

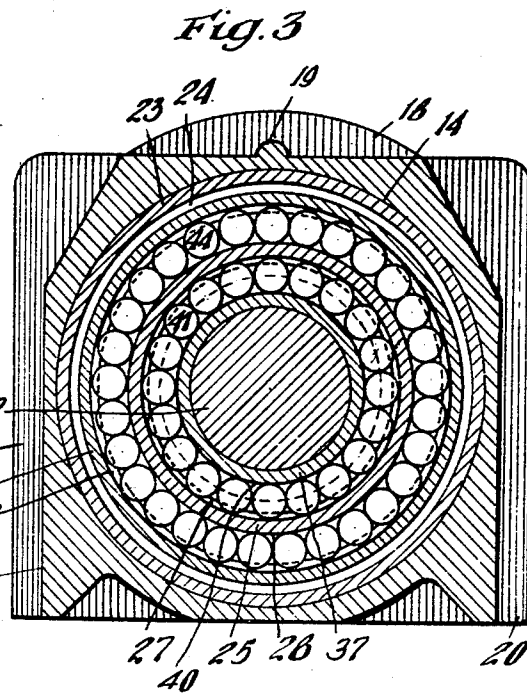
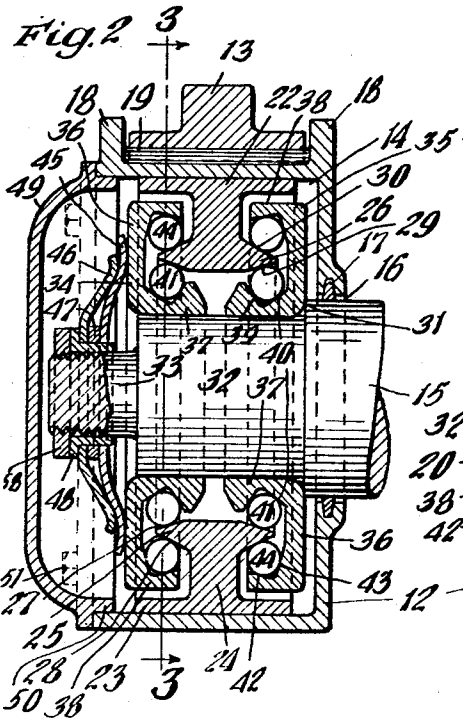
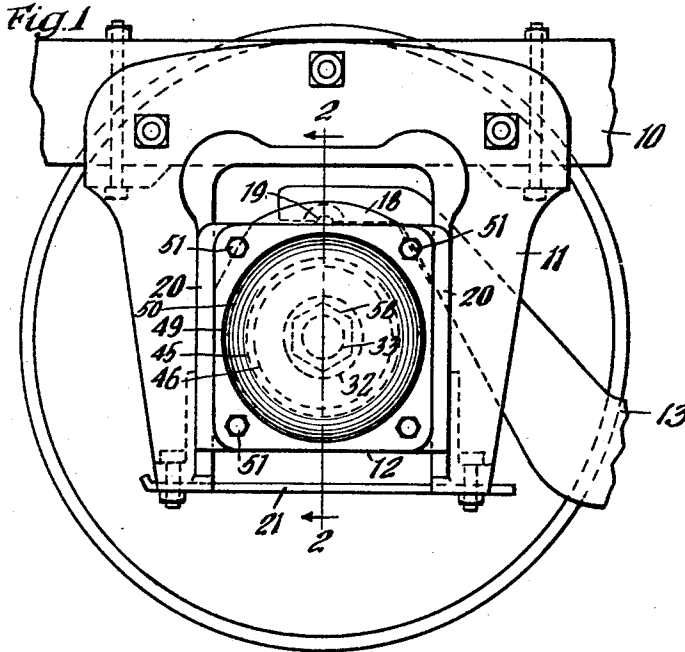
April 14, 1931.

J. F. O'CONNOR

1,800,564

JOURNAL BEARING

Filed Nov. 2, 1927



Witness

Wm. Geiger

Inventor
John F. O'Connor

By George E. Haight
His Atty.

UNITED STATES PATENT OFFICE

JOHN F. O'CONNOR, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. H. MINER, INC., OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

JOURNAL BEARING

Application filed November 2, 1927. Serial No. 230,429.

This invention relates to improvements in journal bearings.

An object of the invention is to provide a ball bearing arrangement, more particularly adapted for use in connection with journal boxes and journals of railway cars, and wherein means are associated with the journal and journal boxes to provide races for a plurality of annular series of balls, said races and balls being so arranged as to place the balls of one series at one side of the journal and the balls of the other series at the opposite side of the journal under load at all times, and to provide a simple construction wherein a minimum number of parts are utilized.

Other and further objects of the invention will more fully and clearly appear from the description and claims hereinafter following.

In the drawings forming a part of this specification, Fig. 1 is a side elevational view of a fragment of a railway car truck, showing a truck pedestal member and the journal box embodying the invention mounted in said pedestal member. Fig. 2 is a transverse vertical sectional view corresponding substantially to line 2—2 of Fig. 1, and Fig. 3 is a vertical sectional view corresponding substantially to the line 3—3 of Fig. 2.

As shown in the drawing, 10 represents a fragment of the body portion of the car truck, and 11 represents a common type of pedestal member mounted thereon, having the usual spaced jaws, between which is slidably disposed a journal box 12, in connection with which the invention is utilized. The numeral 13 indicates one end of an equalizer bar which bears upon the top of the journal box 12, and transmits the load from the frame of the truck to the top of the journal box, which, in turn, transmits the load to the axle.

The journal box comprises side, top, bottom and rear walls, and is of hollow construction having a centrally disposed annular recess 14 adapted for the reception of the journal 15. The journal 15 projects through an aperture 16 in the rear wall of the journal box, and the edge of the rear wall, defining the aperture 16, is provided with a groove

for the reception of packing material 17. The top wall of the journal box A is provided with the usual spaced flanges 18—18, and an equalizer seat 19 for the reception of the grooved end of the equalizer bar 13. The side walls of the journal box are also provided with spaced flanges indicated at 20—20, the latter flanges being adapted to fit upon the opposite sides of the pedestal jaws to provide guides in the usual manner, the journal box 12 being retained in its position between the jaws of the pedestal member by the usual strap 21. Mounted in the annular recess 14 of the journal box, is a race member 22 in the form of a ring having a base portion 23, which bears upon the wall defining the annular recess 14 of the journal box. Formed integrally with the base portion 23, is an inwardly extending centrally formed web 24, the inner extremity of which terminates in a portion providing laterally extending flanges 25 and 26. The flange 25, at its inner side, is provided with an annularly extending bearing surface 27, inclined toward the journal 15. The outer side of the flange 25 is provided with an annularly extending bearing surface inclined oppositely to the bearing surface 27, as best shown in Fig. 2. The flange 26 is provided with inner and outer annularly extending bearing surfaces 29 and 30, of the same character as the bearing surfaces 27 and 28, but being oppositely disposed with reference to the latter.

The journal 15 is provided with an annular shoulder 31, a cylindrical portion 32, and a reduced threaded end portion 33. Mounted upon the cylindrical portion 32 are the race members 34 and 35. The race member 35 comprises a peculiarly formed ring having a vertically extending web 36 and inner and outer integrally formed flanges 37 and 38. The flange 37 on its inner surface is provided with a V-shaped groove so arranged as to define bearing surfaces 39 and 40 adapted to engage the balls of the annular series of balls indicated at 41, interposed between the bearing surfaces 39 and 40, and the bearing surface 30 of the flange 26, the angles of the bearing surfaces 39 and 40 being so disposed that the points of contact thereof with the

balls are arranged in a particular manner, more fully described hereinafter. The outer flange 38 of the member 35 is also provided with a groove upon its inner face, defining bearing surfaces 42 and 43, adapted to bear upon an annular series of balls 44, interposed between said surfaces and the surface 29 of the flange 26 of the member 22, providing a two-point contact of the bearing surfaces 42 and 43 with the balls of the series 44, which points of contact are arranged along a line which intersects the longitudinal axis of the journal 15 at the same point as a line extending through the bearing points of the balls in the annular series 41 upon the bearing surfaces 39 and 40, it being noted that the bearing surface 29 is also disposed in such manner that a projection of the plane in which it lies will intersect the longitudinal axis of the journal 15 at the same point as the lines extending through the points of contact of the series of balls 41 and 44 with the bearing surfaces 39 and 40, and 42 and 43, respectively. The bearing surfaces of the flange 25 of the member 22, the member 34, and the series of balls co-operating therewith, are identically similar to the bearing surfaces of the flange 26, member 35, and an annular series of balls 41 and 44, except for the opposite disposition of the parts, and the same reference characters will be utilized to designate like parts of both. The outer member 34 is held in position on the journal 15 by means of a disc spring 45, which bears against the web 36 of the member 34, a second disc spring 46 being provided which bears upon the spring 45, a spacing member 47 being interposed between the springs 45 and 46. The springs and spacing member are mounted upon a flanged collar 48, mounted upon the reduced end portion 33 of the journal 15, and the collar is held in position by means of a lock nut 48 threaded on to the threads of the reduced portion 33 of the journal. A cover 49 is provided for the journal box, having a flange 50, telescopically engaging the end of the journal box, said cover being secured in position by means of suitable bolts indicated at 51. By the above described arrangement it will be seen that each ball of each series of balls is always under load in all directions, due to the disposition of the bearing faces of the race members, and the parts are readily assembled and resiliently held in position for operation, thereby automatically taking up wear as it occurs.

While I have herein shown and described what I now consider the preferred manner of carrying out my invention, the same is merely illustrative, and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In an anti-friction bearing of the character described, the combination with rela-

tively movable race means, one of which is provided with bearing portions extending in opposite directions, each of said portions being provided with opposed bearing surfaces, and the other of which comprises elements co-operating with each of said portions, and each of said elements being provided with connected bearing surfaces disposed upon opposite sides of each of said bearing portions; and an annular series of anti-friction elements interposed between the opposite bearing surfaces of each of said laterally projecting portions and the adjacent bearing surfaces of said second means.

2. In an anti-friction bearing of the character described, the combination with a journal member and a journal box member; of race means co-operating with said journal box member and provided with laterally extending annular flanges having opposed bearing surfaces thereon; race members co-operating with said journal and disposed at opposite sides of said flanges, and provided with connected spaced bearing surfaces arranged at opposite sides of each of said flanges; and anti-friction elements interposed between the bearing surfaces of the flanges and the bearing surfaces of said journal race members.

3. In an anti-friction bearing of the character described, the combination with a journal member and a journal box member; of race means co-operating with said journal box member and provided with laterally extending annular flanges having opposed bearing surfaces thereon; race members co-operating with said journal and disposed at opposite sides of said flanges, and provided with connected spaced bearing surfaces arranged at opposite sides of each of said flanges; anti-friction elements interposed between the bearing surfaces of the flanges, and the bearing surfaces of said race members being inclined to tighten engagement between said bearing surfaces and said anti-friction elements upon movement of said race members toward each other; and means including resilient parts bearing upon said race members to urge the same toward each other.

4. In an anti-friction bearing of the character described, the combination with a journal box and a journal having an annular shoulder thereon and a reduced end portion; a race member mounted in said journal box and provided with an inwardly disposed radial web terminating in laterally extending flanges, the inner and outer surfaces of said flanges being inclined toward each other and providing race ways; race members mounted on said journal and disposed at opposite sides of said flanges, each of said race members being provided with connected flanges each having a bearing surface arranged adjacent a race way of one flange; annular series of balls interposed between the race ways of each of said flanges and the adjacent bearing

surfaces of the related race member, one of said race members bearing against the annular shoulder of said journal; and resilient means mounted on said journal and bearing on the other journal race member for urging the latter and journal box race member toward the first journal race member.

5. In an anti-friction bearing of the character described, the combination with a journal box and a journal having an annular shoulder thereon and a reduced end portion; a race member mounted in said journal box and provided with an inwardly disposed radial web terminating in laterally extending flanges, the inner and outer surfaces of said flanges being inclined toward each other and providing race ways; race members mounted on said journal and disposed at opposite sides of said flanges, each of said race members being provided with connected flanges each having a bearing surface arranged adjacent a race way of one flange; annular series of balls interposed between the race ways of each of said flanges and the adjacent bearing surfaces of the related race member, one of said race members bearing against the annular shoulder of said journal; and resilient means mounted on said journal and bearing on the other journal race member for urging the latter and journal box race member toward the other journal race member, the race ways of said flanges and the bearing surfaces of said journal bearing members being inclined so that the bearing points of said balls with said race ways and bearing surfaces, when projected, intersect the longitudinal axis of the journal at a common point.

6. In an anti-friction journal bearing, the combination with a journal member and a journal box open at the outer end; of two series of annular bearing elements having rolling movement; and means for transmitting the load from the journal box to said journal simultaneously through the bearing elements of one of said annular series at one side of the journal and through the bearing elements of the other annular series at the opposite side of the journal, said means including detachable race members mounted on the journal member and within the journal box respectively, said detachable members being insertible and removable through said open end of the journal box.

7. In an anti-friction bearing, the combination with two members, one of which is rotatable with reference to the other; of inner and outer annular series of anti-friction elements having rolling movement, said inner and outer annular series being interposed between said members, the annular path of movement of said inner series being of lesser diameter than the path of annular movement of the outer series; means having bearing engagement with the inner and outer series of

elements for transmitting the load from one member to the other simultaneously through the bearing elements of one series disposed at one side of the center of rotation of said rotatable member and through the bearing elements of the other series at the opposite side of said center of rotation; and yielding means cooperating with said last named means compensating for wear of the bearing surfaces thereof.

In witness that I claim the foregoing I have hereunto subscribed my name this 22nd day of October, 1927.

JOHN F. O'CONNOR.

80

85

90

95

100

105

110

115

120

125

130