

(No Model.)

L. KATZENSTEIN.  
Metallic Packing for Piston-Rods, &c.

No. 228,200.

Patented June 1, 1880.

Fig: 1

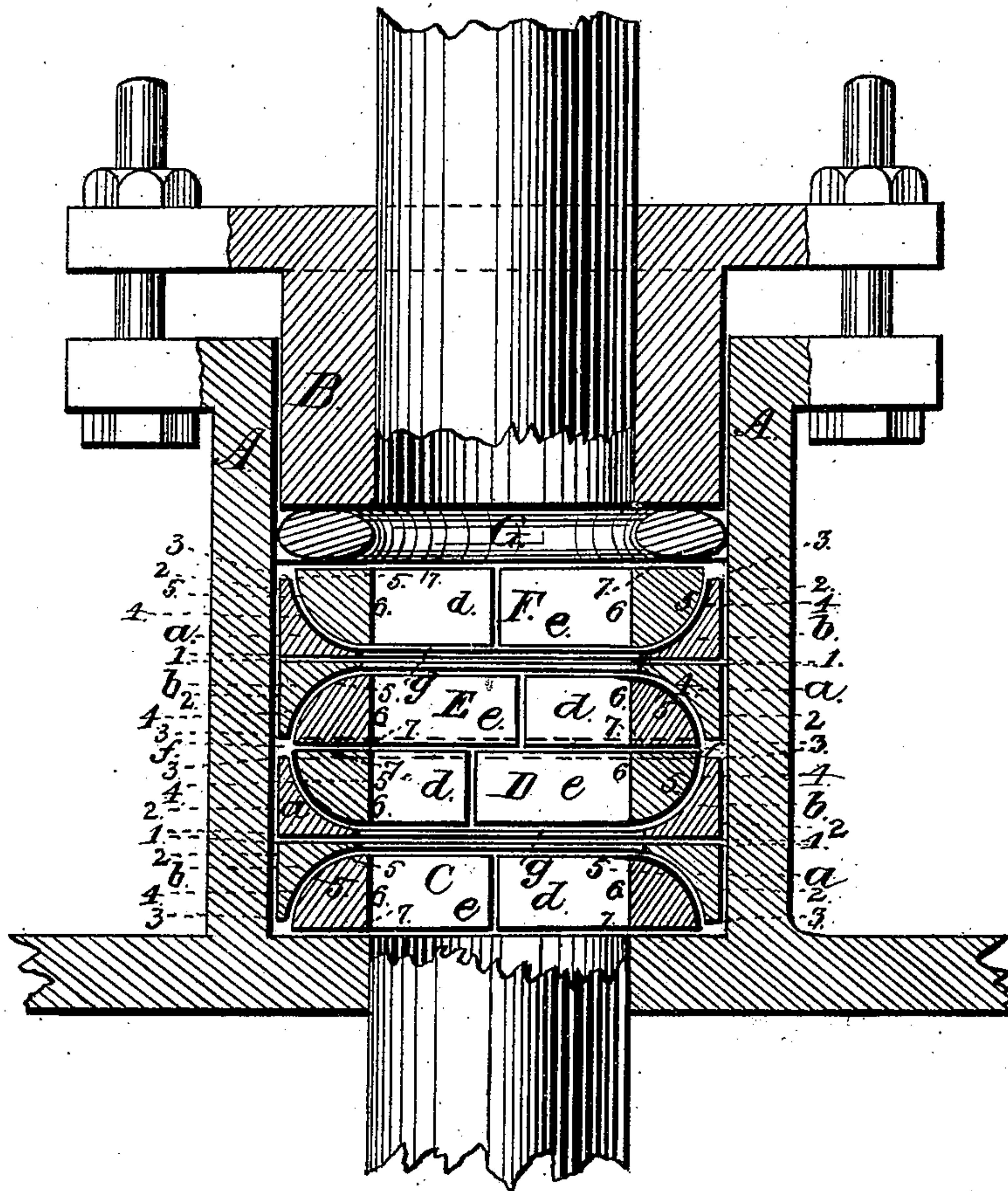
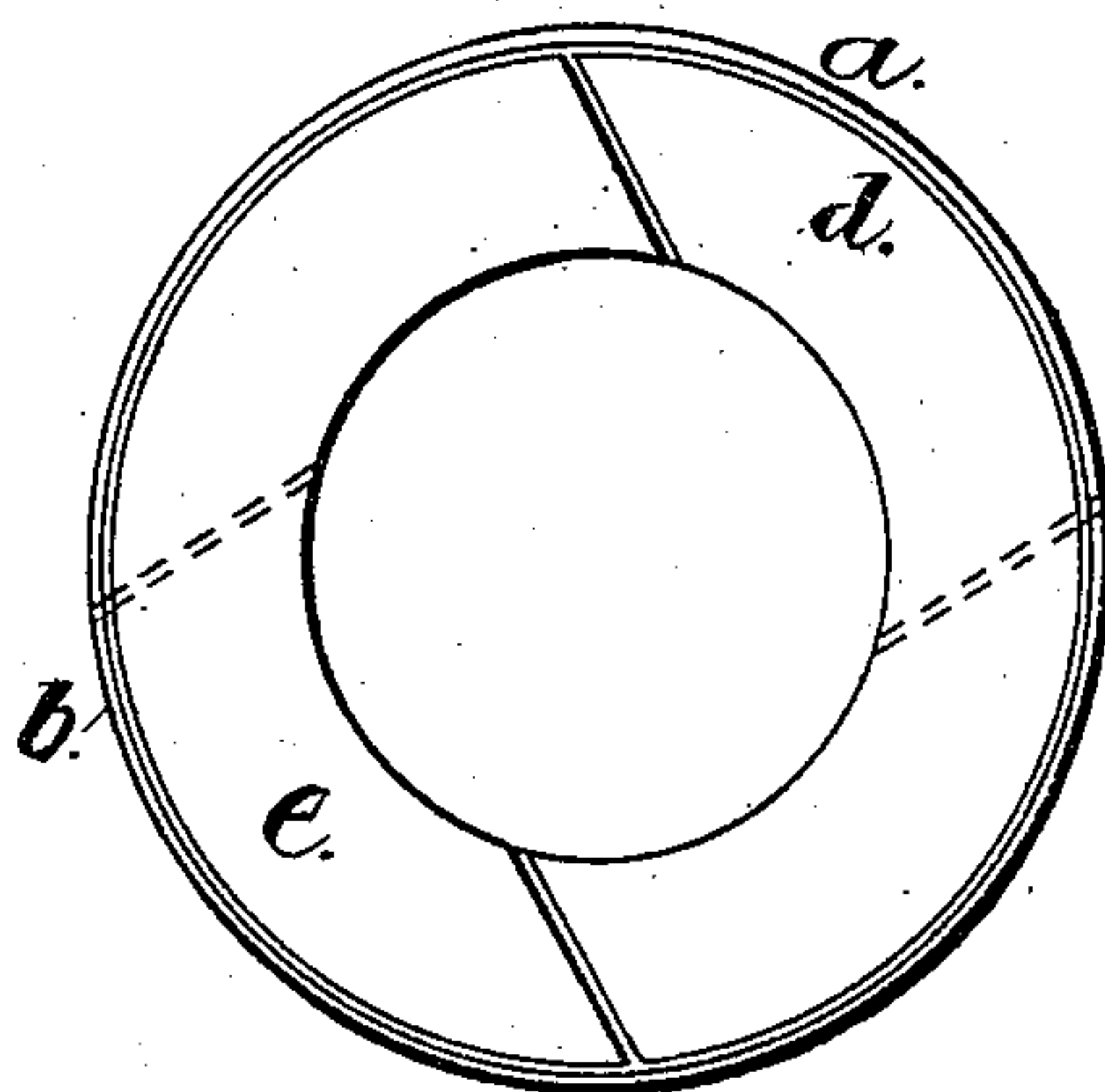


Fig: 2



Witnesses:  
John C. Tunbridge,  
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L. Katzenstein  
by his attorney  
A. B. Briesen



# UNITED STATES PATENT OFFICE.

LEOPOLD KATZENSTEIN, OF NEW YORK, N. Y.

## METALLIC PACKING FOR PISTON-RODS, &c.

SPECIFICATION forming part of Letters Patent No. 228,200, dated June 1, 1880.

Application filed April 10, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, LEOPOLD KATZENSTEIN, of New York city, in the county and State of New York, have invented a new and Improved  
5 Metallic Packing for Piston-Rods and for other similar purposes, of which the following is a specification.

This invention relates to improvements on the metallic packing for which I obtained Letters Patent of the United States No. 215,629,  
10 dated March 7, 1879; and the object of my present invention is to arrange the packing rings or sections so that they will more easily compress around the piston-rod and  
15 against the walls of the stuffing-box, and adjust themselves to any inequality in the motion or position of the piston-rod or in the adjustment of the packing in the box.

The invention consists in making the packing-sections of concentric rings, the inner rings convex and the outer rings concave, and putting them in the box so that the convex sections will be embraced by the concave sections, whereby, when the follower or gland is screwed  
25 down, it will have a tendency to force the inner packing-sections against the piston-rod and the outer sections against the walls of the box; and in case the movement of the piston-rod should be to any extent uneven, or the  
30 packing should not be adjusted perfectly straight in the blocks, or becomes disarranged by wear, the rounded surface between the inner and outer sections of the packing permits a free adjustment of the said sections.

35 In the accompanying drawings, Figure 1 represents a longitudinal sectional view of a stuffing-box and of my improved packing placed therein, showing clearly its form and the manner of arranging it in the box. Fig. 2 is a plan  
40 view of the packing shown in Fig. 1, showing the manner of placing the semi-annular plates together.

Referring to the drawings, A represents a stuffing-box; B, the gland or follower; and C,  
45 D, E, and F are four sections of metallic packing placed within the stuffing-box. Each section consists of two outer semi-annular pieces, *a b*, and of two inner semi-annular pieces, *d e*.

Each outer semi-annular piece, *a b*, is substantially four-sided. The side or part 1 and  
50 outer periphery, 2, are at right angles to each other, and are substantially of the same area

in cross-section, while the side or part 3 is at right angles to the periphery, but only about one-fifth the length of the side in part 1 in  
55 cross-section, while the inner periphery, 4, is concave. The two parts or pieces *a b* are alike, and form when placed in the same plane, end to end, a complete but expansible and contractible annulus of an outer diameter substantially  
60 equal to the interior of the stuffing-box A.

Each semi-annular piece *d e* is substantially three-sided in cross-section, the outer periphery, 5, being convex, and the inner periphery, 6, being straight and at right angles to its  
65 flat outer surface, 7. The two pieces *d e* are alike, and form when placed in the same plane, end to end, a complete but expansible annulus of an inner diameter about equal to the piston-rod. The ends of the pieces *a b* and *d e* are  
70 preferably slanting, as in Fig. 2.

To arrange the packing in the stuffing-box, I proceed as follows: At the bottom of the box two pieces, *d e*, of the inner rings are placed with the convex sides upward; next,  
75 two pieces, *a b*, are placed in the box with the concave sides or peripheries downward and resting on the convex sides of the inner ring, thus forming one packing-section, C. Two pieces, *a b*, are next placed in the stuffing-box  
80 on top of the packing-section C, and with the concave peripheries upward, and on top of these are placed two pieces, *d e*, of the inner ring with the convex sides downward, and resting on the concave peripheries of the  
85 pieces *a b*, thus forming a second packing-section, D. Next is placed a section, E, similar to C, and next a section, F, similar to D, and so on until the box is filled. On top of the whole is placed a ring of ordinary rubber or textile  
90 packing, G, against which the end of the follower bears to protect the metallic packing from direct contact with the end of the follower and to assist in packing the box.

Between the sides 3 3 of the pieces *a b*,  
95 forming the outer rings of oppositely-placed packing-sections D E, a space, *f*, is left, forming channels or grooves, which give space for the adjustment of the sections, allowing the pieces to be brought closer together vertically—  
100 that is, parallel to the axis of the piston-rod—when it is necessary to bring the inner rings closer to the piston-rods or the outer rings closer to the walls of the stuffing-box. These



grooves also serve to collect and hold water of condensation, and to thereby render the packing tighter, and to permit the lateral expansion and contraction of the rings. Between the sections C and D and E and F are inside grooves or spaces *g*, surrounding the piston-rod, which serve a similar purpose as the grooves or channels *f*—that is, to give space for forcing the sections closer together and to collect the waters of condensation.

By making a concave and convex joint between the rings of each section of packing the pieces forming the rings are more easily and effectively pressed against the piston-rod when the follower is screwed in against the packing; and, further, the pieces and sections are allowed to adjust themselves to the movement of the piston-rod, and also to the wear of the packing, so that if there is any vibratory or other irregular movement of the piston-rod, as the pieces of the different sections readily move on each other, it will be readily seen that they will adjust themselves to such irregular movement of the piston-rod without breaking contact. If the packing wears irregularly they will in like manner adjust themselves without injuring the efficiency of the joints.

When the pieces forming the rings are placed in position care must be taken to place the joints between the ends of the pieces

forming one ring between the joints of the other ring, so that the joints between all the rings and sections will be broken.

I am aware that uncut rings having rounded faces have been previously proposed for packings. This I do not claim, nor are uncut rings having rounded faces capable of adjustment such as I obtain by my sectional rings.

I claim—

1. The metallic packing consisting of the sectional pieces *a b* of outer rings, with concave inner peripheries, and of the sectional pieces *d e* of inner rings, having convex outer peripheries, said sectional rings being arranged to form equal sections C D E, &c., in which they are alternately reversed, substantially as herein shown and described.

2. The metallic packing consisting of the sectional pieces *a b* of outer rings, with concave inner peripheries, and of the sectional pieces *d e* of the inner rings, having convex outer peripheries, said sectional rings being arranged to form equal subdivisions in which they are alternately reversed and form outer and inner grooves, *f g*, substantially as described.

LEOPOLD KATZENSTEIN.

Witnesses:

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