O, which is secured to the bolster-beam of the car, is formed with an annular raised ring J, which is cored out, forming a channel L, to be filled with balls K, arranged to travel over the lower plate J' on the truck. The sides of this circular channel L are sufficiently contracted to prevent the balls from dropping out, and the latter are inserted in the channel by making the plate in two sections, first filling the channel with the balls and then fitting the two sections together and bolting them to the bolster-beam, the balls protruding through the opening in the under side of the annular ring. The meeting edges of the two sections are each made with a rabbet *d* and overlap the said edges, being thus prevented from working past each other, which might affect the rolling of the balls, as will be seen by reference to Fig. 8. The upper plate O is made with a socket P, and the lower plate has a raised cup P', which fits in said socket, forming a bearing on which the truck turns and preventing lateral motion. This construction allows the anti-friction balls to travel in a regular circle and obviates any lateral movement of the same.

It will be observed that the balls are held in channels which open downward, and hence no dirt can accumulate and cause the balls to become clogged up.

The construction of the center plates with the socket in the upper one also prevents the accumulation of dirt.

It will be observed that the car-body is now supported entirely on balls, and thus all friction between it and the trucks is overcome.

My invention may also be applied to other vehicles than railroad-cars.

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

1. A ball-bearing for railroad-cars, comprising boxes secured to the bolster-beam of the car and located over suitable bearing-plates on the truck, each box having an elongated open channel containing balls and having its side contracted to prevent said balls from dropping out, the balls to bear upon the plates on the truck and travel over the same and from one end of the channel to the other.

2. A ball-bearing for railroad-cars, comprising boxes secured to the bolster-beam of the car and located over suitable bearing-plates on the truck, each box having an elongated open channel containing balls and having its side contracted to prevent said balls from dropping out, and a removable end piece having an ear through which the fastening securing the box to the bolster extends.

3. A ball-bearing for railroad-cars, comprising boxes secured to the bolster-beam of the car and located over suitable bearing-plates on the truck, each box having an elongated open channel containing balls and having its sides contracted to prevent said balls from dropping out, and a removable end piece having an ear through which the fastening securing the box to the bolster extends, the box having a flange at the end, behind which the ear of the end piece fits, in the manner described.

4. A ball-bearing for railroad-cars, comprising boxes secured to the bolster-beam of the car and located over suitable bearing-plates on the truck, each box having an elongated open channel containing balls and having its sides contracted to prevent said balls from dropping out, the channel being so formed that the balls roll to the center when free, in the manner described.

5. A ball-bearing for railroad-cars, comprising boxes secured to the bolster-beam of the car and located over suitable bearing-plates on the truck, each box having an elongated open channel containing balls and having its sides contracted to prevent said balls from dropping out, the opening in the under side of the channel lessening in width from the middle toward each end, for the purpose described.

6. A ball-bearing for railroad-cars, comprising a center plate secured to the bolster-beam of the car and having an annular raised ring with a circular open channel containing balls and having its sides contracted to prevent said balls from dropping out, the plate being made in two parts and their meeting edges overlapping, for the purpose described, the balls to bear upon a center plate on the truck.

7. A ball-bearing for railroad-cars, comprising a center bearing-plate secured to the bolster-beam of the car and having a socket in the middle and an annular raised ring around the same, with a circular open channel containing balls and having its sides contracted to prevent said balls from dropping out, and a center plate on the truck, having a cup fitting in the socket of the upper plate, the balls bearing upon the surface of this lower plate.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN E. NORWOOD.

Witnesses:

JNO. T. MADDOX,  
FRANK P. DAVIS.