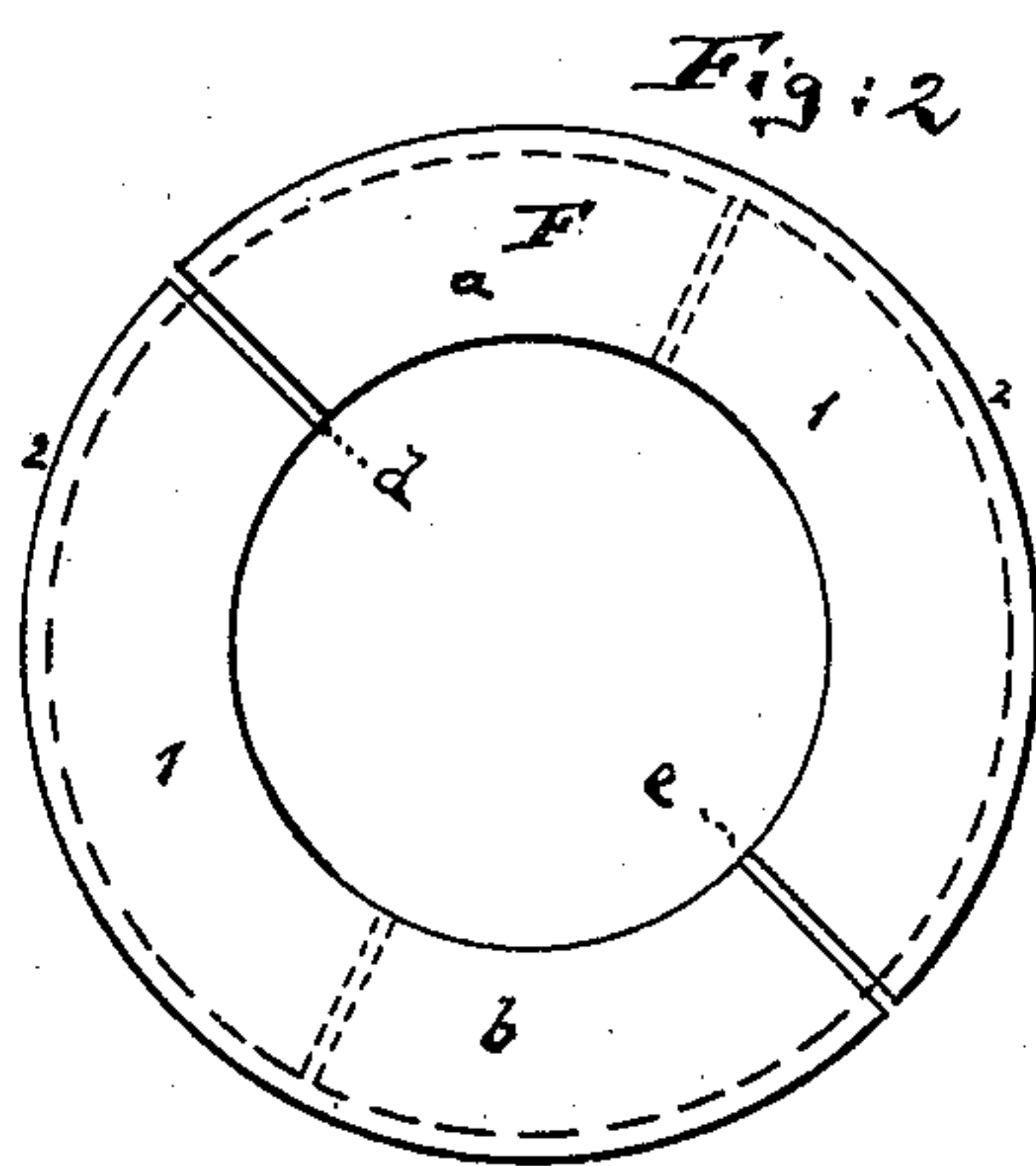
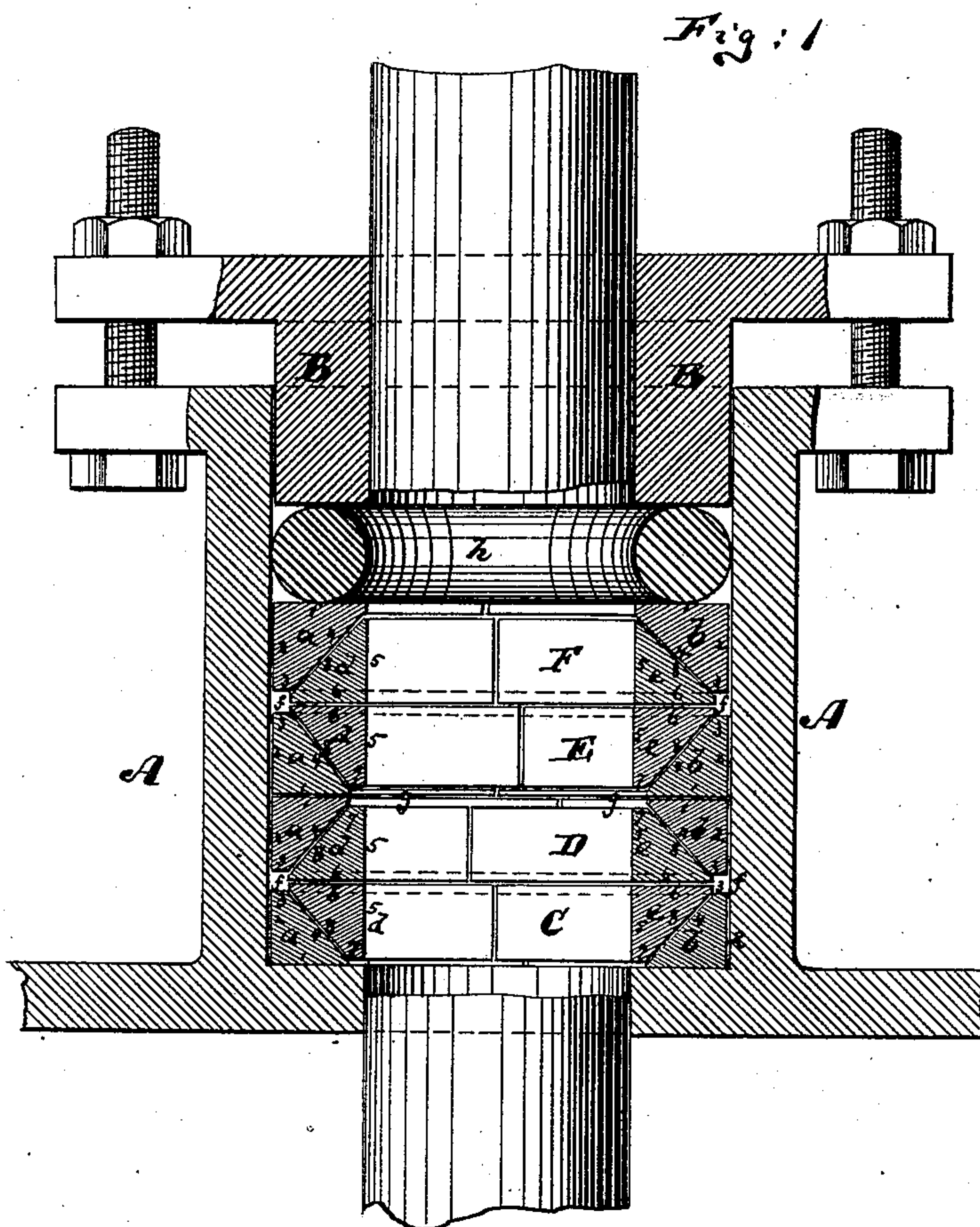


L. KATZENSTEIN.
Packing for Piston-Rods, &c.

No. 215,629.

Patented May 20, 1879.



Witnesses:
John C. Tunbridge
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UNITED STATES PATENT OFFICE

LEOPOLD KATZENSTEIN, OF NEW YORK, N. Y.

IMPROVEMENT IN PACKING FOR PISTON-RODS, &c.

Specification forming part of Letters Patent No. **215,629**, dated May 20, 1879; application filed March 7, 1879.

To all whom it may concern:

Be it known that I, LEOPOLD KATZENSTEIN, of New York city, county and State of New York, have invented a new and Improved Packing for Piston-Rods, Stuffing-Boxes, &c., of which the following is a specification.

Figure 1 is a longitudinal section of a stuffing-box provided with my improved packing. Fig. 2 is a face or end view of the packing.

Similar letters of reference indicate corresponding parts in both figures.

This invention has for its object to produce a sectional packing for piston-rods, &c., which will be easily repaired and replaced, and which will insure a proper tight joint.

Piston-rod packings have heretofore already been made of semi-annular pieces of anti-friction metal; but these pieces were mostly of such form and arrangement as to render the entire packing useless if one part was injured or broken.

My invention consists of a series of semi-annular plates, arranged in sections of four pieces to each section, the corresponding pieces in all the sections being exactly alike, so that any piece broken, injured, or worn is easily replaced. These sections are so placed as to have intermediate annular recesses, within which water of condensation may be collected, and which, moreover, will permit the entire packing to be reset from time to time as the parts are wearing off, all as hereinafter more fully described.

In the accompanying drawings, the letter A represents the stationary part, and B the movable part or gland, of a stuffing-box. C D E F are four (more or less) sections of metallic packing-pieces within the stuffing-box. Each section consists of two outer semi-annular pieces, *a* and *b*, and of two inner semi-annular pieces, *d* and *e*. Each outer semi-annular piece, *a b*, is substantially four-sided in cross-section, the base 1 and outer periphery, 2, being at right angles to each other and of substantially equal lengths in cross-section, the upper edge, 3, being at right angles to the periphery, but only about one-fifth the length of the base in cross-section, while the inner periphery, 4, is slanting, all as shown in Fig. 1.

The two pieces *a* and *b* are alike, and form, when placed in the same plane, end near end,

a complete but expansible and contractible annulus of the cross-section of any one of said pieces, and of an outer diameter equaling, substantially, the interior diameter of the stuffing-box A.

Each inner semi-annular piece, *d e*, is also substantially four-sided in cross-section, the inner periphery, 5, being about as long in cross-section as the outer periphery, 2, of the outer semi-annular pieces, *a b*. The upper surface, 6, (I now describe the lower section, shown in Fig. 1,) is at right angles to the inner periphery, 5, and about of equal length in cross-section as the same. The base 7 is at right angles to the inner periphery, but only about one-fifth the length of the same in cross-section. The outer periphery, 8, is slanting, as shown. The two pieces *d* and *e* are alike, and form, when placed in the same plane end to end, a complete but expansible annulus of the cross-section of any one of said pieces, and of an inner diameter equaling, substantially, the diameter of the piston-rod.

When the pieces *a b* of an outer ring are placed into the box, the pieces *d* and *e* of an inner ring are next put in, so that the slanting outer face, 8, of the inner ring comes against and bears upon the slanting inner face, 4, of the outer ring, as clearly shown in the drawings. This finishes one section, C, of the packing.

Another inner ring is next placed upon that first put in, so that the faces 6 6 of these two are contiguous; and then another outer ring, *a b*, is placed over the inner, as shown in Fig. 1, finishing the next section, D, of the packing. The section E is precisely like the section C, and the section F like the section D, &c.

It will be observed that the rings are reversed in the contiguous sections, and that thereby outer grooves, *f f*, are formed between the sections C and D and between the sections E F, and an inner groove, *g*, between the sections D and E. These grooves allow the adjustment of the sections, because the pieces can be brought closer together vertically—i. e., parallel to the axis of the piston-rod—when necessary to bring the inner rings close to the piston-rod 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 practically steam-tight, and to permit the lateral extension and contraction of the rings.

The pieces of the outer sections being all alike, and those also of the inner sections alike in turn, the entire packing consists of but only two kinds of pieces, *a* and *d*, which are easily duplicated for purposes of repair and replacement.

The packing is easily taken apart for repair or inspection, and may receive a suitable ring, *b*, of rubber or other equivalent material, directly beneath the gland for more effectual service.

The sharp angles formed by the junction of the lines 1 and 4 in the outer rings and by the lines 6 and 8 in the inner rings may be trimmed away, as shown. The short side, 7, may be omitted on the inner ring, *d e*, of the upper section, F, as shown.

I am aware that rings triangular in cross-

section have already been used for piston-packings; but these rings did not have an inner groove formed between them, and did not permit of proper lateral adjustment. I do not claim rings triangular in cross-section; but

I do claim—

A metallic packing consisting of four-sided pieces *a b* of outer rings with slanting inner periphery and of four-sided pieces *d e* of inner rings with slanting outer periphery, said rings being arranged to form equal sections C D E, &c., in which they are alternately reversed, forming outer and inner grooves, *f* and *g*, all constructed and arranged substantially as herein shown and described.

LEOPOLD KATZENSTEIN.

Witnesses:

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