(No Model.)

2 Sheets—Sheet 1.

T. J. REID.

ROLLER BEARING.

No. 596,828. Patented Jan. 4, 1898.

Fig. 1

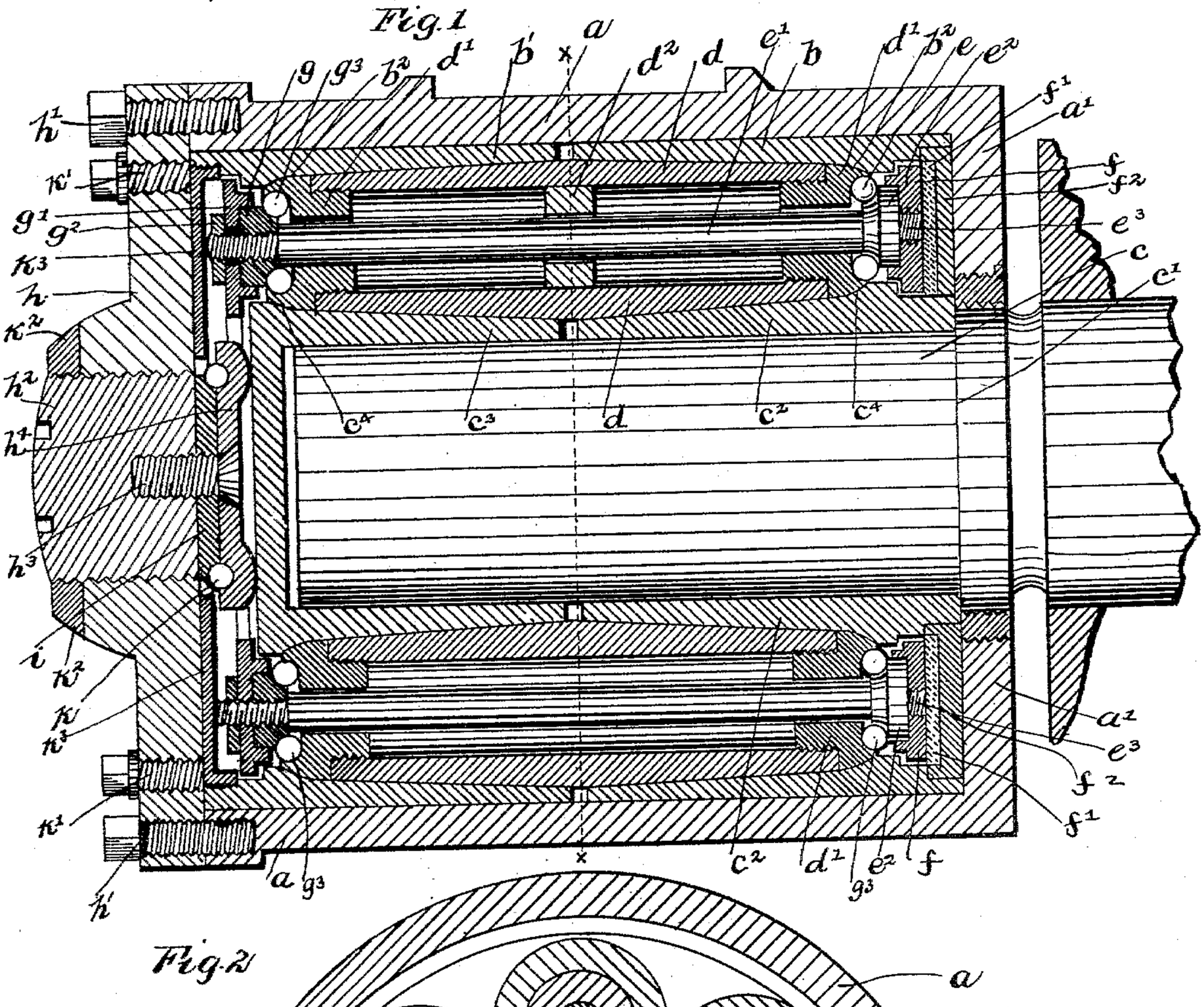
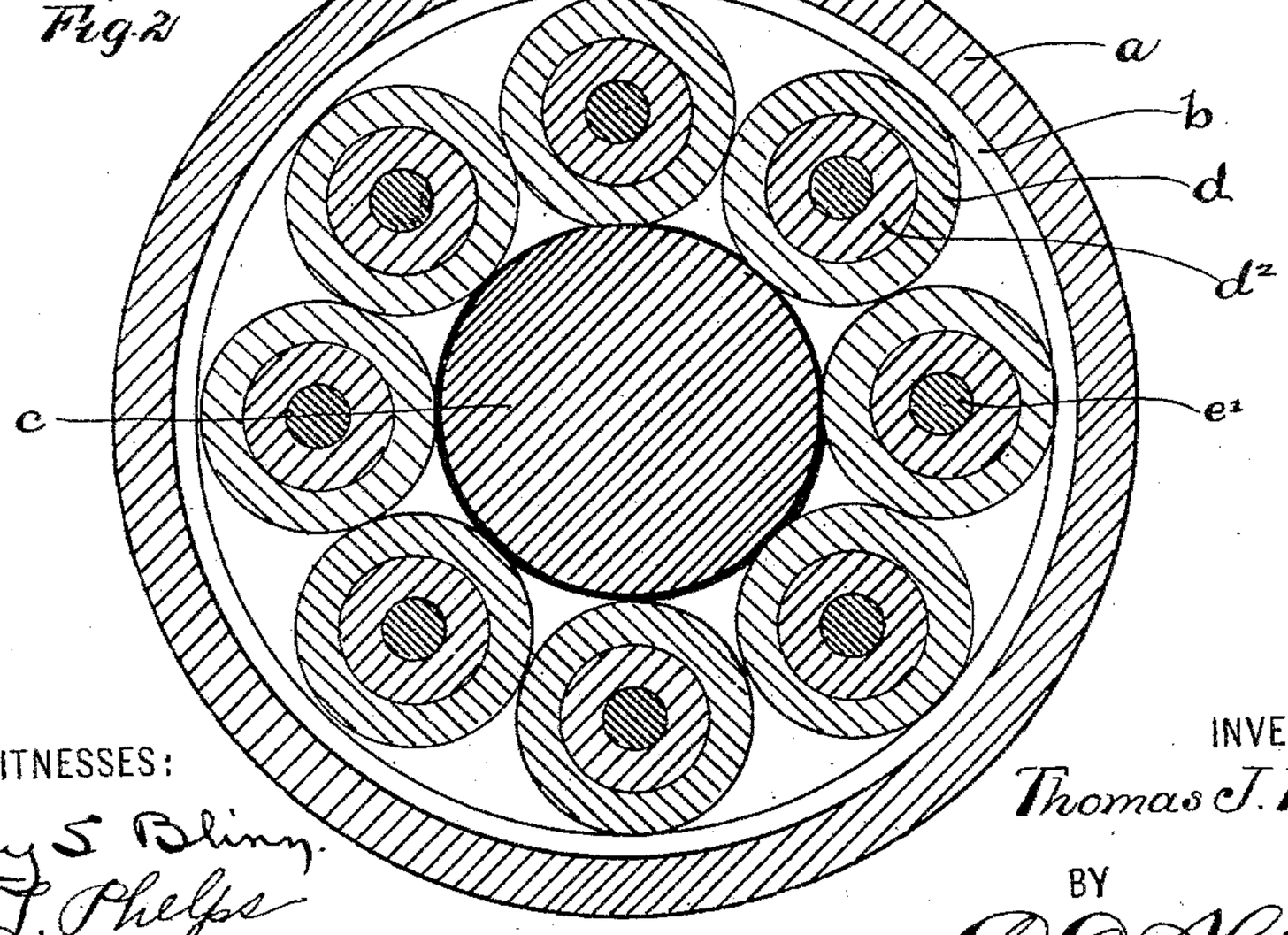


Fig. 2



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(No Model.) 2 Sheets—Sheet 2.

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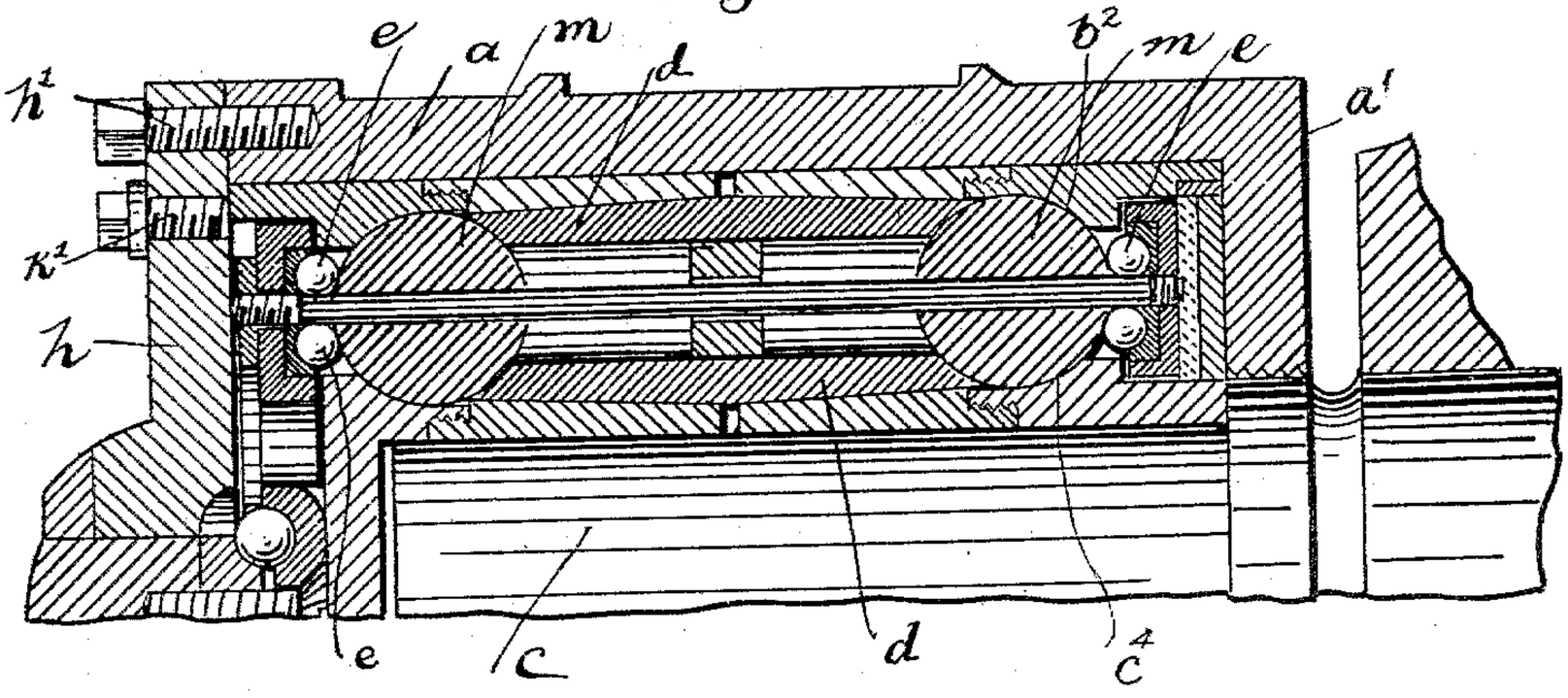
Fig. 3



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UNITED STATES PATENT OFFICE.

THOMAS J. REID, OF WASHINGTON COURT-HOUSE, OHIO, ASSIGNOR OF ONE-HALF TO J. LYMAN DANN, OF COLUMBUS, OHIO.

ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 596,828, dated January 4, 1898.

Application filed August 14, 1896. Renewed September 4, 1897. Serial No. 650,664. (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 the improvement of antifrictional bearings; and the objects of my invention are to provide an improved roller-bearing of such arrangement and construction as to retain the rollers in perfect parallel alinement with the spindle and with each other, to provide improved means for adjustment of the balls and rollers, and to produce other improvements 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 improvement therein. Fig. 2 is a sectional view on line *x x* of Fig. 1, and Fig. 3 is a partial longitudinal section of a modified construction.

Similar letters refer to similar parts throughout the several views.

In carrying out my invention I employ an external case *a*, which is open at its outer end and which is provided on its inner end with an inturned flange portion *a'*. Fitting closely within this external casing is an inner case, which is preferably composed of the sections *b* and *b'*, these sections being capable of a longitudinal movement within said casing for the purpose of adjustment, as hereinafter described. The inner surfaces of said sections are made to taper toward their inner ends, and each of said sections has formed in its inner surface and near its outer end portion a slightly-rounded shoulder or bearing-surface b^2.

c represents an axle-spindle which is provided with the usual peripheral shoulder *c'* at its junction with the axle-body. The spindle *c* fits within and is suitably connected with the sectional sleeve. This sleeve consists of an inner end section c^2 and an outer end section c^3, the latter being in the form of a cap which embraces the outer end portion of the spindle. The outer surface of each of the sleeve-sections c^2 c^3 has formed thereon slightly curved or rounded bearing-shoulders c^4, which, as shown in the drawings, are opposite the correspondingly-shaped shoulders b^2 of the internal casing. Said sleeve-sections are also provided on their outer surfaces with inclines corresponding with the inner surface inclines of the casing-sections above referred to.

Arranged about the sleeve-sections c^2 and c^3 are tubular rollers *d*, each of these rollers tapering from its central portion toward each end or being shaped to conform to the taper of the internal casing and sleeve-sections. Each of the rollers *d* is provided with an end bearing-block *d'*, said block having, as indicated, a screw-threaded connection with the internally-threaded end portion of the roller and forms substantially a continuation of the roller end. The extension or projecting end portion of each of the blocks *d'* has its outer surface provided with a curved or cone taper, which is adapted to bear and run in the correspondingly-inclined surfaces b^2 and c^4 of the internal casing and sleeve-sections. These end blocks also serve, as will readily be seen, to strengthen and support the roller ends, while the central portion of each of the rollers is strengthened by an internal partition or bridge-ring d^2. As hereinafter described for the modification illustrated in Fig. 3, the blocks *d'* may be omitted and bearing-balls substituted therefor.

In Fig. 1 each of the blocks *d'* is provided on its outer end portion with a cone-bearing depression or recess which is adapted to receive bearing-balls *e*. Passing through each of the rollers is a central shaft *e'*, the inner end portion of which carries a cone bearing-ring e^2, and between the bearing-surface of said cone-ring e^2 and the end recess of the adjacent block *d'* are arranged the balls *e*. Each of the shafts *e'* is provided with an inner end screw-threaded extension e^3, which is screwed into a separating-ring *f*, which ring passes about the inner end portion of the sleeve. On the outer side of this separating-ring is arranged a felt packing-ring *f'*, the latter being embraced within a follower f^2. At its outer end the threaded extension of the shaft *e'* has screwed thereon a cone bear-

ing-block g, and on the outer side of this block each of said shaft extensions pass loosely through openings in a separating-ring g', the latter being secured in place by means of nuts g^2. Between the cone bearing-blocks g and the adjacent blocks d' are arranged bearing-balls g^3, corresponding with the balls e at the opposite ends.

h represents an outer end boxing-cap, which by means of the screws h' is united to the outer end of the case. Through the central portion of this cap is screwed an end-thrust-receiving and adjusting screw h^2, and threaded in the inner end of said screw h^2 is another screw h^3, the head or inner end of which has loosely mounted thereon the central portion of a ball-bearing ring h^4. Between the ring h^4 and inner end of the screw h is a bearing cone or ring i, and between said bearing-rings i and h^4 are arranged bearing-balls k. The bearing-ring h^4 is adapted to receive the end thrust of the axle through the cap or head c^3 of the sleeve.

On the outer end of the screw h^2 I provide a lock-nut k^2.

k' represents adjusting-screws which at intervals pass through threaded openings in the cap-plate h and the inner ends of which are adapted to bear against an internal ring k^3, which has its flanged periphery screwed into engagement with the outer end of the internal casing.

Owing to the fact that the rollers are made to taper from their central portions toward each end and that the surfaces within which they bear are similarly tapered, it is obvious that the load or weight on said rollers will tend to the center and that the tendency toward wear of the rollers through sliding friction will be greatly reduced. The shafts e' assist in retaining the rollers in proper alinement, and owing to the engagement of said shafts with the channel-rings g' and f they are retained in parallel alinement with the axle-spindle c and at proper distances one from the other. These shafts also take the place of the cage-bolts which are ordinarily employed to unite the channel-rings, such as are shown at f and g'. These channel-rings serve to close the ends of the cage. It is obvious that the ends of the rollers will be strengthened by the bearing blocks or terminations d' and that the balls e and g^3 will afford antifrictional end bearings for said rollers.

An inward adjustment of the inner casing-sections is attained by a manipulation of the screws k', thereby admitting of compensating for wear on the balls and rollers and their raceways.

The inward adjustment of the sleeve-head c^3 may be accomplished by rotation of the screw h^2, the contact of said sleeve-head with the ball-bearing ring h^4 operating to adjust the rollers and to greatly reduce the friction at the outer end of the sleeve-head. The end-thrust-receiving screw h^2 and the parts which are attached thereto are, however, claimed by me in a separate patent application of even date herewith.

In the modification illustrated in Fig. 3 of the drawings it will be observed that I have substituted for the end blocks or strengthening extensions d' (shown in Fig. 1) balls m. One of these balls is seated against and partially within each end of each of the rollers, and the antifrictional bearing-balls e are retained in frictional contact with said balls m, as shown, while the shafts e' pass through said balls.

As is true of the blocks d', the balls m bear in the curved bearing-surfaces or raceways c^4 and b^2 of the sleeve and casing, and owing to the fact that said balls are by means of the shafts united with the roller said roller and balls become substantially as one body.

The adjustment of the balls and rollers is effected by proper rotation of the cone bearing-blocks g and nuts g^2, all adjustments being effected from the front of the box.

It is obvious that the end blocks or extensions d' (shown in Fig. 1) and the balls m (illustrated in Fig. 3) perform substantially the same functions as bearing extensions.

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

1. In a roller-bearing, the combination, with the external casing, the internal casing and a spindle-sleeve, said internal casing and spindle-sleeve tapering toward their central portions and also forming raceways between them, of a series of bearing-rollers which taper from their centers toward their outer ends and bearing extensions in the ends of said rollers adapted to the aforesaid raceways, substantially as set forth.

2. In a roller-bearing, the combination, with the external casing, a sectional internal casing and sectional spindle-sleeve, said internal casing and spindle-sleeve tapering toward their central portions and also forming raceways between them, of a series of bearing-rollers arranged between said sleeve and internal casing, said bearing-rollers tapering from their centers toward their outer ends, bearing extensions of said rollers and adjustable bolts or shafts connecting said bearing extensions in pairs and extending through said bearing-rollers, substantially as and for the purpose specified.

3. In a roller-bearing, the combination, with the external casing, the internal casing and a spindle-sleeve, said internal casing and spindle-sleeve tapering toward their central portions and also forming raceways between them, of a series of bearing-rollers which taper from their centers toward their outer ends, bearing extensions in the ends of said rollers adapted to the aforesaid raceways, bolts or shafts connecting said bearing extensions in pairs as described, bearing-blocks g and e^2 about the end portions of each of said shafts, bearing-balls between said blocks

and the bearing extensions, separating-rings embracing said bearing-blocks and nuts on the outer ends of said ball-shafts, substantially as and for the purpose specified.

4. In a roller-bearing, the combination, with the external casing, a sectional internal casing and sectional spindle-sleeve tapering toward their central portions and forming raceways between them, of a series of tubular bearing-rollers which taper from their centers toward their outer ends and which are arranged between said sleeve and internal casing, a central strengthening-partition in each of said rollers, bearing extensions in said races and adjustable bolts or shafts connecting said bearing extensions in pairs and extending through said rollers and their central partitions, substantially as and for the purpose specified.

THOMAS J. REID.

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