

No. 670,565.

Patented Mar. 26, 1901.

E. REYNOLDS.  
PISTON ROD PACKING.

(No Model.)

(Application filed July 29, 1899.)

3 Sheets—Sheet 1.

Fig. 1.

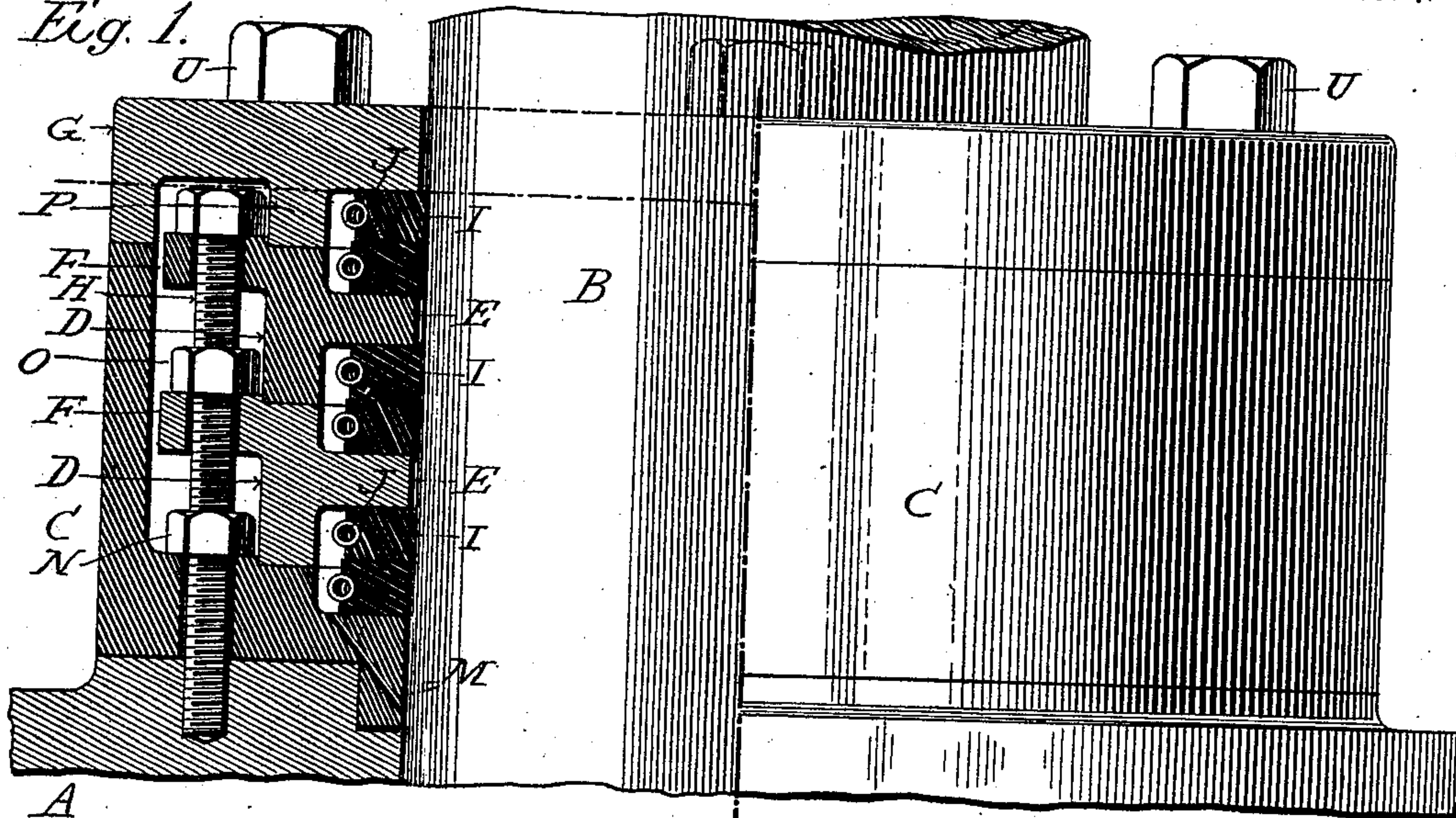
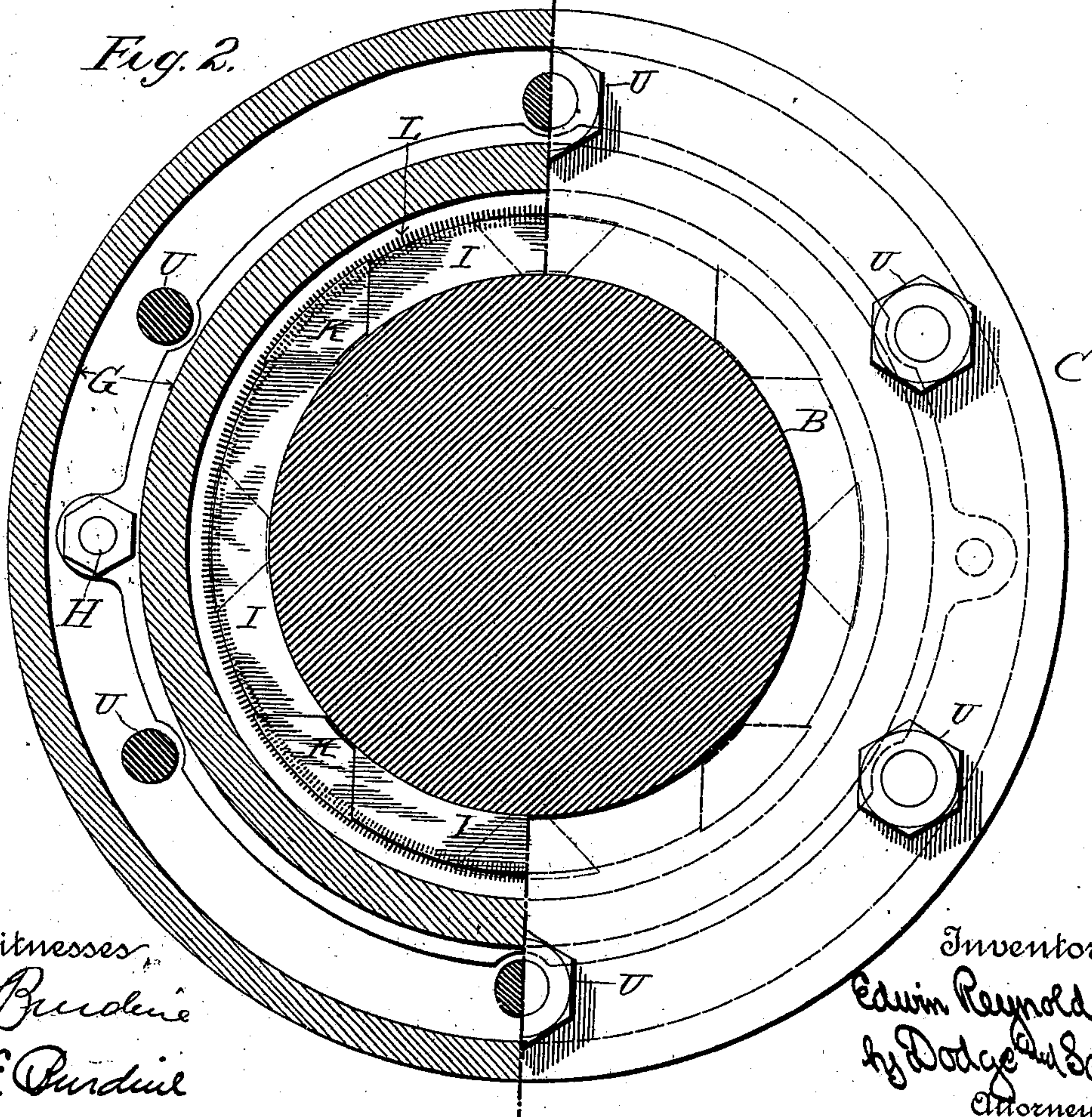


Fig. 2.



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Fig. 3.

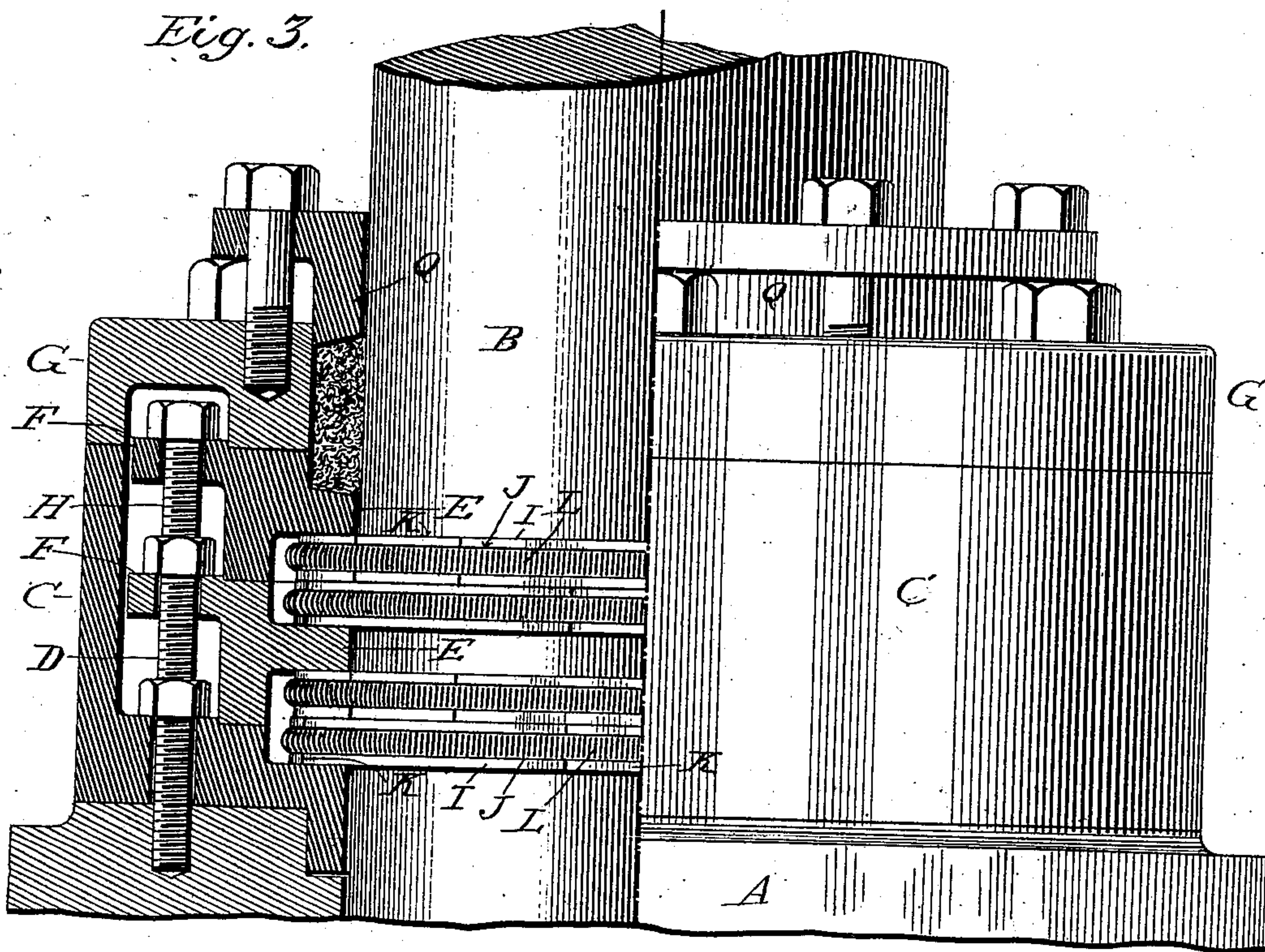


Fig. 4.

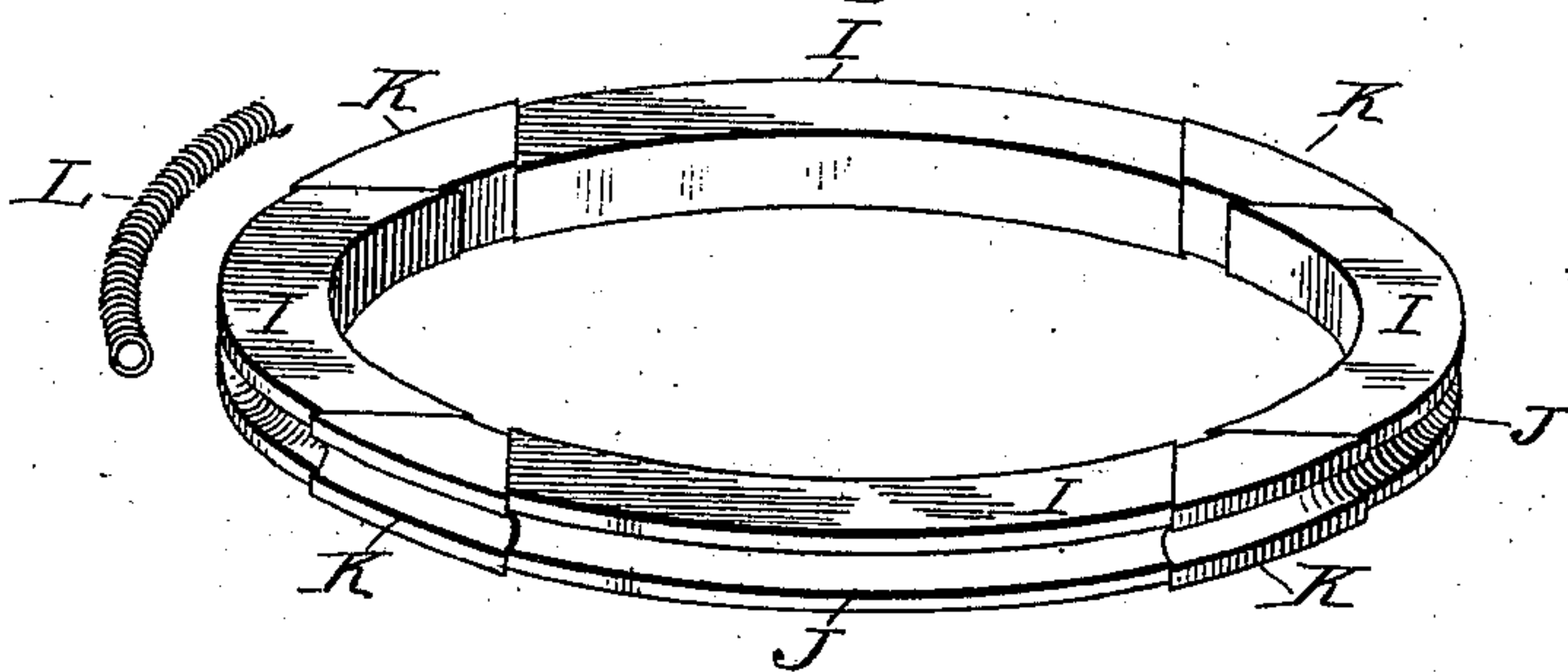


Fig. 5.

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Fig. 6.

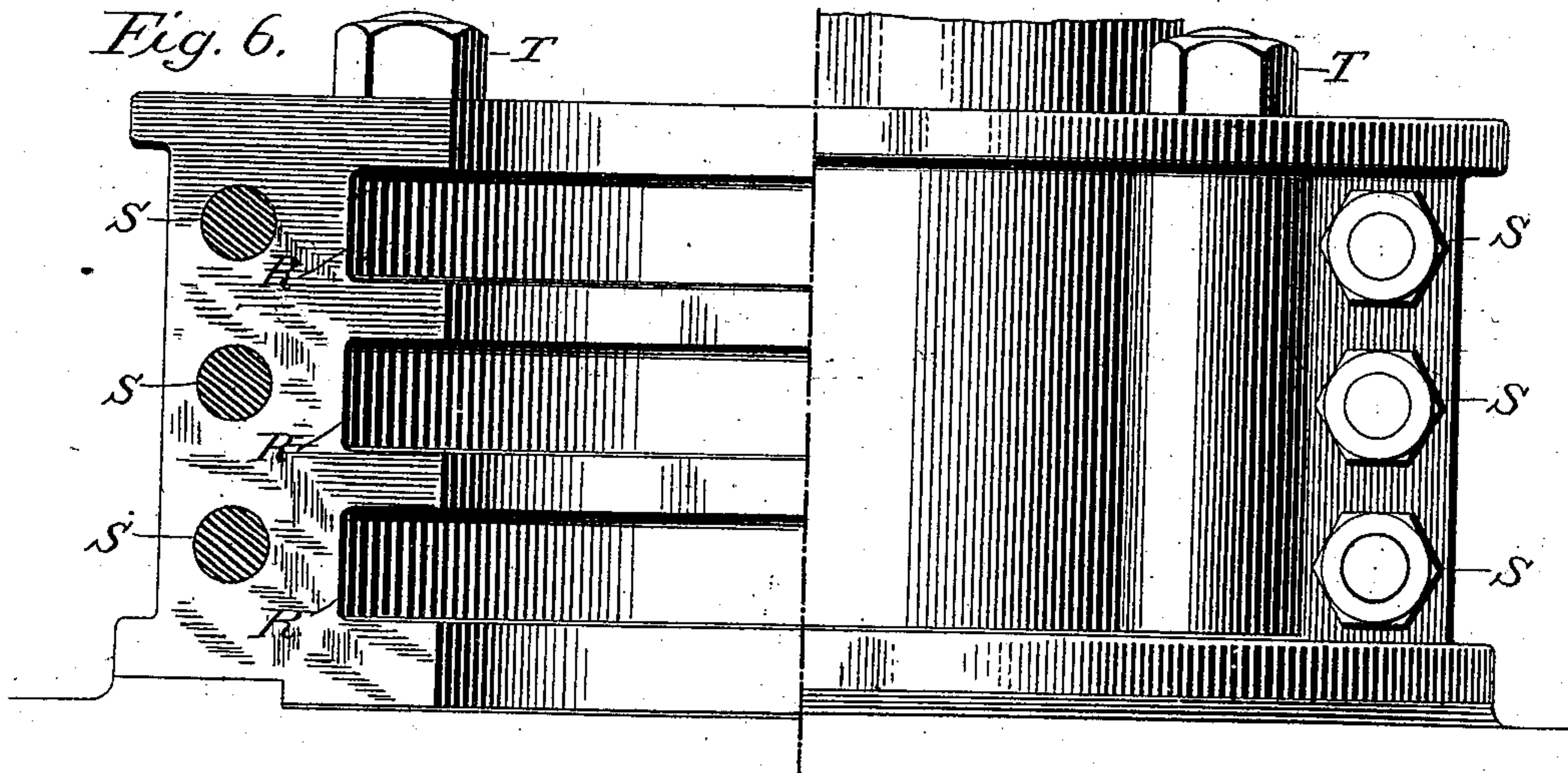
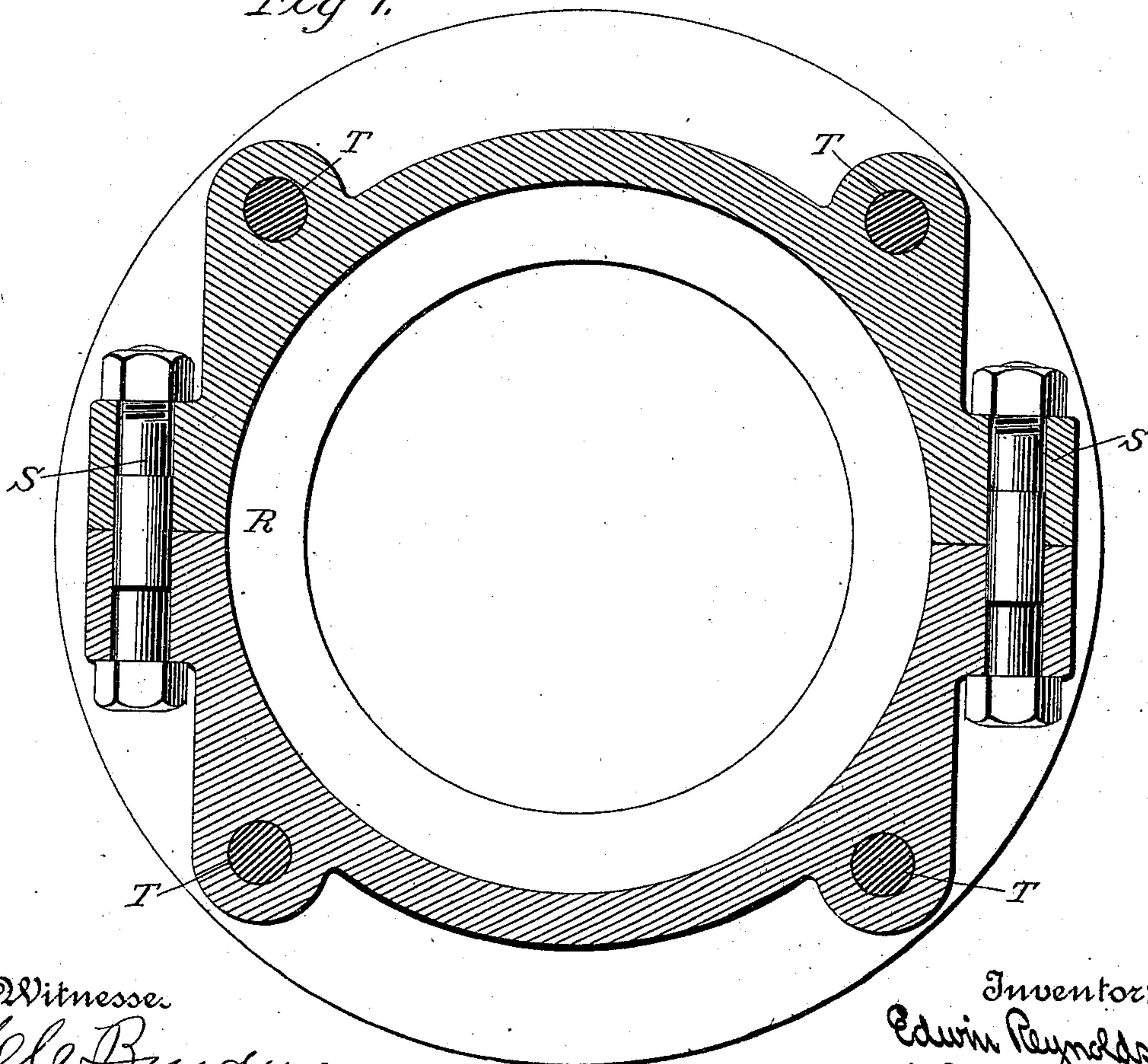


Fig. 7.



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# UNITED STATES PATENT OFFICE.

EDWIN REYNOLDS, OF MILWAUKEE, WISCONSIN.

## PISTON-ROD PACKING.

SPECIFICATION forming part of Letters Patent No. 670,565, dated March 26, 1901.

Application filed July 29, 1899. Serial No. 725,511. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN REYNOLDS, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Piston-Rod Packing, of which the following is a specification.

My present invention relates to piston-rod packing, the construction and advantages of which will be hereinafter set forth, reference being had to the accompanying drawings, wherein—

Figure 1 is an elevation, partly in section, of so much of a cylinder, piston-rod, and the packing as is necessary to illustrate the invention; Fig. 2, a top plan view; Fig. 3, a view similar to Fig. 1, showing a modification of the invention; Fig. 4, a perspective view of one of the packing-rings; Fig. 5, a similar view showing a section or segment of one of the rings and a wedge-block or filling-piece; Fig. 6, a horizontal sectional view of a modified form of the shell or casing; and Fig. 7 an elevation, partly in section, of said modification.

One object of my invention is to provide a suitable metallic packing for high-pressure engines, which packing when once in place will adapt itself to the piston-rod as the rod and packing wear and which may also be readily inspected from time to time without the necessity of removing the entire packing.

A further object is to combine a metallic sectional packing with a soft or hemp packing, adapted more especially for use in connection with a low-pressure cylinder.

Referring to Figs. 1 and 2, A denotes a portion of a cylinder, and B a portion of a piston-rod extending therethrough. Mounted upon the cylinder-head is a hollow casing or shell C, of an internal diameter considerably larger than the external diameter of the piston-rod. Within said shell or casing C are mounted rings or collars D of the form shown in Figs. 1 and 2. They are provided with an inwardly-extending annular flange E and with outwardly-extending lugs F. The inwardly-extending ribs or flanges E form with each other and with the lower face of the outer shell or casing C and with the inner face of the cover or cap G a series of annular chambers, ex-

tending around the piston-rod. The abutting faces of the various parts thus far described are ground so as to make a close fit with each other and to prevent the passage of steam between them.

To hold the shell or casing C to the cylinder-head and also to secure the collars D upon said head and upon each other while the packing is being put in place or removed, I employ a series of bolts H, which extend down through openings formed in the ears or lugs F and also through openings in the base of the shell or casing into suitable threaded holes formed in the head of the cylinder. The openings in the lugs and in the base of the shell or casing are of a diameter larger than the diameter of the bolts, so that the parts may be readily slipped off said bolts without unscrewing the bolts from the cylinder-head.

Mounted within the annular chambers formed as above described are packing-rings made up of a series of segments, as shown in Figs. 2, 4, and 5. As will be noted upon reference more particularly to Fig. 1, two of such rings are mounted in each of the annular spaces or chambers around the piston-rod. Each ring comprises four segments or sections I of a length nearly equal to one-quarter of the circumference of the piston-rod. The ends of each segment are in parallelism, and each of said segments is provided with a groove J upon its outer face.

Interposed between the ends of the segments when they are assembled around the piston-rod are wedge or filling blocks K, which are also grooved upon their outer faces. The length of the segments or sections I is such that when they and the wedge or filling blocks K are assembled the inner face or edge of the blocks will not come into contact with the face of the piston-rod, but will remain a short distance therefrom, as indicated in Fig. 2.

To maintain the bearing-face of the segments against the piston-rod, I employ an endless coiled spring L for each complete ring, the spring being seated in the groove formed in the outer faces of the sections and filling-blocks and tending at all times to force the segments in toward the rod and to maintain them in close contact therewith.

The segments are of such thickness that



the two when placed one upon another in the annular spaces or chambers make a close fit with each other and with the walls of the chambers against which they work. In putting the rings in position the segments are so placed that they break joint with each other, and thus assist in preventing any steam which may be in the chamber from passing directly up between the parts and out against the piston-rod.

A way or channel M is formed in the lowermost portion of the shell or casing, as shown in Fig. 1, and affords communication between the annular chamber and the space surrounding the piston-rod, so that steam may pass from the cylinder into said lowermost chamber in rear of the packing-rings. Steam serves in a measure to hold the rings close up to the face of the piston-rod and to prevent the escape of steam between the bearing-segments and said rod. Any steam which may escape along the rod past the first pair of rings will in a measure, if not wholly, be intercepted by the second set of rings, though in a high-pressure engine it may be necessary to employ three or more separate and distinct sets. In the drawings three sets are shown merely for the purpose of illustration, and I do not desire to be understood as thereby limiting myself to any particular number.

In assembling the parts the shell or casing C is placed upon the cylinder-head, any suitable packing being interposed, and nuts N screwed down thereon. The packing-rings of the innermost chamber are then put in place and one of the collars D passed down around the piston-rod and over the bolts H, when another series of nuts O are screwed down upon the bolts H. The second series of packing-rings is now put in place and the uppermost collar D secured within the shell or casing upon the collar D which has previously been put in place. The last series of packing-rings is now placed in position and the cover or cap G secured over the upper end of the shell or casing, the last series of packing-rings, and the outermost collar D. The bolts U, which are employed for securing the cap in place, force the parts firmly together, making steam-tight joints between the shell or casing, the collars, and the cap.

As will be noted upon reference to Fig. 1, the lower face of the cap or cover is provided with a downwardly-extending rim P, which makes a close joint with the uppermost edge of the outer collar D, so that the outermost pair of packing-rings is held within a steam-tight chamber or recess similar to the other series of rings.

From the foregoing it will be seen that by simply removing the cover access may be had to the outermost pair of packing-rings without disturbing or breaking the joints formed between the other parts and that by simply removing the cover and the outermost collar D access may be had to the intermediate set of rings without disturbing the joint between

the lowermost collar and the shell or casing. This is a point of material advantage.

By making the ends of the bearing-segments with parallel faces the joints are not affected by wear, the springs serving to hold the segments close up to the face of the piston-rod and also to hold the filling or wedge blocks K close up against the ends of the segments. The making of the ends parallel is also an advantage from a manufacturing standpoint.

In Fig. 3 I have shown a construction wherein only two sets of packing-rings are employed; but the cap or cover is provided with a recess adapted to form a chamber for the reception of a soft packing, such as hemp or the like. A packing-gland Q is of course provided. This construction may be used to advantage on low-pressure cylinders.

Instead of making the shell or casing in the form described it may be constructed as illustrated in Figs. 5 and 6. Upon reference to said figures it will be noted that the casing is divided longitudinally and formed in halves, each half being provided with a series of pockets R, in which the packing-rings are mounted when the parts are assembled. The two sections are secured together by bolts S, which pass through wings formed thereon, and the casing as a whole is secured to the cylinder by bolts T. With this form, however, though the packing-rings cannot be inspected and removed without the necessity of disturbing the entire series, yet the rings and casing may be removed without the necessity or taking off the cross-head or piston.

Having thus described my invention, what I claim is—

1. In combination with a cylinder and its piston-rod, a shell or casing mounted upon the head of said cylinder; a series of chambers formed within said shell or casing; packing-rings mounted in said chambers; and means for affording access successively to the chambers and rings contained therein, without disturbing the one immediately below or removing the shell or casing.

2. In combination with a cylinder and its piston-rod, a shell or casing mounted upon the head of said cylinder around the rod; a series of collars secured within said shell or casing, substantially as described; a series of packing-rings mounted within chambers formed by said shell and collars; and means whereby the outermost ring may be removed without disturbing the position of the ring next below it or removing the shell or casing.

3. In combination with a cylinder and its piston-rod, a hollow shell or casing mounted on the cylinder; a series of rings secured within said shell or casing and provided with inwardly-extending flanges E; connections between said rings and the shell permitting the successive removal of the rings without disturbing the one next below or detachment of those below from the shell; a pair of packing-rings mounted within each of the chambers formed intermediate said flanges and the



base of the shell or casing; and a cap or cover mounted over the shell and the upper ring.

4. In combination with a cylinder and its piston-rod, a hollow shell or casing mounted  
5 upon said cylinder around the rod; a series of collars D provided with inwardly-extending flanges E mounted within said shell; a cover G; a pair of packing-rings mounted in the chambers formed intermediate said flanges  
10 at the base of the shell or casing and the outer face of the cap or cover; and means for securing said collars in position, whereby the outermost may be removed without disturbing the one next below it.

15 5. In combination with a cylinder and its piston-rod, a hollow shell or casing mounted upon said cylinder around the rod; a series of collars D mounted within said shell or casing and provided with inwardly-extending ribs  
20 or flanges E; perforate lugs F extending out from said collars; a series of threaded bolts H mounted in the piston-head and extending up through said shell or casing and the perforate lugs; nuts for securing the shell or casing upon the cylinder, and the collars upon  
25 the shell or casing and upon themselves; packing-rings mounted within the chambers formed by the shell or casing and the inwardly-extending flanges of the collars; and  
30 a cap or cover secured to the cylinder over

the upper end of the shell and the uppermost collar.

6. In combination with a cylinder and its piston-rod, a hollow shell or casing mounted  
on the cylinder; a series of rings secured with- 35 in said shell or casing and provided with inwardly-extending flanges E; connections between said rings and the shell permitting the successive removal of the rings without disturbing the one next below or detachment of  
40 those below from the shell; a pair of packing-rings mounted within each of the chambers formed intermediate said flanges and the base of the shell or casing, said rings comprising a series of sections each section hav- 45 ing parallel ends and having its working face of a length less than a quarter of the circumference of the piston-rod, filling-blocks intermediate the ends of said sections, said blocks being out of contact with the rod, and 50 means for holding said sections and blocks in position; and a cap or cover mounted over the shell and the upper ring.

In witness whereof I hereunto set my hand in the presence of two witnesses.

EDWIN REYNOLDS.

Witnesses:

GEO. L. TIFFT,  
E. T. ADAMS.