(No Model.) 2 Sheets—Sheet 1.

T. J. REID.

ROLLER BEARING.

No. 584,893. Patented June 22, 1897.

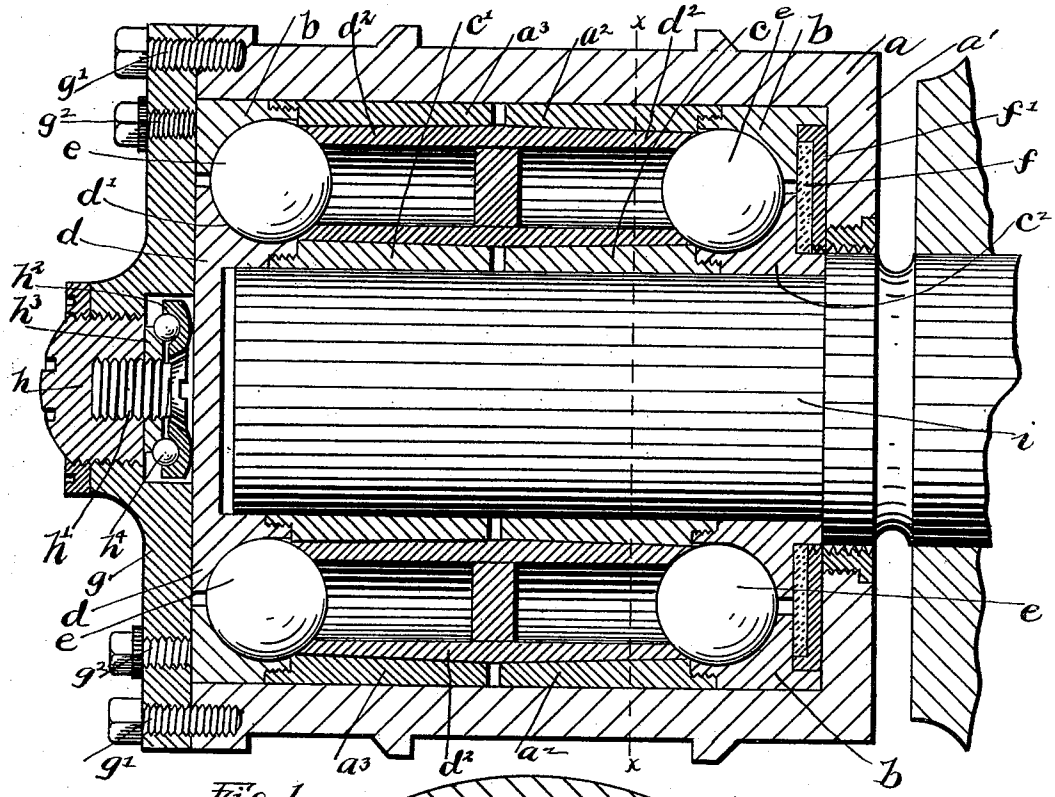

Fig 1

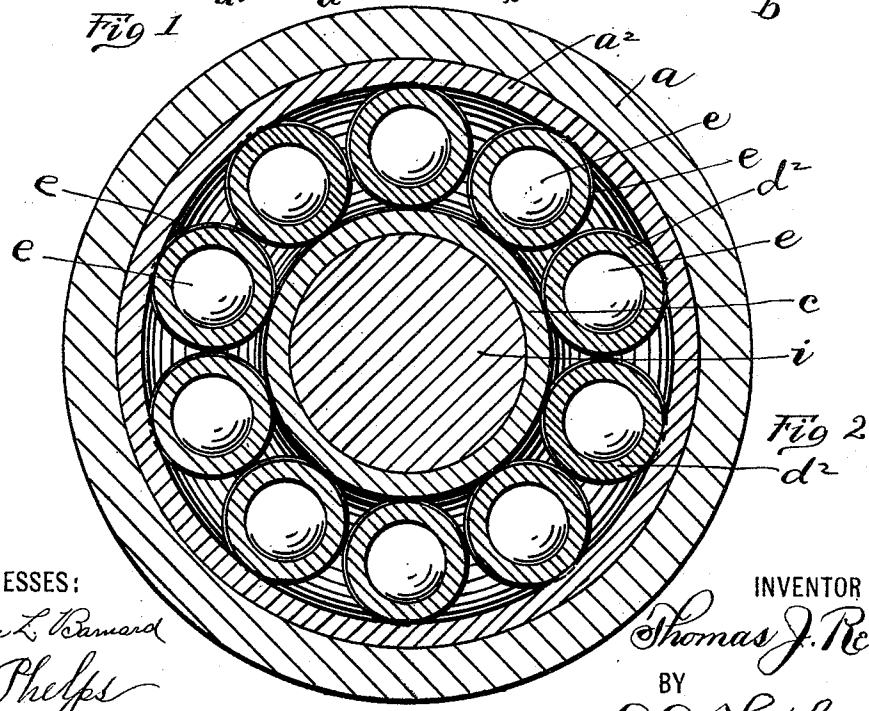

Fig 2

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Fig. 3

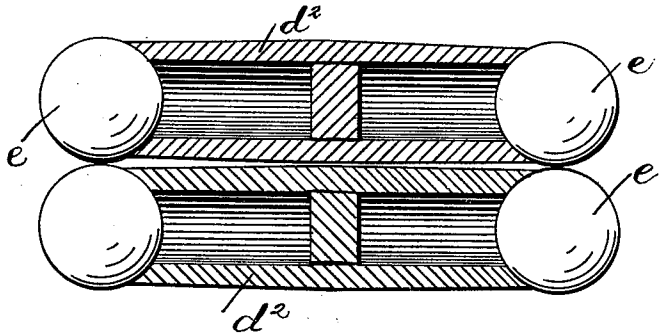
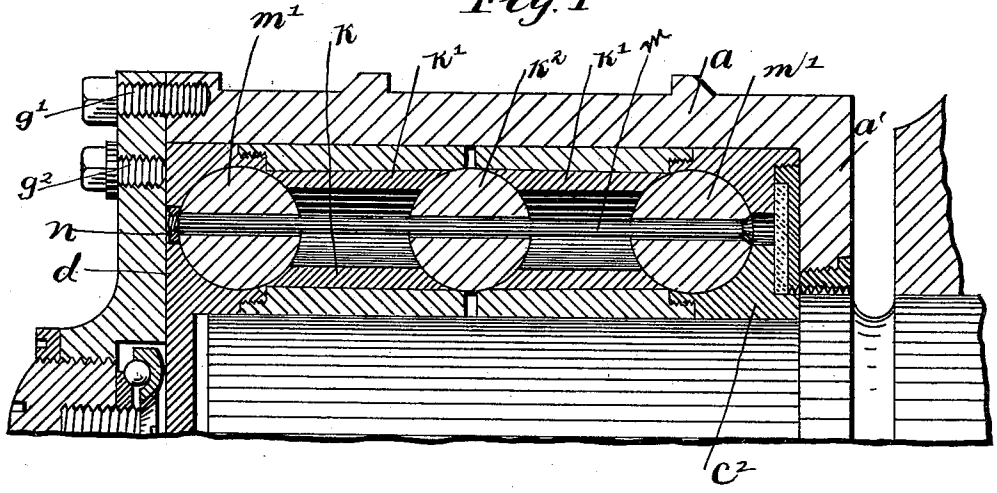


Fig. 4



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UNITED STATES PATENT OFFICE.

THOMAS J. REID, OF WASHINGTON COURT-HOUSE, OHIO.

ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 584,893, dated June 22, 1897.

Application filed August 14, 1896. Serial No. 602,725. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. REID, a citizen of the United States, residing at Washington Court-House, in the county of Fayette and State of Ohio, have invented a certain new and useful Improvement in Roller-Bearings, of which the following is a specification.

My invention relates to antifrictional journal-bearings; and the objects of my invention are to provide a combined ball and roller bearing of such improved construction and arrangement of parts as to provide a uniform wear of both balls and rollers, to provide means for adjustment of the rollers and balls, sleeves and casings, to reduce the frictional contact between the rollers, to prevent undue lateral movement of said rollers and consequent wear of the parts, and to produce other improvements, the details of construction of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of a journal-box having my improvements therein. Fig. 2 is a transverse section on line $x\,x$ of Fig. 1. Fig. 3 is a detail view showing two adjacent rollers and their end balls, said rollers being shown in longitudinal section; and Fig. 4 is a partial longitudinal section of a journal-box, showing a modified construction and arrangement of the bearings.

Similar letters refer to similar parts throughout the several views.

a represents the box or external case, which is provided on its inner end with the inturned flange portion a'. On the inner side of the box a I fit an inner casing which, as indicated in the drawings, is formed of separated sections a^2 a^3, the inner surfaces of these sections tapering toward their inner ends. The outer end of each of these casing-sections has a threaded connection with a cone-bearing ring b.

c and c' represent the axle-spindle sleeve-sections, which, as prescribed for the inner casing-sections, are separated centrally and have their outer surfaces inclined or tapered toward their inner ends. The inner end of the section c has a threaded connection with an inner cone-bearing ring c^2, which forms an inner end extension of the sleeve-section c. The outer end of the sleeve-section c' has a threaded connection with a sleeve-head or end cap d, the latter being opposite the bearing-ring b and having formed in its periphery a cone-bearing surface d'.

d^2 represent parallel rollers, the latter being arranged between the casing-sections and sleeve-sections and having their exterior surfaces tapering toward their outer ends to conform substantially to the inclines or tapers of said casing sleeve-sections.

e represent bearing-balls, these balls being arranged in inner and outer rings and one of said balls bearing partially in each end of each of the rollers and partially in the sleeve-cap d, casing extensions b, and ring c^2.

f represents a packing-ring, of felt or similar material, which is arranged in a recess formed partially in the end of the casing-ring b and sleeve-ring c^2. On the outer side of this packing-ring I provide a follower f'.

g represents the outer end cap of the boxing, which, by means of screws g', is united to said external boxing.

g^2 represent set-screws which pass through threaded openings in the cap g and have their inner ends in contact with the casing-ring b. This cap is provided with a central adjusting and end-thrust-receiving screw h, the latter having formed in its inner end a threaded socket which receives a screw h'. About the inner end portion of this screw is arranged a bearing-ring h^2, and between said bearing-ring and the screw h I provide a cone-bearing block or ring h^3. Between the ring h^3 and ring h^2 are interposed bearing-balls h^4.

As shown in the drawings, the inner surface of the ring h^2 is designed to be in contact with the outer end surface of the sleeve cap or head d.

i represents an axle-spindle which is surrounded by the sleeve-sections c' and c and which is laterally movable therein.

In operation it is evident that the rotation of the axle-spindle will carry with it the sleeve-sections c c', sleeve-cap section d, and inner cone-bearing c^2, while the external casing or box and its inner casing-sections a^2 a^3 and cone-bearing ring b will remain stationary. It will be noted that the balls e are arranged partially in rings b b and partially against parts c^2 d about the inner and outer sleeve-

sections, and that these balls are of such relative size with the central portions of the tubular rollers as to result, as indicated in Fig. 3 of the drawings, in a comparatively light touch of the balls of each circle or ring. In this manner it is obvious that not only the rollers but the balls themselves will be retained at all times in parallel alinement with each other and that no frictional contact will exist between the roller-bodies. It will thus be seen that the friction between the bearing parts of my device will be exceedingly slight.

By employing a ball, as herein shown and described, at each end of each of the roller-bodies it will be observed that each pair of oppositely-located balls practically become a part of the roller which they adjoin.

From the construction which I have shown and described it is obvious that adjustment of the balls or the parts within which they bear for the purpose of compensating for wear on said balls or parts may be accomplished by proper rotation of the adjusting-screws g^2 and end-thrust-receiving screw h.

It will be observed that the parts of my improved journal-box are few, simple of construction, and positive in operation, and that the same may be produced at a reasonable cost of manufacture.

As indicated in Fig. 4 of the drawings, I may modify the construction hereinbefore described by the construction of each of the rollers in two separated sections, which are indicated at k and k', and by the employment of a central or third ring of balls k^2, which are arranged between and have their peripheries projecting partially within the inner ends of said tubular roller-sections. A further part of said modification consists in the employment of horizontal bolts m, which pass through the oppositely-located balls of the three rings and which also pass through the tubular sectional rollers and serve to bind said balls in the positions shown at the ends and central portions of said rollers. The outer rows m' of balls correspond with and perform the offices of the balls e. (Shown in Figs. 1 and 2.) At the outer end of each of the bolts m I provide a nut n, by means of which said balls are united with the roller-sections and made to form substantial parts thereof.

From the construction of the modified form it is obvious that the central ring of balls k^2 being interposed between the separated sections of the rollers and said balls being held in connection with said roller-sections additional means are provided for retaining the rollers in alinement.

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

1. In a roller-bearing journal-box the combination with an external casing, an internal sectional casing a^2 a^3, a bearing-ring b at the outer end thereof and a similar bearing-ring at the inner end thereof, a sectional sleeve, a forward end cap on said sleeve having a ball-bearing surface therein and an inner end sleeve and bearing-ring c^2, of a series of rollers running between said inner casing and sleeve and balls arranged at the ends of said rollers and bearing between said rings b and c^2 and b and d, substantially as and for the purpose specified.

2. In a roller-bearing journal-box the combination with the external casing, an internal casing connected therewith and a sectional sleeve, said inner casing and sleeve having their inner surfaces tapered toward their inner ends, of a series of rollers arranged in parallel alinement between said sleeve and casing and balls bearing in raceways and in the ends of said rollers, each of said balls being of greater diameter than the roller which it adjoins, substantially as and for the purpose specified.

3. In a roller-bearing journal-box the combination with an external casing, a sectional internal casing, a sectional sleeve and outer end cap therefor, of rollers each of which is formed in two separated sections, raceways at the outer ends of each of said roller-sections, balls m' in said raceways and bearing in the outer ends of said roller-sections and balls k^2 arranged between the inner ends of said roller-sections and bearing therein and bolts k passing through said balls m' and k^2 and through said tubular rollers, substantially as and for the purpose specified.

THOMAS J. REID.

In presence of—
A. L. PHELPS,
J. L. DANN.