(No Model.)

J. W. HYATT.

ANTI-FRICTION JOURNAL BEARING.

No. 385,266. Patented June 26, 1888.

Fig. 1.

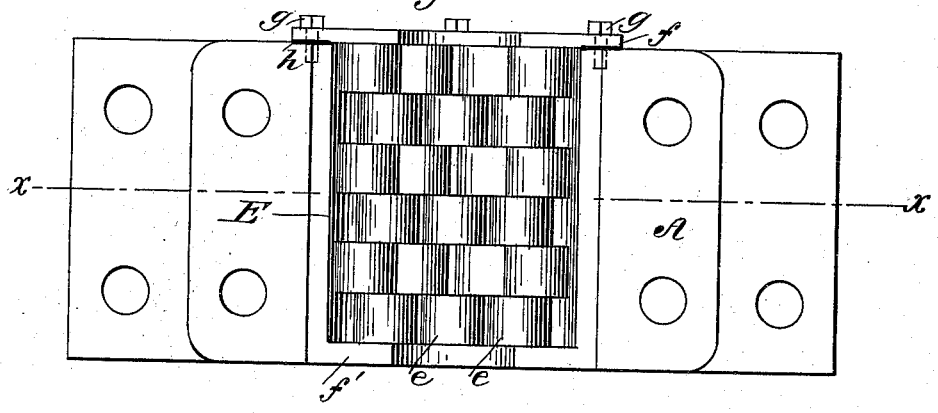
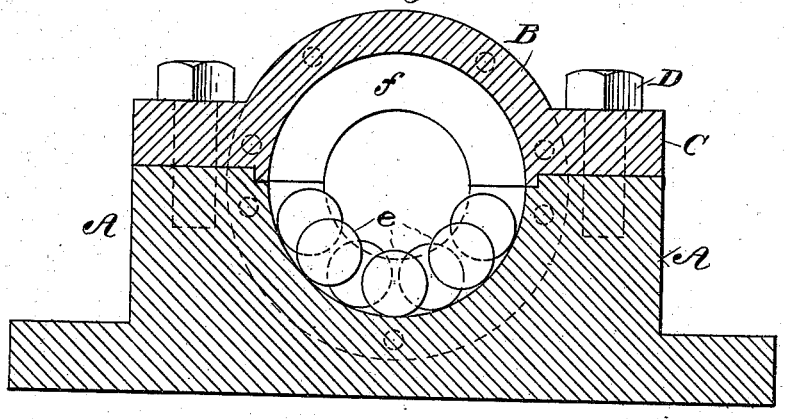


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN W. HYATT, OF NEWARK, NEW JERSEY.

ANTI-FRICTION JOURNAL-BEARING.

SPECIFICATION forming part of Letters Patent No. 385,266, dated June 26, 1888.

Application filed January 9, 1888. Serial No. 260,116. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HYATT, a citizen of the United States, residing at Newark, Essex county, New Jersey, have invented certain new and useful Improvements in Anti-Friction Journal-Bearings, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of my invention is to furnish a cheaper and more effectual construction for a roller-bearing than has heretofore been made; and the device consists in a casing concentric with the shaft, flanges at each end of the casing, and several series of rolls (preferably more than two series) fitted with their adjacent sides in contact and with the series of rolls at each end in close proximity to the end flanges. All the rolls of all the series are wholly disconnected or disunited, and each roll is free to rotate about the shaft, being guided in a fixed path by the adjacent series of rolls or flanges.

My invention is shown in the accompanying drawings applied to a pedestal, Figure 1 being a plan of a pedestal with the cap removed, and Fig. 2 being a side elevation in section on line *x x* of Fig. 1.

A is the base of the pedestal, with its cap B attached by lugs C and bolts D, for convenience of removing the shaft. The space or cavity E, in which the rolls *e* are fitted, is of cylindrical form, of suitable diameter to apply the rolls around the shaft, and flanges *f f'* are provided at opposite ends of such cavity to guide the end series of rolls. The rolls are shown in the base A only to expose the flange *f* more fully, and the rolls are shown of about two-thirds their diameter in length, with six series of rolls arranged side by side between the end flanges. The flange *f* is shown as removable, being secured to the pedestal by screws *g*, and is adjustable toward the flange *f'* by means of packing, *h*, inserted beneath it. This packing may be made of yielding material—such as india-rubber—or of several thin layers of tin or paper, which may be successively removed as the flange requires adjustment. By such adjustment the flanges may be kept as close as desirable to the end series of rolls, and the separate rolls thus kept from displacement. The flange *f* is shown in Fig. 2 divided diametrically, with the two halves attached, respectively, to the base A and cap B, for convenience of removing the shaft from the bearing when required. I find it preferable to lubricate this bearing freely, and it is therefore best to provide means for such lubrication which will increase the efficiency of the bearing. It is not necessary to specify any specific means, as it would readily suggest itself to any mechanic.

It will be perceived that each series of rolls in my bearing is held in an annular path by the plane surfaces of the adjacent series of rolls, which form a continuous annular plane at the side of each separate series, the end series of rolls only being in contact with the flanges. All the rolls thus receive as perfect a support as if they were held between rigid devices. In the practical operation of my device the rolls in the different series become distributed irregularly all around the shaft, and by no chance will assume the position required to form a continuous row of rolls parallel with the shaft, and in which position only could the tipping of one roll be communicated to the others so as to obstruct their movements. In practice the rolls in the different series always break joints with those in the adjacent series, so that the annular plane surfaces required to guide each roll in the prescribed annular path is always maintained.

I am aware that heretofore it has been suggested to use in roller-bearings long rolls in a connected series, and to pivot them between rings or collars at each end, to prevent their twisting and jamming in the casing. Thin rolls or disks have also been used by being pivoted to a loose ring, as shown in United States Letters Patent No. 179,426, dated July 4, 1876, and also, to avoid the use of pivots and guide-rings, several annular grooves have been formed in the casing and a single series of rolls fitted in each of the grooves, as shown in United States Letters Patent No. 50,948, dated November 14, 1865, and grooves have also been formed in both the shaft and the casing to guide independent series of rolls, as in United States Patent No. 97,968, dated December 14, 1869. In United States Patent No. 2,364, of 1841, several series of rolls are shown in lateral contact, but provided with

pivotal studs or pins projected between the adjacent rolls to maintain the relative positions of all the rolls in each series exactly intermediate between those in the adjacent series, and in United States Patent No. 81,860, of 1868, two sets of rolls are shown separated by an intermediate flange, which is rigidly attached to the casing. In all these patented constructions provision was made and applied separately to each series of rolls to prevent the twisting of the separate rolls and the consequent jamming against the end flanges or interior of the casing, while in my invention the means for guiding the rolls is applied only to the rolls of the end series, and the remainder of the rolls are required to guide each other. I am enabled to employ such a construction by the discovery that short rolls having a length, for instance, less than or not much greater than their own diameter are capable of guiding one another efficiently if held in a casing without material end play or movement, though I do not limit myself to the precise length of the rolls shown so long as they are not much greater in length than their diameter.

It will thus be perceived that my invention differs, essentially, from all those shown in the prior patents referred to, in the absence of all means to guide each series of rolls separately or of means to retain each roll in any fixed relation to the rolls of the adjacent series. Where intermediate flanges or casings have been adopted, as in some of the patents referred to, although such flanges serve to guide each series of rolls separately, it will be perceived that if any one roll of any one of such series be obstructed or retarded, as by the entrance of a small obstacle in the casing, all the series of which such roll forms a part will be obstructed, while my construction obviates the expense of such intermediate flanges, and also tends to remove any such obstruction which may enter the casing, because the rotation of the rolls in contact with the obstructed series of rolls tends to gradually carry the obstructed series around and remove the obstruction; and in all cases where the rolls have heretofore been adjusted in contact with each other, as in the aforesaid Patent No. 2,364, of 1841, means have been provided for retaining the rolls of each series in a fixed relation to those in the adjacent series. The use of any such means, however, obviously serves to arrest all the rolls within the casing if the rotation of any one roll is obstructed or retarded, and in this case a rotation shaft would quickly wear a hollow in one spot on each roll, and thus impair the subsequent operation of the device, whereas in my invention each series of rolls rotates around the shaft independently of the others, and thus sustains the shaft independently of the others, and forms an anti-friction journal which will temporarily support the weight of the shaft if any other of the series becomes inoperative, and such independent rotation of the several series in my construction makes the rolls of any one series alternate with those of the other series, the pressure upon the shaft being thus divided and distributed between the different series of rolls from time to time, and the wear thereby rendered more uniform at all points in the casing than where the rolls are coupled positively together. It will therefore be seen that in my construction the rolls perform some different functions from those of the prior patents referred to.

The use of an adjustable end flange is of great advantage in my construction; but it is not absolutely essential that such flange should be adjustable if the casings and rolls be lubricated to avoid wear or are made of material to wear well under the load imposed and the parts are properly fitted together. The flanges for holding the rolls in lateral contact may also, obviously, be attached to the shaft instead of the casing, such means of applying the end flanges also affording an opportunity for adjusting the length of the casing.

The rolls and the casing may be made of any desired material, and my bearing may be applied to line-shafts, car and vehicle axle journals, and bearings of all kinds, only requiring such modifications of the casing and the employment of such numbers of series of rolls as will suit them to the particular location in which the bearing is to be used, and such modifications will readily present themselves to any mechanic, and I therefore do not limit myself to the construction of the casing shown.

I hereby disclaim the construction shown in the Letters Patent referred to, and also disclaim the subject-matter claimed in my application No. 260,117, filed January 9, 1888.

What I claim as my invention is—

The combination, in a roller-bearing, of separate independently-rotating series of disunited rolls held in lateral contact in a casing with closed ends, each series of rolls being held in an annular path by the plane of the adjacent series of rolls, substantially as shown and described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN W. HYATT.

Witnesses:
L. LEE,
THOS. S. CRANE.