No. 670,950. Patented Apr. 2, 1901.

S. S. EVELAND.

ANTIFRICTION BEARING.

(Application filed Apr. 26, 1899.)

(No Model.)

Fig. 1.

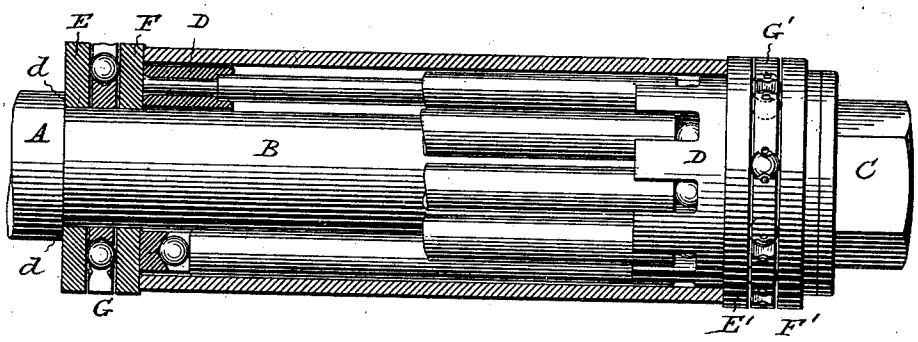


Fig. 2.

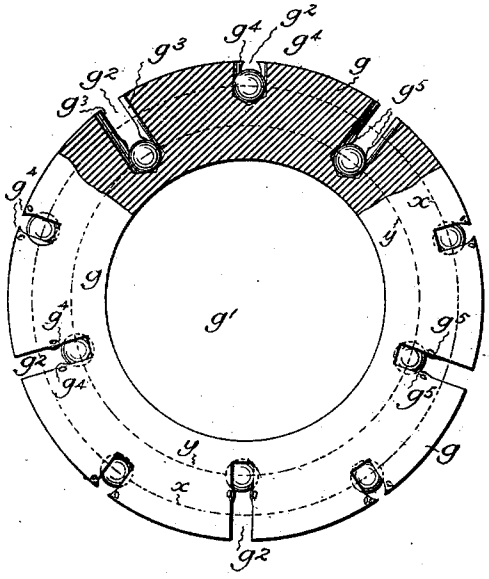
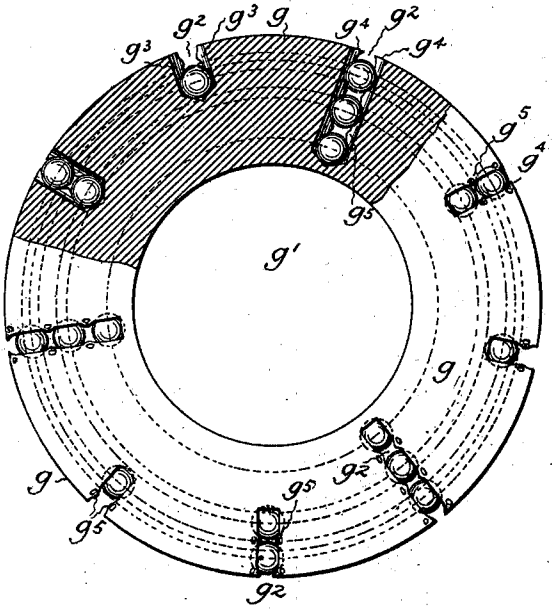


Fig. 3.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL S. EVELAND, OF PHILADELPHIA, PENNSYLVANIA.

ANTIFRICTION-BEARING.

SPECIFICATION forming part of Letters Patent No. 670,950, dated April 2, 1901.

Application filed April 26, 1899. Serial No. 714,472. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. EVELAND, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Antifriction-Bearings, of which the following is a specification.

My invention relates particularly to the class of antifriction-bearings known as "thrust-bearings;" and my object is to provide a bearing of this class that may be cheaply made and yet fulfil all requirements.

In carrying out my invention I use a ring, preferably made of brass, but it may be made of other material, and form in it a series of sockets extending inwardly from the periphery toward the inner part of the ring, and in these sockets I arrange balls which project through the sides of the openings of the sockets and present bearing-surfaces on opposite sides of the ring. The balls are prevented from moving out of the sockets by small burs formed by swaging the metal at the edges of the sockets with a sharp tool. The sockets are of different lengths and have concave walls. The balls are arranged alternately close to the periphery of the ring and at a distance therefrom close to the inner edge of the ring, burs being formed on the sides of the ring at the edges of the sockets to confine the inner series of balls, while burs are formed on the periphery of the ring to confine the outer series.

The details of construction will be further explained hereinafter.

In the accompanying drawings, Figure 1 shows, partly in section and partly in side elevation, (some of the parts being broken away,) a vehicle-axle provided with a roller-bearing and two of my improved end-thrust bearings. Figs. 2 and 3 are on an enlarged scale. Fig. 2 shows, partly in elevation and partly in section, one way of arranging the balls in the ring. Fig. 3 shows, partly in elevation and partly in section, another way of arranging the balls.

While my improvements are confined to the arrangements shown in Figs. 2 and 3, I have shown in Fig. 1 one way of applying my improvements. In this figure, A indicates the end of a vehicle-axle, and B the journal-arm thereof. D indicates a roller-bearing of the type shown in Hobron's United States patent, No. 602,047 of April 5, 1898. C indicates a flanged nut secured to the end of the axle-arm for confining the roller-bearing on the arm. Between the inner end of the roller-bearing and the shoulder d of the axle are interposed two collars E and F, which neatly but loosely fit the axle-arm, and between these collars is interposed one of my improved end-thrust bearings G. In like manner the two collars E′ F′ are interposed between the outer end of the roller-bearing and the inner end of the flanged nut C, and between the collars E′ and F′ is interposed one of my improved end-thrust bearings G′.

In general outline my thrust-bearing consists of a ring g, provided with a central opening g' to fit the axle-arm and a series of ball-sockets g^2, extending inwardly from the periphery of the ring, open on opposite sides, and having concave walls g^3, conforming to the shape of the balls. While the balls extend through the openings in the sides of the sockets, they cannot pass down therethrough, as the width of the socket is less than the diameter of the balls. The inner ends of the sockets are closed, as shown, and the balls are confined in the sockets and prevented from passing out through the openings in the periphery by means of burs formed by swaging the metal at the edges of the sockets. The burs extend inwardly toward each other, so as to reduce the width of the sockets, and thus confine the balls.

The sockets g^2 vary in length. In Fig. 2 every alternate socket is twice as long as the others. The balls are arranged at the inner ends of the sockets. Burs g^4 are formed on the periphery of the ring to confine the outer series of balls, while burs g^5 are formed on the sides of the ring at the edges of the sockets to confine the inner series of balls. It will be observed by reference to the dotted lines x and y that the balls are arranged in circles, the radii of which are of different lengths, so that the outer series of balls do not contact with the same surface as the inner series of balls.

In Fig. 3 a modification is shown in which

the sockets are made of three different lengths, the shorter socket being adapted to accommodate one ball, the longer socket being adapted to accommodate three balls, while the third socket is made to accommodate two balls. The balls are held in proper position in the sockets by burs formed on the periphery of the ring and also on opposite sides thereof, as indicated. It will be noted by reference to the dotted circular lines how the balls are adapted to contact with the surface against which they bear. By arranging the balls in this way whatever wear there is on the washers or surfaces with which the balls engage will be distributed and formation of grooves prevented.

I have shown in Fig. 1 my improvements applied to a vehicle-axle and in connection with a particular kind of roller-bearing; but my invention is not confined to such use of my improvements, as my thrust-bearing may be used in a great many places where it is desired to relieve end thrust, such as machinery, shafting, &c.

I claim as my invention—

An end-thrust bearing comprising a ring formed with a series of sockets of different lengths extending from the outer edge or periphery of the ring inwardly, and which are open at their sides and have concave walls, and balls confined in said sockets and arranged alternately close to the periphery of the ring and at a distance therefrom close to the inner edge of the ring, said ring having swaged burs on the periphery at the outer ends of the smaller sockets, and projecting laterally into them to confine the balls, and said ring having also swaged burs on the sides of the ring projecting into larger sockets to confine the balls at the inner ends of the sockets near the inner surface of the ring.

In testimony whereof I have hereunto subscribed my name.

SAMUEL S. EVELAND.

Witnesses:
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