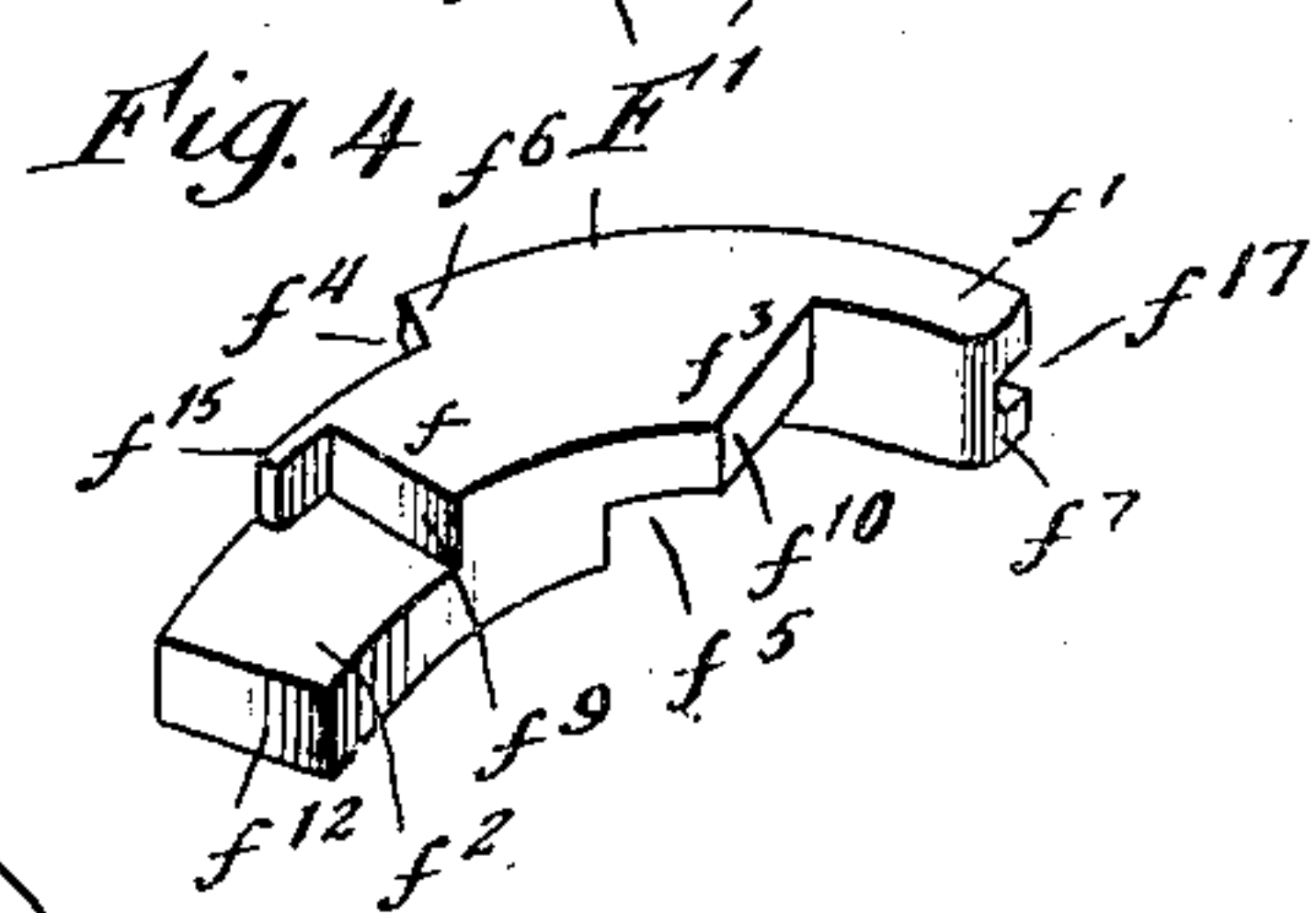
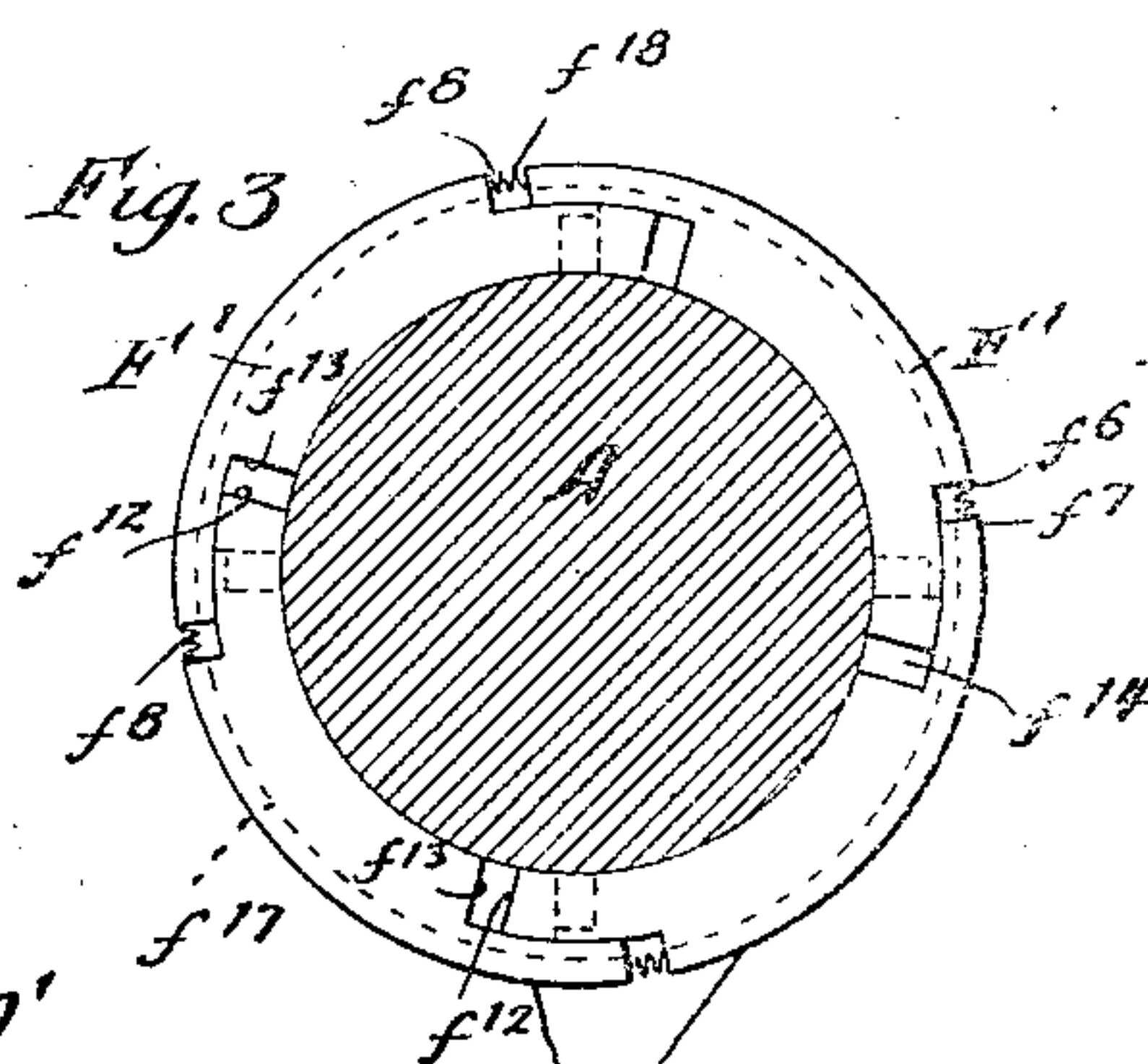
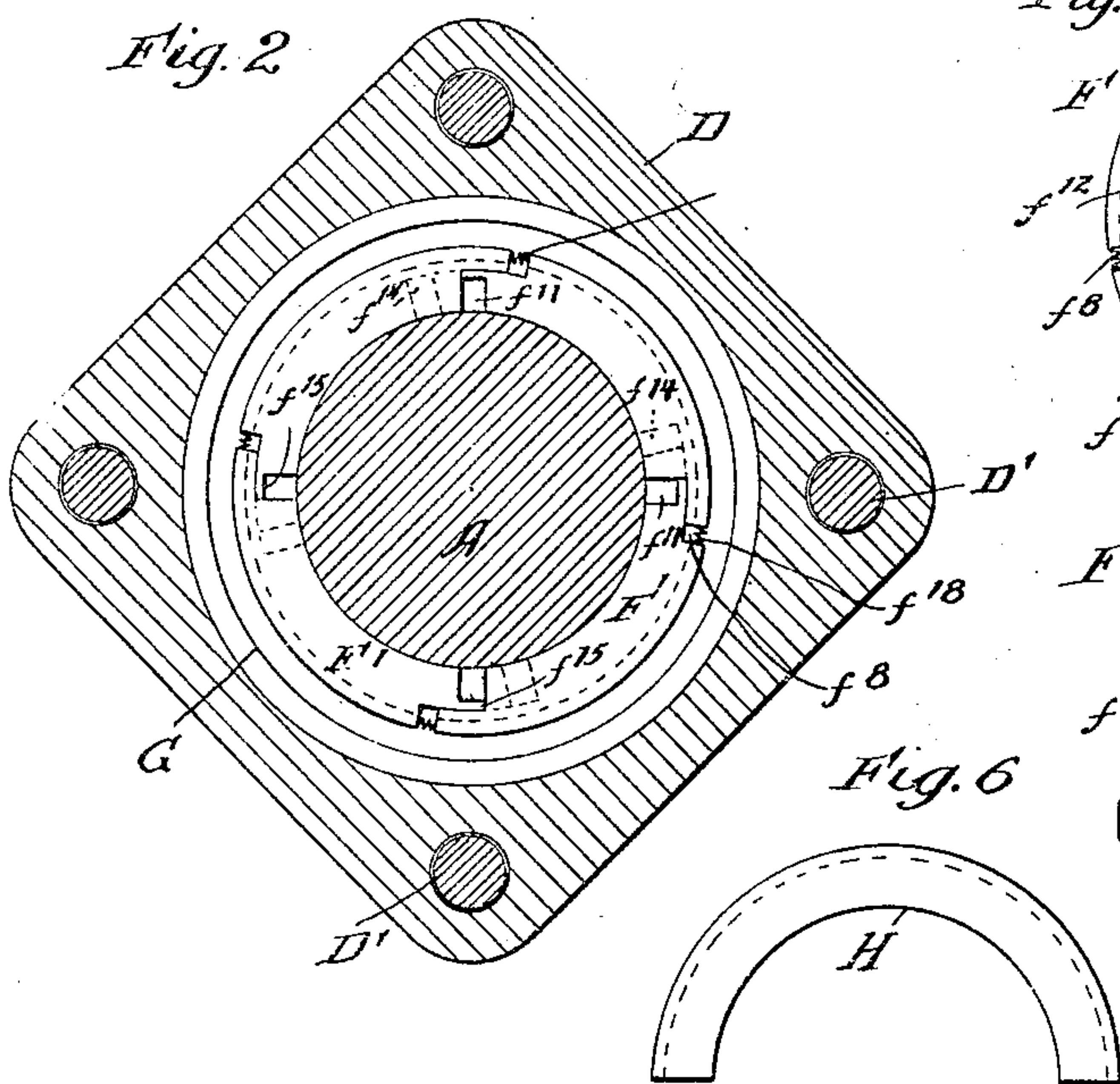
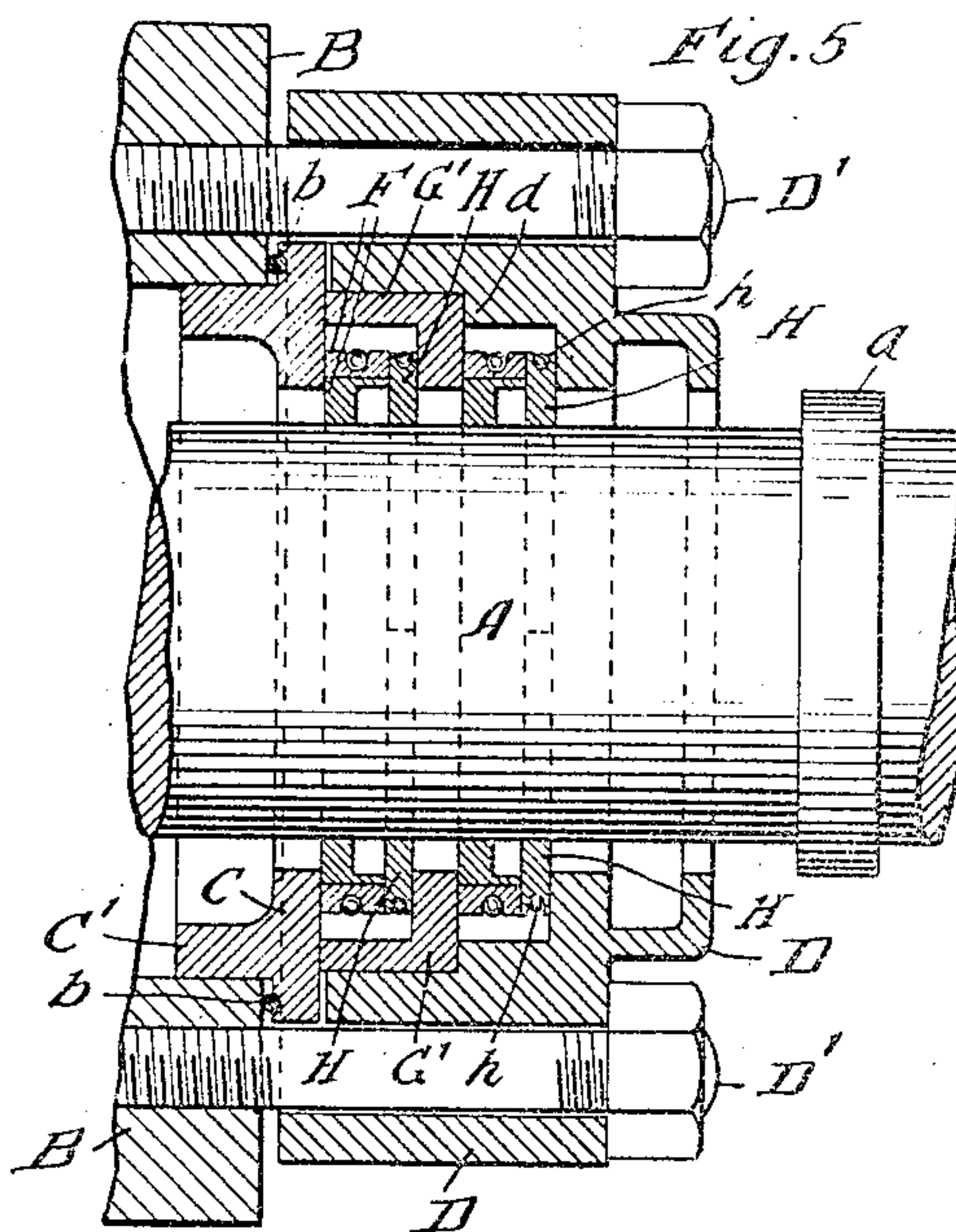
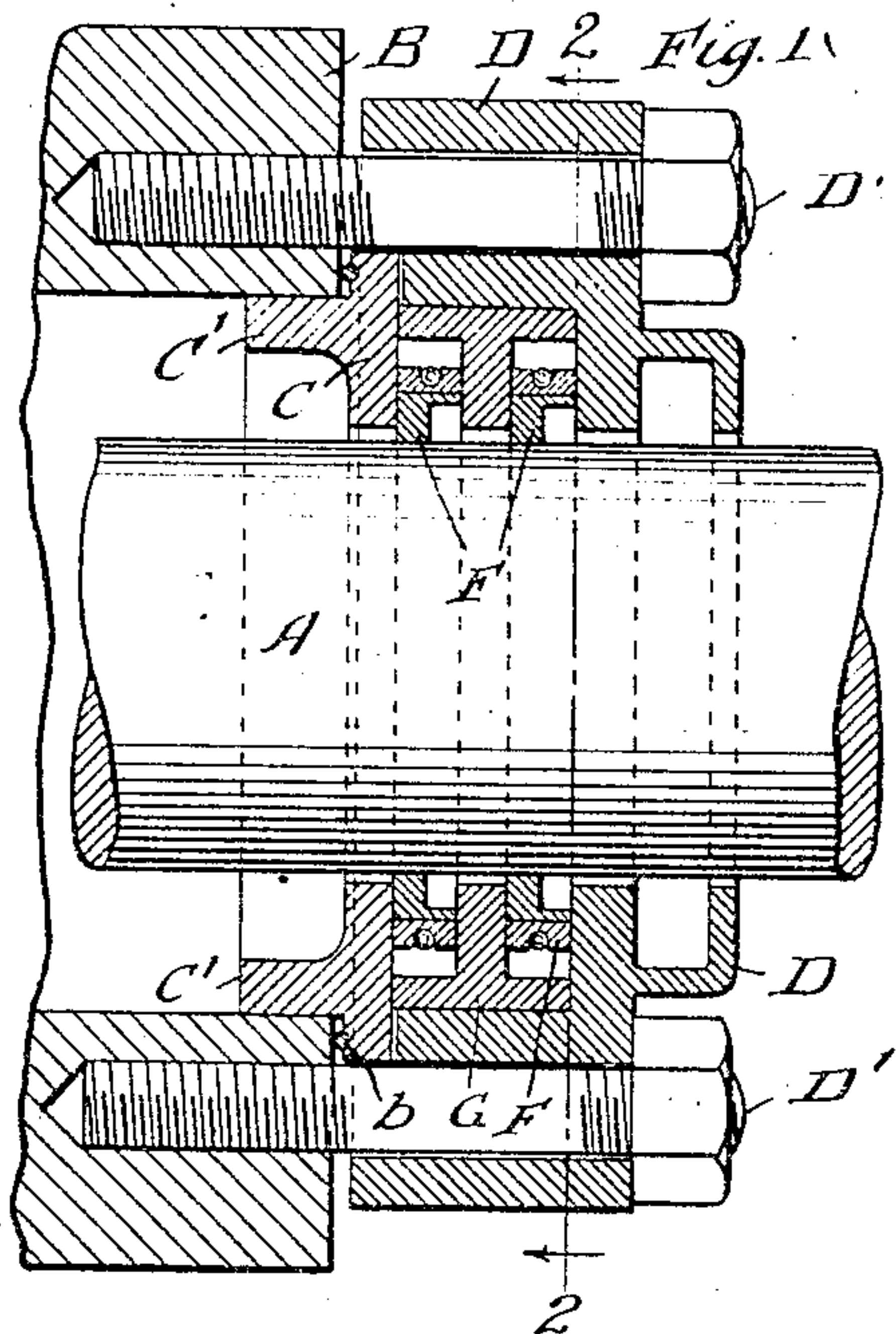


No. 832,068.

PATENTED OCT. 2, 1906.

J. H. LEWIS & L. G. KUNZER.  
METALLIC PACKING FOR PISTON RODS.

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Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN H. LEWIS AND LOUIS G. KUNZER, OF CHICAGO, ILLINOIS.

## METALLIC PACKING FOR PISTON-RODS.

No. 832,088.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed November 23, 1905. Serial No. 288,642.

*To all whom it may concern:*

Be it known that we, JOHN H. LEWIS and LOUIS G. KUNZER, citizens of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Metallic Packing for Piston-Rods, of which the following is a specification.

Our invention relates to improvements in metallic packing for piston-rods, and more specially to improvements upon the metallic piston-rod packing forming the subject of our Patents Nos. 721,709 and 721,710, of March 3, 1903, and of our Patent No. 807,294, dated December 12, 1905.

The object of our present improvement is to increase the efficiency in practical operation of our metallic piston-rod packing.

Our present improvement consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described, and more particularly specified in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a longitudinal vertical section showing a portion of a cylinder-head and piston-rod furnished with our improved metallic packing and embodying our invention. Fig. 2 is a cross-section on line 2 2 of Fig. 1, showing one of the packing-rings in elevation. Fig. 3 is a face view of one of the packing-rings, looking from the opposite side thereof, which is shown in Fig. 2. Fig. 4 is a detail perspective view showing one of the segments of one of the metallic abutment-rings, and Fig. 5 shows a construction wherein additional packing-rings are employed. Fig. 6 is a detail view of one of the parts shown in Fig. 5.

In the drawings, A represents the piston-rod, and B a portion of the cylinder-head, of a locomotive, through which the piston-rod reciprocates, our invention being specially designed for use as a packing for locomotive piston-rods, though applicable for other purposes.

D is the packing gland or collar, which is secured to the cylinder-head by threaded bolts D', a packing-head ring C being interposed between the cylinder-head and gland and a wire or other packing *b* being interposed between the packing-head ring C and the cylinder-head B to insure a tight joint. The ring C has a flange C', which fits inside the cylinder-head B. The packing-head ring C, in connection with the gland D, which is of

a right-angle form in cross-section, forms a chamber to receive the segmental packing-rings F F and the division-ring G, which is preferably of a T shape in cross-section and serves to separate the segmental packing-rings F F from each other and forms a separate annular chamber for each of the packing-rings. Each of the segmental metallic packing-rings F comprises a plurality of segments F', preferably four in number, each of which is halved, notched, or offset in two planes, one plane or surface of division being parallel to the circumference of the piston or packing-ring, and the other plane or surface of division being at right angles to the piston and forming overlapping leaves or members and three radially-extending partial joints, each of which radial joints, however, extends only part way across or through the packing-ring.

The segments F' are all exactly alike, and each thus has at one end an inner leaf or member *f* and at its opposite end an outer leaf or member *f'*, which overlaps the inner leaf or member *f* of the adjacent meeting segment. Each of the segments F' also has its inner leaf or member *f* provided with a side leaf or member *f<sup>2</sup>* and at its opposite end with a side member *f<sup>3</sup>*, which overlaps the corresponding side leaf or member *f<sup>2</sup>* on the end of the adjacent or meeting segment. Each of the segments F' has a peripheral notch *f<sup>4</sup>* at one end to receive the overlapping leaf or member *f'* on the adjacent or abutting segment and with an interior partial notch *f<sup>5</sup>* half-way through the thickness of the segment to receive the side leaf *f<sup>2</sup>* on the inner leaf *f* of the adjacent or abutting segment. The shoulder *f<sup>6</sup>* of the notch *f<sup>4</sup>* and the end *f<sup>7</sup>* of the outer leaf *f'* of two adjacent segments thus form one partial radial joint *f<sup>8</sup>* through the packing-ring, this joint extending through the whole thickness of the ring, but only partially through the ring radially. The adjacent shoulders *f<sup>9</sup>* of the inner leaf *f* and *f<sup>10</sup>* of the side member *f<sup>3</sup>* thus form another partial radial joint *f<sup>11</sup>*, this joint extending only half-way through the thickness of the packing-ring as a whole and also only part way through the packing-ring radially, and the adjacent shoulders *f<sup>12</sup>* and *f<sup>13</sup>* also form another partial radial joint *f<sup>14</sup>*, which likewise extends only partially through the packing-ring as a whole radially and only part way through the thickness of the packing-ring, and the several partial joints *f<sup>8</sup>*, *f<sup>11</sup>*, and *f<sup>14</sup>* also come at different points of the



circumference or break joints with each other. The inner leaf or member *f* of each segment is furnished with a narrow or compression finger *f*<sup>15</sup>, the extreme edge of which abuts snugly against the radial shoulder *f*<sup>10</sup> of the next adjacent segment, thus forming a tight joint therewith, while at the same time permitting compression or upsetting of this narrow finger, and thus compensating for wear and permitting the segments to contract or come together as the inner periphery of the packing-ring wears away by the reciprocation of the piston. All the segments *F* are furnished with a peripherally-extending groove *f*<sup>17</sup> to receive a coiled spring-ring *f*<sup>18</sup>, which surrounds the segmental metallic packing-ring as a whole and serves to hold the segments together.

The division or T ring *G* is snugly clamped between the gland *D* and the packing-head ring *C* and serves thus in connection with the packing-head ring *C* and gland *D* to form a tight chamber to receive the segmental packing-rings *F* and also to separate the segmental packing-rings *F* from each other. As illustrated in Fig. 5 the division-ring *G* is made of a right-angle form in cross-section, and the gland *D* is provided with an offset or shoulder *d* for the division-ring to abut against. In the construction illustrated in Fig. 5 also the openings in the gland *D* and packing-head ring *C* to receive the piston are made large enough for the collar *a* of the piston to pass through, and in this construction we consequently employ supplemental or abutment segmental rings *K*, preferably made in two parts or segments and held together by a coiled wire spring *h*. This enables a piston having a collar to be passed through the gland.

We claim—

1. In a metallic packing for piston-rods, the combination with the cylinder-head and piston-rod, of a packing-head ring *C*, gland *D*, division-ring *G* and a pair of metallic segmental packing-rings *F F* each comprising a plurality of segments, having at their meeting ends double notches or offsets in different planes forming overlapping leaves, and three joints at different points of the circumference, one of which joints extends only through one portion of the radial thickness of the packing-ring and the other two of which joints extend each only part way through the other portion of the radial

thickness of the packing-ring, said segments being furnished on their inner leaves or members with a compression finger or member overlapped by the outer leaf or member of the adjacent segment and serving by its upsetting or compression to permit the segments to contract and compensate for each other, substantially as specified.

2. In a metallic packing for piston-rods, the combination with the cylinder-head and piston, of a packing-head ring *C*, a gland *D*, a division-ring *G* fitting within said gland and between it and said ring *C* and a pair of segmental metallic packing-rings *F F*, one fitting on each side of said division-ring *G* and each comprising a plurality of segments having overlapping leaves or members at their meeting ends forming a plurality of partial radial joints, substantially as specified.

3. In a metallic packing for piston-rods, the combination with the cylinder-head and piston, of a packing-head ring *C*, a gland *D*, a division-ring *G* fitting within said gland and between it and said ring *C* and a pair of segmental metallic packing-rings *F F*, one fitting on each side of said division-ring *G* and each comprising a plurality of segments having overlapping leaves or members at their meeting ends forming a plurality of partial radial joints, said division-ring *G* being of a T shape in cross-section and its outer rim being clamped between said gland *D* and ring *C*, substantially as specified.

4. In a metallic packing for piston-rods, the combination with the cylinder-head and piston, of a packing-head ring *C*, a gland *D*, a division-ring *G* fitting within said gland and between it and said ring *C* and a pair of segmental metallic packing-rings *F F*, one fitting on each side of said division-ring *G* and each comprising a plurality of segments having overlapping leaves or members at their meeting ends forming a plurality of partial radial joints, said segments of each of said metallic packing-rings being provided with narrow compression members yielding or upsetting to permit contraction of the segments and compensation for wear, substantially as specified.

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