J. A. PERKINS.

ROLLER BEARING.

APPLICATION FILED AUG. 14, 1903. RENEWED AUG. 28, 1908.

900,199. Patented Oct. 6, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

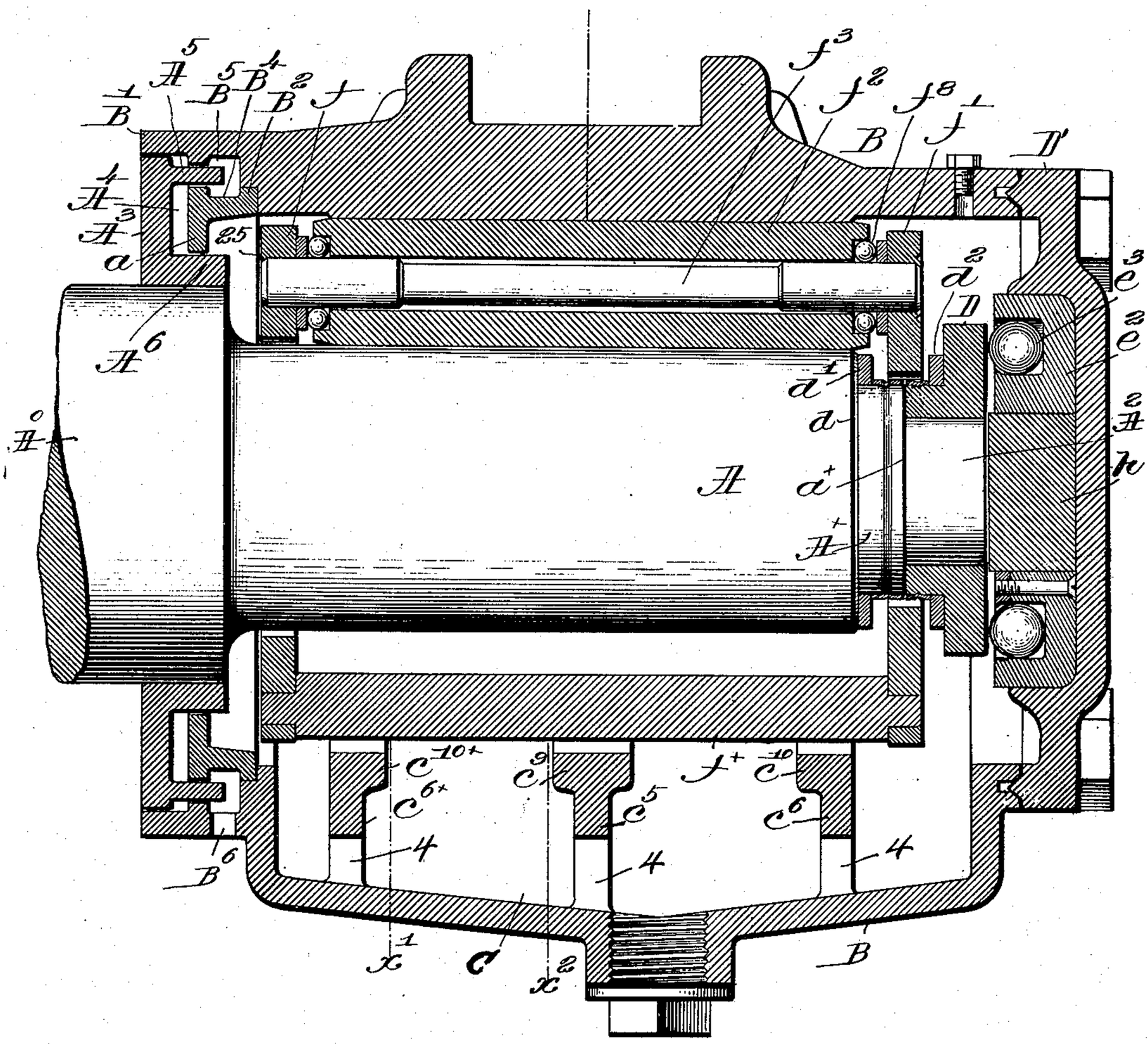
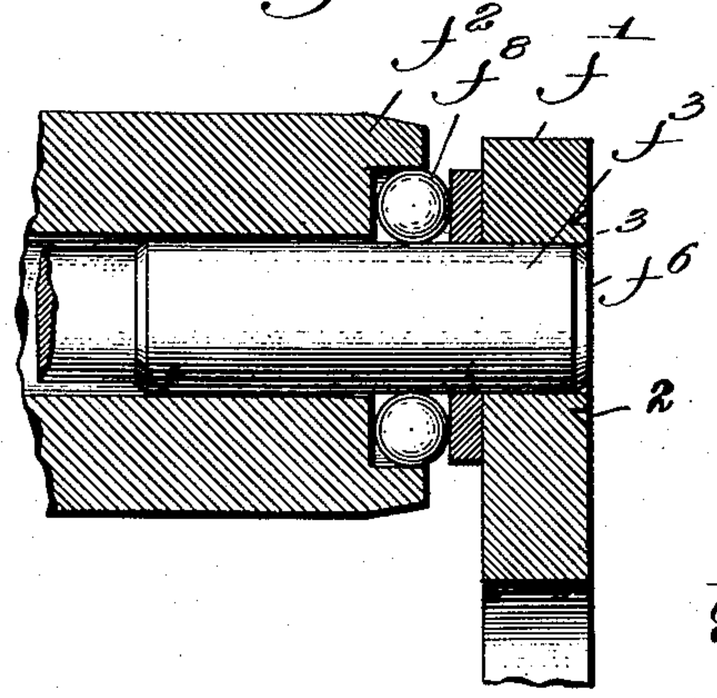


Fig. 1a.



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2 SHEETS—SHEET 2.

Fig. 3.

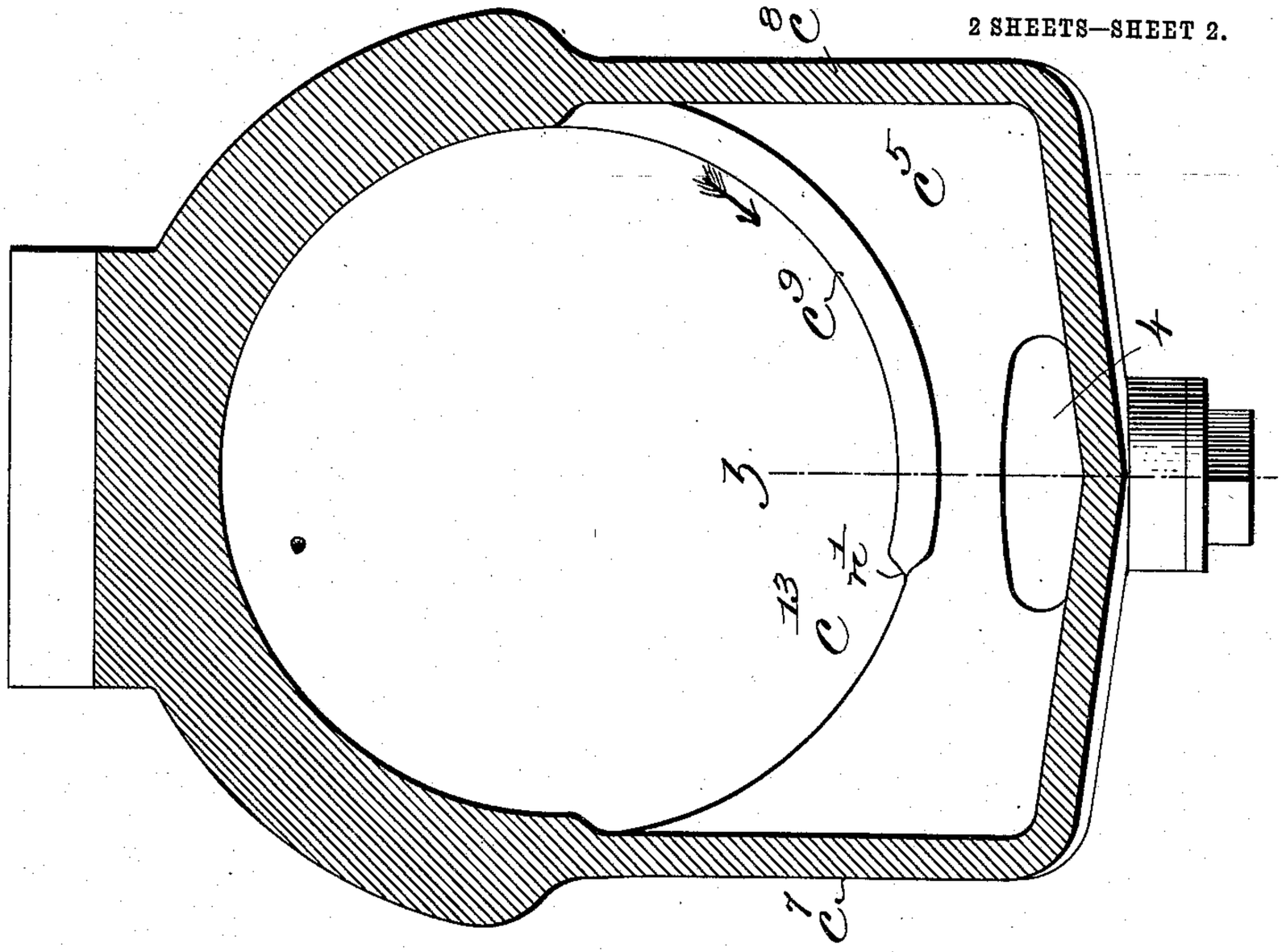
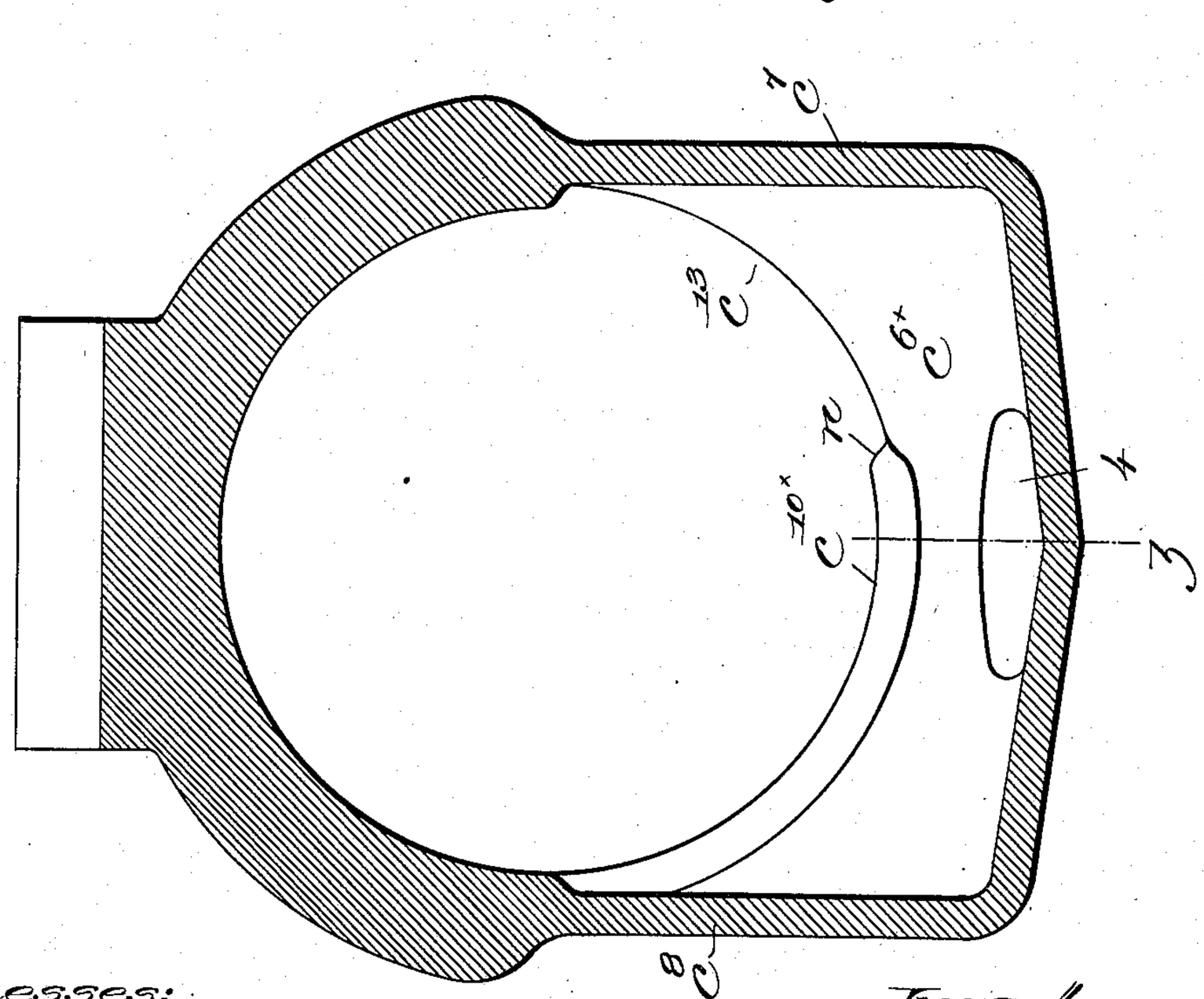


Fig. 4.



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UNITED STATES PATENT OFFICE.

JULIUS A. PERKINS, OF OMAHA, NEBRASKA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED STATES ROLLER BEARING COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ROLLER-BEARING.

No. 900,199. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed August 14, 1903, Serial No. 169,500. Renewed August 28, 1908. Serial No. 450,743.

To all whom it may concern:

Be it known that I, JULIUS A. PERKINS, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented an Improvement in Roller-Bearings, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its aim to improve, strengthen, and simplify the construction of roller bearings of the class shown in United States Patent No. 664,820, dated December 25, 1900.

The box in the patent referred to contains in its lower half a series of roller-sustaining arms or tracks that extend but partially across a residuum-receptacle in the bottom of said box. The arms or tracks crossing the residuum-receptacle and unsupported at their lower sides, had, to afford the necessary strength, to be made broader than desirable taking into consideration the length of the box. Theoretically these arms or tracks should be as narrow as practicable, and in decreasing their width, to insure the required strength, I have provided said receptacle with a series of webs rising from the bottom thereof, the upper edges of which are shaped and adapted to serve the purpose of tracks, the tracks being wider than the webs and preferably integral therewith. This construction, besides affording tracks of the desired width and strength also enables the strength of the lower half of the box to be increased and the weight of the box to be reduced.

In the patent referred to the oil in the residuum-receptacle was free, as the bearing was run, to slosh from end to end of the receptacle, and on meeting one end of the box the oil would slosh up and onto but a part of the bearing-rollers and cage at one end thereof. By providing the box with a plurality of webs standing in the residuum-receptacle the oil will be sloshed uniformly over the entire length of the bearing-rollers. The webs have openings by which the oil in the box may retain the same level.

Figure 1 in elevation shows part of the journal of a railroad car shaft with its box and intermediate parts in section; Fig. 1ª is an enlarged detail showing parts of a cage-end spindle and bearing roller, the spindle-end being unsecured in the cage end; Fig. 2 is a section through the box to the left of the dotted line x', Fig. 1; Fig. 3 is a section through the box to the right of the dotted line x^2, Fig. 1.

Referring to the drawing, A represents one of the journals of a car-axle A^0, having a reduced portion $A^\times$ and a tenon A^2. The axle near the inner end of the journal is surrounded by a collar A^3 the face of which next the box is provided with a space A^4 leaving an exterior flange A^5 and an interior flange A^6.

The box B has on its rear end a flange B′, and inside said flange the box has extended from it and fast with relation thereto a ring B^2 having its outer end flanged, the width of the flanged end of the ring at its outer end being such as to nearly fill the space in the collar, the inturned flange of the ring substantially touching the inner flange of the collar and preventing oil in the residuum chamber and substantially filling the same from escaping from the box. The exterior of the ring has an annular groove B^4, and the flanged part of the box opposite said groove has an annular groove B^5.

When the box and shaft are in running condition as in the drawings, the outer flange of the box substantially overlaps the collar and nearly touches the same, and the outer flange of the collar enters the space between the inner side of the flange of the box and the exterior of the ring connected with the box, the end of the flange A^5 terminating in the annular grooves B^4 and B^5 which constitute a waterway having an outlet B^6 below the journal.

The collar and box constructed as described prevent water and dust entering the bearing so as to injure the bearing-rollers and journal, and at the same time the oil in the residuum-receptacle in the bottom of the box to be described is prevented from escaping from the box.

The underside of the box is chambered at C to constitute a residuum-receptacle, and this chamber, in practice filled with oil, has webs c^5, c^6, $c^{6\times}$, integral therewith that are connected with the opposite sides c^7, c^8, of the box. The tracks c^9, c^{10}, $c^{10\times}$, at the upper edges of these webs extend alternately from opposite sides of the box and are wider in cross section than the thickness of each web. The tracks extend about the tops of the webs for a distance a little in excess of 90°, so that the extremities n and n' of the

alternate tracks pass beyond the vertical lines *z*, Figs. 2 and 3, or said extremities overlap one another in a direction crosswise of the box, so that for instance, before a bearing-roller runs off the extremity n' of the central track c^9 carried by web c^5, said roller will get well onto the two tracks c^{10} and $c^{10\times}$. When a bearing-roller is moving down along the track c^9, Fig. 3, in the direction of the arrow, the entire length of the roller except where in contact with said track runs over the narrow tops of the webs c^6, $c^{6\times}$, thus enabling any residuum on the roller to drop therefrom into the residuum chamber. Just before the bearing-roller moving as described crosses the line *z*, Fig. 3, and while traveling over track c^9, it comes onto the ends of the two tracks c^{10}, $c^{10\times}$, which sustain said bearing-roller at two points instead of one, and leave free of contact with either track c^{10}, $c^{10\times}$, that part of the bearing-roller that was sustained on the central track c^9.

The omission of the tracks from the webs leaves spaces c^{13} over which the rollers travel freely. There are wide spaces between the tracks over which as the bearing-rollers travel, each roller being left free from external pressure, so that any residuum composed of dust and oil or other foreign matter that may accumulate on the bearing-rollers in use may drop into said receptacle. It will be noticed that the entire length of each bearing-roller is exposed opposite a space as each bearing-roller in its planetary motion passes about the journal.

It is of great importance that the surfaces of the bearing-rollers be kept clean and free from accumulations of any foreign material, for otherwise the bearing-rollers might be thrown out of alinement which would be destructive to the box.

The webs have apertures 4 through them below the tracks so that oil with which said receptacle is filled may find its own level. Further these webs are of great importance, for in the swaying or sloshing of the oil in the residuum-receptacle as the box is being run, the webs and the end of the box cause the oil to be sloshed uniformly over the bearing-rollers throughout their length.

The box is closed at its outer end by a cap D′ held in place by suitable bolts entering screw-threaded portions of the box. The interior of the cap has a recess that receives a ring e^2 provided in its face with an annular groove next the end of the journal, said groove receiving a series of balls e^3 that serve to arrest and prevent wear due to end-thrust.

The tenon at the end of the journal has applied to it a controller D having a radial flange. The inner end of the controller substantially abuts the shoulder $a^\times$ of the reduced part $A^\times$ of the journal. The shoulder *d* of the journal, as well as the inner side of the radial flange of the controller D, each sustain an anti-friction washer d', d^2, which may be of hard-fiber or equivalent material. The cage carrying the bearing-rollers f^2 is composed of two end rings *f*, *f′*, united rigidly by bars $f^\times$, or in any usual manner. The outer ring *f′* overlaps the ends of the bearing-rollers f^2 surrounding spindles f^3 held in the cage-ends. The outer-ring enters loosely the space between the washers d' and d^2, and has a freedom of movement therein sufficient to provide for the flotation of the cage between the journal and the box. Herein in order to enable the bearing-rollers to be brought closer to the car-wheel which will be secured upon the shaft as closely as practicable to the collar A^3 surrounding the same, I have provided for controlling the extent of flotation of the cage from the outer end thereof.

The washers d', d^2 receive the blows of the cage in its rotation with the journal, and are suitably retained in place on the reduced portion $A^\times$ of the journal and on the detachable controller D. The spindles f^3 have their opposite ends tapered or beveled somewhat as at f^6, and they are inserted in holes in the cage. A tapering abutment 25 is formed in that cage-end against which may take seat the beveled end of the spindle first to be inserted in the cage, as for instance the left hand end of the spindle shown in Fig. 1. Outside the hole drilled through the opposite end of the cage I cut an annular groove 2, see Fig. 1^a, leaving a flange 3, and when the spindle has been inserted and the opposite end seated I turn over the flange 3 onto the beveled end of the spindle, as shown in Fig. 1. This locks the spindles firmly against either longitudinal or rotary movement in the cage-end.

I have provided the bearing with an auxiliary frictional end-thrust device herein represented as a block or disk *h* preferably of brass, located centrally in the end-thrust ring e^2, and the face of the disk projects a little to the left, Fig. 1, beyond the face of said ring.

Now, in case the balls e^3 should, due to carelessness in hardening, cut into the face of the controller D′, or into the groove in which the balls run, or for any reason the end-thrust means should become inoperative, the end of the controller D and the end of the tenon, or either, may contact with the disk *h* so that the latter will constitute a frictional end-thrust device. Preferably the disk will be so applied that it may revolve under the action of the journal.

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

1. A box having a residuum-receptacle provided with a plurality of webs crossing the

box and connected with the opposite sides thereof, said webs being provided for part of their length at their upper edges with tracks over which bearing-rollers travel in their planetary movement about the journal of the axle, said tracks being so located as to enable the entire periphery of each bearing-roller in its planetary movement to be exposed above a space of the residuum-receptacle.

2. A roller-bearing comprising an axle having a journal, a cage having bearing-rollers, and a box having in its lower portion a series of webs crossing the bottom of the box and connecting the opposite side walls thereof, the upper portions of said webs having tracks that cross the longitudinal center of the box, each track acting to sustain different portions of the several bearing-rollers as they travel about said journal.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JULIUS A. PERKINS.

Witnesses:
GEO. W. GREGORY,
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