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W. P. DEPPE.

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NO MODEL.

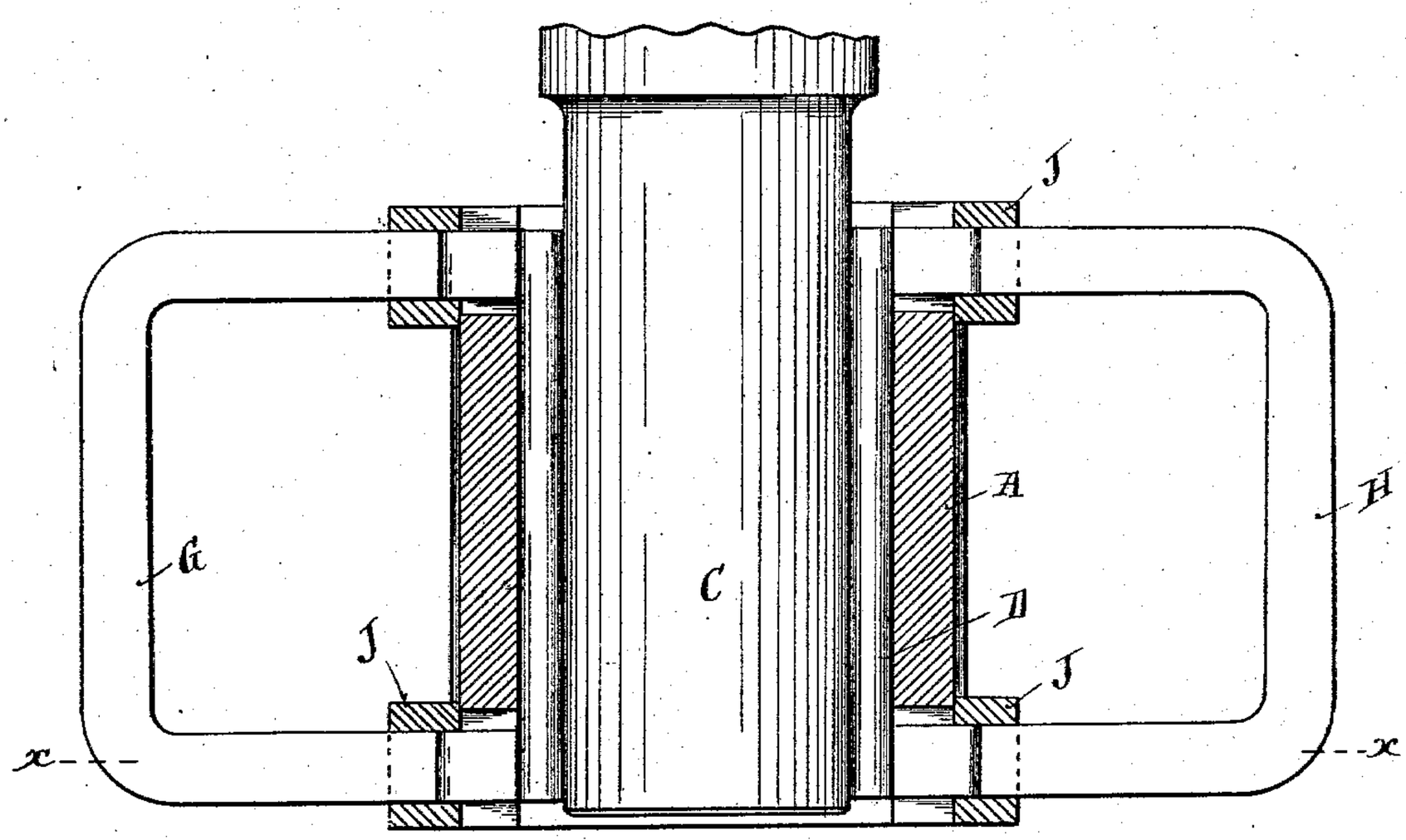

Fig. 1.

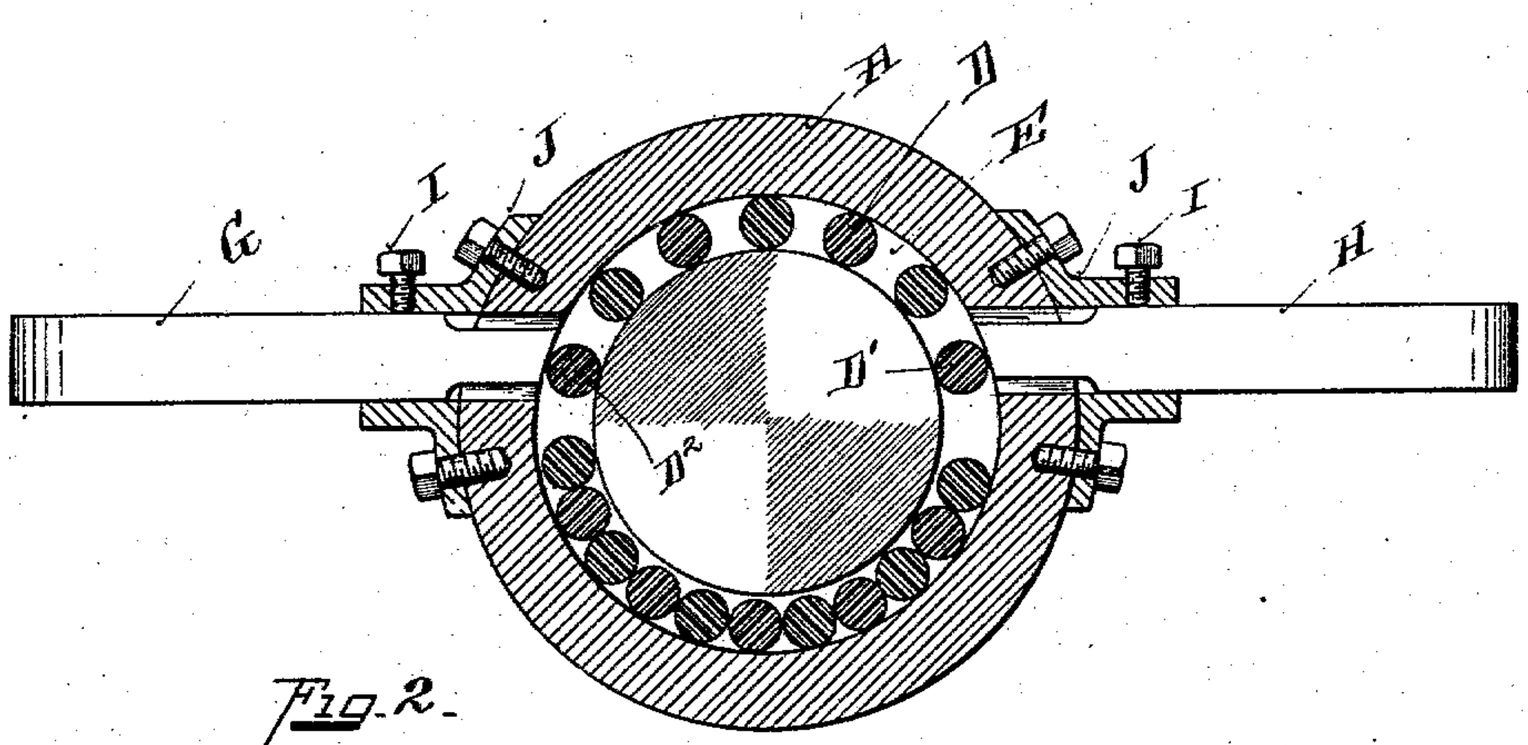

Fig. 2.

Witnesses
Oliver B. Kaiser
Louise Beck

Inventor
William P. Deppe
By Wood & Wood.
Attorneys

No. 753,242. Patented March 1, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM P. DEPPE, OF CINCINNATI, OHIO.

JOURNAL.

SPECIFICATION forming part of Letters Patent No. 753,242, dated March 1, 1904.

Application filed September 28, 1903. Serial No. 174,997. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. DEPPE, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Journals, of which the following is a specification.

My invention relates to an improvement in journal-bearings.

The principal object of my invention is to provide an antifriction ball or roller bearing device for a journal adapted to meet the following physical conditions: a great load, rapid speed, and continuous use.

The invention is shown as applied to a car-axle. The ordinary roller-journal device has been found entirely inadequate for this purpose, because it is impossible to uniformly dispose the bearing-rollers around the axle and because the rollers cannot be maintained parallel with the axle, but work awry under the rapid speed and severe strains. Therefore the friction of the rollers upon one another and upon the axle and journal-box quickly destroys the bearings. To overcome these defects, I have conceived of a journal-box in which the bearing-rollers travel in an intermediate annular chamber, sustaining the load in the upper arc of travel and free from the load in the lower arc of travel. This requires the annular chamber to be narrower at the top than at the bottom. A magnetic field is interposed between these two arcs in the direction of rotation, which serves to successively snap up the rollers from a position of non-bearing to a bearing relation with the axle and journal-box. The primary object of this invention is therefore to automatically and invariably space the bearing-rollers as they successively pass from idle position into commission. As this magnetic influence is invariable, it forms a reliable feed, as it were, lifting the rollers with mathematical precision and regularity, thus effectively spacing the balls in commission. Also as this magnetic influence is equal in all directions the rollers are lifted and presented to contact with the journal-box and axle in a true position parallel to the axle. As the rollers are presented toward the magnet by the rotation of the axle the magnetic influence is instantaneous and invariable and successively snaps the rollers up at a faster speed than their speed of rotation around the axle.

The features of my invention are more fully set forth in the description of the accompanying drawings, forming a part of the specification, in which—

Figure 1 is a top plan view of my improvement, showing a section of the box removed. Fig. 2 is a transverse section in elevation of my improved bearing on line *x x*, Fig. 1.

As shown in the drawings, the journal-bearing is of the form used for supporting the axles of cars, in which the weight is supported on the top of the bearing.

A represents the journal-box; C, the axle; D, the rollers. It will be observed that the rollers D do not completely fill their annular chamber E between the axle and the journal-box. In order that the idle rollers may be brought into working position and may be carried past the middle horizontal diameter of the axle and on each side thereof, I provide a pair of horseshoe-magnets G H, having their respective poles projecting into the annular chamber E above the horizontal diameter of the axle, so that the rollers are attracted by said magnets and lifted into working position.

I do not wish to limit myself to the use of horseshoe-magnets as the attractive agents for passing the journal-bearings into and out of position, and other magnets may be employed in lieu thereof. As constructed these magnets are easily removable, as they are held in position by screws I and lapping brackets J, which brackets are suitably secured by bolts or other suitable means in the annular bearing A.

It will be observed that the relation of the axle and surrounding box forms an intermediate annular chamber in which the rollers travel. Of course any antifriction devices are the equivalents of the rollers shown, and any shaft or center is the equivalent of the axle. This axle and surrounding journal-box have their upper arcs described on the same center; but the lower portion of the journal-box is described with a radius greater than the radius of the upper arc. The result of this is

that the upper portion of the chamber is narrower than the bottom portion. This upper narrower portion of the annular chamber is uniform, while the lower or wider portion of the annular chamber is non-uniform and gradually tapers upon each side to the smaller arc. The diameter of the rollers substantially fits the width of the narrower portion of the annular chamber, so as to form a bearing therein between the journal-box and axle. In the lower wider portion of the annular chamber the rollers fall together, as shown in Fig. 2, being idle. As these rollers are successively influenced by the magnet in their rotation around the axle they are attracted into the narrower portion of the annular chamber and come into frictional engagement with the axle and journal-box.

Permanent magnets or electromagnets can be used as desired. In fact, various ways may be employed of supporting the magnet, it being only essential that it be supported in such relation to the axle, journal-box, and antifriction devices that its magnetic field extends into said annular chamber in position to successively attract the rollers from idle to operative position, as described, thus properly spacing the rollers which are in commission in the narrower portion of the annular chamber.

I have shown two magnets, one on each side of the journal-bearing. Two magnets are provided, so that the journal may be driven in either direction. Only one magnet is necessary or in use at the same time. Thus when the axis is revolving around to the left when the line of travel is in that direction the roller D′ has been attracted by the magnet opposite it, so as to come in frictional contact with the axis. The opposite roller D^2 is discharged into idle position. The number of rollers may be increased or decreased without affecting the principle of invention shown and described in my improvement. In either direction of rotation the rollers are constantly urged under influence of velocity upwardly toward one of the magnets, and such magnet will successively lift up the rollers in the direction in which they are being revolved. Therefore it is the function of the magnets to effectively space the rollers as they pass in either direction of rotation from the idle to the bearing position.

Having described my invention, I claim—

1. In a journal-bearing box, an axle, antifriction devices between the axle and box, having a bearing engagement in the upper arc of their travel and a non-bearing relation in the lower arc of their travel, a magnet having a field of influence adapted to successively lift the antifriction devices from idle to working position as they revolve around the axle, substantially as described.

2. In a journal-bearing box, an axle, an intermediate annular chamber, being formed by the opposing surfaces of the box and axle, antifriction devices in said chamber in bearing engagement in the upper part of said chamber and non-bearing engagement in the lower part of said chamber, and magnets having fields of influence extending into said chamber above the idle position of said antifriction devices, adapted to successively lift said devices into bearing position as they revolve in either direction around the axle, substantially as described.

3. In a journal-bearing box, an axle, intermediate antifriction devices, and a magnet arranged for the purposes described.

4. In a journal-bearing an axle having the same center as the box, the lower arc of the box having a greater radius than the upper arc of the box, thereby forming between the axle and box an annular chamber narrower at the top, antifriction devices in said chamber adapted to substantially fit and form a bearing in the upper portion of the annular chamber, and to be free from bearing engagement in the lower portion of said chamber, and a magnet adapted to successively attract the antifriction devices into the narrower portion of said chamber, substantially as described.

5. In a journal-bearing an axle having the same center as the box, the lower arc of the box having a greater radius than the upper arc of the box, thereby forming between the axle and box an annular chamber narrower at the top, antifriction devices in said chamber adapted to substantially fit and form a bearing in the upper portion of the annular chamber, and to be free from bearing engagement in the lower portion of said chamber, and magnets interposed into said chamber above the wider portion thereof on each side, adapted to successively attract the antifriction devices in either direction of rotation from idle to bearing relation, substantially as described.

In testimony whereof I have hereunto set my hand.

WILLIAM P. DEPPE.

Witnesses:
OLIVER B. KAISER,
LUISE BECK.