B. C. WHITE.

MOLD FOR USE IN CASTING ROLLER BEARING CAGES.

APPLICATION FILED OCT. 26, 1910.

1,003,837. Patented Sept. 19, 1911.

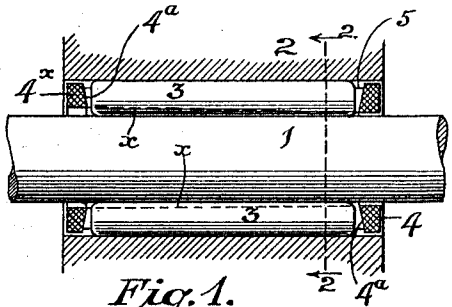

Fig. 1.

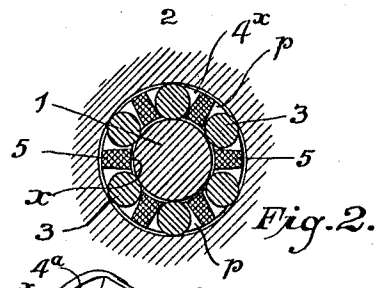

Fig. 2.

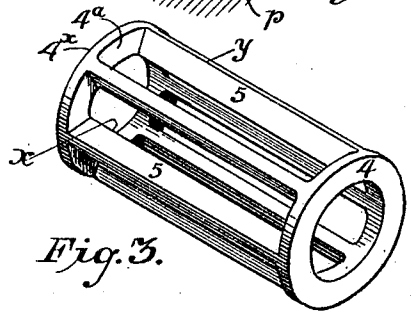

Fig. 3.

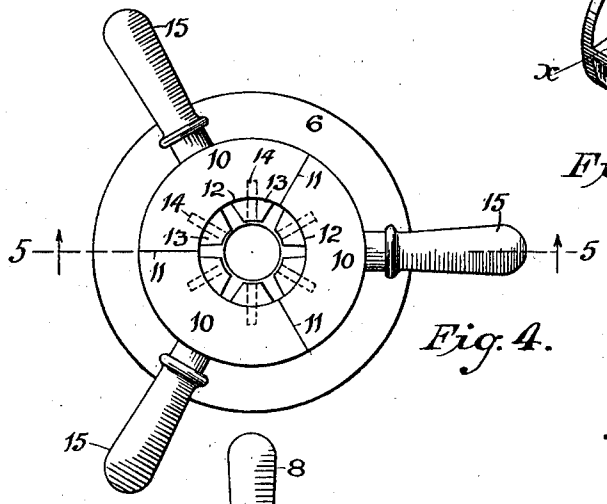

Fig. 4.

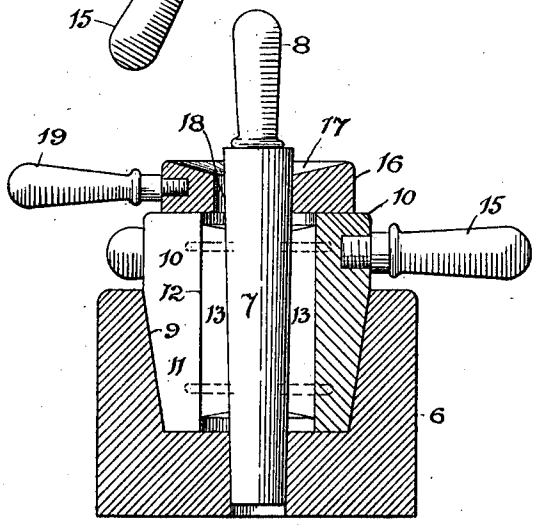

Fig. 5.

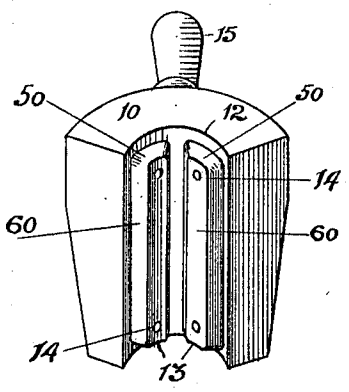

Fig. 6.

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MOLD FOR USE IN CASTING ROLLER-BEARING CAGES.

1,003,837. Specification of Letters Patent. **Patented Sept. 19, 1911.**

Application filed October 26, 1910. Serial No. 589,246.

To all whom it may concern:

Be it known that I, BRUCE CLARK WHITE, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Molds for Use in Casting Roller-Bearing Cages, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that type of roller-bearings in which a series of cylindrical rollers are introduced between the surface of a shaft and the bore of a hole or journal bearing, said rollers being spaced about the shaft and parallel thereto and retained in such relation by a spacer or retainer or cage. I am not aware that such cages have heretofore been made of a metal adapted to be cast in metal molds, or that metal molds have ever been produced for their rapid manufacture.

The object of my invention is to produce a mold for making a roller-bearing cage of such form that it can be cast rapidly and cheaply in a sectional casting device whereby the casting operation and the removal of the cage from the casting device are facilitated and the product reduced in cost. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of a roller-bearing. Fig. 2 is a transverse section of the same, at line 2—2 of Fig. 1. Fig. 3 is a detailed view in perspective of the roller cage. Fig. 4 is a plan view of a sectional mold with the ring removed. Fig. 5 is a vertical section of the same, at line 5—5 of Fig. 4. Fig. 6 is a detailed perspective view of a section of the mold.

Referring to the several figures of the drawing, in which similar characters of reference indicate like parts, 1 is a shaft.

2 is a journal bearing for the shaft.

3, 3 are anti-friction rollers interposed between the shaft and its journal bearing. These rollers are retained in a cage consisting of end rings 4, 4^x connected by integral bars or strips 5, 5. In the roller-receiving pockets or spaces p formed between the strips 5, 5 and the end rings 4, 4^x are placed the rollers 3, 3, which fit freely therein. The cage fits loosely upon the shaft 1 and in the hole 2, and is retained endwise by collars or washers, not shown, but all of which will be readily understood by persons skilled in the art.

The cage is cast in one piece in a sectional metal mold of a metal which melts at a relatively low temperature, such as Babbitt metal, for example. To facilitate the removal of the sections of the mold from the cage, the cage-bars 5, 5 are somewhat thicker at their inner edges x than at their outer edges y, thus giving them radial draft. This form of rib is new with me, and functions to retain the rolls in the cage when the shaft is removed from the roller-bearing and also to facilitate the separation of the cage and the mold in which it is cast. To further facilitate the removal of sections of the metal mold from the cage when the latter has been cast, the inner faces of the end rings 4, 4^x are outwardly beveled at 4^a, thus making the spaces p between the bars 5, 5 somewhat shorter at the inside than at the outside.

To facilitate the ready removal of the cage from the central metal core around which it is cast, I make the central shaft-receiving hole of the cage slightly larger at one end than at the other. This is illustrated by dotted lines and otherwise in Fig. 1, where the interior diameter of ring 4^x is greater than the diameter of the other end-ring 4, the dotted lines indicating the inner edges x of the bars 5 being slanted in reference to the longitudinal axis of shaft 1.

The mold for casting the cage consists of a metal block 6, having a round hole through it, preferably slightly tapering, in which is fitted the end of the upright slightly tapering metal core 7, provided with a wooden or other heat-insulating handle at its upper end. The block 6, which forms a mold holder, is recessed at 9 with a tapering countersink into which are fitted three sections of mold blocks 10, 10, 10. These mold blocks are accurately fitted together along their radial joints 11, 11, 11, which each diverge 120°. Concave surfaces 12 formed on the inside of each of the molds, whose diameter and length are equal respectively to the outside diameter and length of the cage to be cast. The core 7 corresponds in diameter with the diameter of the hole required in the cage, and is preferably

tapered to produce the preferable taper of the shaft-receiving hole through the cage.

The strips 13, 13 are secured by pins 14 to the concave face 12 of each mold block 10, the said strips being lengthwise of and of a length to correspond with that of the pockets p required in the cage, and of a cross-section to correspond with that of said pockets, the inner surfaces of said strips being arcs of circles and fitting accurately against the core 7 when the mold is assembled. Wooden or other heat-insulating handles 15 on each mold section facilitate the handling, as the parts become hot after a few cages are cast.

A top ring or cover 16 fitting around the central core 7 is formed with a funnel-like surface 17 into which to pour the metal, and a passage 18 forms a gate to the mold cavity. The ring 16 may be turned a short distance by means of the handle 19 to shear the gate from the cage after casting.

The operation consists in assembling the parts as shown in Fig. 5, pouring sufficient Babbitt metal into the mold at 17 to fill it. Then by giving the handle 19 a slight turn the gate is sheered off smoothly. Next, raising two of the handles 15, all of the mold parts will be lifted out of block 6. The three mold blocks 10 will fall from the cast cage, leaving it upon the central core, their release therefrom being facilitated by the beveled ends 50 and sides 60 of the strips 13, which are withdrawn freely from the cast cage. Grasping the handle 8 and giving the central core a jar or endwise blow, the cast cage will drop off. The parts may now be quickly reassembled and the operation repeated.

Other forms of cages may be cast in molds of other shapes in accordance with the principle of my invention.

I do not herein claim the described cage, as it forms the subject-matter of my application Serial No. 589,245, filed October 26, 1910.

What I claim is:—

A mold comprising a removable cylindrical central core; removable sectional mold blocks surrounding said core but spaced apart therefrom to form an annular metal-receiving space; lengthwise strips attached to said removable mold blocks and fitting against said central core; and a funnel-like cover over said annular space with a port therethrough, said cover being free to turn to shear off metal cast in said metal-receiving space from metal in said port; and a holder for the mold blocks.

In testimony whereof I have affixed my signature in presence of two witnesses.

BRUCE CLARK WHITE.

Witnesses:
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F. E. NARES.