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COMPLETE SPECIFICATION.

**“Improvements in Ball Bearings”.**

I, GEORG LUGER of No 28 Weimarerstrasse, Charlottenburg near Berlin, (Germany) Engineer, do hereby declare the nature of the said invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to ball bearings of the kind comprising grooved concentric bearing rings between which the balls are introduced through an entrance gap formed by transverse recesses or cavities extending into the space between the opposing faces of the rings.

The invention has for its object to provide means for preventing the balls from  
10 falling out laterally through the entrance gap.

For this purpose, according to the said invention, one or both of the bearing rings is or are provided, at the inner end of the aforesaid recess, with a slight depression the sides or edges of which form ridges that diverge from each other towards the ball race and tend to guide back into their proper course any ball  
15 that may have digressed laterally towards the gap.

After the balls have all been introduced the entrance gap may be barred by a radially projecting stud inserted into the recessed part of one or the other of the bearing rings, so as to further ensure the retention of the balls in their proper place.

20 In order that the said invention may be clearly understood and readily carried into effect it will now be more fully described with reference to the accompanying drawings, in which:—

Figure 1 is a side elevation partly broken away of a bearing embodying the features of the invention,

25 Figure 2 is a view in perspective of a portion of the outer ring,

Figure 3 is a face elevation of Figure 2,

Figure 3\* is a transverse section of Figure 3,

Figure 4 is a view corresponding with Figure 3 of a portion of the outer ring as heretofore constructed, and

30 Figure 5 shows a somewhat modified form of the present invention.

In the said drawings *p* is the outer ring and *u* the recess therein, *q* the inner ring and *v* the recess therein, these recesses, when brought radially opposite to each other, constituting the entrance gap, *r r* the balls, *s* the retaining stud and *w* an imaginary line representing the proper path of travel of the balls in their  
35 race.

Referring to the particular form shown in Figures 2 to 3\* inclusive, the recess *u* extends partially across the inner circumference of the ring *p* at right angles to the edges thereof, in the well known way, but instead of its converging edges *a* gradually merging into the surface of the circular groove or ball race, as heretofore and as shown in Figure 4, they terminate comparatively abruptly at the angles *d*, at which point the recess widens into a shallow cavity or depression *o* the sides or outlines of which are very slightly defined except at the points *c c* where they join the sides *a b* of the recess *u*, forming therewith the acute angles *d* above referred to. It will be obvious that the parts *c c* will thus

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*Luger's Improvements in Ball Bearings.*

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constitute ridges off which, when in operation, any ball which may have deviated from the path *w* will fall into the depression *o*, and that while in said depression the ball will momentarily be partly relieved of pressure, such relief giving an opportunity for the ridges *c* to guide the ball back into its proper path. As further security against the escape of any of the balls, the stud *s* may be arranged 5 to project radially from the surface of the recess *u*, and it is preferably located quite near the inner end of said recess.

In the modified examples shown in Figure 5 the recess *u* instead of extending at right angles to the edges of the ring *p*, is arranged somewhat obliquely or helically thereto as before proposed. In this instance one of the angles *d* is 10 dispensed with, the ridge *b* being continued in alignment with the side of the recess *u* in place of the corresponding ridge *c* shown in Figures 2 and 3. The remaining ridge *c*, Figure 5, lies at a right angle to the side *a* of the recess *u*.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what 15 I claim is:—

1. A ball bearing in which the ball filling recesses that extend from the sides thereof to the race have at their inner ends offset or diverging extensions forming oblique directing ridges adapted to guide the balls back to their proper path, and whereby the balls are prevented from escaping at the filling gaps, substan- 20 tially as described.

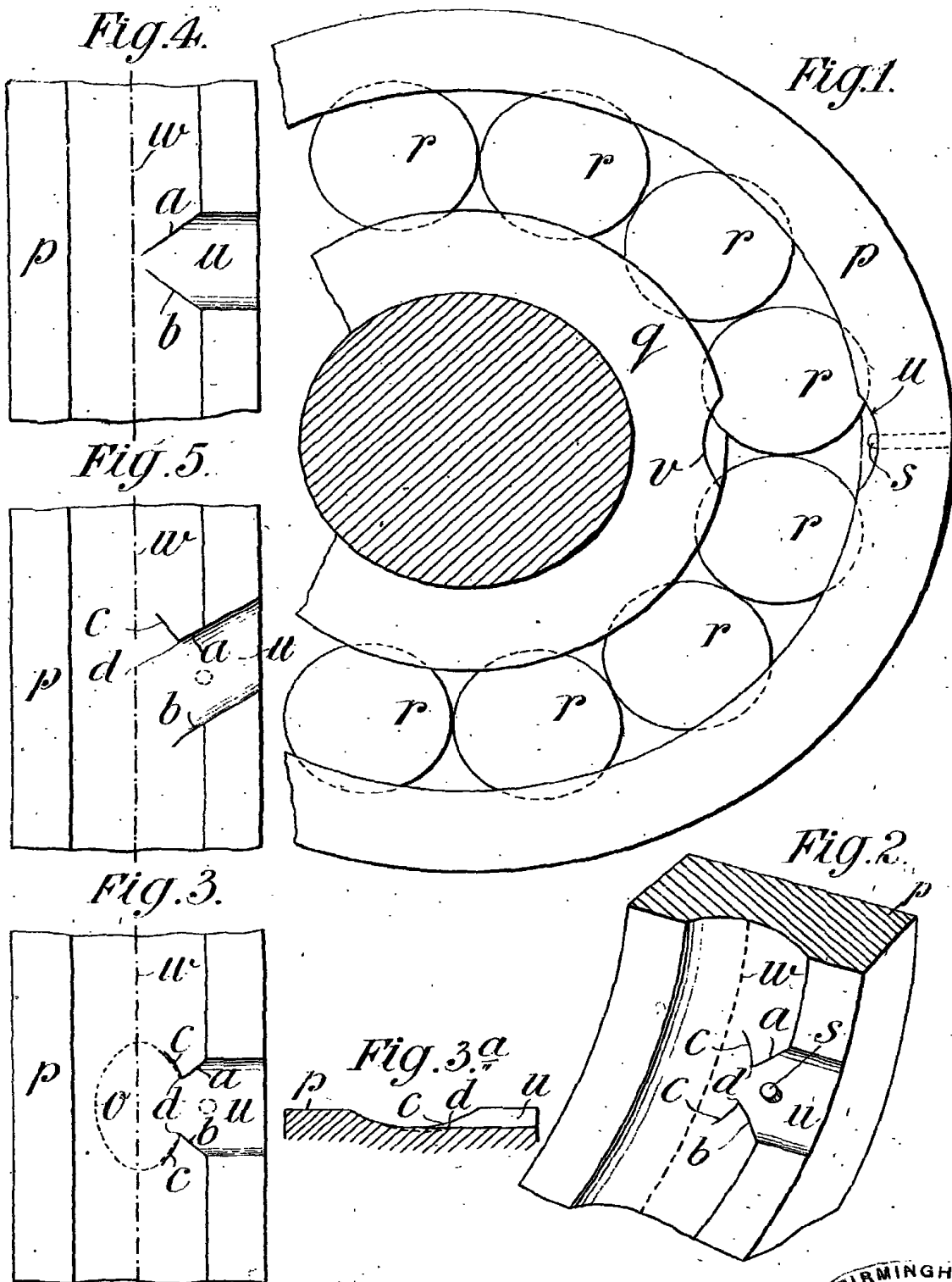
2. A ball bearing as described in the preceding claim having a shallow cavity in the track connected to the ball entering recesses and forming the relieving means described.

3. A ball bearing of the kind referred to in Claim 1, provided with a stud or 25 the like projection inserted into the entrance gap after the balls have been introduced into place, for the purpose set forth.

Dated this 21st day of May, 1906.

PHILIP M. JUSTICE,  
Chartered Patent Agent, London. 30  
For the Applicant.

[This Drawing is a reproduction of the Original on a reduced scale.]



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