A. L. WESTMAN.

SEPARATING ROLLER FOR ANTIFRICTION BEARINGS.

APPLICATION FILED MAR. 1, 1917.

1,289,062. Patented Dec. 24, 1918.

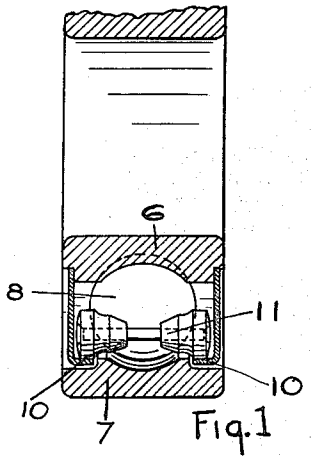


Fig. 1

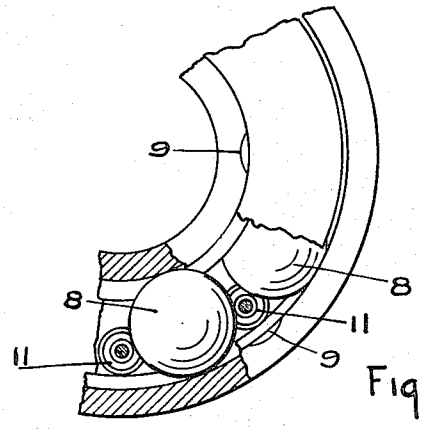


Fig. 2

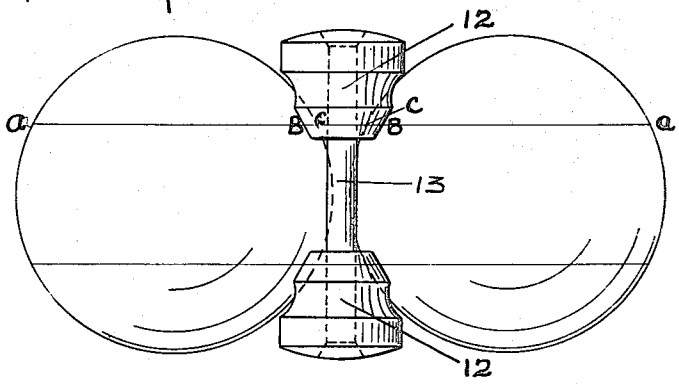


Fig. 3

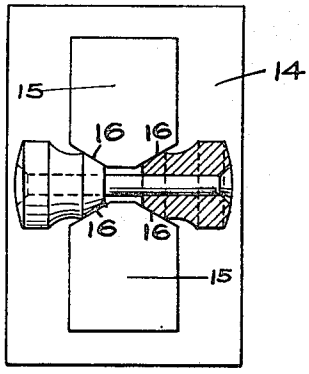


Fig. 4

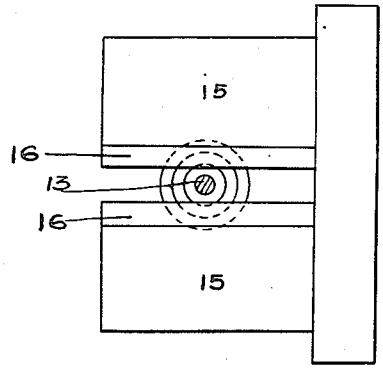


Fig. 5

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UNITED STATES PATENT OFFICE.

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SEPARATING-ROLLER FOR ANTIFRICTION-BEARINGS.

1,289,062. Specification of Letters Patent. Patented Dec. 24, 1918.

Application filed March 1, 1917. Serial No. 151,790.

To all whom it may concern:

Be it known that I, AXEL L. WESTMAN, a citizen of the United States of America, and a resident of Long Island City, in the county of Queens and State of New York, have invented certain new and useful Improvements in Separating-Rollers for Anti-friction-Bearings, of which the following is a specification.

This invention relates to separating rollers for anti-friction bearings in which rolling bearing members are kept from contact with one another by means of rolling separating members for which tracks are provided, the parts being so proportioned that only rolling friction is occasioned by the operation of the bearing.

One of the objects of the invention is the production of a separating roller which possesses the requisite hardness and durability of the track contacting and ball separating portions and a connecting shaft for said members which possesses resiliency and toughness.

In a bearing of the character above described, there must exist a certain relationship between the circles of contact on the balls and the corresponding circles of contact on the separating roller. In the manufacture of a separating roller from a single piece, great care must be taken in order that this relationship may be assured and in certain cases, particularly where the neck of the roller is very small in proportion to the head, difficulty is experienced in maintaining true alinement of the roller in hardening.

A further object of this invention is the production of a separating roller in which this extreme care is obviated but which still possesses this necessary relationship with the balls.

In the accompanying drawings, which form a part of this application, I have illustrated one form of my invention but it should be understood that the drawings are only illustrative and that my invention is not limited to the precise showing thereof.

In these drawings—

Figure 1 is a partial vertical cross-section, partly broken away, of a bearing embodying one form of my invention;

Fig. 2 is a partial view of the embodiment of Fig. 1 partly in side elevation and partly in cross-section;

Fig. 3 is a diagrammatic illustration of the relationship between the circles of contact on the balls and the corresponding circles of contact on the separating rollers;

Fig. 4 is a plan of one type of jig which may be used in the construction of the separating roller, one of the separating rollers being shown in place therein; and

Fig. 5 is a side elevation of the apparatus of Fig. 4.

The bearing embodied in the drawings as a means of illustrating the separating roller is a radial bearing comprising an inner race 6 and an outer race 7 with rolling bearing members, herein illustrated as balls, 8 8 interposed between the races in any suitable manner as for example by the aid of filling slots 9 9. On the inner race are suitably supported tracks 10 10 upon which run separating rollers 11 11, the parts being so proportioned that only rolling friction is caused by the rotation of the bearing.

The separating roller comprises two bearing and contacting heads 12 12 joined together by and rigidly mounted upon a shaft 13. The material chosen for the heads of the rollers should preferably be one suitable for hardening and the material chosen for the shaft, one which possesses resiliency and toughness. As an illustration of desirable material for these purposes, Bessemer rod or cold rolled steel are desirable materials for the heads, and piano wire a desirable material for the shaft.

In Fig. 3 the circles of contact on the balls between the balls and the separating roller are indicated by the lines *a c* and the corresponding circles of contact on the separating flanges of the roller by the lines *b b*, the separating flanges being here shown for purposes of convenient illustration as conical.

The diameters of the contacting circles on the ball are dependent upon (in the form illustrated) the angle of the conical separating surface of the roller so that maintaining the correct angle will insure the desired diameters of the contacting circles on the balls. The diameters of the corresponding circles on the roller will be determined by the general distance apart of the two (as here shown conical) separating flanges of

the roller. As these separating flanges are located farther apart on the shaft their circles of contact with the balls decrease in diameter and vice versa. As a result of this fact the proper location of the two ends on the shaft will insure contacting circles of correct diameters providing the separating flanges are tangent to the balls on the proper angle.

In Figs. 4 and 5 is illustrated a jig by which the separating roller may be so assembled as to insure a spacing between the separating flanges which will give the correct diameters of contacting circles thereon. The jig illustrated comprises suitably mounted uprights 15 15 with opposing faces 16 16 accurately formed to constitute the complements of the particular type and form of separating flanges desired.

In assembling the roller by the aid of such a jig one head of the separating roller may be firmly fastened to the shaft and this head placed tightly against the faces on one side of the upright. The other head is then placed on the shaft and fastened thereon while held in close contact with the faces on the other side of the upright.

The foregoing detailed description has been given for clearness of understanding and no undue limitation should be deduced therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

What I claim as new and desire to secure by Letters Patent is:

1. As a new and improved article of manufacture, a separating roller for antifriction bearings comprising two heads of suitable material to resist compressional stress, and a connecting shaft for the heads of suitable but different material to resist bending stress, each head being provided with a circular track-engagement surface and a circular ball-engagement surface, substantially as described.

2. As a new and improved article of manufacture, a separating roller for antifriction bearings comprising two heads of suitable material to resist compressional stress, and a connecting shaft for the heads of suitable but different material to resist bending stress, each head being provided with a circular track-engagement surface and a circular ball-engagement surface the latter lying in the face of a cone, substantially as described.

3. As a new and improved article of manufacture, a separating roller for antifriction bearings comprising two heads of suitable material to resist compressional stress, and a connecting shaft for and extending through the heads and rigidly attached thereto and being of suitable material to resist bending stress, each head being provided with a circular track engagement surface and a circular ball engagement surface the latter lying in the face of a cone, substantially as described.

Signed at New York, N. Y., this 28th day of Febry., 1917.

AXEL L. WESTMAN.