No. 703,148. Patented June 24, 1902.

S. W. McMUNN & E. S. WOODS.

ROLLER SIDE BEARING FOR RAILWAY CARS.

(Application filed Nov. 4, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig 1

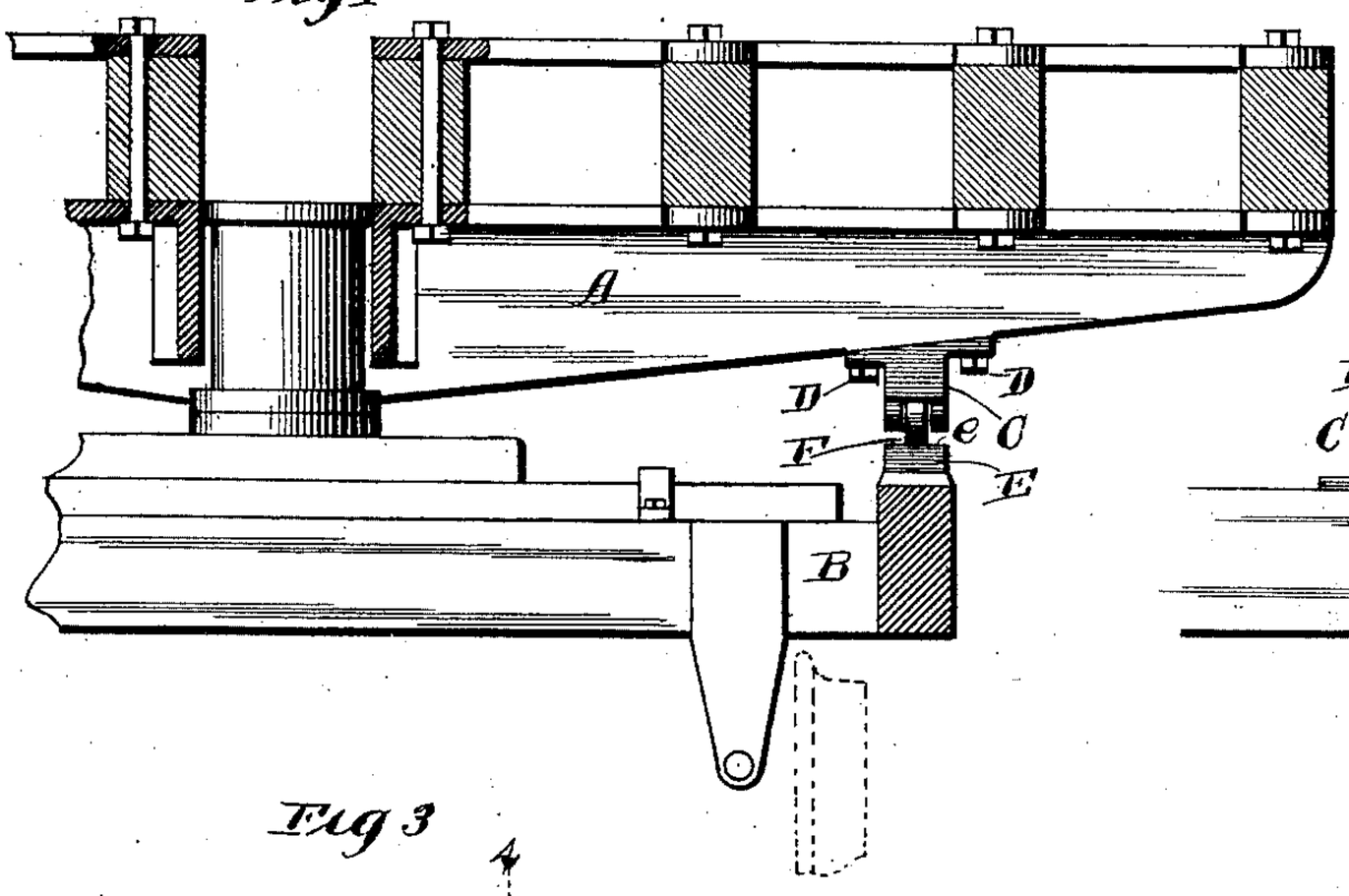

Fig 2

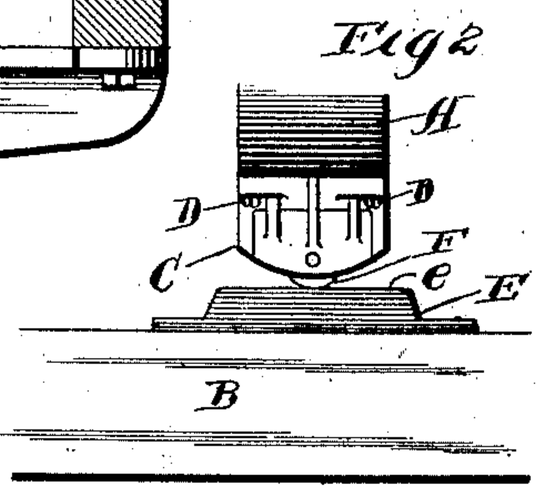

Fig 3

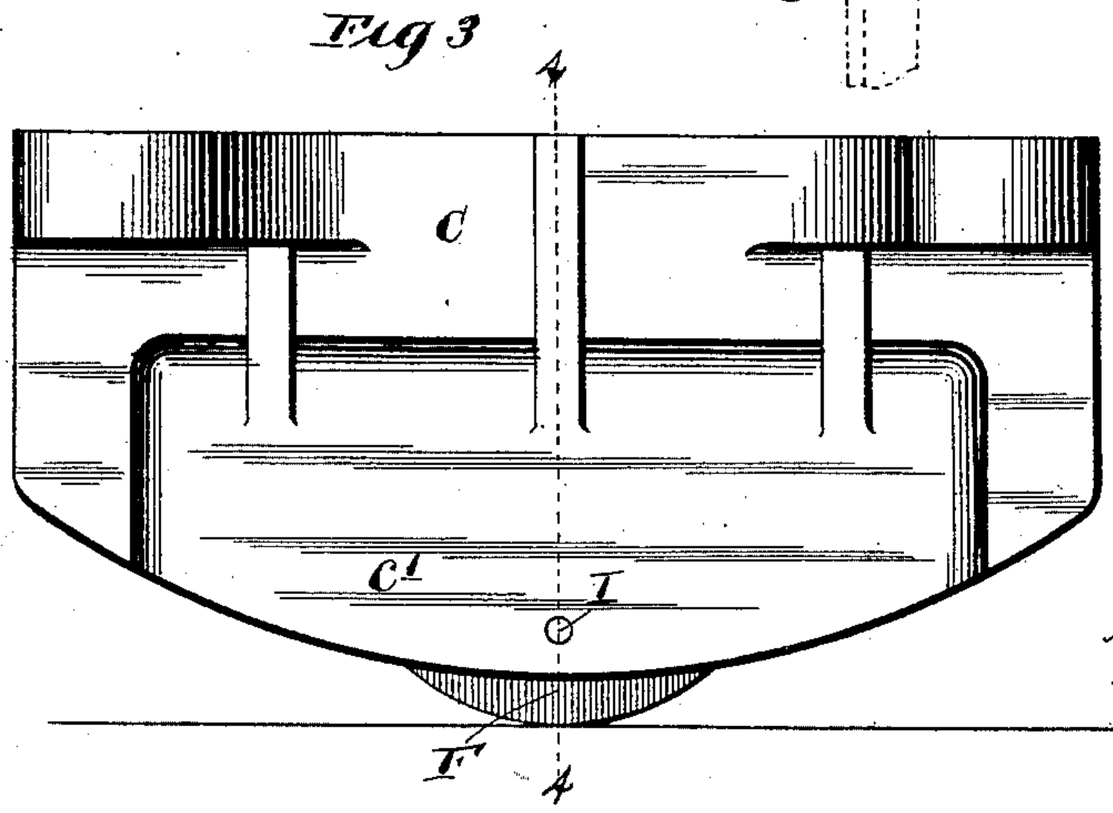

Fig 4

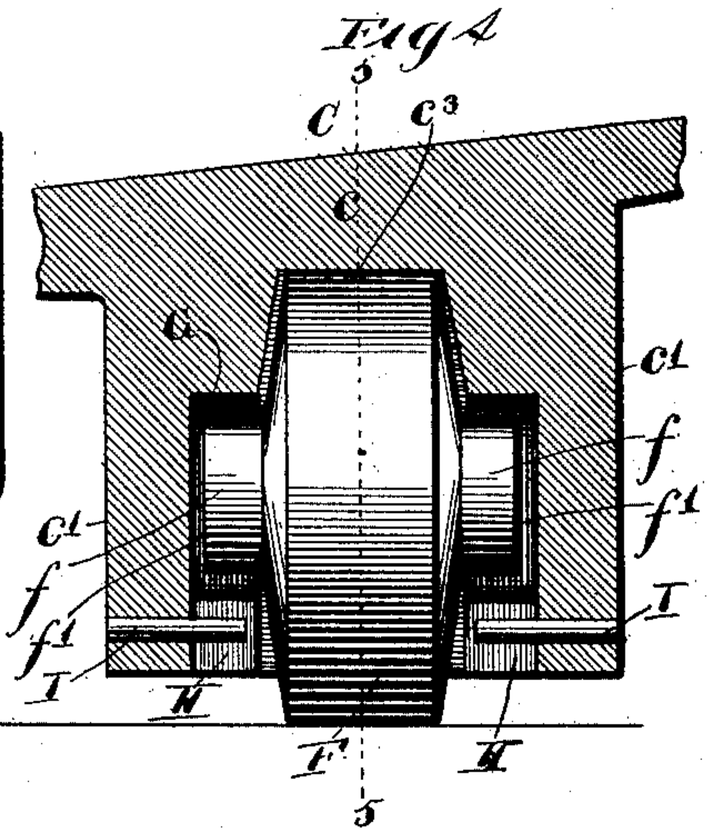

Fig 5

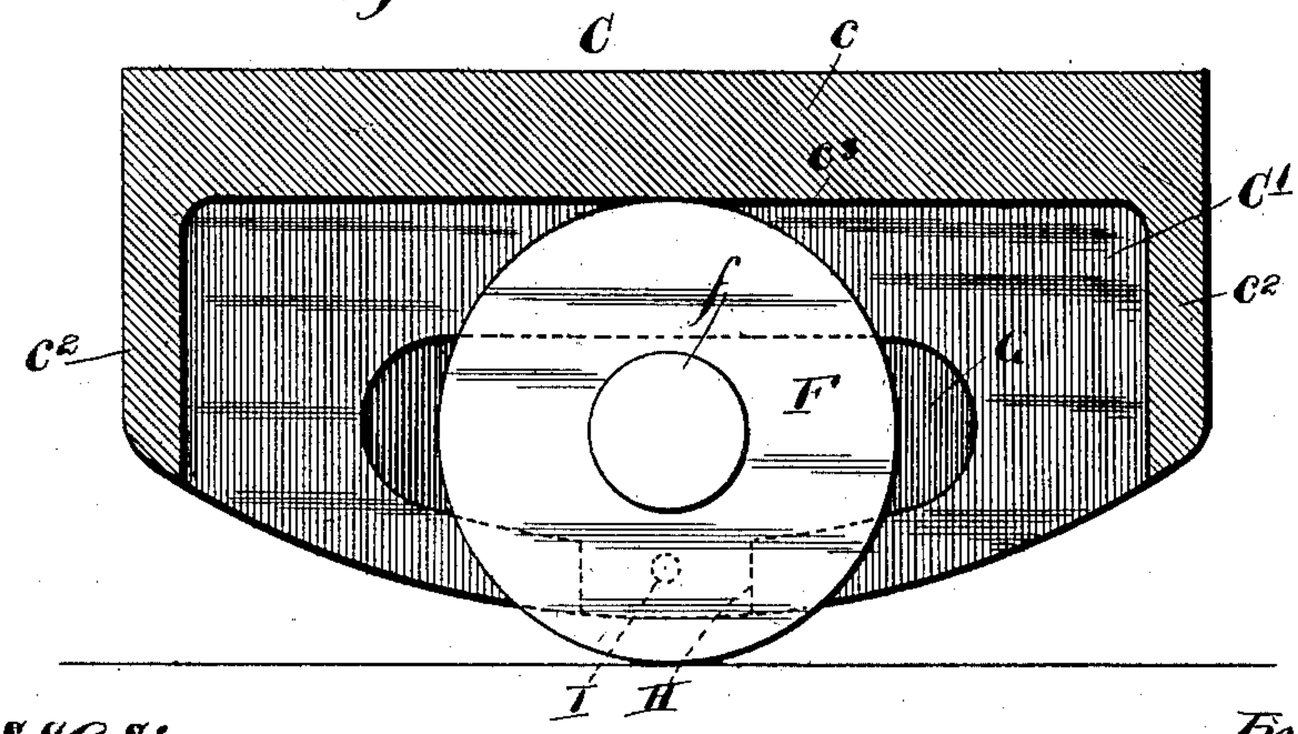

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Fig 6

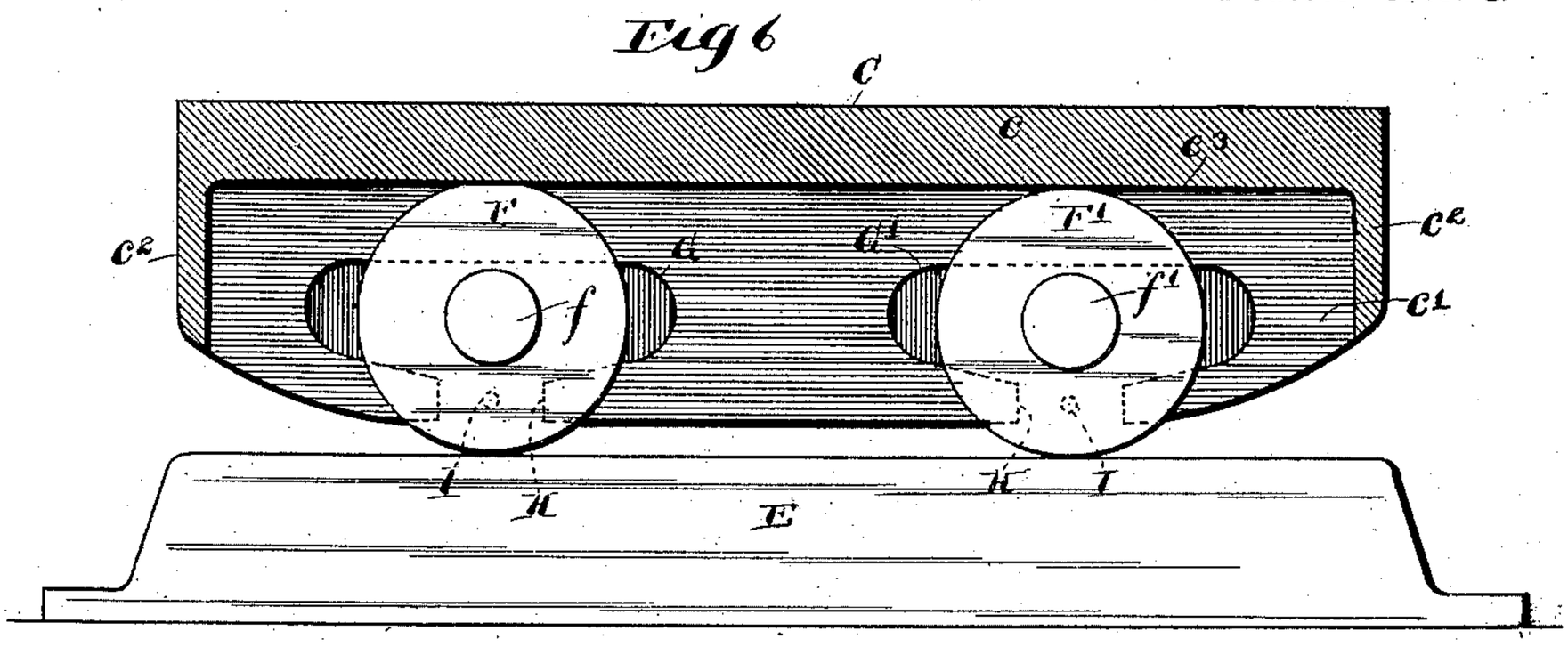


Fig 7

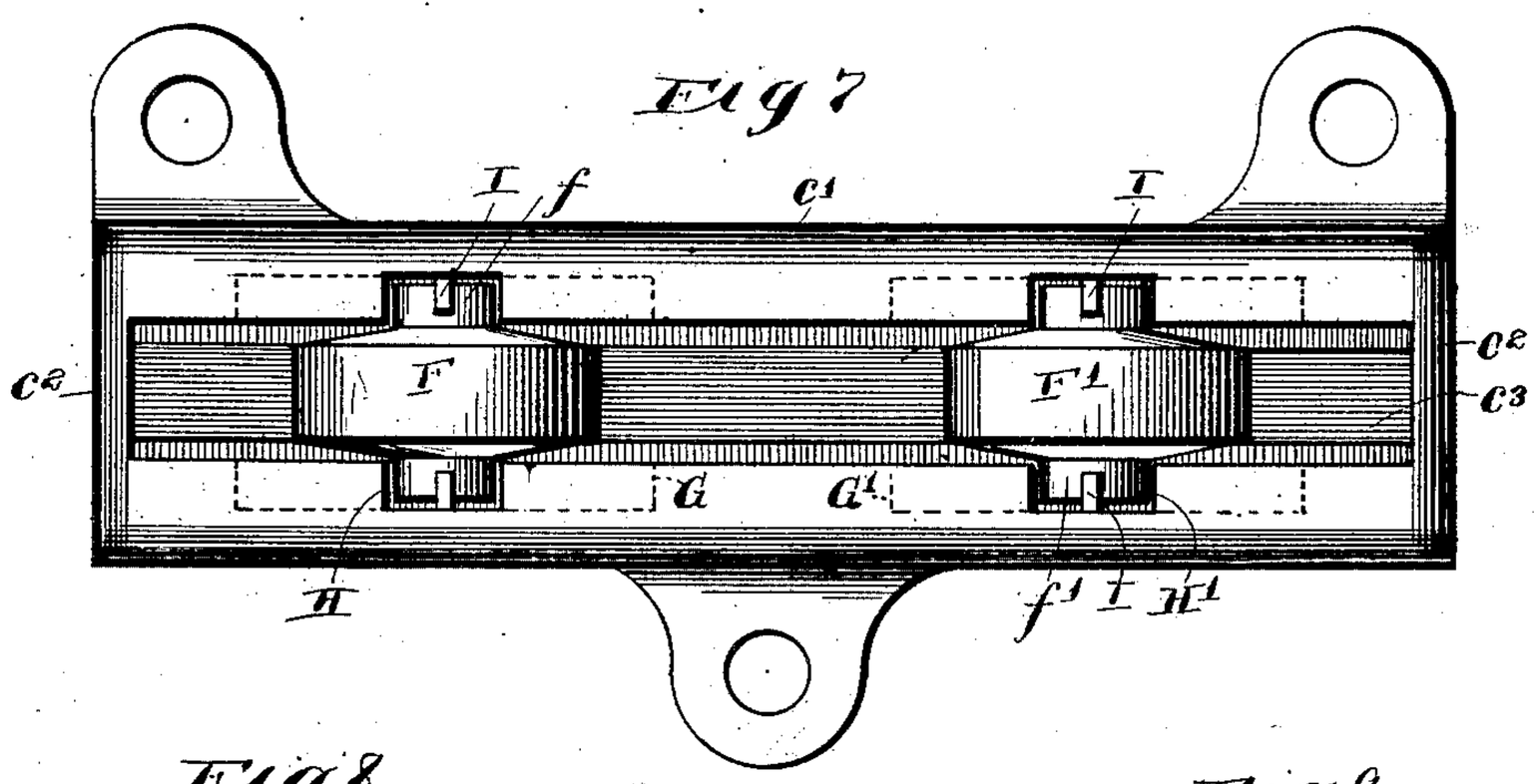


Fig 8

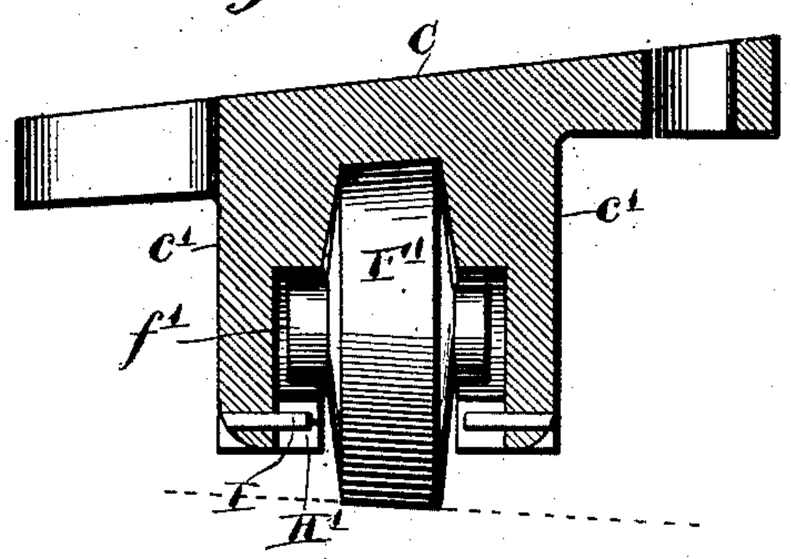
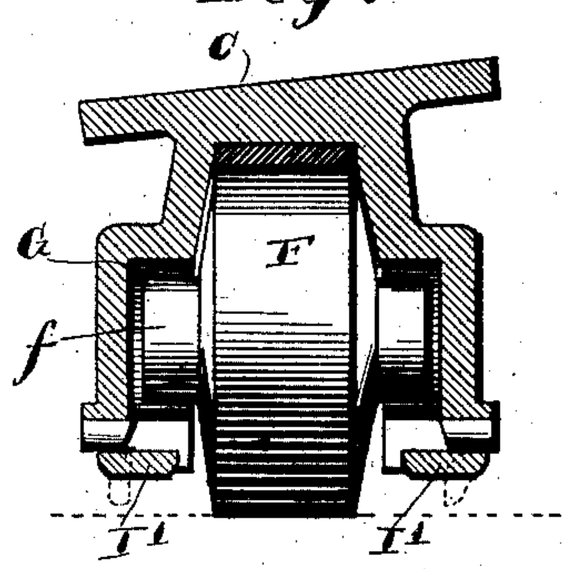


Fig 9



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UNITED STATES PATENT OFFICE.

SAMUEL W. McMUNN AND EDWIN S. WOODS, OF CHICAGO, ILLINOIS.

ROLLER SIDE BEARING FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 703,148, dated June 24, 1902.

Application filed November 4, 1901. Serial No. 80,997. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL W. McMUNN and EDWIN S. WOODS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Roller Side Bearings for Railway-Cars; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in roller side bearings for railway-cars.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the following claims.

Figure 1 is an end elevation of a side bearing embodying the invention attached to a body-bolster and a truck-bolster. Fig. 2 is a side elevation of the bearing. Fig. 3 is a side elevation, on a larger scale, of the bearing. Fig. 4 is a vertical cross-section on line 4 4 of Fig. 3. Fig. 5 is a vertical longitudinal section on line 5 5 of Fig. 4. Fig. 6 is a longitudinal vertical section of a modified form of the device. Fig. 7 is a plan view of said modified form. Fig. 8 is a transverse section of a modification, showing a conical form of roller. Fig. 9 is a transverse section of a still further modification.

A device in which our invention is embodied embraces in general terms a metal roller horizontally journaled in a bearing-casting on the under side of the body-bolster of a car and so disposed that upon any tendency of the body and truck bolsters, which are normally in parallel horizontal planes, to assume vertical angular relations from the swaying of the car or the tilting of the truck while rounding curves the periphery of the roller will come in contact at diametrically opposite points with a bearing-surface on the bearing-casting and a bottom side bearing on the truck, thereby, in effect, giving a roller-bearing between the outer portions of the body-bolster and truck which checks the oscillation of the car-body and at the same time permitting free horizontal angular swinging of the truck while passing around curves and switches. The bearings of the roller are so arranged that the contact with the bottom side bearing lifts the roller off from its trunnions or journal-bearings, whereby the vertical stress is taken by the roller and not by the trunnions, thereby enabling the trunnions to be made relatively small in diameter and the bearings therefore correspondingly light. At the instant of release from such contact the trunnions of the roller fall back into engagement with their bearings, and said bearings are so made that the roller resumes its normal position, thereby presenting new points of surface for the next instant of peripheral contact with the side bearing.

Referring to the drawings, A represents a portion of a body-bolster of a car, and B the corresponding part of the truck. A bearing-casting C is secured by bolts D or other suitable means to the under side of the body-bolster near its outer end. A bottom side bearing E is suitably secured to the upper face of the truck-bolster B opposite said bearing-casting. A roller F is horizontally journaled in said bearing-casting C, with its axis normally perpendicular to the longitudinal axis of the car. Said bearing-casting comprises a base-plate *c*, with depending parallel side walls or flanges *c'*, stiffened by suitable ribs, as shown in the drawings, and by cross-flanges c^2, which connect the ends of said side flanges. Said base-plate *c* is further fashioned so that the part of its outer surface c^3 which is inclosed between the flanges is practically parallel to the bottom of the car-body. The roller F has trunnions *f*, which run in parallel horizontal channels G, formed on the inner surfaces of the side flanges *c'* of the bearing-castings. Said channels are of sufficient depth to give clearance beyond the ends *f'* of the trunnions and have a width greater than the trunnion-diameters. The radius of the roller and the distance between the center lines of the channels G and the bearing-surface c^3 of the casting are so proportioned that when the periphery of the roller is in contact with the bearing-surface c^3, Fig. 4, the trunnions *f* are out of contact with both the upper and lower faces of said channels, and the weight of the bolster and the parts carried thereby is transmitted to the bearing-plate E directly through the larger part of the roller without bringing stress upon the trunnions. The distance be-

tween the outer edges of the said flanges c' and the bearing-surfaces c^3 is less than the diameter of the roller, so that the latter projects below the side flanges. Said channels are of such length as to arrest the travel of the roller along the surface c^3 before it is brought into contact with the end flanges c^2, the end surfaces of the channels G constituting stops which engage the trunnions to arrest the travel of the rollers. This construction prevents frictional contact between the periphery of the roller and the end flanges c^2 of the casting, which would obviously result in a greater impediment to the rotation of the rollers than would be caused by the frictional contact between the trunnions and the end surfaces of the channels. The trunnions may be made relatively small, as the weight brought upon the bolster is transmitted through the roller and not through said trunnions. Furthermore, the lower faces of the channels which constitute the bearing-surfaces for the roller-trunnions when the roller is free are not straight, but curved or inclined downwardly, so that their lowest parts approximate the vertical center line of the casting. This inwardly-inclined arrangement of the lower bearing-surfaces of the channels permits the rollers when free to return by gravity from the outer to the central parts of said castings. In other words, when the end of the bolster is raised to free the upper bearing-surface c^3 of the bearing-casting from the roller the trunnions of the roller rest in contact with the inclined lower surfaces of the channels and the weight of the roller causes the same to travel or move inwardly over said inclined parts of the channel to its central position.

To permit the mounting of the roller in its bearings, the side flanges c' are provided centrally with upwardly-opening notches or grooves H, which intersect the channels. When the roller is inserted in place, the trunnions thereof pass through said vertical notches, and the roller is prevented from dropping out therethrough by means of suitable stops I passing across said notches. As shown in the drawings, said stops comprise pins passing through the said flanges across said notches. Said notches may also have the form of lugs I', formed integrally on the casting C and adapted to be bent inwardly into said notches H in the manner shown in Fig. 9 to prevent the rollers dropping out of place. In case the lugs be provided apertures i for the pin form of stops will also be desirably formed in the flanges in order to permit the pins to be used should injury occur to the lugs. The construction shown affords a ready means for inserting the rollers in place and for retaining the same therein after they have been placed in position.

The operation of the device is obvious. The bottom side bearing on the truck and the bearing-casting are so disposed that in the normal position of the car the bearing-surface c^3 of the casting C and the surface e of the bottom side bearing are practically parallel. Said parts may be proportioned to give suitable clearance between said bottom side bearing and the roller in the normal positions of the truck, which roller under such condition is supported on its trunnions in the lowest parts of the trunnion-channels G. When the truck and body bolsters assume vertical angular relations due to the oscillation of the truck from any cause, the roller is lifted off its trunnions by the bottom side bearing and into peripheral contact with the bearing-surface c^3 of the bearing-casting, thereby affording a rigid side bearing, which tends to check the swaying of the car. In the horizontal swing or angular movement of the truck, as in passing around curves, the roller rolls in contact with said surfaces, the movement of the surfaces relative to each other being necessarily twice that of the roller. When the car sways, so that the side bearing momentarily releases the roller from such peripheral contact, the roller-trunnions drop into bearing with the lower curved or inclined surfaces of the channels and rolls back on its trunnions to its normal central position in the lowest part of the channels. As the diameter of the roller is greater than the diameter of the trunnions, the angular velocity of the periphery of the roller and its consequent rotation are greater on the return to the normal position than on the outward movement therefrom, and consequently new points of surface are presented for engagement at the next instant of contact between the roller and bearing-surfaces. It is also apparent that the bearing-surfaces and the roller may be so adjusted, if desired, as to bear upon the bottom side bearing and its bearing-casting when the car-body and truck are in their usual relative positions. In such instance the separation of the parts when rounding curves or from any other cause momentarily releases the roller and permits it to shift its wearing or contact points as before.

In practice the surface of the roller and its bearing-casting may be hardened to minimize wear.

The form of the roller-bearing is such that the lodging of particles of dirt or dust therein is prevented, and consequently there is minimum liability of the device becoming clogged.

In Figs. 6 and 7 a bearing is shown which comprises two rollers F and F', mounted parallel to each other in trunnion-channels G and G', similar to the channels already described. The rollers are separately mounted in the bearing-casting, the bearing-channels G G' for the trunnions thereof being separate and independent and each having separate means for introducing the rollers thereinto. This form having two or more rollers may be found expedient to use under certain conditions.

In Fig. 8 a roller F is shown which has the

form of a frustum of a cone, and said roller is placed with its smaller diameter nearest the car center.

Among the advantages gained by the construction shown are that the device is simple and compact and the cost of manufacture and application to the cars is very low. The pressure of the car on the side bearings is carried directly by and through the roller and not by the roller trunnions or journals, the latter being free at all times from vertical pressure and are subject to slight horizontal stress only when the most extreme turning of the truck brings them momentarily against the end walls of the trunnion-channels. It is also obvious that as the roller has only half the movement of the surfaces between which it is interposed the shifting of the weight of the car on the side bearings from the normal load-line of the truck-bolster, which is the longitudinal axis of said bolster, by the swinging of the truck is minimized, and under usual working conditions the point of application remains so close to the center line as to have very little torsional or tilting effect upon the bolster. Furthermore, the arrangement of parts is such that the roller is constantly presenting new points for contact, and therefore the wear is uniform. Consequently there is little tendency of the roller to become flattened by irregular wear.

It will be noted that in both forms of the device—to wit, the single and double roller construction—the peripheries of the rollers do not have sliding frictional contact with the bearing-casting at the ends of their travel, nor do the rollers have sliding frictional contact with each other. The friction is thereby reduced to a minimum, and the efficiency of the device is correspondingly high.

We claim as our invention—

1. A side bearing for railway-cars comprising upper and lower castings having normally parallel bearing-surfaces, a single roller adapted for contact with said bearing-surfaces, and trunnions on said roller which travel in channels or ways in said upper casting, the lower surfaces of which channels are inclined from the ends thereof toward the center, said trunnions being out of contact with the bearing-surfaces of the channels when the roller has contact with the parallel bearing-surfaces of the castings.

2. A side bearing for railway-cars comprising upper and lower castings having normally parallel bearing-surfaces, a roller adapted for contact with said bearing-surfaces, and trunnions on said roller which travel in channels or ways in said upper casting, the lower surfaces of which are inclined from the ends thereof toward the center, said trunnions being out of contact with the bearing-surfaces of the channels when the roller has contact with said parallel bearing-surfaces of the castings, and the ends of said channels or ways constituting stops to arrest the bodily movement of the roller with respect to said bearing-surfaces.

3. A side bearing for railway-cars comprising upper and lower castings having normally parallel bearing-surfaces, the upper casting being provided with depending side and end flanges forming an inclosed space to receive a roller, a roller located in said space and adapted for contact with said bearing-surfaces, trunnions on said roller which travel in channels or ways formed in the side flanges of the casting, the lower surfaces of which channels are inclined, said trunnions being out of contact with the bearing-surfaces of the channels when the roller has bearing with said parallel bearing-surfaces of the castings, and the ends of said channels constituting stops to arrest the bodily movement of the rollers before said rollers are brought into contact with the end flanges of the upper casting.

4. A side bearing for railway-cars comprising upper and lower castings having normally parallel bearing-surfaces, of a roller adapted for contact with said bearing-surfaces, and trunnions on said roller which travel in channels or ways in said upper casting, the lower surfaces of which channels are inclined from the ends thereof toward the center, said trunnions being out of contact with the bearing-surfaces of the channels when the roller has contact with the parallel bearing-surfaces of the castings, upwardly-opening slots in said upper casting, intersecting said channels and through which the trunnions of the rollers pass when the rollers are inserted in place, and removable stops projecting into said slots.

In testimony that we claim the foregoing as our invention we affix our signatures, in presence of two witnesses, this 7th day of October, A. D. 1901.

SAMUEL W. McMUNN.
EDWIN S. WOODS.

Witnesses:
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TAYLOR E. BROWN.