

F. WINKLER.
SPACER FOR BALL BEARINGS.
APPLICATION FILED APR. 9, 1915.

1,155,185.

Patented Sept. 28, 1915.

Fig. 1.

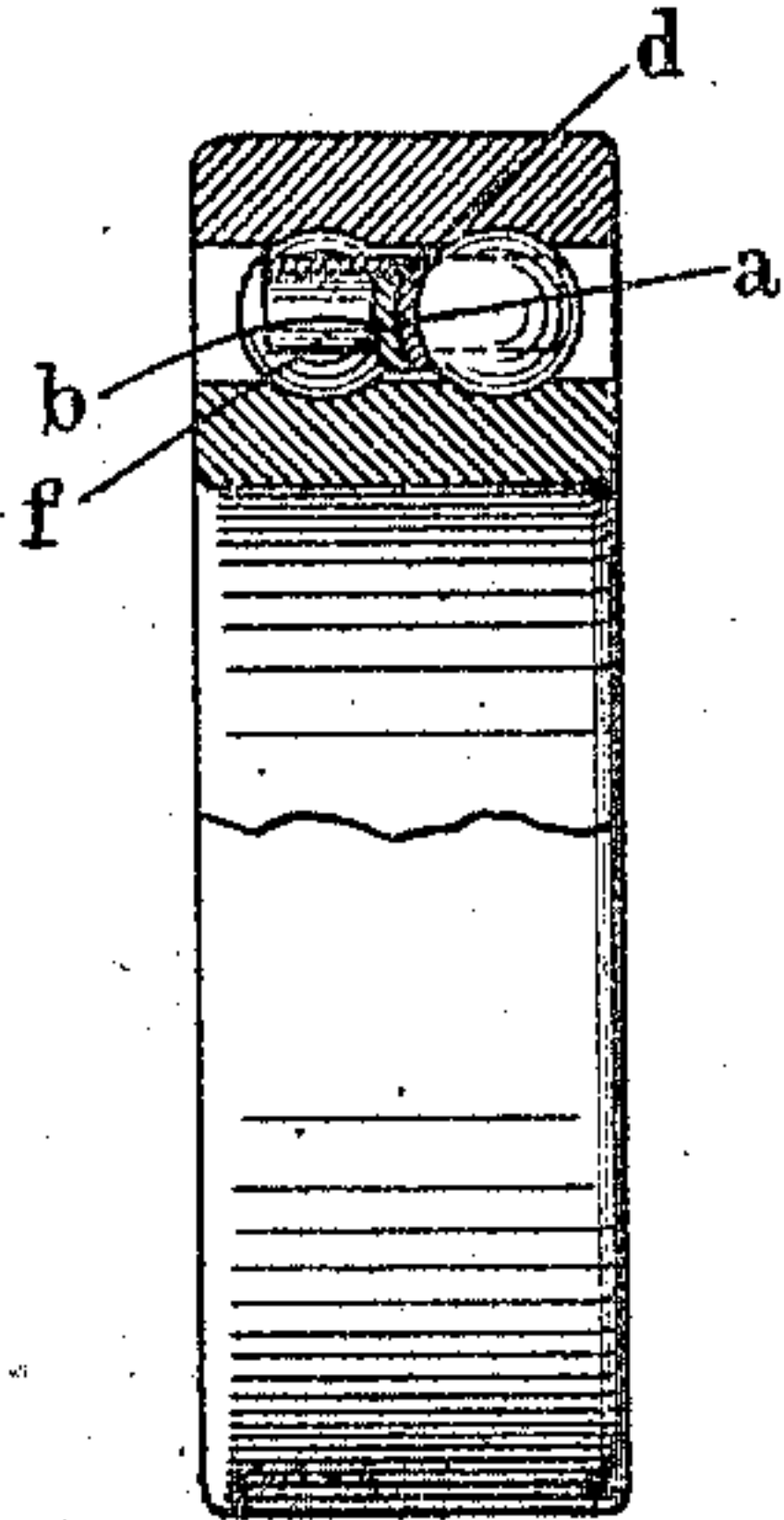


Fig. 2.

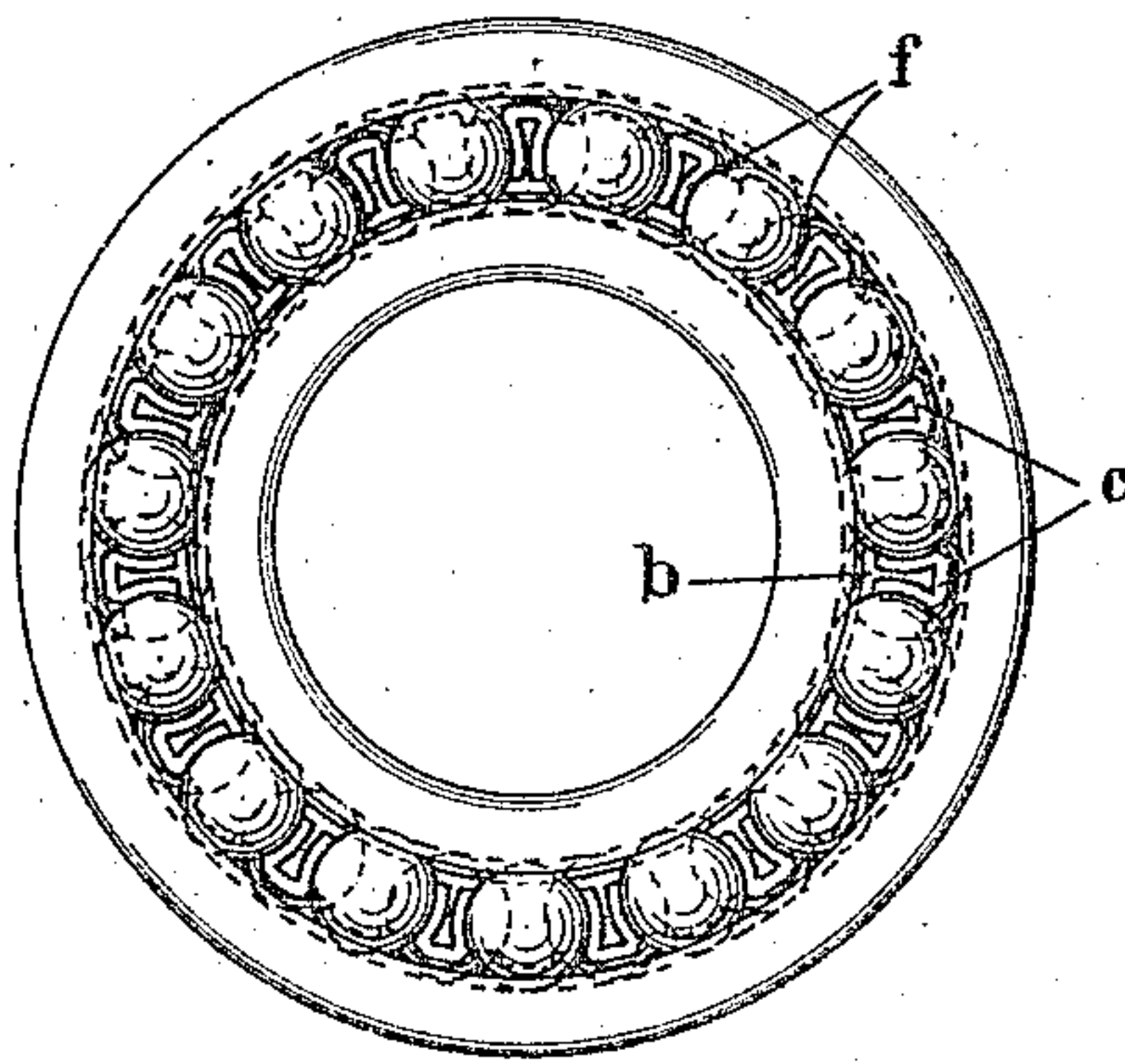


Fig. 3.

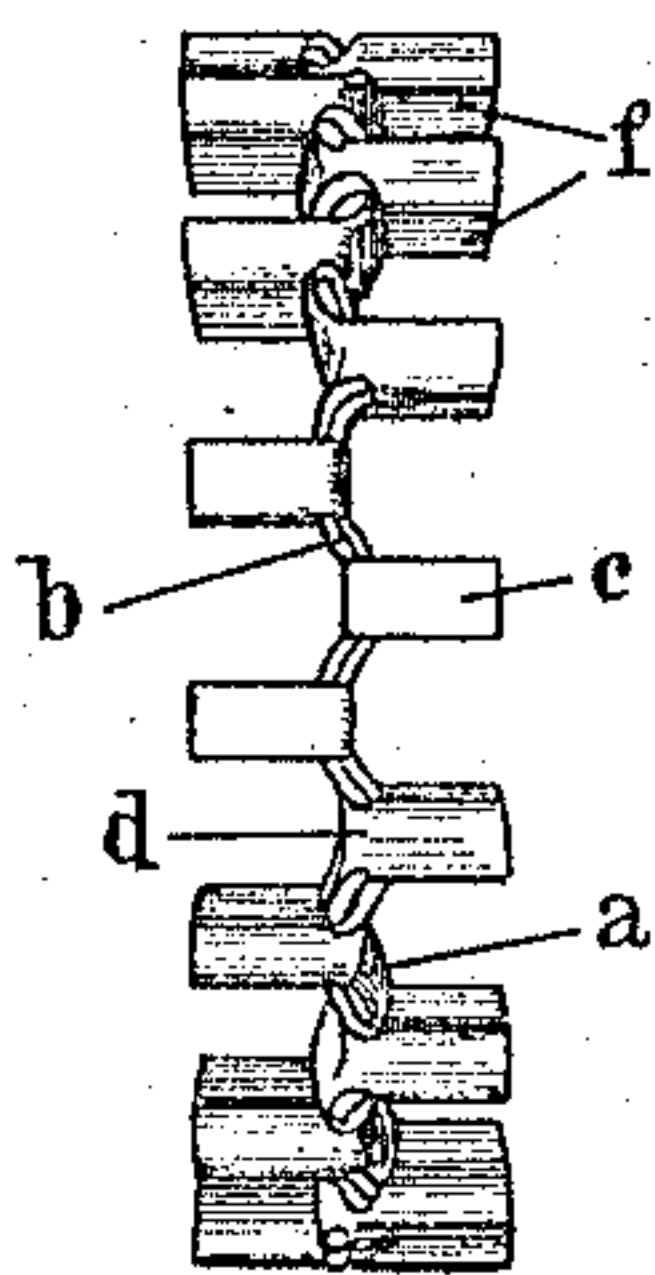


Fig. 4.

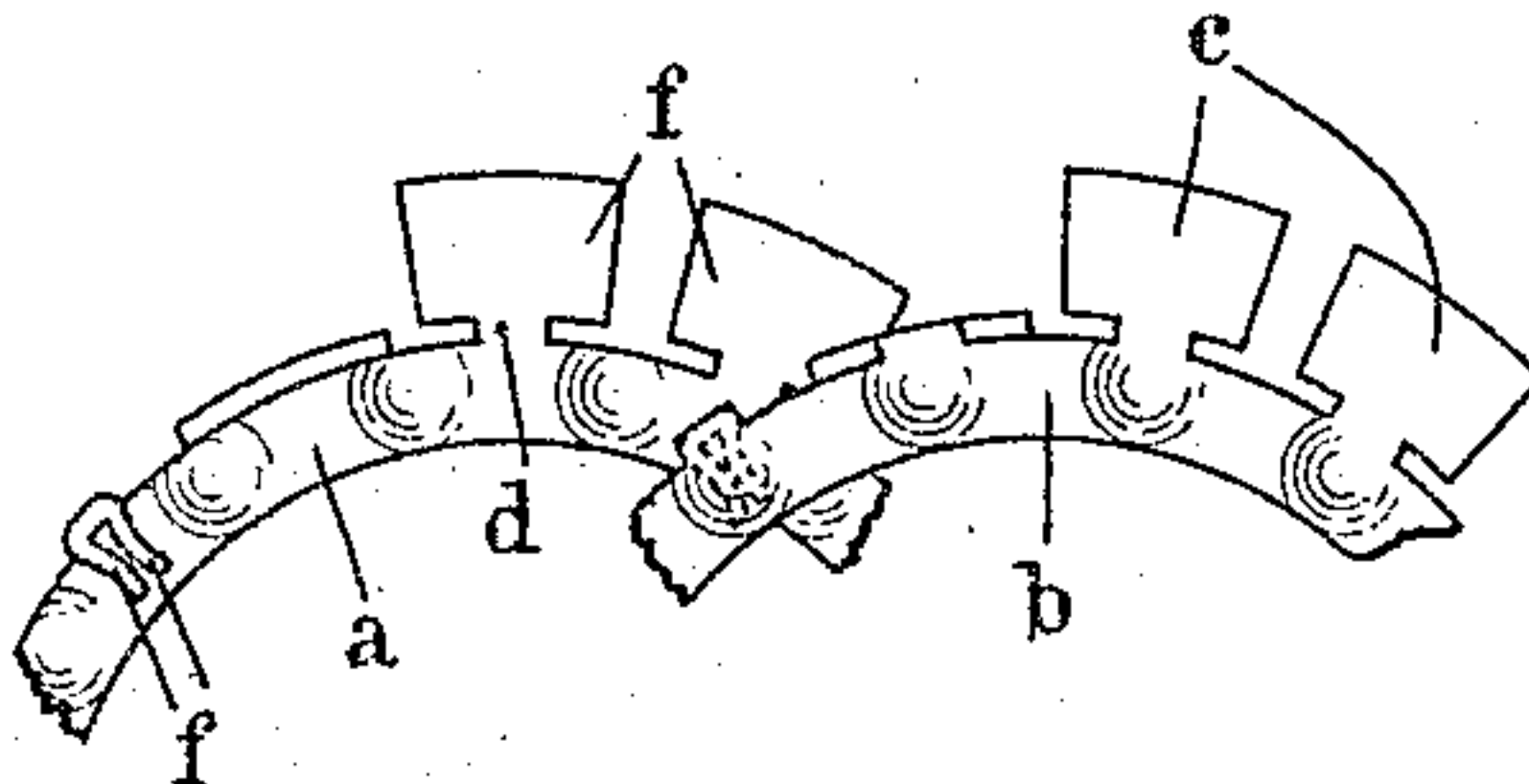
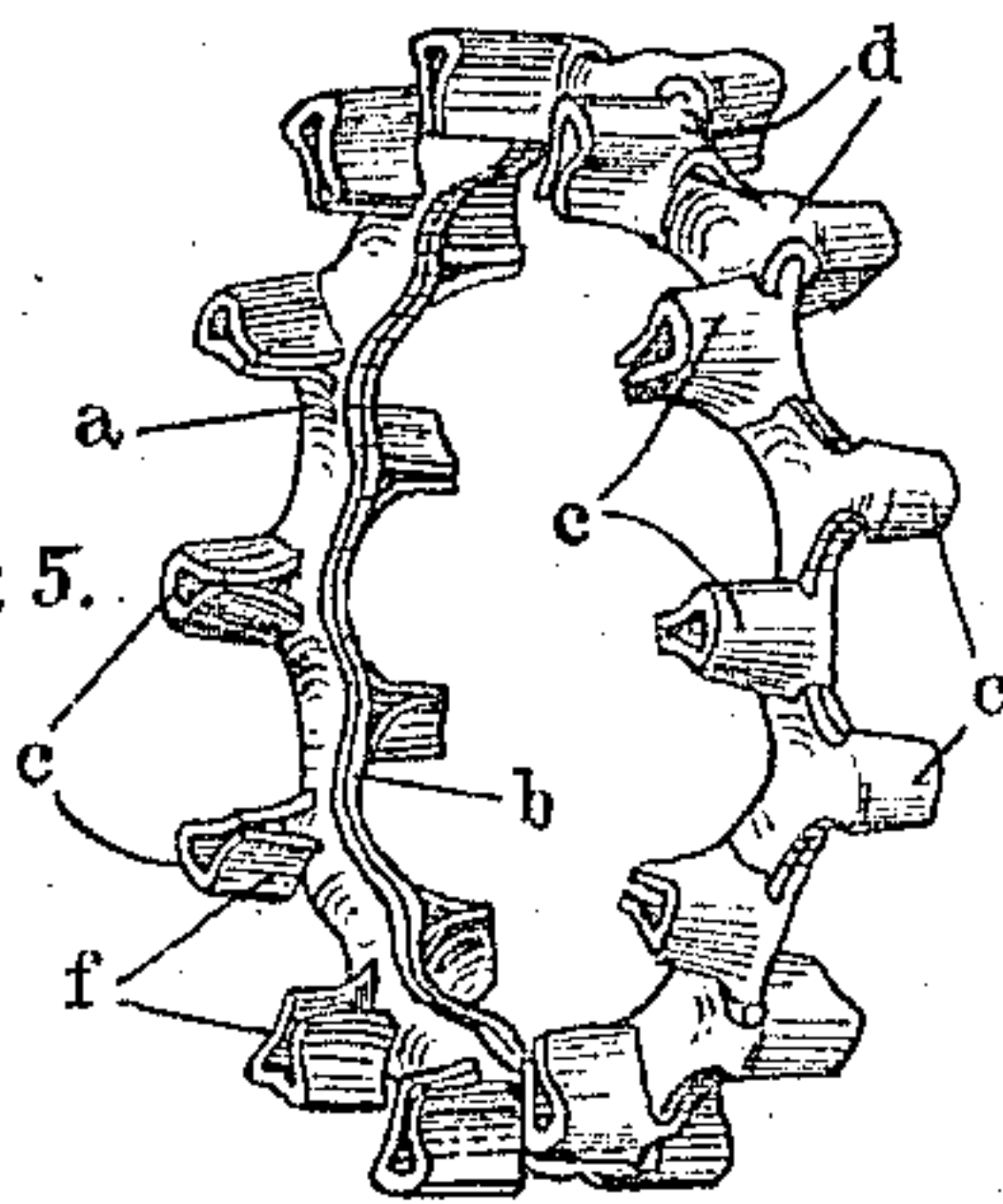


Fig. 5.



Witnesses

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FRANZ WINKLER, OF SCHWEINFURT, GERMANY.

SPACER FOR BALL-BEARINGS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANZ WINKLER, a subject of the King of Bavaria, residing at Schweinfurt, Germany, have invented new and useful Improvements in Spacers for Ball-Bearings, of which the following is a specification.

The object of the invention is to provide a spacer- or retainer-ring especially for double-row ball-bearings, which ring is strong in construction, effective in the separation of the balls at given distances, while guiding the balls of the two series at the same time, light in weight, and easy to manufacture at a moderate price. This object is attained by constructing the ring of two identical parts which are placed side by side and secured to each other by means of lugs integral with, and alternately projecting from the edges of the ring parts and which, when bent down over the other contiguous ring part and folded together with their lateral wings, tightly clamp the two rings together. The said lugs or projections which by their folding are given a U-shape also form the spacing pieces extending between, and spacing the balls of each series. The recesses on either side of the ring are preferably rounded out to adapt the periphery of the balls to be received by them. To this end the two rings are undulating or sinuous on their sides, and the recesses formed on these sides between the single lugs are accordingly arranged in a staggered relation.

In the drawing which forms a part of this specification, an embodiment of the invention is illustrated by way of example.

Figure 1 represents, partly in cross-section, an annular ball-bearing of usual construction with two series of balls and the spacer-ring mounted therein. Fig. 2 is a side-elevation of the said bearing and spacer-ring. Fig. 3 is an outer view of the spacer-ring alone. Fig. 4 partly represents the two ring parts which form the spacer-ring, illustrating the single operation of bending and folding the lugs. Fig. 5 is a perspective view of the spacer-ring.

Like reference letters denote like parts throughout all figures of the drawing.

The spacer-ring which can be used in ball-bearings of any usual construction with two series of balls and any suitable ball-tracks or races, such as cylindrical, conical, spherical, or grooved races (Figs. 1 and 2 illustrate

the latter arrangement), is composed of the two rings *a* and *b* of congruent form; the said rings are, for example, undulated on their sides or sinuous in axial direction and are placed with their flat sides against each other, in which position they are in close contact throughout the entire circumference, as the undulations of one ring conform to the corresponding undulations of the other ring. This tight fit will best be seen from Figs. 1, 3 and 5. Projecting from the outer edges of either ring *a* and *b* are lugs *c* which are connected with the corresponding ring body only by the comparatively small strip *d*, while their sides are enlarged in opposite directions, so as to form wings *f* (Fig. 4). The said lugs *c* of either ring are bent down over the outer edge of the other ring, that is to say, the said lugs of the ring *a* are bent over the ring *b* and vice versa, so that they project in opposite directions from the central body, and their wings *f* are folded radially inwardly, whereby their inner edges bear against the lateral face of the other ring, while the longitudinal edges of said wings converge toward each other. By this construction of the lugs *c* which are the spacing means for the balls and are arranged alternately upon the two sides of the ring-body *a* and *b* in staggered relation, U-shaped and radially extending members can be formed of any suitable length for passing through between two consecutive balls, as shown in Figs. 1 and 2.

The central double body of the spacer-ring can be formed of two plane rings, but preferably the said rings are undulating, as shown in the example, and the strips *d* are formed on the depressions of the corresponding ring, so that the lugs *c* are located upon the elevations of the other ring, as clearly represented in Fig. 3. This shape of the central body in connection with the rounded sides of the lugs *c*, will more perfectly conform the walls of the recesses between two lugs to the periphery of the balls therein received and guided (Fig. 5). Moreover, it is obvious that the construction will not be altered, if the lugs are in connection with the inner edge of one or both rings *a* and *b*, or alternately with the outer and inner edges; these modifications therefore do not require illustration. The lugs may also be of any desired height and at their free extremity as broad as is suitable for holding the balls.

To manufacture the spacer-ring, two congruent blanks cut of sheet-metal are used, the form of which can easily be imagined from the partial representation in Fig. 4. The lugs *c* shown at the right of the rings *a* and *b* in the plane with the ring body, are illustrated in the middle part as bent up at right angles and at left as folded to the definite shape. The two rings can be joined in different ways. For instance, first the wings *f* of all lugs *c* are folded toward each other, whereupon the rings are placed the one against the other in such a manner that the lugs of either ring alternately project over and beyond the edge of the other ring. When the lugs are then bent down upon the side of that other ring a secure connection of the structure is obtained, while the rings *a* and *b* are tightly held together. If the lateral dimension of the lugs *c* is reduced or the distance between the single lugs increased, the assembling of the two rings may be effected after the erection of the lugs *c*, as shown in the middle part of Fig. 4, and when the rings are joined, the wings *f* are finally folded together.

The composition of the spacer-ring of two symmetrical rings not only has the effect to strengthen the central part of the spacer by doubling its thickness, but also insures the cheap and easy manufacture of the construction. The special double arrangement of the lugs produces rigidity of the connection and a certain yieldingness of the wings which will favor the smooth and noiseless running of the balls.

What I claim as my invention, and desire to secure by Letters Patent, is:—

1. A spacer-ring for ball-bearings with two rows of balls, composed of two rings having lugs projecting from the edges of either ring over the other ring so as to clamp

the said rings together, also forming spacing means for the balls.

2. A spacer-ring for ball-bearings with two series of balls, comprising two rings and lugs projecting from the edges of either ring and bent down upon the side of the other ring, the said lugs being so formed as to be the spacing means for the balls.

3. A spacer-ring for ball-bearings with two series of balls, comprising two congruent rings placed side by side, lugs projecting from the edges of either ring beyond the other ring, and wings of the lugs folded together and bearing upon outer side of the other ring.

4. A spacer-ring for ball-bearings with two series of balls, comprising two sinuous rings placed side by side, lugs projecting from the edge of either ring over the other ring, and wings of the lugs folded together along the elevation of the other side of the spacer-ring, the sides of the lugs being hollowed out so as to conform themselves to the periphery of the balls to be received in the interstices between every two lugs.

5. The combination with a ball-bearing having two rows of balls, of a spacer-ring, comprising two rings placed side by side and situated between the two rows of balls, and lugs projecting from the edge of either ring over the outer side of the other ring, so as to clamp the rings tightly together, and extending between two consecutive balls for spacing same.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANZ WINKLER.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."