No. 649,802. Patented May 15, 1900.

W. J. BREWER.

BALL BEARING.

(Application filed Sept. 21, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

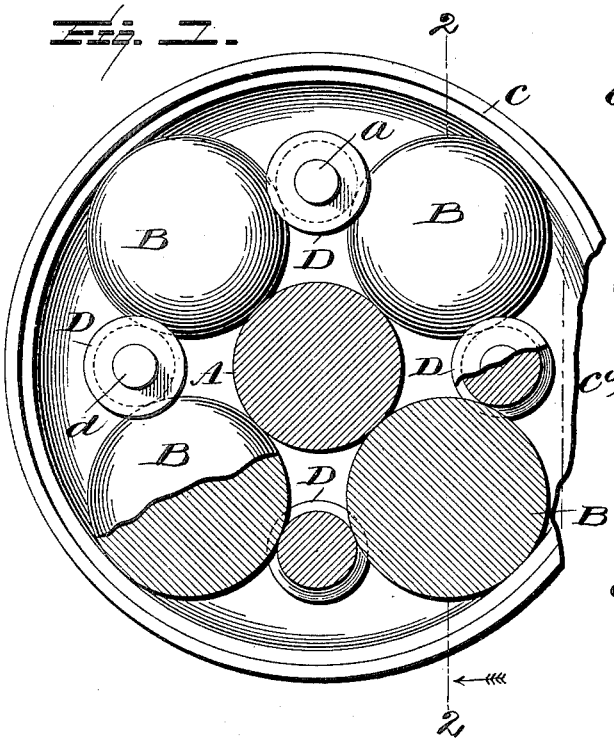
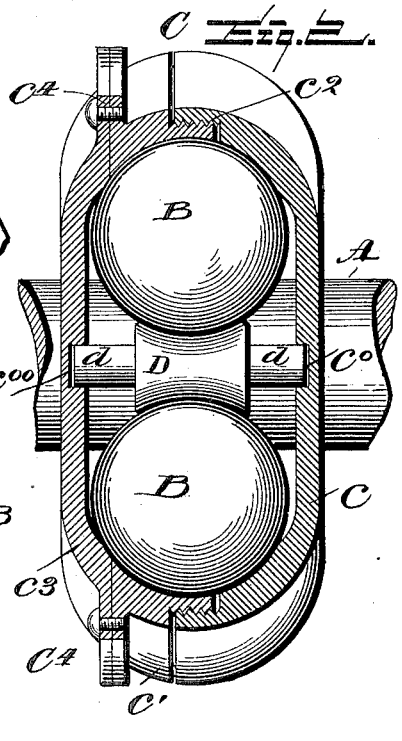


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

Fig. 3.

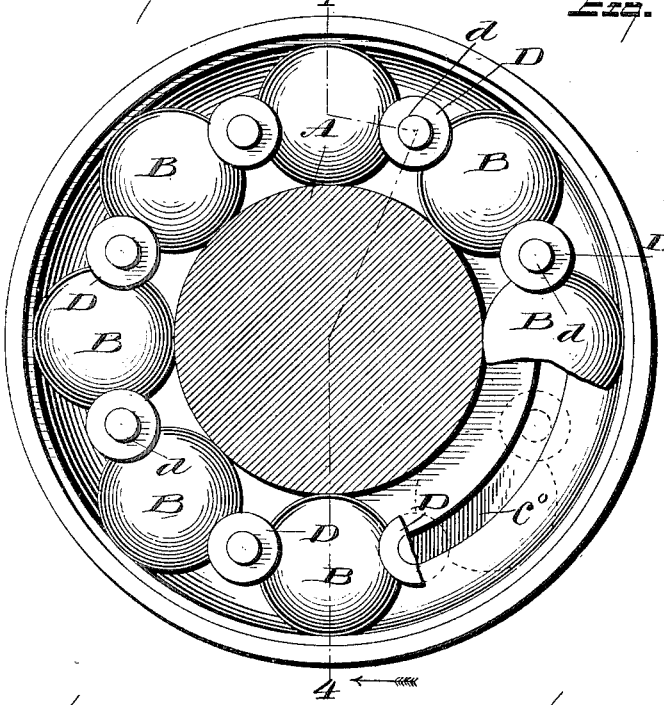


Fig. 4.

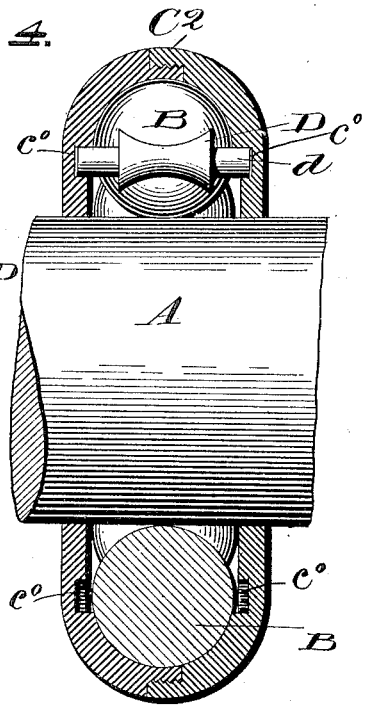


Fig. 5.

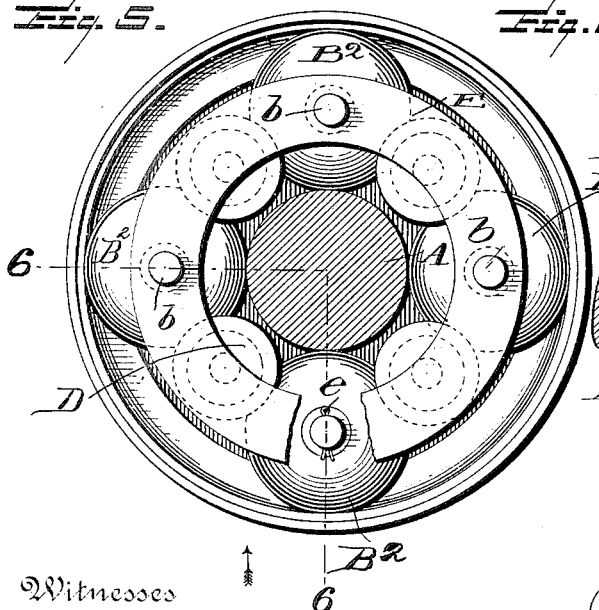
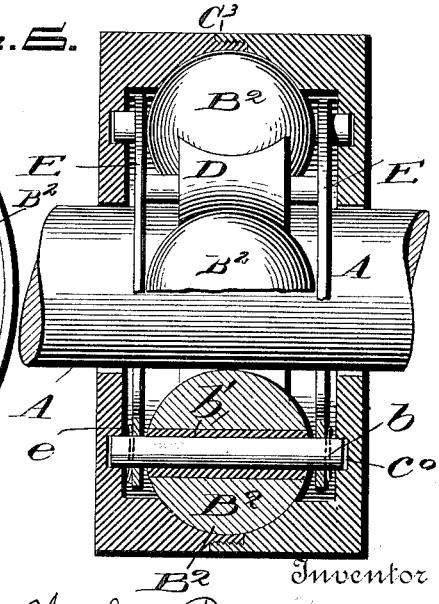


Fig. 6.



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BALL BEARING.

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(No Model.) 3 Sheets--Sheet 3.

Fig. 7.

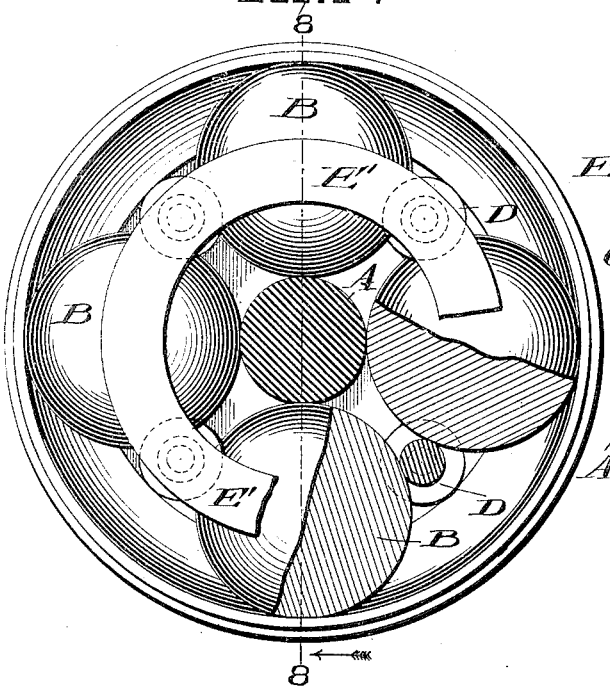


Fig. 8.

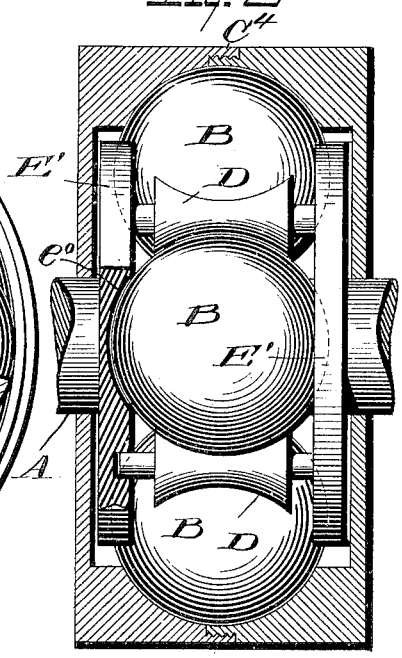


Fig. 9.

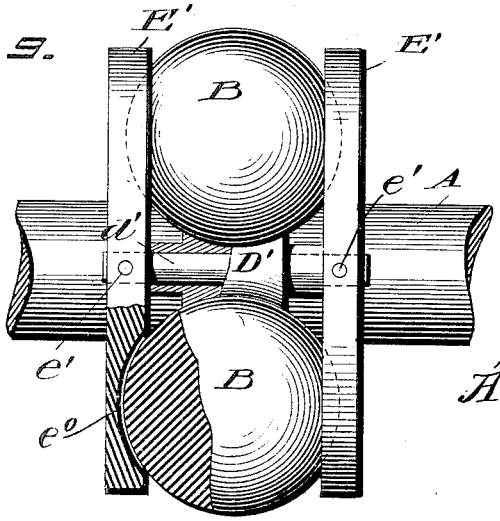
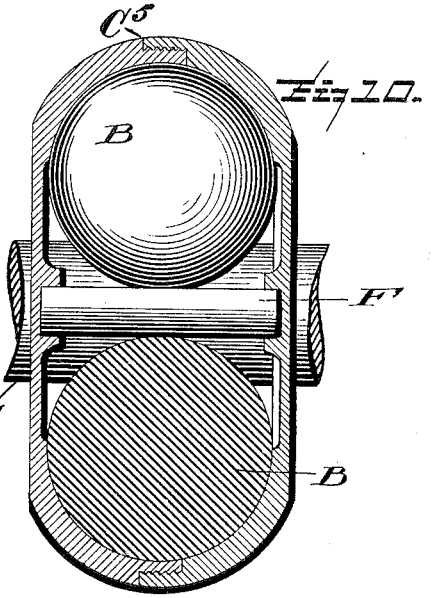


Fig. 10.



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UNITED STATES PATENT OFFICE.

WILLIAM JOHN BREWER, OF LONDON, ENGLAND.

BALL-BEARING.

SPECIFICATION forming part of Letters Patent No. 649,802, dated May 15, 1900.

Application filed September 21, 1899. Serial No. 731,214. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JOHN BREWER, a subject of the Queen of Great Britain and Ireland, residing at London, in the county of Middlesex, England, have invented certain new and useful Improvements in Adjustable and Interchangeable Ball-Bearings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to improvements in antifriction or ball bearings, and more particularly to an improved form of ball-bearing in which the parts are adjustable and interchangeable.

According to my invention I place between each two adjacent balls an independent roller to prevent the balls from touching each other and also to prevent them from violent side play, at the same time preserving the same freedom of adjustment as is now the custom, the object of my invention being to reduce to a minimum the friction between the many parts of the bearing and at the same time render the same readily adjustable and interchangeable.

In order to accomplish these objects, my invention consists of the novel constructions and combinations hereinafter more fully described and claimed, and in order that my said invention may be more clearly understood the same will be described with reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of one form of bearing embodying my present invention with one of the cups or half of the housing removed. Fig. 2 represents a section through the housing, taken along the line 2 2, Fig. 1, and looking in the direction of the arrow, showing the balls and rollers in elevation. Fig. 3 represents in sectional elevation another form of bearing embodying my invention in which the number of balls is increased and having a slightly-different housing from that previously shown. Fig. 4 represents a section taken along the line 4 4, Fig. 3, and looking in the direction of the arrow. Fig. 5 represents in sectional elevation a form of my improved bearing in which the balls are mounted on spindles carried in removable rings, the balls being provided with interchangeable wear-sleeves. Fig. 6 represents a section taken along the line 6 6, Fig. 5, and looking in the direction of the arrow. Fig. 7 represents in sectional elevation, with portions broken away, another form of my invention in which the rollers only are mounted in the removable rings. Fig. 8 represents a section taken through the housing along the line 8 8, Fig. 7, and looking in the direction of the arrow and showing a portion of one of the supporting-rings broken away. Fig. 9 represents in elevation and partly in section another form of my invention in which the rollers between the balls are loosely mounted on spindles secured fast to removable rings. Fig. 10 represents in elevation and partly in section another form of my invention in which the rollers have the shape of cylindrical rods.

Similar letters refer to similar parts throughout the several views.

Referring first to Figs. 1 and 2, A represents the journal or main axle, and B the balls mounted around it. C represents a housing comprising a front portion c and a back c'. These portions c and c' of the housing are screw-threaded, as at c^2, so that either or both portions may be removed at pleasure. The back c' is provided with a removable plate c^3, which is bolted or otherwise removably secured to the back c', as at c^4. D represents rollers having concave surfaces and inserted between the balls, as shown. These rollers are each provided with spindles d, which are mounted in the recesses c^{00} of the housing. These rollers thus allow the balls free movement around the axle; but at the same time keep them separated and prevent them from grinding. It will be seen also that all of the parts are separately removable and may be replaced at pleasure.

In the form of my invention shown in Figs. 3 and 4 the balls and rollers are practically the same as in Figs. 1 and 2, except in the latter instance their number is increased. The housing C^2 differs from that shown in Figs. 1 and 2 in that it is not provided with the removable plate C^3; but obviously the same form of housing may be used with either form of bearing. The rollers D in this instance are mounted in the channels or annular recesses c^0 of the housing.

In the form of my invention shown in Figs.

5 and 6 the balls B^2 are mounted on spindles b, each of which is provided with a removable friction-sleeve b', which engages the interior opening through the ball. These spindles b are mounted in the rings E, located on each side of the balls and pass into the channels c^0 of the housing. The rings E are held in place by the split pins e or other convenient means. The rollers D in this instance are rotatably mounted in the rings E also, but do not extend into the channels of the housing. The rings E, as will be seen, may rotate around the axle, together with the rollers. The balls, together with the sleeves b', rotate on the spindles, and when the sleeves become worn they may be readily replaced by others, as likewise is the case with the other parts.

In the form of my invention shown in Figs. 7 and 8 the balls are free and similar to those shown in Figs. 1 and 2, the rollers D only being mounted in the rings E', which rings are provided with the concave portions or recesses e^0 to receive the balls.

The form of my invention shown in Fig. 9 is substantially the same as that shown in Figs. 7 and 8, with the exception that in this case the rollers D' are hollow, being mounted loosely upon the spindles d', which are secured fast to the rings E', as at e'.

In Fig. 10 is shown a cylindrical rod F, separating the balls B, which may be used in the place of the rollers of the forms hereinbefore described.

It will thus be seen that the channels or recesses in the housing in which the ball-separating rollers are mounted have two functions—they afford a bearing for the rollers, and at the same time allow the separate members of the housing to be screwed up and adjusted in order to take up the wear.

The feature of my invention which enables the wear of the parts to be taken up by adjusting the box or housing is an important one and will be readily appreciated by those familiar with the art to which my invention relates.

From the foregoing description it will be seen that there is no limit to the number of balls and intermediate rollers employed, that the balls may be of any required diameter, that the intermediate rollers, as well as the balls, may be fast or loose on their axles, and that the balls may be solid or hollow, all without departing from the spirit of my invention; but,

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In an antifriction-bearing, the combination with a shaft, of a plurality of balls mounted around said shaft, a housing inclosing said balls and forming a bearing-surface therefor, spindles mounted within said housing and passing through said balls, intermediate rollers separating adjacent balls from each other and in engagement therewith, and means for supporting said spindles within said housing, substantially as described.

2. In an antifriction-bearing, the combination with a shaft, of a plurality of balls mounted around said shaft, a housing inclosing said balls and forming a bearing-surface therefor, spindles mounted within said housing and passing through said balls, interchangeable wear-sleeves carried by said spindles, intermediate rollers separating adjacent balls from each other and in engagement therewith, and means for supporting said spindles and rollers within said housing, substantially as described.

3. In an antifriction-bearing, the combination with a shaft, of a plurality of balls mounted around said shaft, a housing inclosing said balls and forming a bearing-surface therefor, a plurality of spindles provided with interchangeable wear-sleeves and passing through said balls, rollers separating the adjacent balls from each other, spindles carrying said rollers, and removable rings in which said spindles are mounted, substantially as described.

4. In an antifriction-bearing, the combination with a shaft, of a plurality of balls mounted around said shaft, a housing inclosing said balls and forming a bearing-surface therefor, said housing being provided with recesses, a plurality of spindles provided with interchangeable wear-sleeves and passing through said balls, rollers separating the adjacent balls from each other, spindles carrying said rollers, removable rings in which the said spindles are mounted, the said rollers being mounted in said recesses, substantially as described.

5. In an antifriction-bearing, the combination with a shaft, of a plurality of balls mounted around said shaft, a separable and adjustable housing inclosing said balls, forming a bearing-surface therefor and provided with annular recesses on each side of the balls, spindles mounted in said annular recesses within said housing and passing through said balls, intermediate rollers separating adjacent balls from each other and in engagement therewith, and means for supporting said rollers within said housing, substantially as described.

6. In an antifriction-bearing, the combination with a shaft, of a plurality of balls mounted around and in contact with said shaft, a housing inclosing said balls, said housing being composed of separable and independently-adjustable members in direct contact with and forming bearing-surfaces for said balls, and separating-rollers located between said balls, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM JOHN BREWER.

Witnesses:

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GEORGE W. WALSH.