No. 639,684. Patented Dec. 19, 1899.

J. E. NORWOOD.

ANTIFRICTION BEARING FOR RAILROAD CARS.

(Application filed Mar. 9, 1899.)

(No Model.)

Fig. 1.

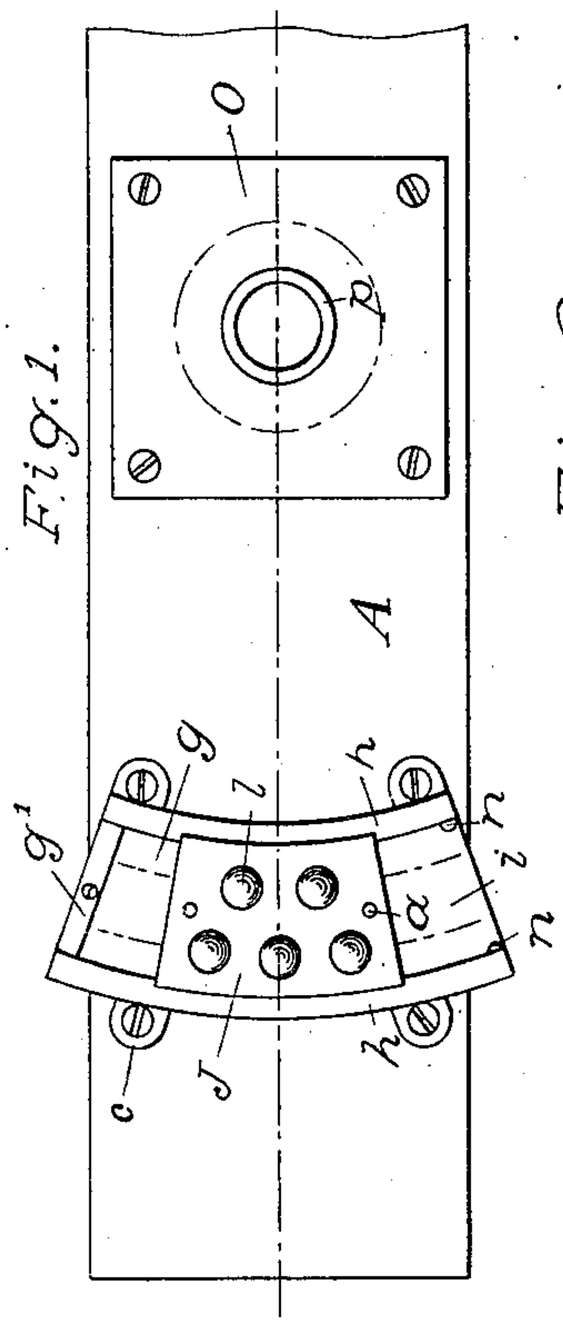


Fig. 2.

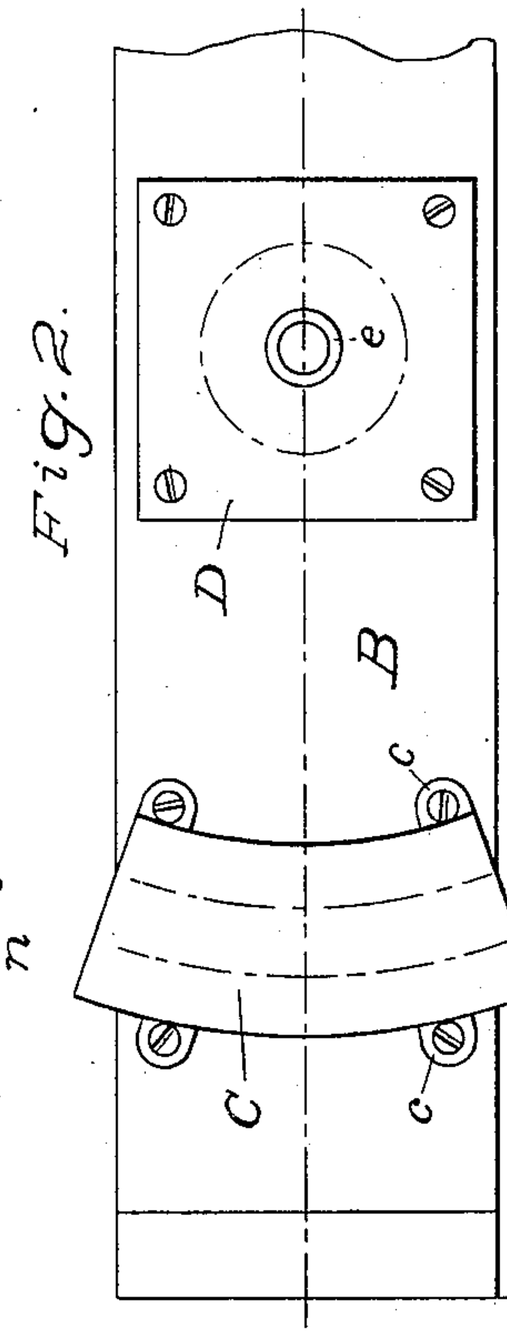


Fig. 3.

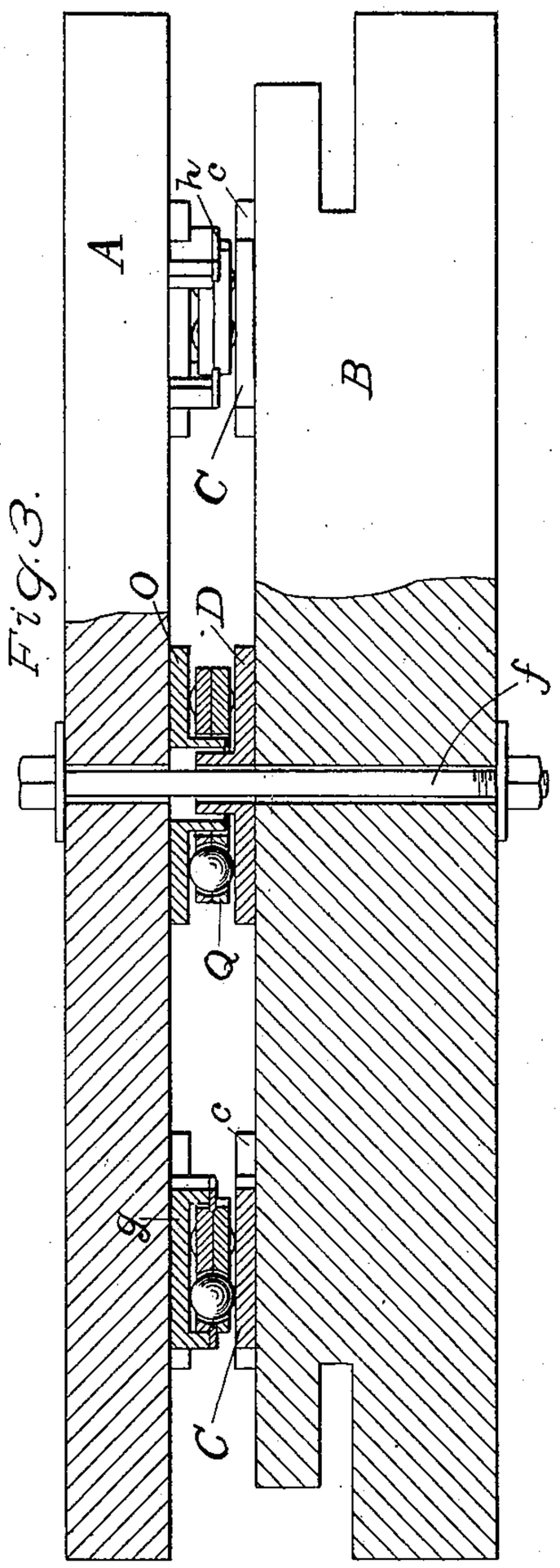


Fig. 4.

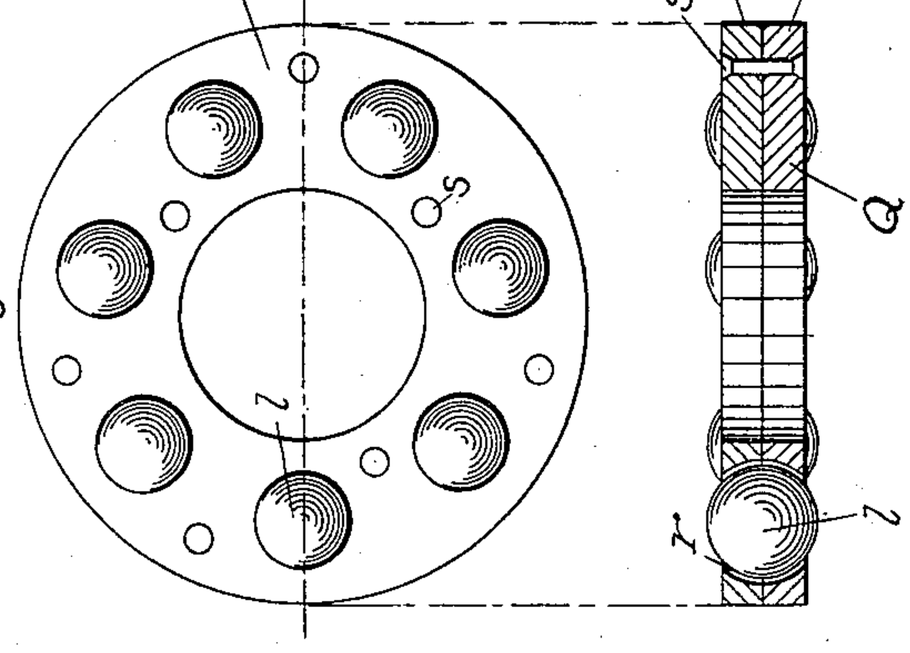


Fig. 5.

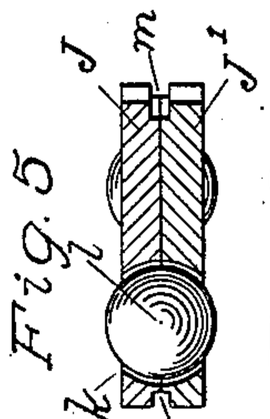
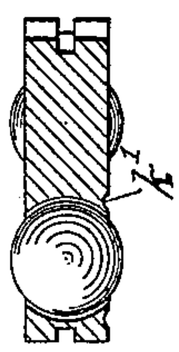


Fig. 6.



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UNITED STATES PATENT OFFICE.

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ANTIFRICTION-BEARING FOR RAILROAD-CARS.

SPECIFICATION forming part of Letters Patent No. 639,684, dated December 19, 1899.

Application filed March 9, 1899. Serial No. 708,311. (No model.)

To all whom it may concern:

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

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

The object of the invention is to provide an improved antifriction ball-bearing that will reduce the friction to a minimum when the moving car is rounding a curve and which will require no special preparation of the car-bolster or truck.

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

Figure 1 is an inverted plan view of the car-body bolster, showing one end at the right hand broken off. Fig. 2 is a top plan view of the truck-bolster, the right-hand end being broken off. Fig. 3 is a vertical front view of the two bolsters, partly in section, and showing the relation of the parts. Fig. 4 shows two views of the ring-traveler bearing. Fig. 5 is a cross-section of the sliding ball-carrying plate. Fig. 6 is a modification.

Referring to the drawings, A designates the car-bolster, and B the truck-bolster, which are provided with my improved construction of bearings.

The truck-bolster B carries at each end a bearing-plate C, which in the present instance are secured in position by means of screws or bolts, which pass through projecting ears *c*, which are integral with said bearing-plates. These bearing-plates C are curved or segment-shaped with respect to the pivot of the truck. The truck-bolster B also carries a center-bearing plate D, which latter is provided at its center with an upward-projecting ring-flange *e*, through which latter the king-bolt *f* passes to couple the car-body and truck together.

The car-bolster A on its under side carries at each end a bearing-plate *g*, which latter have position directly over the bearing-plates C on the truck-bolster. These bearing-plates *g* are also curved or segment-shaped with respect to the center bearing, and each plate is provided at either side with guide-flanges *h*, and a flat bearing-surface *i* has position between the said guides. A ball-carrying frame J is mounted in the guide-flanges *h* and is free to slide therein. This frame J in the present instance consists of two plates *j j'* in contact with each other, with circular holes *k* to receive the balls *l*, and said two plates are secured together by rivets *a* to keep the balls separate and retain them in the same relative position with respect to each other. In the construction of the ball-carrying frame as shown in Fig. 5 it will be understood that each plate is first drilled where a ball is to be used to form a round hole and then the hole is reamed out to form a curved countersink *k*. The balls are then seated in the countersunk holes of the lower plate and the upper plate is then placed on the lower plate, which brings together the largest diameters of said two countersunk holes, converting the ball-retaining hole into a cage-hole, and the two plates are then riveted together, which leaves the opposite sides of all the balls protruding slightly beyond the upper and lower surfaces, respectively, of said plates *j j'*, as shown in Fig. 5. It will be seen that when the balls of this movable frame J are in contact with the upper and lower bearing-plates *g* and C the said frame is at such time suspended entirely by the balls, which results from the construction of the cage-holes, leaving the upper and the lower portions of the balls projecting. The guide-flanges *h* on the upper bearing-plates suspend the movable frame J only when the position of the car-body is such that the balls are not in contact with the said upper and lower bearing-plates. It is to be understood that while I show and describe these frames J as consisting of two plates each provided with countersunk holes I do not limit my invention to that construction, as a single plate may be employed, as shown in Fig. 6, where the lower edge *k'* of the metal is crimped in around the ball.

The ball-carrying frame J is provided at either side with guide-grooves *m*, which latter receive the guides *h* of the bearing-plate. The bearing-plates *g* at one end are each provided with a removable cross-bar *g'*, which serves as a stop to prevent the ball-carrying frame J from becoming disengaged from the

guides *h*, and at the opposite end and beneath the guide-flanges *h* each bearing-plate *g* is provided with a stop-lug *n* to prevent the ball-carrying frame J from becoming disengaged from the guides *h* at that end. Thus it will be seen that the ball-carrying frame J has a sliding movement on the bearing-plates between the movable cross-bar *g'* and the stops *n*. It will also be seen that in case it is desired to remove said frame J from the guides it will not be necessary to jack the car up, but simply to remove the small cross-bar *g'*, and the frame J may then be drawn out.

In further carrying out my invention I provide the car-bolster A at its center with a bearing-plate O, provided with a downward-projecting ring-flange *p*, which latter takes over the upward-projecting ring-flange *e* on the bearing-plate D, and said two ring-flanges *e* and *p* serve to relieve the king-bolt *f* of lateral strain. Another ball-carrying frame Q is provided for the center. This frame is ring-shaped and surrounds the ring-flange *p* and forms the center bearing. This ring-frame in the present instance is constructed substantially in the same manner as the sliding ball-carrying frames J—that is, in two plates. In the present instance the ball-retaining plates are designated *q q'*, with the balls projecting above the top and below the bottom through the circular holes or openings *r*. The plates in this instance are also secured together by rivets *s*; but I may mount the balls in circular openings formed in a single plate and then secure each ball independently, as shown in Fig. 6. It will be seen that the balls of this ring-shaped frame have their upper projecting portions and lower projecting portions always in contact with the respective bearing-plates O and D, and the balls are free to turn in their sockets in all directions, and that the ring-shaped frame Q is suspended entirely by the balls and is free to move concentrically forward or backward as the truck may be turned.

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

1. In an antifriction-bearing for railroad-cars the combination of lower bearing-plates mounted on the truck-bolster; upper bearing-plates, *g*, mounted on the car-bolster above said lower bearing-plates and provided with parallel guides, *h*; a ball-carrying frame, J, provided at each side with a groove, *m*, which receive the said guides; a plural number of balls each mounted independently in a cage-hole and free to turn in all directions and projecting above and below said frame whereby when the balls are not in contact with the said upper and lower bearing-plates the frame is suspended by the parallel guides, and when the balls are in contact with said bearing-surfaces the said frame is suspended entirely by the balls substantially as described.

2. An antifriction-bearing for cars having in combination a bearing-plate mounted on the truck-bolster; a bearing-plate mounted on the car-bolster; a ball-carrying frame comprising an upper and lower plate in contact with each other and secured together each of said plates being provided with a plural number of circular-shaped holes, the holes of the upper plate and those of the lower plate on their contacting faces being reamed out or countersunk and in register with each other; and balls carried in said reamed-out holes and projecting above and below the said plates and free to turn in all directions, whereby the said frame will be movable and suspended by said balls between the said upper and lower bearing-plates, substantially as described.

3. An antifriction-bearing for railroad-cars having in combination a bearing-plate, C, mounted on the truck-bolster; a bearing-plate, *g*, mounted on the car-bolster above said bearing-plate and provided with parallel guides; a ball-carrying frame provided with a plural number of circular-shaped cage-holes; balls carried in said holes and projecting both above and below said frame and adapted to suspend the frame between the said upper and lower bearing-plates when the balls are in contact with the said upper and lower plates; a removable cross-bar, *g'*, at the end of the upper bearing-plate which confines the ball-carrying frame, J, but allows it to be taken out on the removal of the said bar, substantially as described.

4. An antifriction-bearing having in combination two bearing-plates; a ball-carrying frame between said two plates and provided with a plural number of circular-shaped cage-holes; balls confined in said cage-holes and projecting on both sides of said frame whereby the projecting parts bear on the said two plates and the ball-carrying frame is suspended by the balls, as set forth.

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

JOHN E. NORWOOD.

Witnesses:

CHARLES B. MANN, Jr.,

GEO. KOETHER.