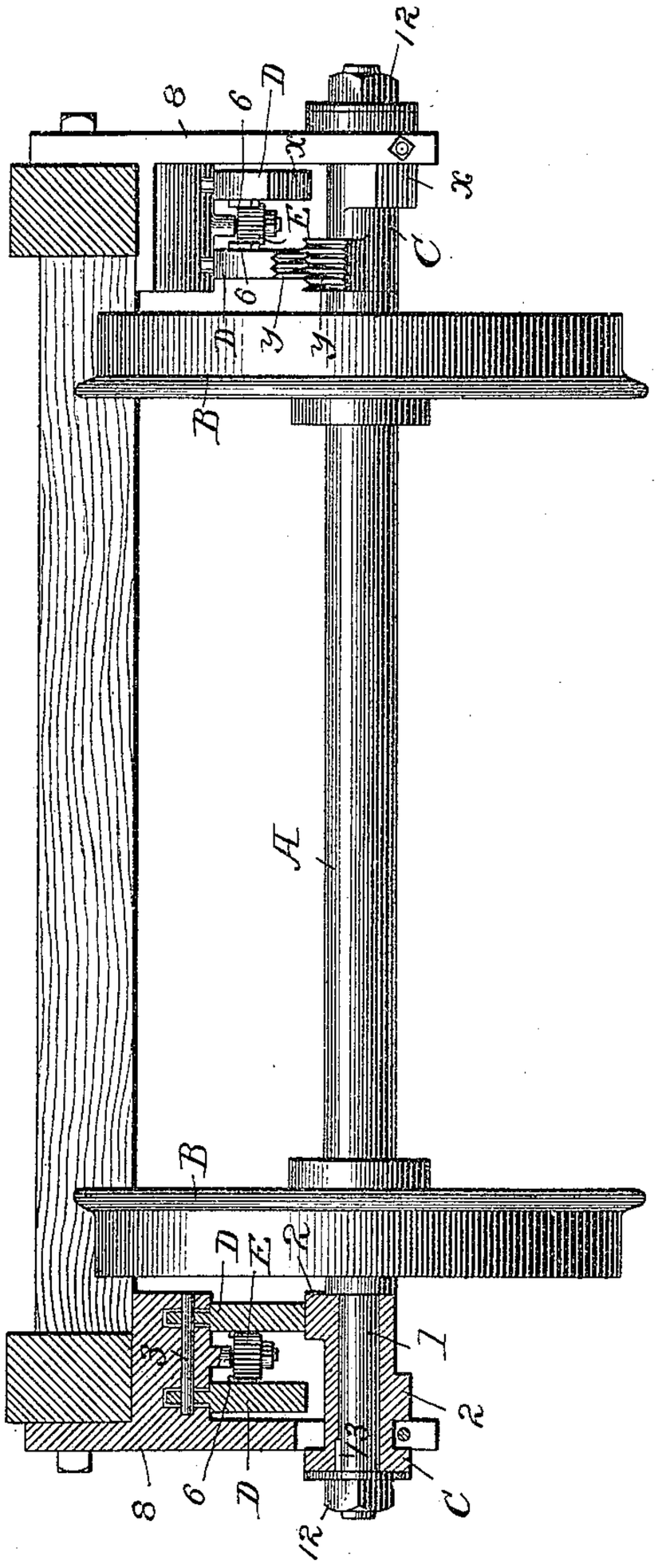
(No Model.) 2 Sheets—Sheet 1.

J. N. MILEHAM.

ANTI-FRICTION BEARING.

No. 438,442. Patented Oct. 14, 1890.

Fig. 1.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

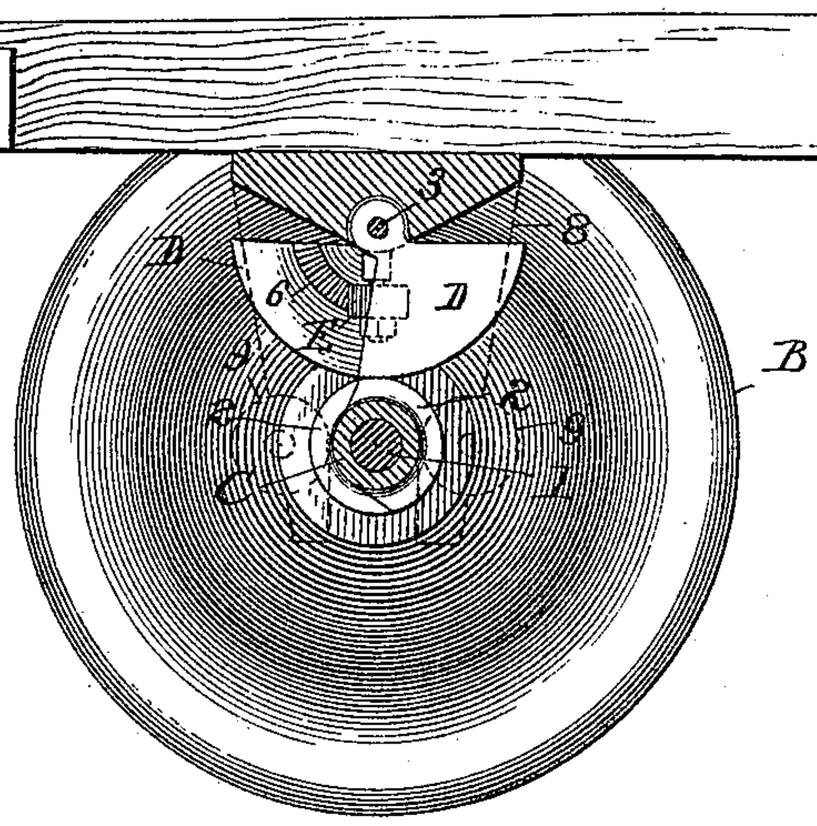


Fig. 3.

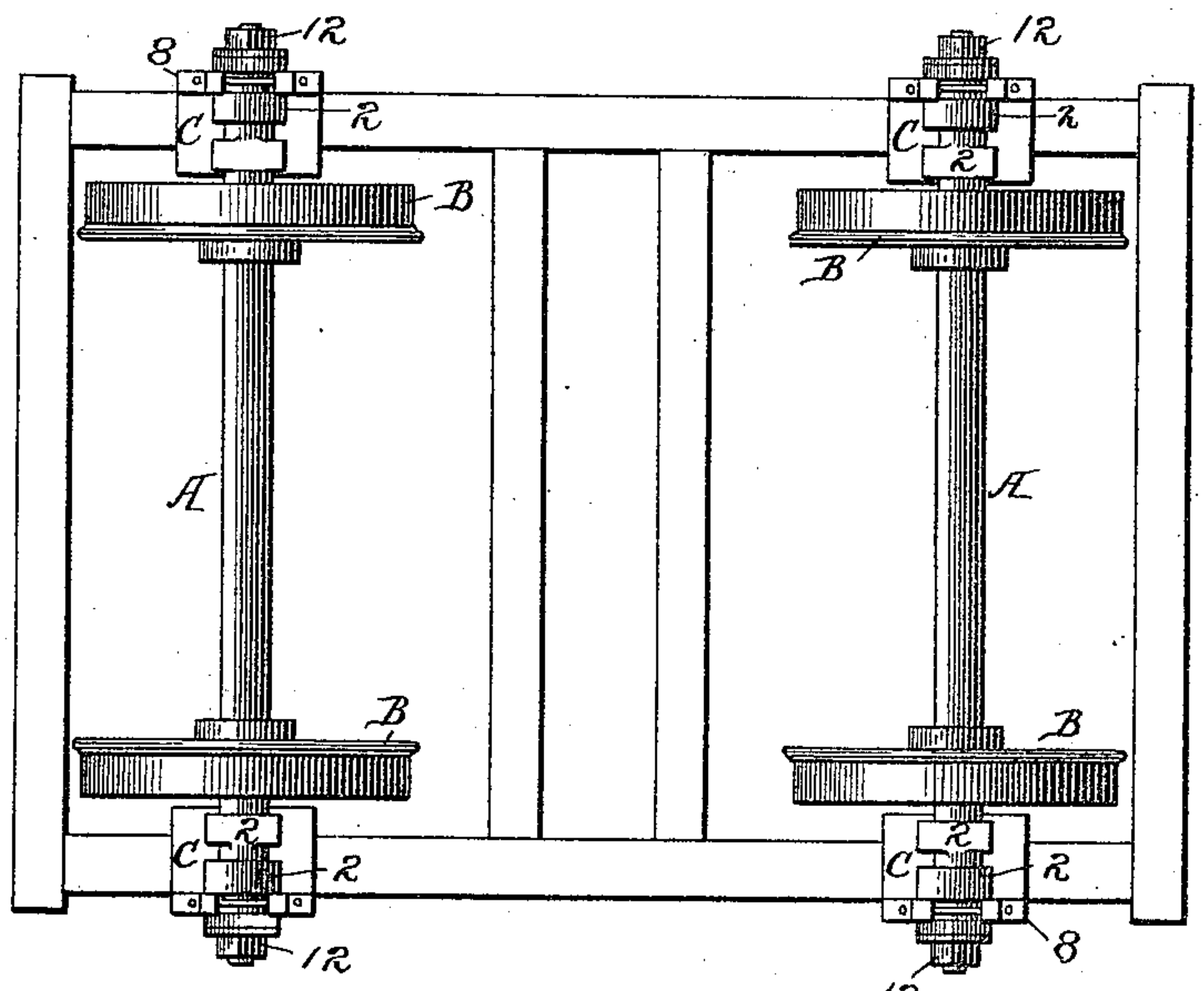


Fig. 4.

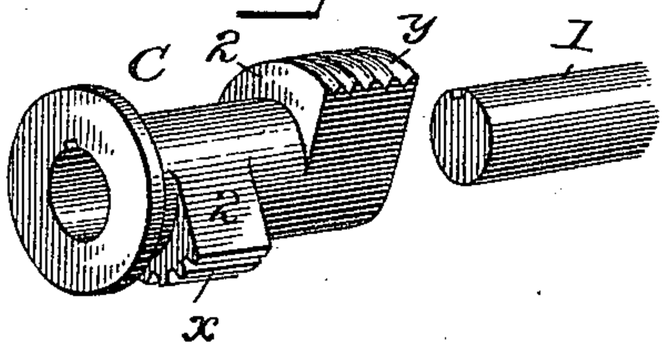
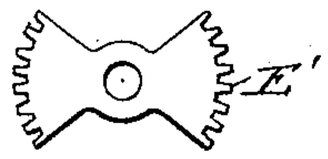


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ANTI-FRICTION BEARING.

SPECIFICATION forming part of Letters Patent No. 438,442, dated October 14, 1890.

Application filed June 30, 1890. Serial No. 357,282. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH N. MILEHAM, a citizen of the United States, residing at Rutherford, Bergen county, State of New Jersey, have invented certain new and useful Improvements in Anti-Friction Bearings, of which the following is a specification.

My invention relates to that class of anti-friction bearings for axles, shafts, &c., in which in place of the ordinary stationary bearing-block, or of the rotating disk-bearings sometimes used, pivoted or vibrating sectors are employed.

In that class of bearings in which such sectors are used, the journal, shaft, or axle is provided with curved bearing-ribs set to make successive contact with the different sectors, which necessitates expensive forgings, the heating and weakening of the shaft or axle, and renders the application of the bearing difficult and expensive to structures already in use.

In order to obviate these objections and to otherwise improve the construction and operation of this class of bearings, I construct the same as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a transverse sectional elevation of the truck of a railway-car provided with bearings embodying my improvements. Fig. 2 is a side elevation in part section, showing one of the bearings. Fig. 3 is an inverted plan view of one of the bearings; Fig. 4, a perspective view showing the shaft and bearing-sleeve detached; Fig. 5, a detached view showing a modification.

I have illustrated my invention, which may be applied to shafts or axles of any character, in connection with the axle A, connected with the wheels B B of a car-truck, said axle terminating in the end journals 1, which may be of ordinary diameter or may be slightly reduced, and to each journal is secured a sleeve C, upon the exterior of which are two or more curved ribs 2 2, arranged in different vertical planes, with the end of one rib upon the same longitudinal plane as the end of the other or adjacent rib, so that said ribs together extend completely around the axle, but at a different distance from the end.

In connection with each rib 2, the bearing-face of which is curved to correspond to a circle having the axis of an axle as its center, is a pivoted sector D, the pivot or fulcrum 3 of which coincides with the center of the circle to which the curved edge of the sector corresponds, each of said sectors being in the same plane with one of the ribs 2, so that as the axle revolves and the end of said rib is brought beneath the edge of the sector the rib will bear upon said edge and the two will move together until the rib passes from the sector, after which the adjacent rib (which makes contact with the adjacent sector prior to the separation of the first rib and sector) will constitute the bearing. In order to avoid the necessity of increasing the size of the sector, the latter should be swung automatically to such a position that the end of the bearing-rib will first make contact with the bearing-edge of the sector at a point adjacent to the end of the latter, for which purpose the sector should be swung to the position indicated in Fig. 2 prior to the rib 2 being brought to position to make contact with the sector. In order to effect this result, I interpose between each pair of sectors a toothed pinion or wheel E, Fig. 1, which engages with curved racks 6 6 upon the inner faces of the opposite sectors, so that as one is carried forward by contact with its bearing the other, which is then out of contact with its bearing, will be brought to a position (shown in Fig. 2) to make contact with the bearing as the first bearing passes from on contact with its sector.

In order to insure the positive and continued travel of the sectors and bearings together, each sector and its bearing may be provided with teeth, as shown at *x x*, Fig. 1, which mesh with each other in the same manner as gears, or greater frictional adhesion than results from having plain surfaces may be secured by making the bearing-faces with V-shaped grooves and projections corresponding to those of ordinary frictional gears, as shown at *y y*, Fig. 1.

Where the bearings are employed in connection with car-axles, or with shafts provided with fly-wheels or pulleys, the sleeve may be applied to the axle or shaft inside of the wheel or pulley instead of to an outside journal, as shown in Fig. 1, and in order to

preserve the proper position of the shaft or axle with its axis vertically below the pivotal points 3, I make use of a slotted guide or hanger 8 adjacent to each bearing, and to reduce the friction from lateral thrust I provide said hanger with anti-friction rollers 9, bearing against the opposite sides of the axle or shaft. (See dotted lines, Fig. 2.)

Any suitable means may be employed for securing the sleeve upon the axle or shaft. As shown in Fig. 1, where the sleeve is on the end of the axle, it is secured by a nut 12, screwing onto the end of the axle, a feather 13 preventing the sleeve from turning independently of the axle.

By forming the curved ribs 2 upon the sleeve I am not only enabled to apply the bearing to structures already in use with little or no alteration thereof, but I am further able to reduce to a very great extent the cost of the bearing, inasmuch as the sleeve and ribs may be cast, thus avoiding the forging necessary to form the ribs on the shaft or axle, while the weakening of the latter from repeated heating in forging is prevented.

Each sector may be pivoted to a part of the bracket 8, and, while the said pivoted connection may be of any suitable character, I prefer to provide each sector with an ear 15, which enters a slot in a transverse portion 16 of the bracket, across which slot passes the pivot 3.

Where the swinging movements of the sectors is limited, a lever E′, Fig. 4, having toothed ends, may be substituted for the pinion.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim—

1. The combination, with an axle or shaft and with two or more pivoted sectors, of a sleeve secured to the axle or shaft and provided with two or more curved ribs for engaging the edges of the sectors, substantially as set forth.

2. The combination, with an axle, of a sleeve provided with two or more curved ribs and sectors pivotally supported above the axle and having curved bearing faces or ribs and an intermediate connection between the sectors, whereby the movement of one imparts a reverse motion to the other, substantially as set forth.

3. The combination, with the hangers 8, of sectors pivoted to the hangers, the intermediate pinion or lever E, and the sleeve C, provided with curved bearings 2 and secured to a shaft or axle, substantially as set forth.

4. The combination, with the shaft, of curved bearings provided with toothed bearing-faces and pivoted sectors also having toothed bearing-faces, substantially as set forth.

5. The combination, with the axle and curved bearings, of pivoted sectors having racks and an intermediate toothed pin or lever engaging said racks, substantially as set forth.

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

JOSEPH N. MILEHAM.

Witnesses:
A. W. KIDDLE,
E. M. TAYLOR.