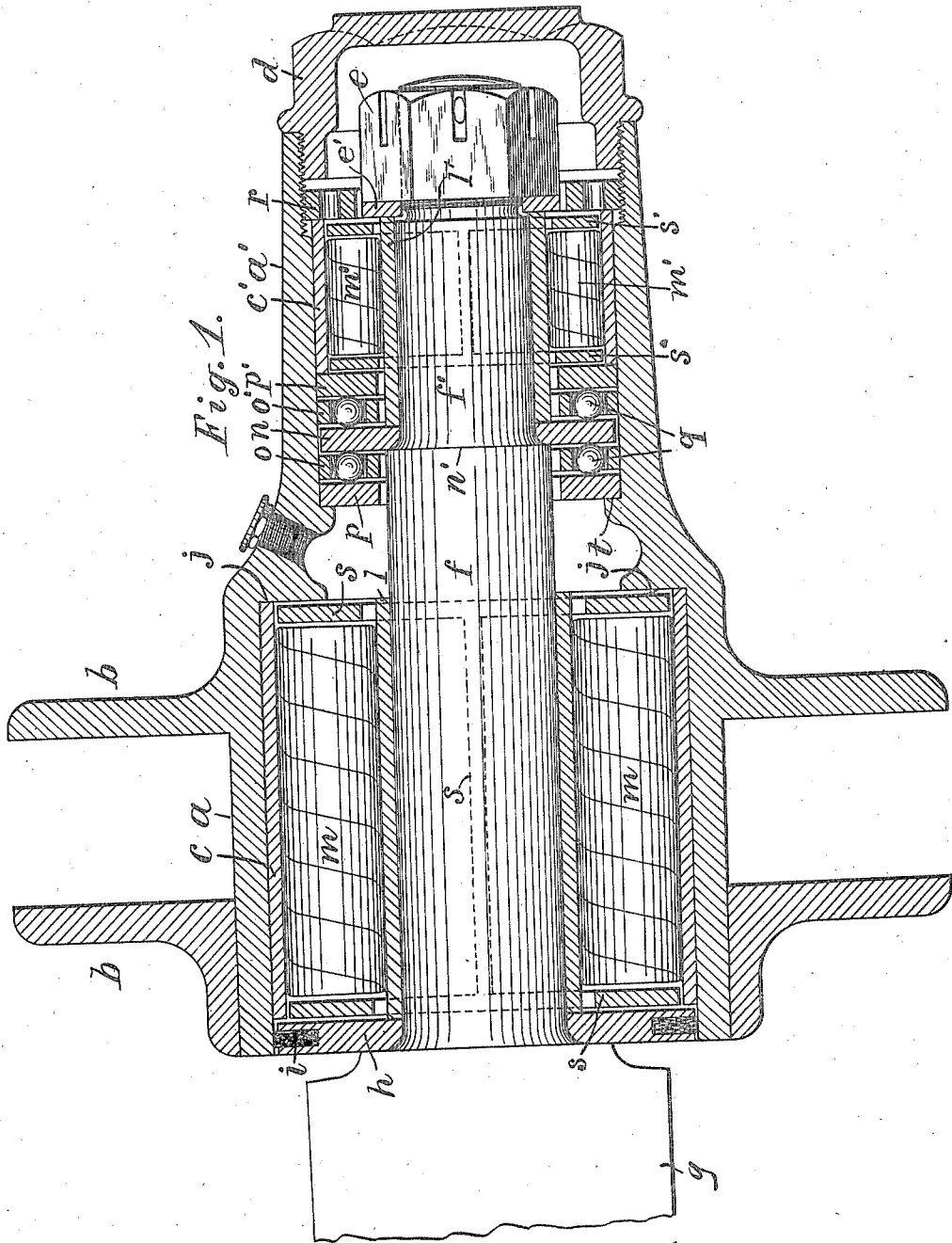


C. S. LOCKWOOD.
ROLLER BEARING.
APPLICATION FILED NOV. 30, 1904.



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L. Lee.
Arthur T. Foster, per Thomas S. Crane, Atty.

Inventor.
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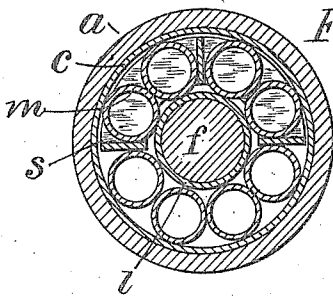


Fig. 2.

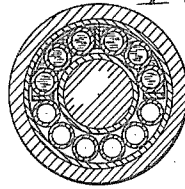


Fig. 3.

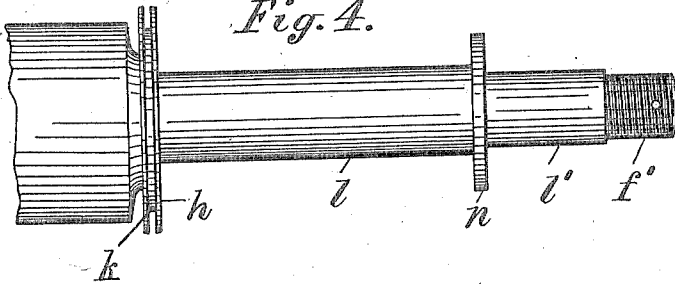


Fig. 4.

Fig. 13.

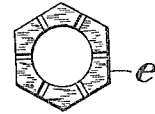


Fig. 5.

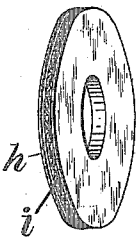


Fig. 6.

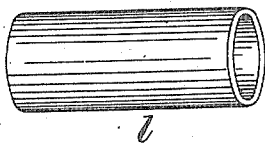


Fig. 7.



Fig. 8.

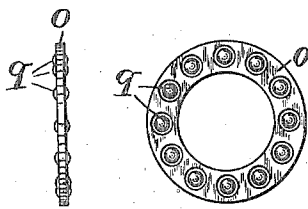
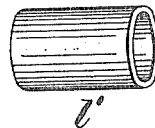


Fig. 9. Fig. 10.

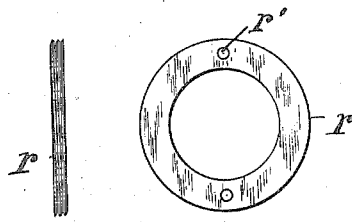


Fig. 11. Fig. 12.

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L. Loe.
Arthur F. ...

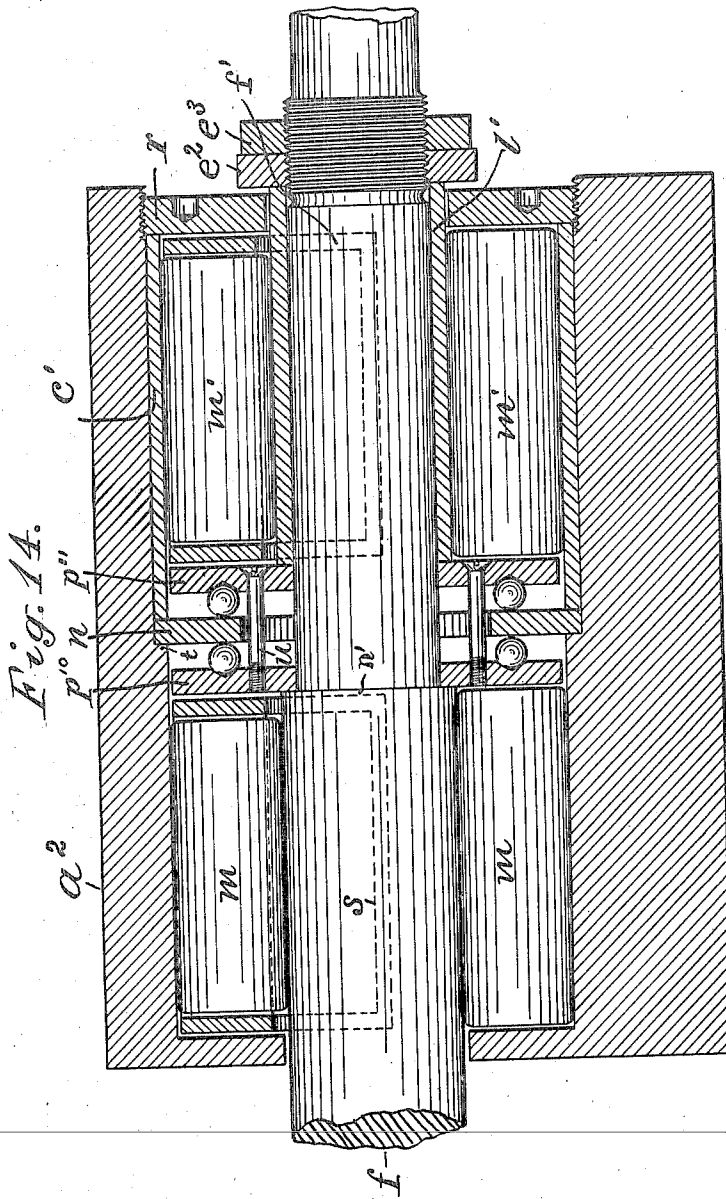
Inventor:
Charles S. Lockwood,
per Thomas S. Crane, Atty.

No. 821,656.

PATENTED MAY 29, 1906.

C. S. LOCKWOOD.
ROLLER BEARING.
APPLICATION FILED NOV. 30, 1904.

3 SHEETS—SHEET 3.



Attest:
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UNITED STATES PATENT OFFICE.

CHARLES S. LOCKWOOD, OF NEWARK, NEW JERSEY, ASSIGNOR TO
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A CORPORATION OF NEW JERSEY.

ROLLER-BEARING.

No. 821,656.

Specification of Letters Patent.

Patented May 29, 1906.

Application filed November 30, 1904. Serial No. 234,854.

To all whom it may concern:

Be it known that I, CHARLES S. LOCKWOOD, a citizen of the United States, whose residence and post-office address is 289 Market street, Newark, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Roller-Bearings, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to an improved construction for the thrust-collar in a roller-bearing, and comprises a casing and a journal having shoulders facing in the same direction, a thrust-collar fitted to one of said shoulders, a series of balls applied to each side of the thrust-collar, abutment-rings to press the balls against such collar, and the casing and journal provided, respectively, with a lining and with a sleeve, one of which is adapted to hold the thrust-collar against its shoulder and the other of which is adjustable to regulate the pressure of the abutment-rings upon the balls.

In the drawings the inner end of the bearing is shown closed by a collar upon the axle, and the outer end is shown closed by a cap screwed upon the outer end of the hub.

The construction is particularly adapted for overhung bearings like those in wheel-hubs upon the end of an axle; but it may also be used for the journals of lining shafts or spindles in the construction of machinery where the shaft extends through the bearing. The thrust-collar in either case may be held rigidly upon the journal or in the casing, as may be preferred, the former construction being shown in Figure 1 and the latter construction in Fig. 14.

In the drawings, Fig. 1 is a view of the end of the axle, with a longitudinal section of the wheel-hub and its attachments. Fig. 2 is a cross-section of the bearing through the larger part of the axle. Fig. 3 is a cross-section of the bearing through the smaller part of the axle. Fig. 4 is a side elevation of the axle with the hub removed. Fig. 5 is a perspective view of the collar for closing the inner end of the bearing. Fig. 6 is a perspective view of the sleeve upon the axle adjacent to such collar. Fig. 7 is a perspective view of the thrust-collar; and Fig. 8, a perspective

view of the sleeve upon the smaller part of the axle, which serves to hold such thrust-collar in place. Fig. 9 is an edge view, and Fig. 10 a side view, of one of the guide-collars for the thrust-balls. Fig. 11 is an edge view, and Fig. 12 a side view, of the adjusting-nut for the thrust-bearing; and Fig. 13 is an edge view of the nut for clamping the thrust-collar and the sleeve which holds it in place. Fig. 14 is a longitudinal section of a pedestal for a revolving shaft.

In Fig. 1, *a* designates the larger part of the wheel hub or casing of the bearing provided with flanges *b* to clamp the spokes thereon. A lining *c* is shown within the part *a*. A smaller part of the hub is marked *a'* and is provided with a lining *c'*, and a screw-cap *d* is shown screwed into the outer end of the hub over the nut *e*, which is applied to a thread upon the end of the axle. The body or portion of the axle by which it is mounted on the vehicle-frame is designated *g*. The larger part within the hub portion *a* is designated *f*, and the smaller part within the hub portion *a'* is designated *f'*. The collar *h* is shown fitted upon the axle next a shoulder adjacent to the body portion *g* and provided upon its periphery with a groove in which a felt collar *i* is fitted to contact with the bore of the hub portion *a*, and thus exclude dirt from the inner end of the bearing. The hub portion *a* is formed with a chamber extending to a shoulder *j*, and the lining *c* is extended against such shoulder. A sleeve *l* is applied to the corresponding portion of the axle *f*, and a series of rolls *m* is fitted to rotate between such sleeve and lining to support the hub upon the axle. The spoke-flanges *b* are shown projecting from the hub portion *a* over nearly the middle portion of the rolls *m*, so that the weight upon the bearing falls chiefly upon such rolls.

The usual roll-guide *s* is shown fitted to the rolls *m* in Figs. 1 and 2 to hold the rolls parallel with the axle. A thrust-collar *n* is applied to the axle against the shoulder *n'* between the larger portion *f* and the smaller portion *f'* of the journal and is held firmly against such shoulder by a sleeve *l'* upon the smaller portion of the axle and the nut *e* upon the end of the axle which presses a washer *e'* against the sleeve *l'*.

The chamber in the portion a' of the axle in which the lining c' is fitted is formed with a shoulder t at its rear end at a sufficient distance from the thrust-collar n to insert a ball-guiding ring o and an abutment-collar p' which rests against such shoulder. A similar ball-guiding ring o' and an abutment-collar p' are fitted within the chamber upon the outer side of the thrust-collar, and the inner end of the sleeve c' is fitted to contact with the collar p' . Balls q are inserted in holes in the ball-guiding rings o and o' and project from the opposite sides of said rings to contact with the opposed faces of the abutment-collars and the thrust-collar n .

A threaded collar r is fitted to a thread in the outer end of the wheel-hub in contact with the outer end of the lining c' and has holes r' for turning it by a suitable spanner. The turning of the threaded collar presses the lining c' against the outer abutment-collar p' and adjusts the contact of both sets of balls with the thrust-collar n . The thrust-collar is held rigidly upon the axle by the sleeve l' and the nut e , and the abutment-collars are held rigidly in the wheel-hub by the lining c' and the threaded collar r , so that the wheel-hub is firmly held from longitudinal movement when the thrust-bearing is suitably adjusted.

A series of antifriction-rolls m' is inserted between the sleeve l' and the lining c' and provided with the usual guide s' , such rolls and guide substantially filling the space between the outer abutment-collar p' and the threaded collar r . The rolls m' serve to lengthen the bearing of the wheel-hub upon the axle, and thus increase the resistance to any lateral strain upon the wheel-hub.

The reduction of the axle near its outer end, which forms the shoulder n' , serves in conjunction with the sleeve l' and nut e to furnish a convenient means of securing the thrust-collar n rigidly and detachably upon the axle.

In practice the collar h and sleeve l may be made separate from the axle and fitted tightly thereon; but the axle may be made without the sleeve and the collar h made integral thereon, if desired, as it is not essential that either should be removable. The thrust-collar n and the sleeve l' require, however, to be removable to permit the detachment of the wheel-hub from the axle for examination or repairs and to permit the assembling of the parts in manufacture.

By removing the nut e , the washer e' , and threaded collar r the wheel may be pushed off of the axle with the entire thrust-bearing and the sleeve l' and such parts again placed upon the axle when restoring the wheel to its operative position.

Where the thrust-collar is located between the two sets of rolls $m m'$, as in the present design, the sleeve l' is an essential means of

holding the thrust-collar rigidly upon the axle at a suitable distance from its outer end.

Fig. 14 shows the invention applied to a pedestal or stationary bearing for a revolving shaft. In this construction the thrust-collar is clamped in the casing a^2 of the pedestal by the lining c' and nut r , and the abutment-collars p^{10} p^{11} are secured adjustably upon the shaft against the shoulder n' by means of two nuts e^2 and e^3 applied to the outer end of the sleeve l' . This arrangement is the reverse of that in Fig. 1. The rolls at opposite sides of the thrust-bearing are shown of the same diameter and length, and the shaft is extended through the bearing beyond the nuts and broken off to indicate that it may be extended at any required distance.

In Fig. 1 ball-guiding rings $p p'$ are shown; but such rings are not essential, as the balls may be guided by grooves in the thrust-collar and abutment-collars or in the abutment-collars alone, as shown in Fig. 14. With such construction the abutment-collars are preferably secured together loosely with the balls and the thrust-collar by suitable fastenings, as the screws u , (shown in Fig. 14,) which prevents the displacement of the rings when setting the same upon the journal and permits the subsequent adjustment of the abutment-collars as required.

It will be observed by reference to Fig. 1 that the sleeve l' performs the double function of securing the thrust-collar n upon the journal while it also forms a bearing for the inner sides of the antifriction-rolls m' . The lining c' also performs a double function, as it forms the means for adjusting the thrust-bearing with the aid of the nut r and also forms a bearing for the outer sides of the antifriction-rolls. By the use of such lining and sleeve a smooth steel bearing-surface may be furnished for the rolls, as is common in such constructions, and the same elements—namely, the sleeve and the lining—be employed to form and operate the thrust-bearing. The construction shown in Fig. 14 is substantially the same, except that the arrangement of the parts is reversed, and the lining c' serves to hold the thrust-collar in place, while the sleeve l' serves for adjusting the thrust-bearing; but this lining and sleeve also furnish the bearings for the outer and inner sides of the antifriction-rolls m' , as in Fig. 1. It will be observed that in both the constructions (of Fig. 1 and Fig. 14) the shoulders n' and t , which cooperate with one another upon the journal and casing, both face in the same direction—that is, toward the end of the bearing in which the lining c' is inserted and from which it is removable. This construction permits the thrust-bearing to be withdrawn from the casing and journal in the same direction simultaneously when the sleeve and lining are removed from the outer end of the casing.

Having thus set forth the nature of the invention, what is claimed herein is—

1. In a roller-bearing, the combination, with a casing and a journal having the shoulders n' and t facing in the same direction, of the thrust-collar n fitted to one of said shoulders, the abutment-rings with balls q fitted to the thrust-collar, the casing having the lining c' and the journal having the sleeve l' with a set of antifriction-rolls m' fitted between the same, and nuts operating respectively upon the lining c' and upon the sleeve l' , one of said nuts operating to adjust the abutment-rings in relation to the thrust-collar, the whole arranged and operated substantially as herein set forth.

2. In a roller-bearing, the combination, with a casing and a journal having shoulders n' and t facing in the same direction, of the thrust-collar n fitted to the shoulder upon

the journal, and abutment-rings p, p' , with balls q fitted to the thrust-collar, the abutment-ring p being fitted to the shoulder upon the casing and the casing having the lining c' movable against the abutment-ring p' , with the annular nut r for adjusting such lining and abutment-ring, and the journal having the sleeve l' with nut e for clamping the thrust-collar n against the shoulder n' , and a set of antifriction-rolls m' fitted between the sleeve l' and the lining c' , the whole arranged and operated substantially as herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES S. LOCKWOOD.

Witnesses:

CHARLES W. VOSS,
THOMAS S. CRANE.