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PATENTED OCT. 15, 1907.

G. S. LOCKWOOD.
CAGE FOR ROLLS IN ROLLER BEARINGS.

APPLICATION FILED OCT. 25, 1906.

2 SHEETS—SHEET 1.

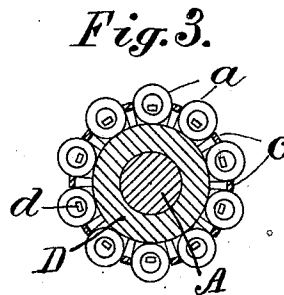
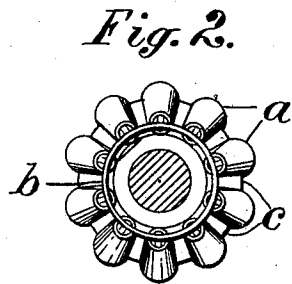
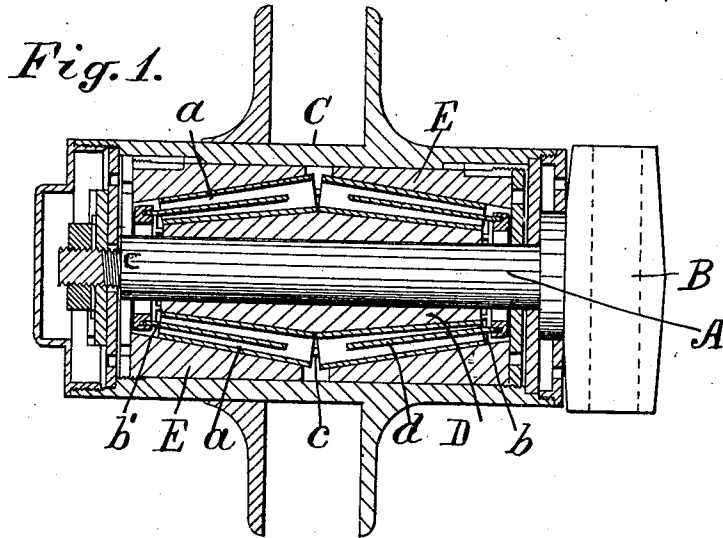
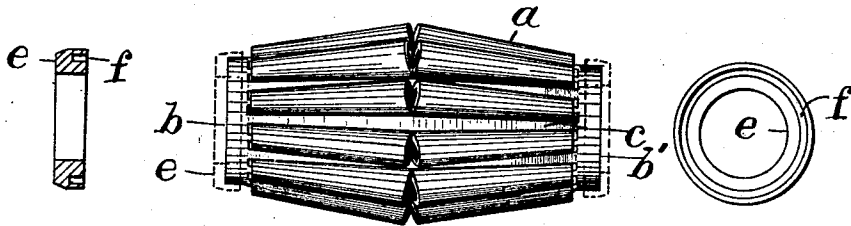


Fig. 4a.

Fig. 4.

Fig. 4b.



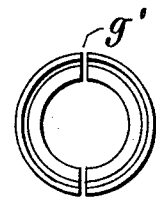
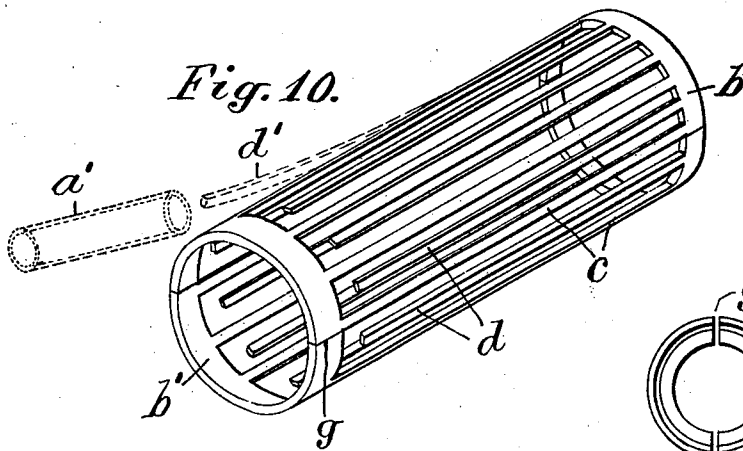
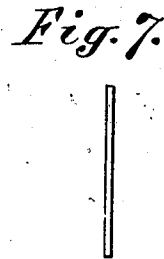
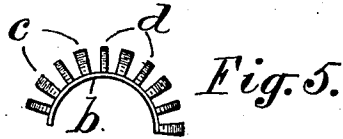
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES S. LOCKWOOD, OF NEWARK, NEW JERSEY, ASSIGNOR TO HYATT ROLLER BEARING COMPANY, OF HARRISON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CAGE FOR ROLLS IN ROLLER-BEARINGS.

No. 868,105.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed October 25, 1906. Serial No. 340,434.

To all whom it may concern:

Be it known that I, CHARLES S. LOCKWOOD, a citizen of the United States, residing at 289 Market Street, Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Cages for Rolls in Roller-Bearings, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to furnish a guide for the rolls, in a roller bearing which shall serve as a cage to retain a set of rolls in "one piece," to facilitate handling, and which may be made by stamping a suitable blank from sheet-metal.

Such roller-guides are, in practice, termed "yokes", and the yoke in the present construction is furnished with annular heads at opposite ends, integral tie-bars connecting the heads, which lie between the rolls in the bearing, and serve as guides for the same; and the heads having, intermediate to the tie-bars, integral prongs projecting from one or both of the heads, and sufficiently flexible to be bent out of their normal position to slip the rolls thereon, and then bent back again to hold the rolls in place between the guide or tie-bars.

The prongs are proportioned to clear the interiors of the rolls when in operation, and thus perform no function when the rolls are in the bearings; but serve to hold the rolls in the cage when made up into sets, so that they may form a "one-piece" structure, comprising the rolls and the guides and prongs which form the cage.

To make the projections flexible and to cheapen the manufacture of the yoke or cage, it is preferably formed of one piece of sheet-metal cut out by a suitable punch and die, with its several parts integrally connected.

To facilitate the manufacture of the cage from sheet metal, and the application of it with the rolls to opposite sides of a shaft, the cage may be divided into two or three sections, each of which may be stamped from sheet-metal and bent into the desired shape to form part of the complete cage.

The divided heads at the ends of the complete cage are preferably clamped together by a suitable collar or by wrapping a wire around the same, thus retaining the whole in a "one-piece" structure until it is to be applied to the journal of the bearing.

When the collars are removed, each of the sections, by means of its prongs, supports the proportion of the rolls which it carries, and each section with such rolls can be placed in the bearing without the difficulty which exists in handling loose rolls.

The invention will be understood by reference to the annexed drawing, which shows, except in Fig. 10, the improvement applied to a double cone journal in which the rolls prevent end movement as well as lateral movement of the bearing.

Figure 1 is a longitudinal section of such a roller-bearing; Fig. 2 is an end view of the cage and rolls with a cross section of the axle; Fig. 3 is a cross section of the same parts intermediate to the middle and end of the bearing in Fig. 1; Fig. 4 is a side view of the cage and rolls held in "one-piece" by separable sections; Figs. 4^a and 4^b are details of the collar; Fig. 5 is an end view of a section forming one-half of the cage; Fig. 6 is a plan, and Fig. 7 an end view of a flat blank from which such section is formed; and Fig. 8 is an edge view, and Fig. 9 an end view of the blank partially bent to the completed form, as would be required for a double cone bearing. Fig. 10 shows a divided cage for straight rolls, suitable for use with a cylindrical journal. Fig. 11 shows a collar divided in half.

In Fig. 1, A designates the axle of a steering-wheel for an automobile, B the vertical pivot for the same; C the hub of the wheel forming a casing for the roller bearing, D a double cone upon the axle, and E hollow cones fitted within the casing at opposite ends, to form seats for the rolls.

a are hollow or tubular rolls, *b* and *b'* are the opposite halves of the head of the cage; *c* are the tie-bars connecting the heads of the cage, and serve to guide the rolls, and *d* the prongs projecting within the bores of the rolls, as shown in Fig. 1.

Collars *e* are shown with grooves *f* fitted to the sections of the heads to clamp the same together, thus holding the rolls and cage all in "one piece," as shown in Fig. 4, where the collars are indicated merely by dotted lines.

In Fig. 1, the collars are shown in position clamping the sections of the cage together; but after the cage and rolls are inserted in the bearing, the clamping collars may be removed if preferred, as the rolls are held in place without the aid of such collars.

In Figs. 1, 2 and 4, separate rolls are shown for each end of the journal and two sets of prongs *d* are required to project inwardly from the opposite heads of the cage to support the two sets of rolls when apart from the bearing; but the cylindrical cage shown in Fig. 10 is provided with only one set of prongs, as the rolls in such a bearing can extend from one end to the other, and are readily applied to the prongs by springing the same outwardly as indicated by the dotted lines *d'*, adjacent to which are dotted lines *a'* indicating a roll in position to be slipped over such prong, after which the roll is readily forced inwardly between the guide-bars *c*, thus bending the prong back to its normal position.

One section or half of the cage is shown in Fig. 5 of proportions adapted to be cut out and struck up from sheet-metal, the blank for such section being shown in Figs. 6 and 7 with one of the tie-bars *c* at one edge, and the prongs *d* at the opposite edge; the strips at the ends

of the blank forming each one-half of the head when bent to the final shape.

For a double cone bearing as shown in Fig. 1, the blank is next bent, as shown in Fig. 8, with the prongs and tie-bars sloped upwardly from the ends toward an intermediate point, and Fig. 5 shows such bent piece then stamped in a suitable die to curve it laterally, which spreads the tie-bars apart and disposes the guides in the proper position to lie between the rolls, as shown in Fig. 3.

The collars *e* are shown with a groove to fit upon the divided parts of the head, to clamp the same together; but a simple band fitted snugly outside of the heads is obviously an equivalent.

In Fig. 10 the heads of the cage are shown divided in two halves at the line *g-g*, but such a cage may obviously be made from a flat blank with a division at one side only, and in such case would retain its cylindrical form without any collars such as are shown upon the halves of the cage in Fig. 1, but could only then be applied to a bearing by slipping it over the end of the shaft. Such a one-piece cage possesses all the characteristics of the others described, in having the end collars or heads of cylindrical form with the tie-bars *c* connecting them integrally, and one of the heads having integral prongs *d* extended between the tie-bars to hold the hollow rolls in place, the same as the other constructions.

Where the collar is made in one piece, as shown in Fig. 4^b, it cannot be applied to the halves of the cage after they are in place upon the shaft, but the collar may be divided in halves upon the line *g'* shown in Fig. 11, which adapts the halves to be fitted to the heads of the cage with its joint at right angles to the division of the cage, and thus serve to hold the halves of the cage together.

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

1. A sheet-metal cage, for hollow bearing-rolls, having annular heads *b, b'*, at the ends, integral guide-bars *c* connecting such heads and integral flexible prongs projected from at least one of the heads between the guide-bars to penetrate the rolls and hold them in place. 40

2. A cage for hollow bearing rolls, the cage having annular divided heads at the ends, guide-bars connecting the heads, intermediate flexible prongs projected from the heads to penetrate the rolls and hold them in place, and means for clamping the halves of the divided heads together. 45

3. A cage for hollow bearing rolls, the cage having annular divided heads at the ends, guide-bars connecting the heads, intermediate flexible prongs projected from the heads to penetrate the rolls and hold them in place, and grooved collars fitted to the divided heads to clamp the halves together. 50

4. A cage for hollow bearing rolls, the cage being made in sections of sheet-metal and having annular heads at the ends, guide-bars connecting the heads, and intermediate flexible prongs projected from the heads to penetrate the rolls and hold them in place. 55

5. The combination, with a set of hollow rolls, of a combined cage and roller-guide having heads at opposite ends, guide-bars connecting the heads intermediate to the rolls to guide the same, and flexible prongs projected from the heads within the rolls to hold them in place. 60

6. The combination, with a set of hollow rolls, of a combined cage and roller-guide having divided heads at opposite ends, guide-bars connecting the heads intermediate to the rolls to guide the same, flexible prongs projected from the heads within the rolls to hold them in place, and collars fitted to the divided heads to clamp the halves together. 65

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

CHARLES S. LOCKWOOD.

Witnesses:

THOMAS S. CRANE,
ALFRED C. WARD.