S. SCHNEIDER.

BALL RETAINER.

APPLICATION FILED APR. 28, 1917.

1,241,669. Patented Oct. 2, 1917.

Fig. 1.

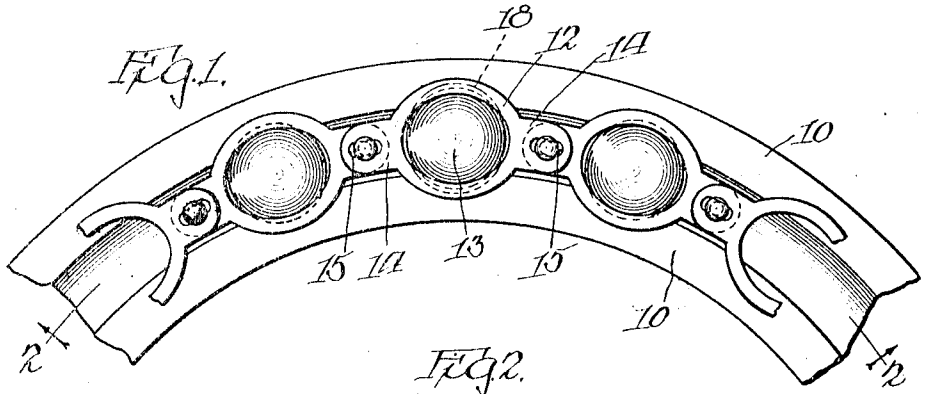


Fig. 2.

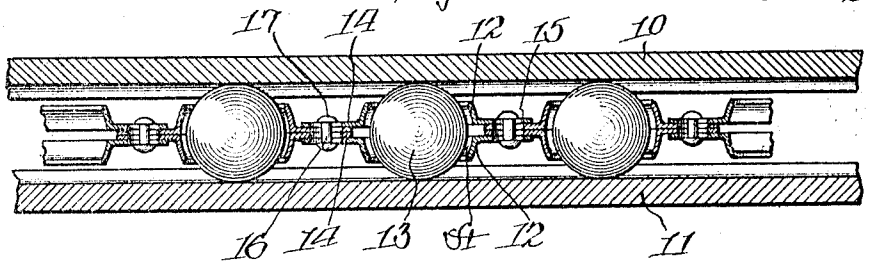


Fig. 3.

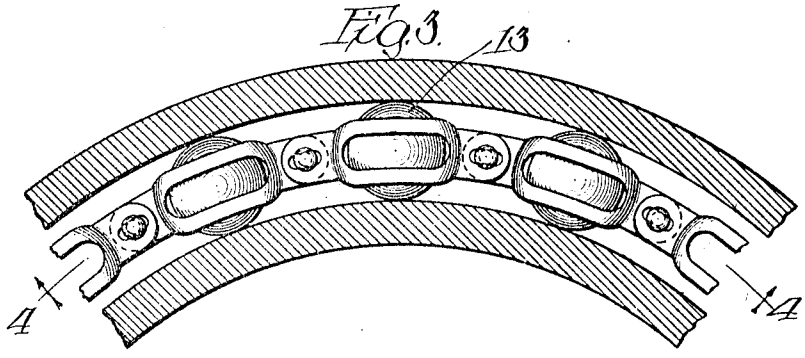
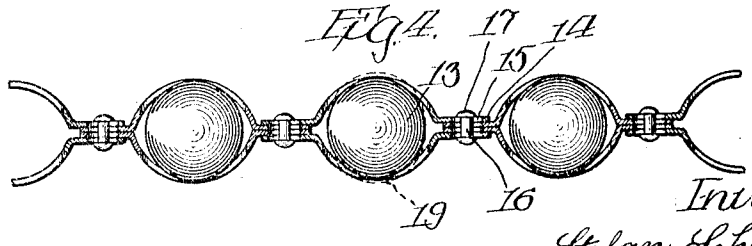


Fig. 4.



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UNITED STATES PATENT OFFICE.

STEFAN SCHNEIDER, OF CHICAGO, ILLINOIS.

BALL-RETAINER.

1,241,669. Specification of Letters Patent. Patented Oct. 2, 1917.

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To all whom it may concern:

Be it known that I, STEFAN SCHNEIDER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ball-Retainers, of which the following is a specification.

My invention relates to ball retainers and has for its primary object the provision of an improved ball retaining cage which shall have improved means for permitting play of the balls in a ball race, while providing also means for handling the balls in their retainer as a single unit.

A further object of the invention is the provision of a ball retainer which shall be adaptable to ball races of greatly varying dimensions by the insertion or withdrawal of one or more balls with their individual retaining structures.

A further object of this invention is the provision of a ball retainer wherein each ball is held in an individual pocket, the pockets being loosely secured together to provide a linked relation between them.

Other objects and advantages of my invention will become apparent from the following description taken in conjunction with the accompanying drawings which form a part of this specification and illustrate the preferred embodiment of my invention.

In the drawings

Figure 1 is an end elevation of my invention showing the same positioned in a ball race adapted to receive an end thrust.

Fig. 2 is a section substantially on line 2—2 of Fig. 1.

Fig. 3 is an end elevation of a modified form of my invention, showing in section the inner and outer annuli of an ordinary ring bearing raceway.

Fig. 4 is a section taken approximately on line 4—4 of Fig. 3 and omitting the raceway elements.

Reference numerals 10 indicates one of the annuli of an end thrust bearing raceway, 11 being the opposing annulus.

In the construction of my invention I provide a plurality of ball pockets generally indicated at A, each being formed of two cups 12 positioned with their concavities opposite each other to receive the ball 13, each of these cups having its bottom punched out to permit engagement between the ball and the annuli of the raceway. The cups of each pocket are substantially ovalescent in shape and are provided at opposite ends with anticlinal arms 14 which are longitudinally slotted as at 15 to permit arcuate play of the entire pocket with respect to the adjacent pockets. Preferably the arms 14 of one pocket overlap the outer sides of the juxtaposed arms of the adjacent pocket, all of the slots 15 of the four overlapping arms being alined and loosely engaged by rivet 16, the heads 17 of which are of sufficient diameter to retain the arms upon the rivet while at the same time permitting the play of the rivet through the length of the slots. The bottoms of the cups 12 are cut away a sufficient distance to permit considerable play of the ball within the pocket while still retaining the ball from displacement. The shortest diameter of each pocket is likewise sufficiently larger than the ball to permit axial play of the ball with respect to the bearing to an extent indicated in a dot and dash line numbered 18 in Fig. 1.

In the modification illustrated in Fig. 3 the pockets are altered in shape to permit the ball to protrude from the inner and outer sides of the retainer instead of from the ends thereof, as best illustrated in Fig. 3. The end play of the balls, however, is provided for as illustrated by a dotted line 19 Fig. 4, the other elements of the retainer being substantially the same in construction as that hereinabove described.

In the use of my invention it will be seen that because of the ovalescent shape of each pocket the ball retained in that pocket is permitted a large degree of play which adapts the ball to take up wear in the bearing and to seek that point in the worn bearing where its anti-frictional function is needed. If the retainer is used in an end thrust bearing, as in Figs. 1 and 2, the play of the ball is axially of the axis of the bearing while in the case of an ordinary ring bearing, as in Figs. 3 and 4, the play of the ball is radially of the axis of the bearing. In case a ballrace becomes so worn that balls not in a retainer would continually drop to the bottom of the raceway, it will be seen that the linked construction of my retainer permits a shrinkage in the arc of the retainer permitting the balls to travel through a circle of shorter radius than they did when the raceway was new, this function being the result of the use of the elongated slots in the arms 14.

As a standard machine part my invention

is peculiarly adapted inasmuch as it may be sold in any desired size. Thus, if a raceway of small radius is to be fitted a given number of my improved ball pockets are linked together by means of rivets 16, while a raceway of greater dimension may be fitted by merely increasing the number of pockets linked together into one retainer.

While I have illustrated and described the preferred embodiment of my invention, it will be obvious that one skilled in the art may construct modifications thereof without departing from the spirit of the invention. I wish, therefore, not to be restricted to the precise embodiment shown except in so far as the same is limited in the appended claims.

I claim:

1. In a ball retainer the combination with a pocket comprising two bottomless cups having their concavities opposed and each provided with arms having elongated slots in register of a plurality of similar pockets forming an annulus, and rivets loosely engaging the registering slots of adjacent pocket arms.

2. In a ball retainer the combination with a pocket comprising two bottomless cups having their concavities opposed and each provided with anticlinal arms having elongated slots in register of a plurality of similar pockets forming an annulus, rivets loosely engaging the reigstering slots of adjacent pocket arms, and bearing balls loosely retained in said pockets.

3. In a ball retainer the combination with a pocket comprising two bottomless cups having their concavities opposed and each provided with anticlinal arms having elongated slots in register of a plurality of similar pockets forming an annulus, rivets loosely engaging the registering slots of adjacent pocket arms, and bearing balls loosely retained in said pockets, the bottoms of said cups being cut away to permit play of the balls through a path greater in length than the original ball space in a raceway.

4. A ball retainer comprising an annulus formed of linked ball retaining elements, said elements having arcuate play with respect to each other about the axis of the bearing whereby said retainer may be adapted to variations in the dimensions of ball raceways.

5. A ball retainer comprising an annulus formed of ball retaining elements loosely linked together for relative arcuate play about the axis of the bearing, each of said elements having opposite oval side openings, and an interior larger than the ball to be retained, whereby the ball is permitted play axially of the bearing.

In testimony whereof I have affixed my signature.

STEFAN SCHNEIDER.