

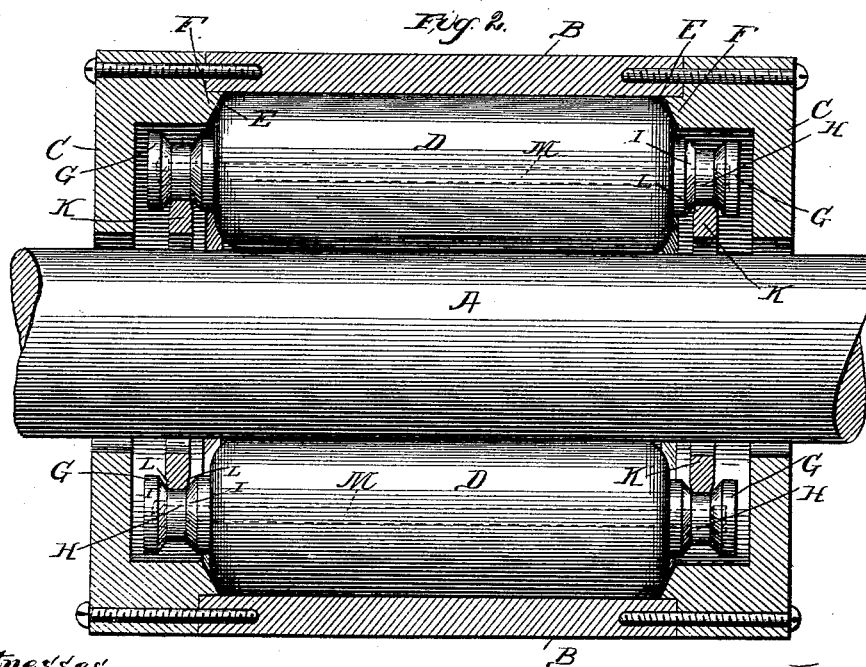
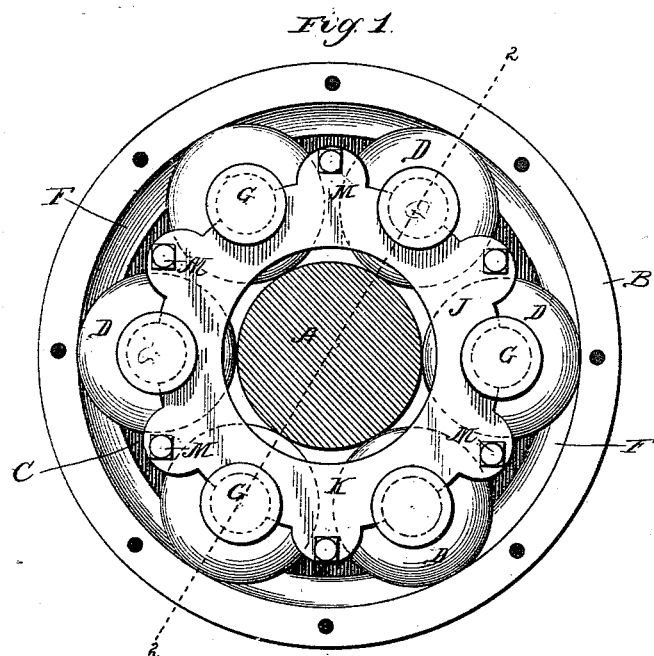
(No Model.)

2 Sheets—Sheet 1.

W. E. ELLIOTT.
ANTI-FRICTION JOURNAL BEARING.

No. 420,047.

Patented Jan. 28, 1890.



Witnesses—

Wm. Rheem.
H. R. Quohundro.

Inventor.

William E. Elliott
By Jno. S. Elliott
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

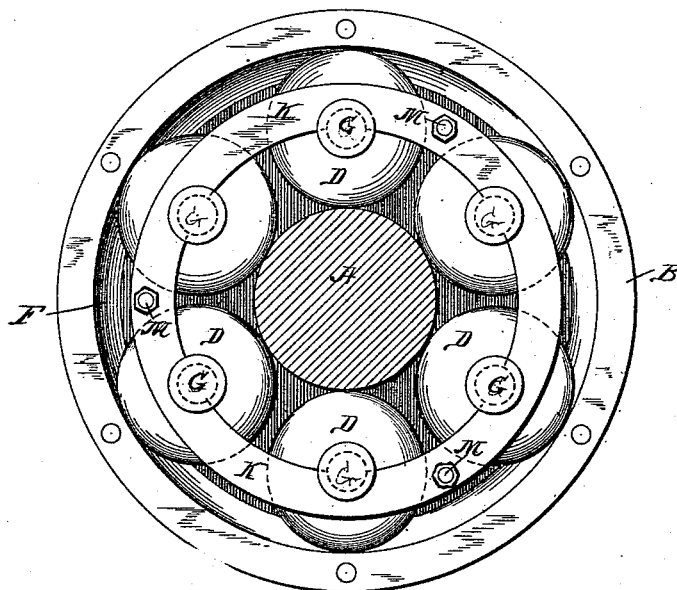


Fig. 3.

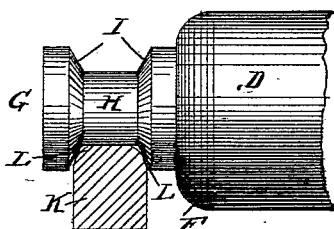


Fig. 5.

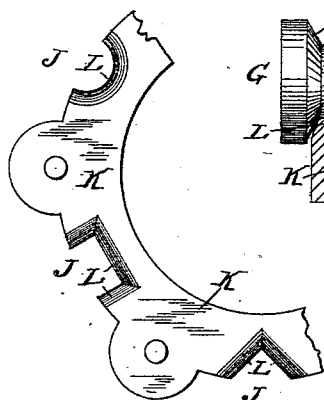
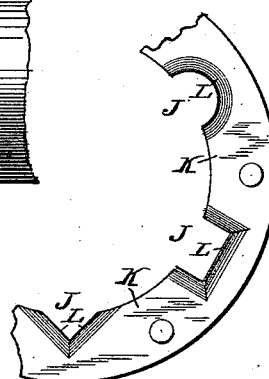


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM E. ELLIOTT, OF CHICAGO, ILLINOIS.

ANTI-FRICTION JOURNAL-BEARING.

SPECIFICATION forming part of Letters Patent No. 420,047, dated January 28, 1890.

Application filed April 4, 1889. Serial No. 305,936. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. ELLIOTT, a citizen of the United States, residing in the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Anti-Friction Journal-Bearings, of which the following is a specification.

This invention relates to improvements in anti-friction journal-bearings in which the series of bearing-cylinders have heretofore been held out of frictional contact with each other by means of intermediate separating-cylinders alternating with the bearing-cylinders, and having in turn a bearing on the casing within which the bearing-cylinders work.

The prime object of this invention is to dispense with the employment of the separating-cylinders and to separate the bearing-cylinders by means of devices traveling therewith and bearing thereon, and not upon the casing, in such manner as to offer the minimum frictional resistance to the rotation of said rollers.

Another object is to maintain a fixed relative distance between the bearing-cylinders at all times, and to have the separating devices of such a character that the weight of the parts tending to separate the cylinders will be equally distributed between the bearings of the adjacent cylinders, which thereby equalize each other without affecting the remaining cylinders.

A further object is to have the end bearing-surfaces of the bearing-cylinders upon the casing and separating devices of such a character as to reduce the friction resulting from an endwise movement of the parts to the minimum.

I attain these objects by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents an end elevation of a journal-bearing embodying my invention, with the end plate of the casing removed, showing the separating-ring working within the circle traversed by the axes of the bearing-cylinders; Fig. 2, a longitudinal section thereof on the line 2 2 of Fig. 1, showing the journal and the bearing-cylinders in eleva-

tion; Fig. 3, an enlarged detail section of the journal end of the bearing-cylinders and the separating devices, more clearly showing the anti-friction bearing between the parts for reducing the friction resulting from endwise movement; Fig. 4, a view similar to Fig. 1, showing the separating-ring working outside the circle traversed by the axes of the bearing-cylinders; Figs. 5 and 6, detail face views, respectively, of a portion of the separating-rings illustrated in Figs. 1 and 4, more clearly showing bearing-sockets for the cylinder-journals.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A indicates the journal; B, a hollow cylindrical casing surrounding the same, provided with removable end caps C, and D a series of bearing-cylinders confined and working within the casing between it and the journal, there being just sufficient space between the interior or bearing wall of the casing and the journal for the insertion of these bearing-cylinders. Each cylinder has the ends rounded, as shown at E, opposing inclined annular bearings F upon the end caps of the casing, the said cylinder being slightly shorter than the distance between the bearings, so that the ends thereof will not be constantly in engagement with the shoulders, but only when the casing is caused to have an endwise movement, at which time the bearing of the convex or curved surface of the roller end upon the straight inclined face of the bearing will present the minimum frictional contacting-surface; and I may here add that, if desired, the bearings might be rounded and the ends of the cylinders beveled without departing from the spirit of my invention.

From each end of the rollers beyond the bearings thereof project contracted journals G, each provided with an annular groove H, the bottom of which is preferably parallel with the periphery of the journal, but the side walls I of which incline toward the bottom of the groove. These contracted journals are designed to bear in sockets J, provided in annular separating-rings K at each end of the casing, which rings do not have

any bearing upon or engagement with the casing, being carried upon and moving with the journals of the bearing-cylinders, while at the same time serving to effectually separate the cylinders from each other. I may here state that it is immaterial whether these separating-rings work and lie just within the circle traversed by the axes of the bearing-cylinders, as shown in Fig. 1, with the bearing sockets J in the outer periphery thereof, or whether they lie outside of such circle, as illustrated in Fig. 4, with the bearing-sockets upon the inner periphery thereof, for the result would be substantially the same in either case.

The peripheral recesses J correspond in number and location with the bearing-cylinders, and, as illustrated in Figs. 5 and 6, may be of any desired shape, either semicircular, square, or angular, so as to constitute bearings for the contracted journals of said cylinders, the recesses being of such diameter and the ring of such width as to receive the grooved portion H of the journals of the cylinders.

The edges of the bearing-recesses J in the separating-rings are rounded, as more clearly shown at L in Fig. 3, so that the rounded portions will bear upon the beveled or inclined side walls I of the groove H in the journal, and thus reduce friction between the parts, for the cylinder has an axial rotation within this recess independent of the bodily travel of the separating-ring with the cylinder.

The bearing of the grooved portions of the journals of all the bearing-cylinders within the recesses in the separating-rings not only serves to impart to the ring a bodily rotation about the journal A simultaneously with the bearing-cylinders, but also serves to prevent any lateral movement of the rings relative to the said cylinders, and hence maintains the rings in an upright position at all times, notwithstanding their rotation about the journal, with which they have no contact, and obviously no other support for these rings is necessary; but in practice, for convenience in inserting the parts in the shell or casing, I prefer to employ the separating-rings illustrated in Figs. 1 and 2, and to connect the rings by means of a series of tie-rods lying between the bearing-cylinders and out of contact therewith, for by this arrangement the rings are connected into a frame, in which the cylinders may be more readily inserted and the whole bearing slipped into the casing at once, thus rendering the parts much easier and more convenient to handle and requiring less time to be placed in operative position.

From the foregoing it will be understood that each of the bearing-cylinders has an independent but fixed bearing upon the separating-ring, which serves to maintain the cylinders in fixed relative position to each other at all times, said separating-rings being free

to revolve within the casing in unison with the cylinders, between which latter and the rings there is only the friction of the contracted journals of the cylinders, which is limited to the weight of the rings and partially of the cylinders not actually supporting the weight of the journal, and so divided between the several adjacent cylinders carrying the weight placed upon the bearing as not only to be equalized therebetween and the other cylinders correspondingly relieved, but reduced to such an extent as to be practically immaterial in the operation of the bearing.

Another important feature of the preferred construction is that the bearing-cylinders and separating devices do not depend in the slightest degree upon the journal for their maintenance in proper relative position to each other, for the journal may be withdrawn entirely from the bearing without anywise affecting the same, and as a result of this arrangement the bearings may be made and kept in stock in sizes to fit journals of varying diameter, from which the orders may be filled without further fitting, and which bearings may be as easily applied as any plain hub, requiring not the slightest skill for their attachment to a journal or for the insertion of a journal therein; so, also, may the casing or shell and the separating-rings be made in halves or sections for greater convenience in applying to and removing the bearing from a shaft, for by so doing the shaft and its connecting or operating mechanism need not be disturbed when the bearing is removed or substituted by another.

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

1. In an anti-friction journal-bearing, the combination, with the journal and a casing encompassing the same, provided with inclined annular end bearings, of a series of bearing-cylinders interposed between and working upon said journal and casing, the ends of which cylinders are rounded so as to oppose and bear upon the inclined bearings on the casing, and separating-rings traveling with and in which each of said cylinders has a bearing, substantially as described.

2. In an anti-friction bearing, the combination, with the journal and a casing encompassing the same, of a series of bearing-cylinders interposed between and working upon said journal and casing, the said cylinders having contracted journal ends provided with annular peripheral grooves having inclined side walls, and separating-rings provided with peripheral recesses having rounded edges in which the journals of the bearing-cylinders work, substantially as described.

3. In an anti-friction bearing, the combination, with the journal and a casing encompassing the same, provided with inclined annular end bearings, of a series of bearing-

cylinders interposed between and working upon said journal and casing and having rounded ends opposing and bearing upon the inclined bearings on the casing, the con-
5 tracted journal ends of said cylinders provided with annular peripheral grooves having inclined side walls, and separating-rings

provided with peripheral recesses having rounded edges in which said journal ends bear, substantially as described.

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