

S. SCHNEIDER.
BALL BEARING.
APPLICATION FILED SEPT. 9, 1912.

1,061,636.

Patented May 13, 1913.

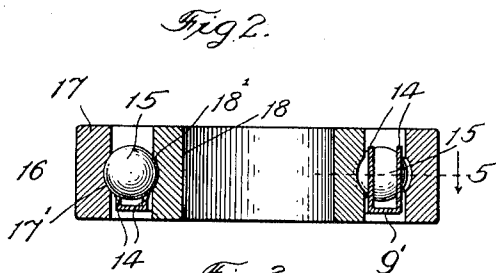
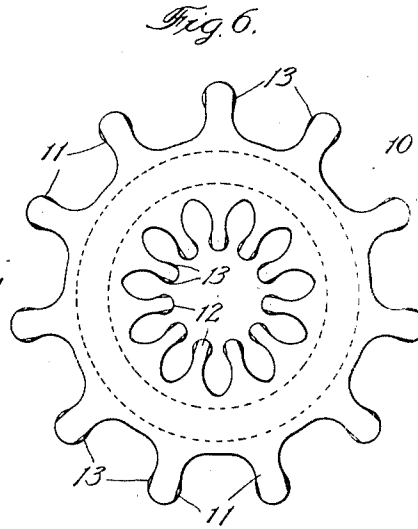
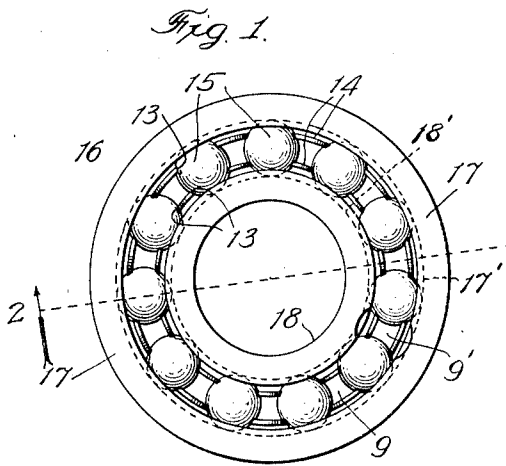


Fig. 7.

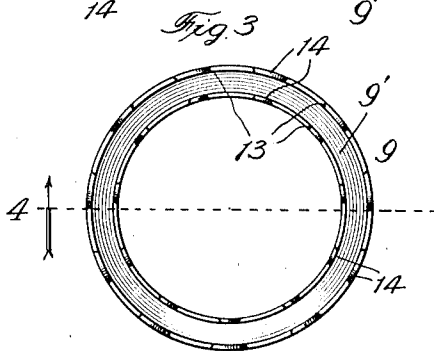
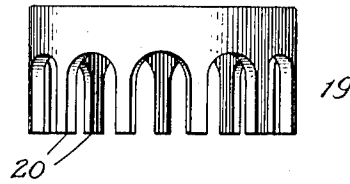


Fig. 8.

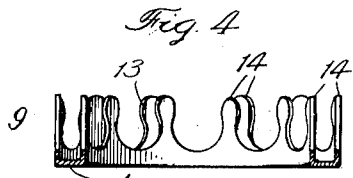
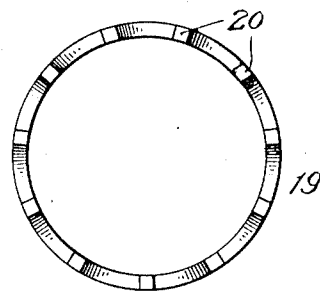
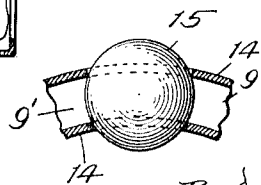


Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

STEFAN SCHNEIDER, OF OAK PARK, ILLINOIS.

BALL-BEARING.

1,061,636.

Specification of Letters Patent.

Patented May 13, 1913.

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To all whom it may concern:

Be it known that I, STEFAN SCHNEIDER, a subject of the Emperor of Germany, residing at Oak Park, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Ball-Bearings, of which the following is a specification.

My invention relates to an improvement in the rotatable cage-like retainer for the balls in a ball-bearing, formed, as by stamping out of sheet-metal, in one piece, whereby the spacers are provided in pairs composed of opposite members presenting mere attenuate edges to the balls to reduce friction to the minimum.

In the accompanying drawing, Figure 1 is a plan view of a ball-bearing embodying my improvement; Fig. 2 is a section on line 2 of Fig. 1; Fig. 3 is a face view of the annular retainer; Fig. 4 is a section on line 4, Fig. 3; Fig. 5 is an enlarged view showing a ball, in elevation, confined between the opposing edges of the spacers presented to it; Fig. 6 is a plan view of the sheet-metal blank from which the retainer is formed; Fig. 7 is a side view of a suitable implement for dislodging the retainer from its operative position in a ball-bearing when it is desired to take it apart, and Fig. 8 is a face view of the implement.

The retainer 9 is struck up from a blank stamped out of more or less resilient sheet-metal, preferably steel, to form a ring with radially projecting outer tongues 11, equidistant apart and concaved at their opposing edges to conform to the circular shapes of the balls, and similarly-shaped but narrower inwardly-projecting tongues 12 registering with the outer tongues. Each tongue is shown to be slightly chamfered at 13, on the opposite edges of its under or head portion, for the purpose hereinafter explained. Striking up this blank forms the annular retainer 9 with a circular base 9^a and the tongues extending at right-angles to it in pairs forming resilient spacers 14 for the balls 15, to which they present their attenuate concave edges for confining the balls, thereby reducing friction to the minimum.

The ball-race is formed, in a usual manner, in a casing 16 composed of an outer ring 17, containing an internal circumferential groove 17^a, and an inner ring 18 containing an external circumferential groove 18^a, the rings being concentric and so held by the

balls 15 in the race formed by the opposing grooves. With the ball-bearing in this condition, to maintain the balls in their properly spaced relation in rotating, the retainer, which fits as an annulus rotatably in the space between the casing-members 17 and 18, is placed into operative position by applying it in a manner to register the ends of each pair of the spacers 14 with the space between two balls, when the spacers will encounter the adjacent surfaces of the balls to a slight extent. By then forcing the annular retainer-body into place, the resilient spacer-members will be sprung over the aforesaid ball-surfaces, thereby bringing the spacers into the position relative to the balls shown of the ball represented in Fig. 5, wherein it is retained, for free rotation, under approximately circular confinement between the concave spacer-edges presented to it. The chamfered edges 13 of the spacers, by their wedging action against the balls in introducing the retainer in place, facilitate the operation; and when the spacers have been sprung past the balls, they resume by resiliency their normal condition to enhance their ball-confining action in fitting uniformly about the balls near opposite sides of the space between the casing-members. In the free rotation of the retainer, the balls, rotating in their spacer-confinements are, as are also the spacers, subjected to a degree of wear which is practically negligible, because the frictional surfaces of the spacer-edges presented to the balls are so attenuate. The salient advantage of my improvement, however, lies in the construction adapting the opposing inner and outer tongues 14 to be resiliently spread apart by the balls when confined in their casing, either in originally applying the annular retainer to the latter or withdrawing therefrom to free the balls as when a ball becomes damaged requiring replacement thereof by a perfect one. These operations are materially facilitated by the chamfered edges 13 of the tongues, since they adapt the balls, in forcing the retainer into place and withdrawing it, to act wedgingly against the resilient tongues to spread them apart.

The implement 19 shown in Figs. 7 and 8, is provided as a convenient and effective means for dislodging the retainer when it is desired to take the ball-bearing apart. It is a metal strip, preferably steel, provided with a row of teeth at uniform intervals apart

corresponding with the intervals between spacers 14, and rolled into the form of an annulus of a diameter adapting it to enter its teeth 20 into the space between the casing-forming rings. To use the implement for its purpose, its teeth 20 are inserted into that space, from the side of the casing opposite that at which the retainer is inserted, in a manner to introduce each tooth between the members forming a spacer 14, and to abut at their ends against the inner surface of the retainer-forming ring; when a more or less slight blow, with the hand, against the annular body of the implement will cause it to dislodge the retainer by springing its resilient spacer-forming members outwardly past the balls.

I realize that considerable variation is possible in the details of construction of the retainer herein shown and described, and I do not intend by illustrating a single, specific or preferred form to limit my invention thereto, my intention being in the following claims to claim protection upon all the novelty there may be in my improved device as broadly as the state of the art will permit.

What I claim as new and desire to secure by Letters Patent is—

1. In a ball-bearing, the combination of a casing having balls rotatably confined therein, and a freely floating retainer comprising an annulus with a series of resilient tongues extending at intervals from its outer edge, and a series of resilient tongues extending from its inner edge, forming pairs presenting concaved edges to successive balls, such edges extending to a point be-

yond the rotative axes of said balls to suspend such container and space such balls apart, said pair forming resilient tongues being parallel to each other and extending at right angles to the annulus and adapted to be sprung apart by the balls when such balls pass between the same, whereby the retainer may be applied to and withdrawn from the balls while the latter are in place in the casing.

2. In a ball-bearing, the combination of a casing having balls rotatably confined therein, and a freely floating retainer comprising an annulus with a series of resilient tongues extending at intervals from its outer edge, and a series of resilient tongues extending from its inner edge, forming pairs presenting concaved edges to successive balls, such edges extending to a point beyond the rotative axes of said balls to suspend such container and space such balls apart, said pair forming resilient tongues being parallel to each other and extending at right angles to the annulus and adapted to be sprung apart by the balls when such balls pass between the same, said pair forming resilient tongues having the inner faces of their edge portion chamfered near their ends to exert a wedging action against the balls in placing the retainer in position, whereby the retainer may be applied to and withdrawn from the balls while the latter are in place in the casing.

STEFAN SCHNEIDER.

In presence of—

L. HEISLAR,
E. D. STEELE.