

No. 708,268.

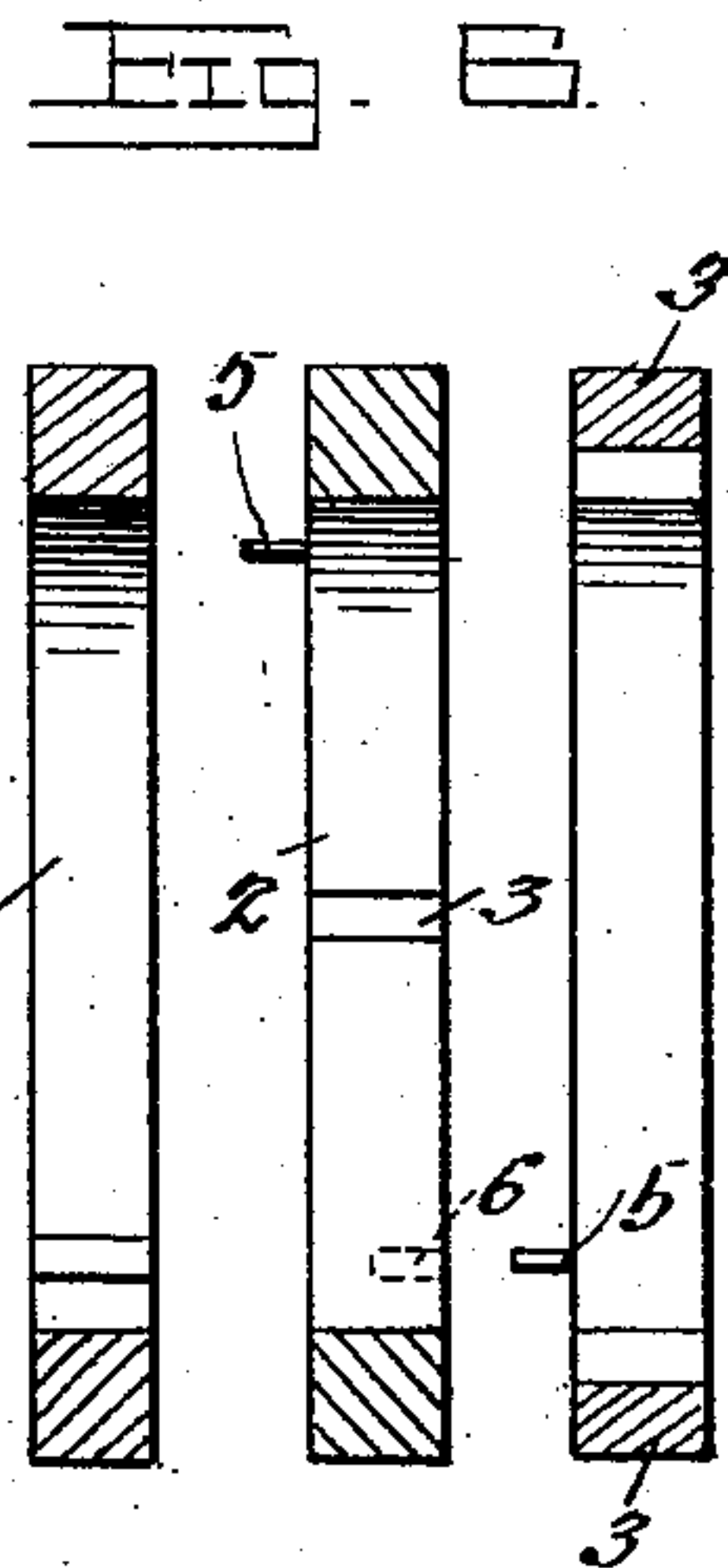
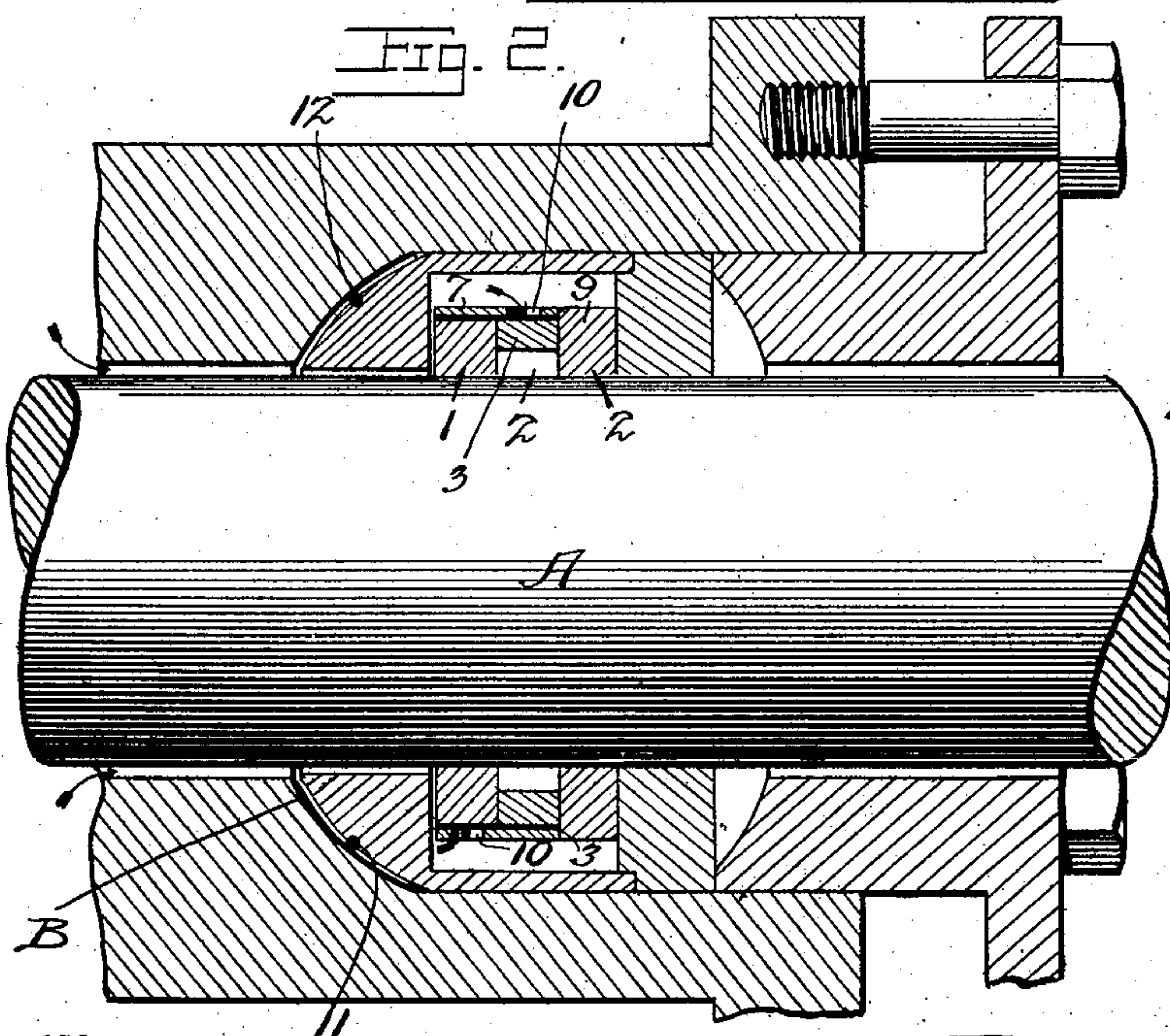
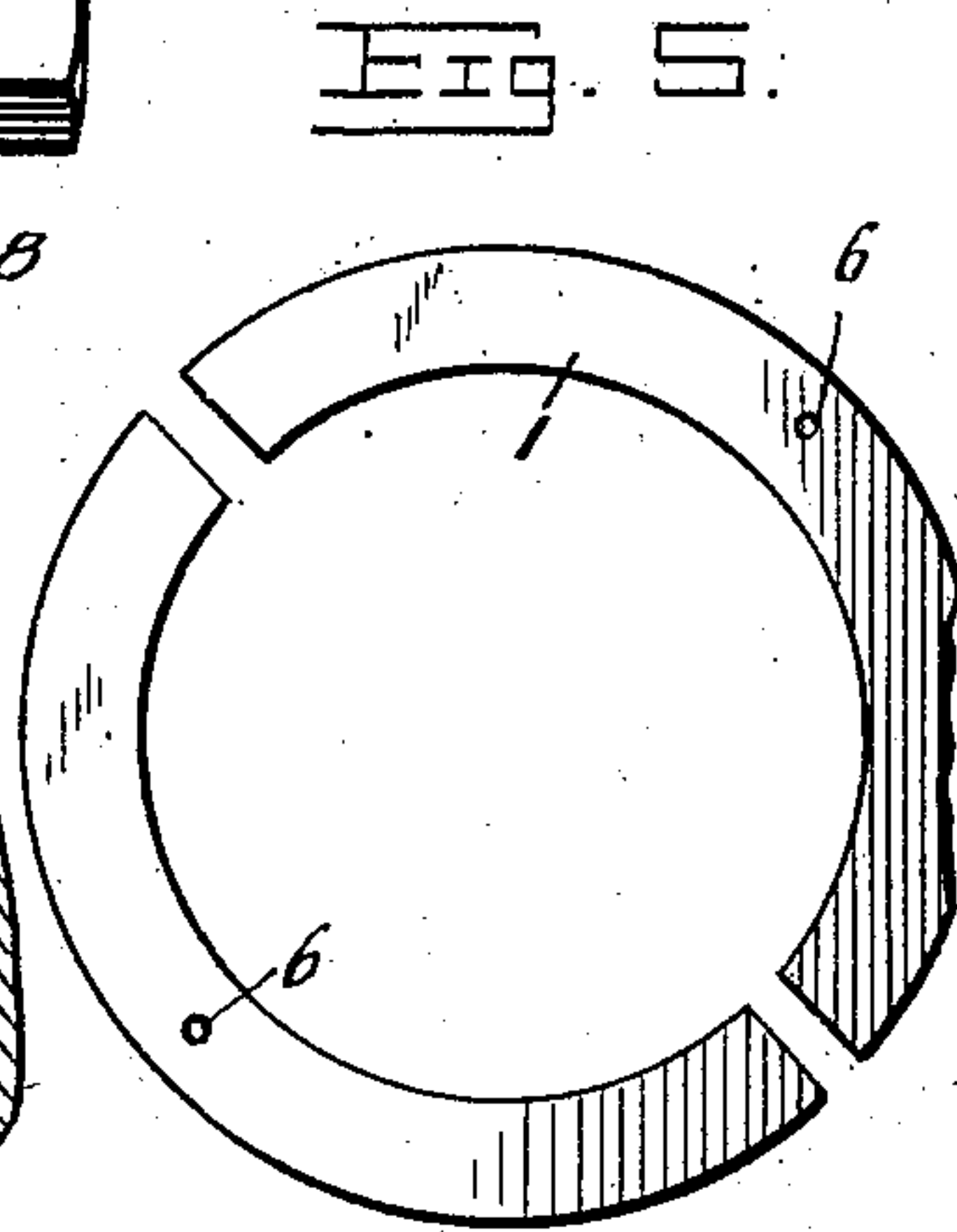
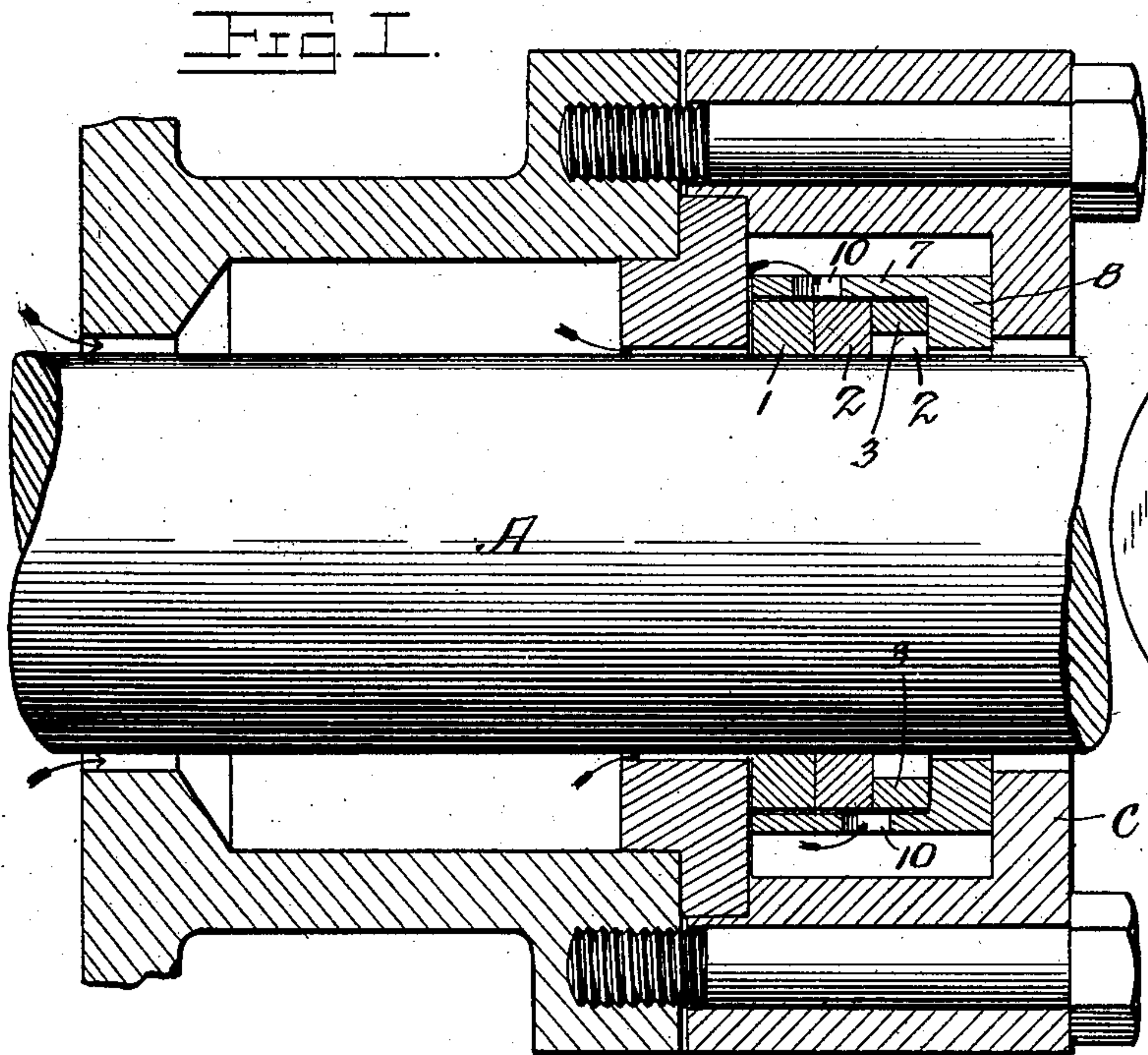
Patented Sept. 2, 1902.

T. SMITH.
METALLIC PACKING.

(Application filed July 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
F. B. Alden.
J. W. Garner.

by Thomas Smith, Inventor.
C. A. Snow & Co.
Attorneys

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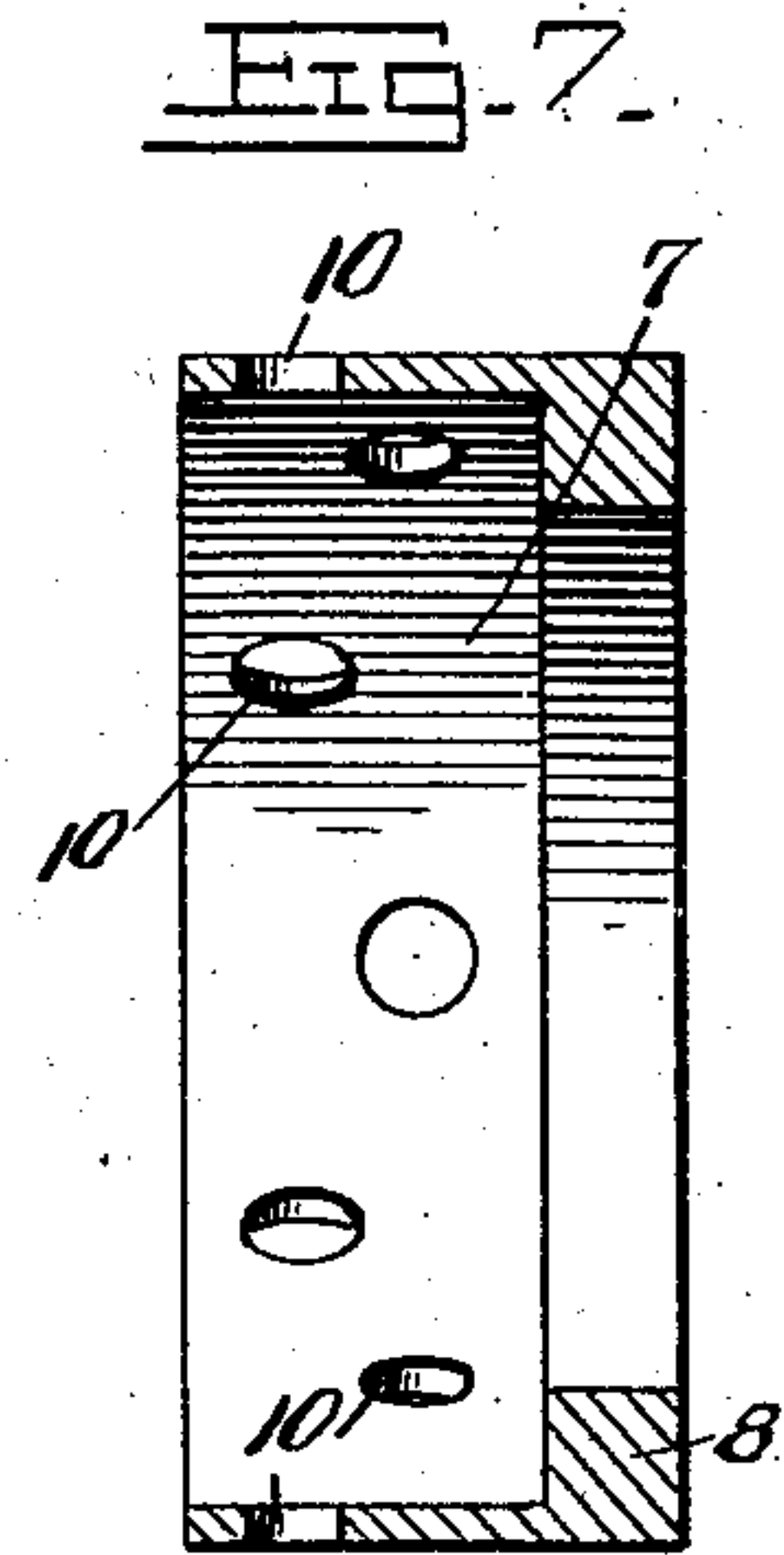
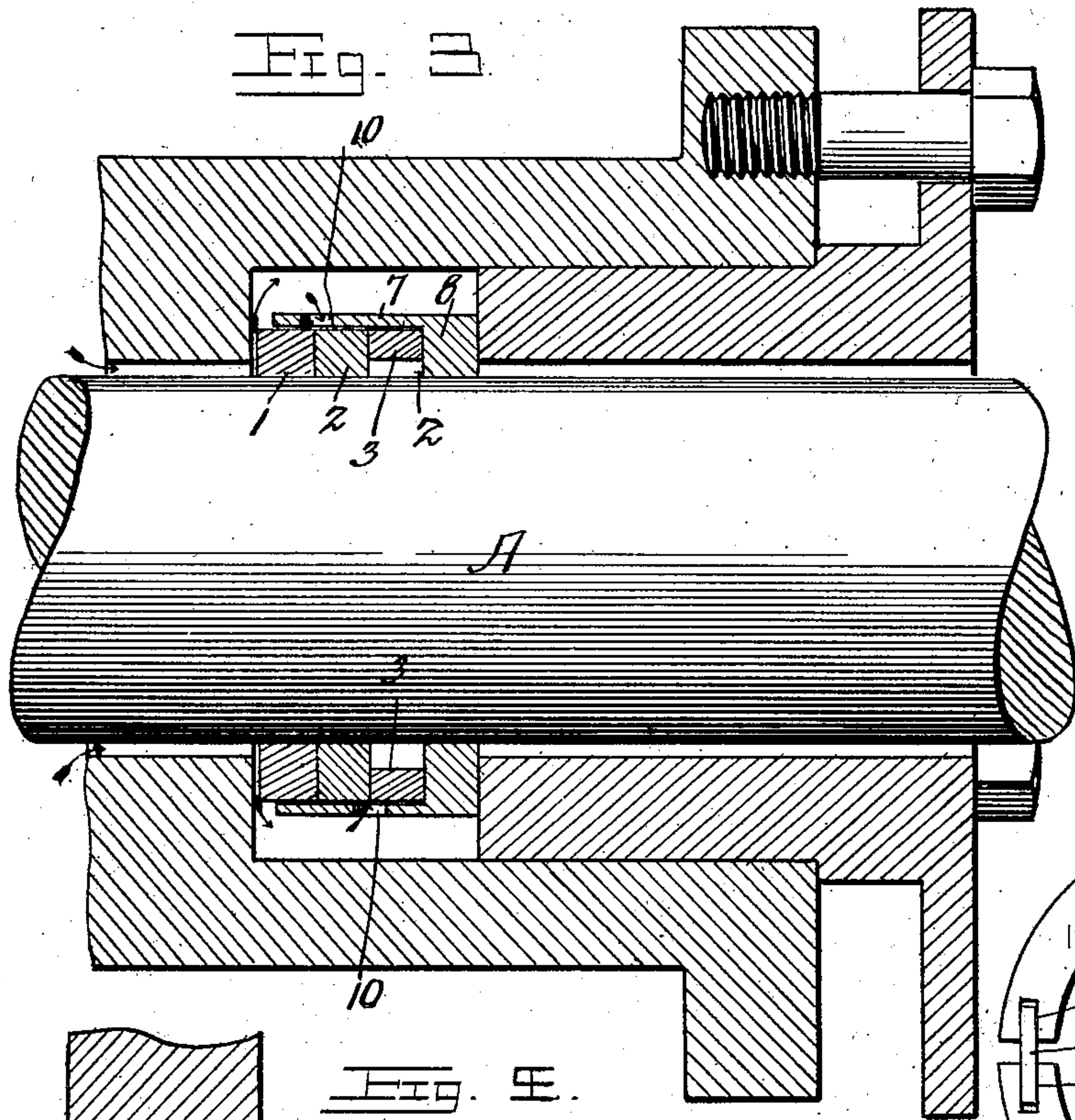
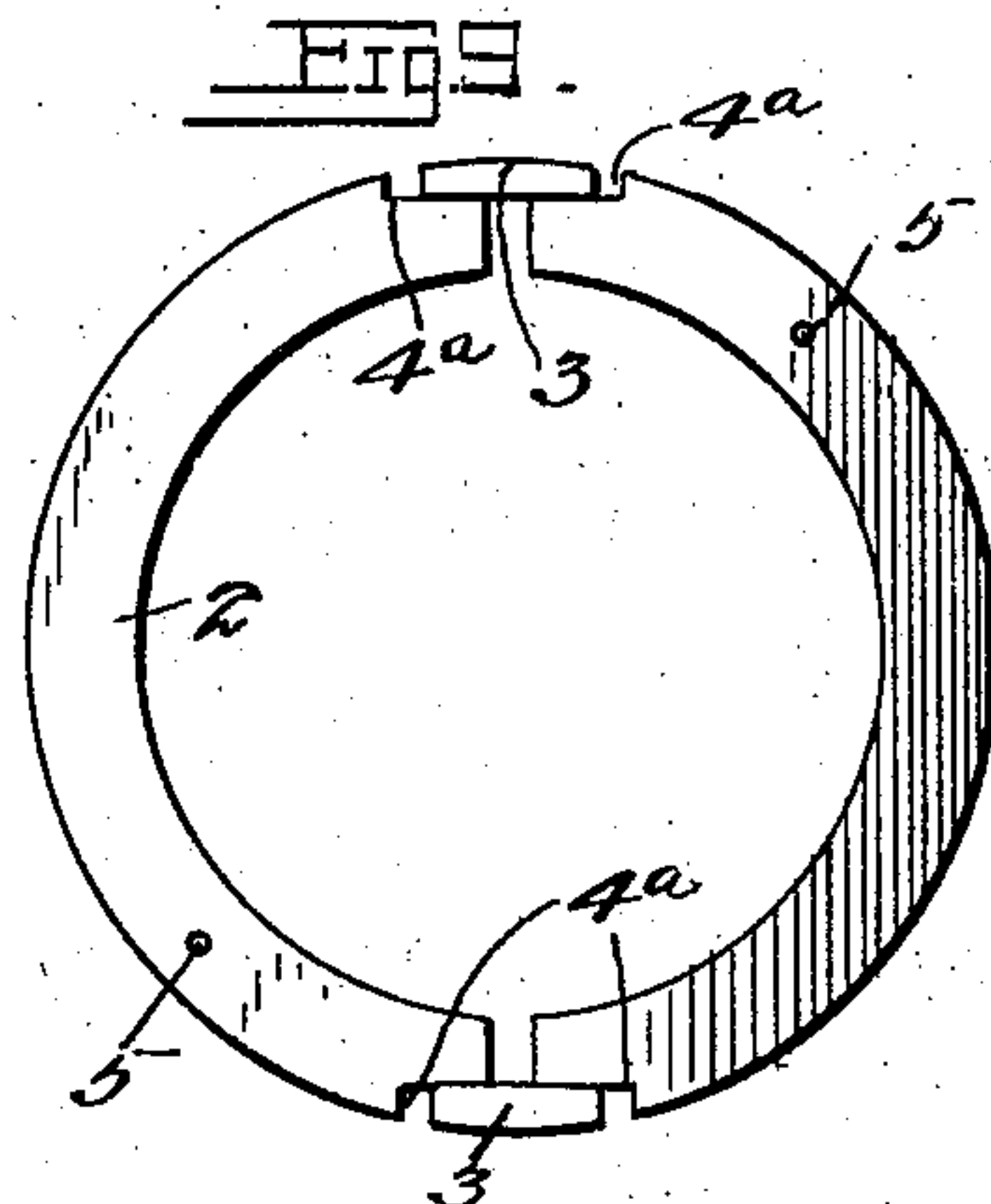
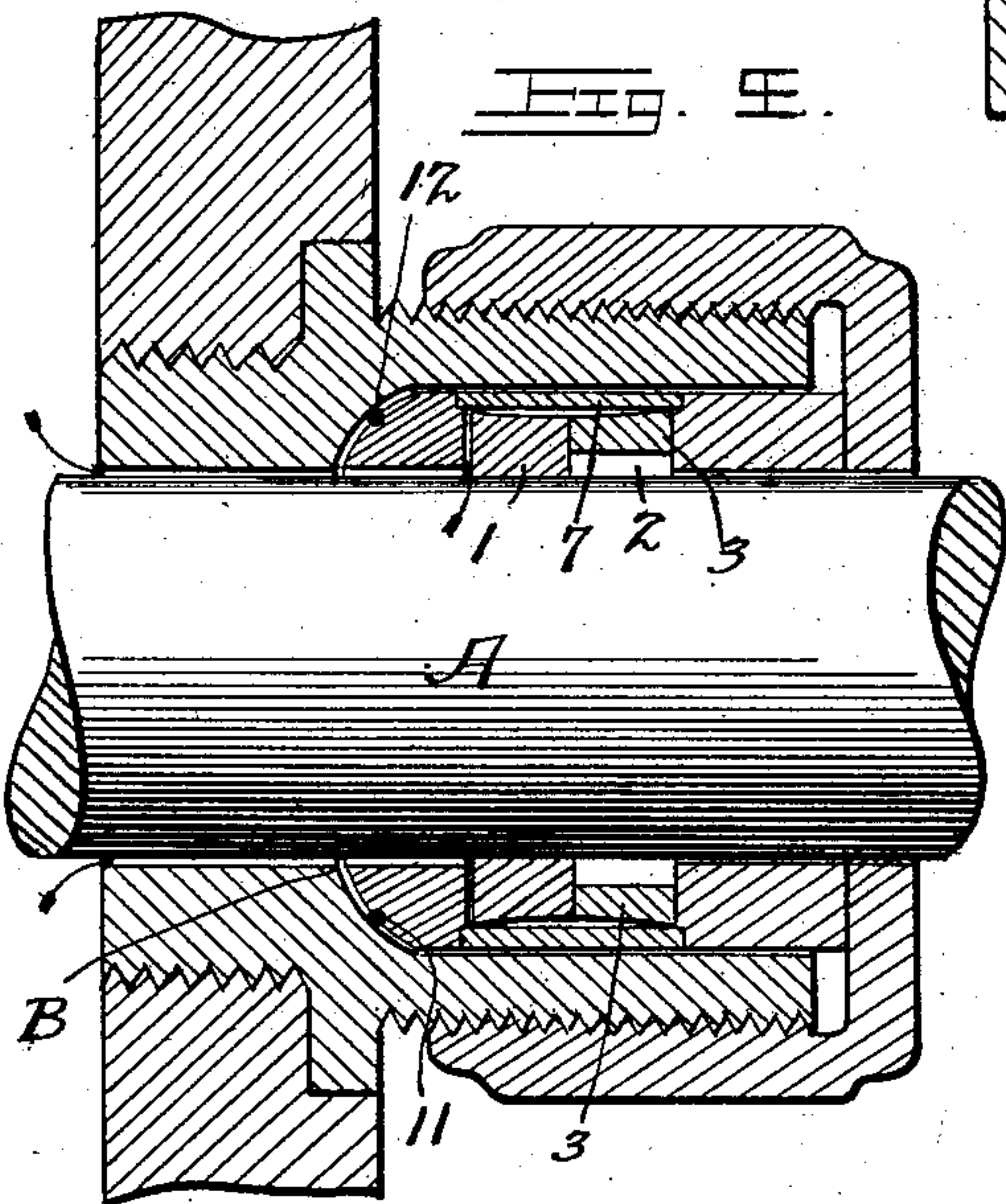
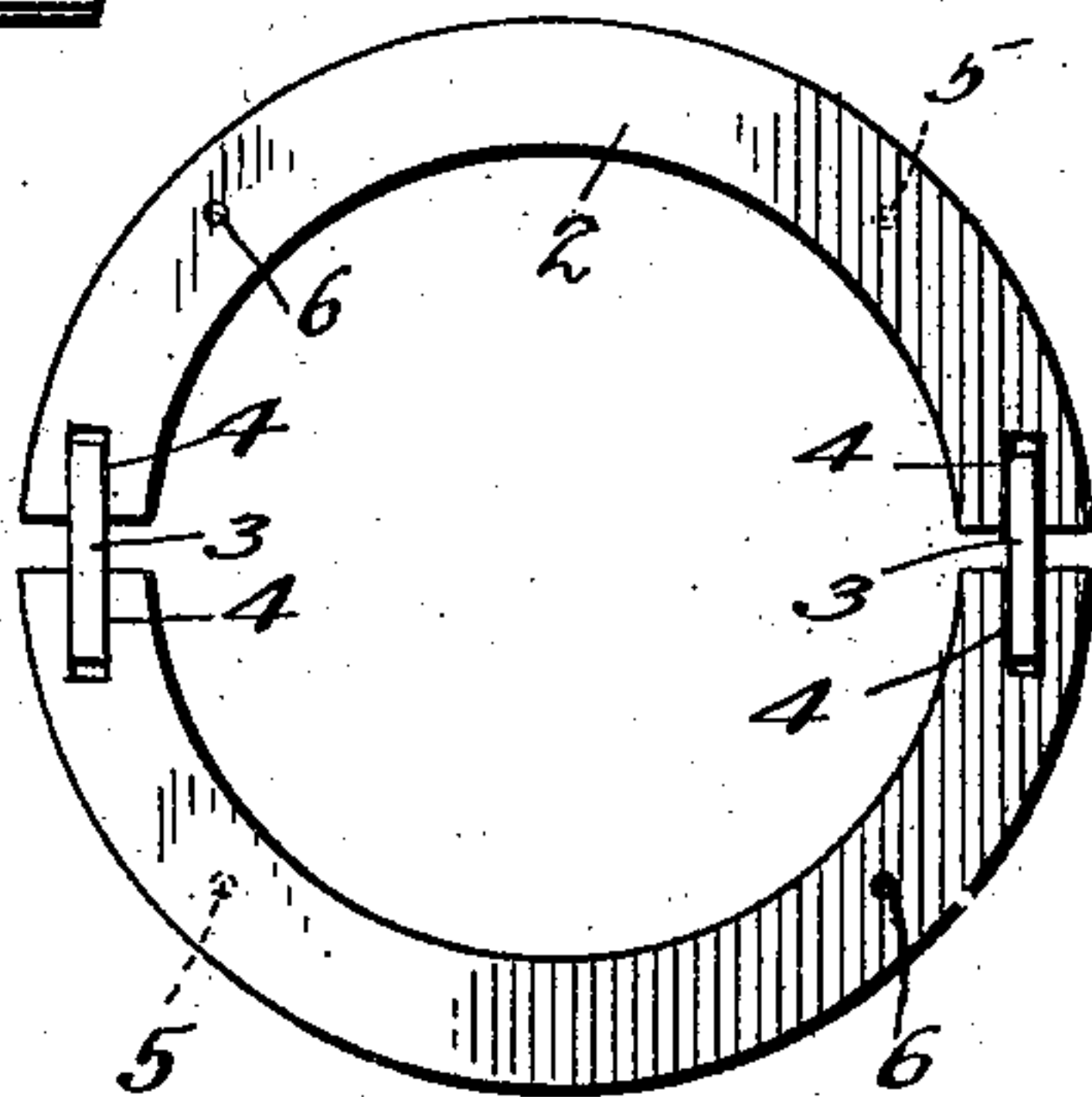


Fig. 8.



Witnesses
F. E. Alden.
J. W. Garner

Thomas Smith Inventor
by C. A. Snow & Co.
Attorneys

UNITED STATES PATENT OFFICE.

THOMAS SMITH, OF SAN LUIS POTOSI, MEXICO, ASSIGNOR OF TWO-THIRDS
TO C. E. HOAG AND R. M. THOMAS, OF SAN LUIS POTOSI, MEXICO.

METALLIC PACKING.

SPECIFICATION forming part of Letters Patent No. 708,268, dated September 2, 1902.

Application filed July 2, 1901. Serial No. 66,884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SMITH, a citizen of the United States, residing at San Luis Potosi, Republic of Mexico, have invented a new and useful Metallic Packing, of which the following is a specification.

My invention is an improved metallic packing for piston-rods and the like, is adapted for use in stuffing-boxes and glands of the steam and air cylinders of locomotives and other engines without alteration of such stuffing-boxes or glands, and is further adapted to be readily placed in position on a piston-rod in a stuffing-box or gland and to be readily disassembled when necessary and reassembled to enable worn parts to be replaced.

With these ends in view my invention consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a sectional view of a metallic packing embodying my improvements, showing the same applied on the piston-rod of a locomotive-engine in a gland. Fig. 2 is a similar view of the same slightly modified and disposed in the stuffing-box of a locomotive steam-cylinder. Fig. 3 is a similar view illustrating another modified form of my invention. Fig. 4 is a similar view of the same as modified for use in the stuffing-box of the cylinder of a locomotive air-pump. Fig. 5 is a detail elevation of one of the packing-rings. Fig. 6 is a sectional view of a plurality of packing-rings, showing the same detached. Fig. 7 is a detail sectional view of the casing. Figs. 8 and 9 are detail elevations of packing-rings provided with bridge-pieces.

In the embodiment of my invention I provide a plurality of packing-rings 1 2. Each of the said packing-rings is composed of a pair of separate semicircular sections. The meeting ends of the packing-rings 2 are connected together by bridge-pieces 3, which may operate and be seated in open slots 4 in the proximate ends of the packing-ring sections, as shown in Fig. 8, or may be disposed in rabbets 4^a on the outer sides of the packing-ring sections at the meeting ends thereof, as shown in Fig. 9. These bridge-pieces while connecting the sections of packing-rings 2 to-

gether admit of movement of the said sections toward and from each other, as will be understood. The interior diameters of the packing-rings 1 2 are equal to the diameter of the piston-rod A, on which they are placed, the said packing-rings being designed to fit closely on the piston-rod and to effect steam-tight joints therewith, and these packing-rings are the only parts of my improved metallic packing which are subject to friction and wear. Two of the said packing-rings may be employed or more, as may be desirable. The respective joints between the sections of the packing-rings are out of line with each other when the packing-rings are operatively assembled, and the same are maintained in position to break the joints by dowelpins 5 and openings 6, with which the packing-rings are provided.

My improved packing-rings are contained within a casing 7. The same may be formed integrally with a cap-ring 8, as shown in Figs. 1 and 3, or with a base-ring 9, as shown in Fig. 2, or separately from both the cap and base rings, as shown in Fig. 4. The interior diameter of the casing 7 slightly exceeds the exterior diameter of the packing-rings, so that an annular space is formed between the said packing-rings and the said casing. In the form of my invention shown in Figs. 1, 2, and 3 the said casing 7 is provided with steam ports or openings 10. The same are, however, omitted in the form of my invention shown in Fig. 4. The openings in the base and cap rings through which the piston-rod extends are somewhat greater in diameter than the piston-rod, and hence said base and cap rings are under all conditions out of contact with the piston-rod, not subject to wear, and an annular space is formed between the base-ring and the piston-rod, through which steam from the cylinder at the pressure of the steam in the cylinder may pass to enter the stuffing-box or gland, as the case may be, enter the space between the casing 7 and the packing-rings, and hence by acting exteriorly on the said packing-rings compress and close the same upon the piston-rod and effectually pack the latter and prevent loss of steam from the cylinder.

In the form of my invention shown in Fig.

4, in which the openings 10 in the casing 7 are dispensed with, the outer sides of the packing-rings 1 2 are beveled or hollowed to form an annular steam-space between the same and the casing. In the various figures of the drawings the course of the steam in its passage from the cylinder to the space around the packing-rings is indicated by arrows.

Where the inner end of a stuffing-box B is rounded or concaved and it is desirable to locate the packing directly in the stuffing-box, as shown in Figs. 2 and 4, instead of in a gland C, as shown in Fig. 1, the base-ring is correspondingly fashioned. On the base-ring is an annular groove 11, in which I place a packing-ring wire 12, which is made of copper or other suitable ductile metal and which serves to effect a steam-tight joint between the base-ring and the base of the stuffing-box, as shown.

It will be understood from the foregoing description and by reference to the drawings that none of the parts of my improved metallic packing are screwed together in assembling the same and that my improved packing may be readily placed in a stuffing-box or gland and as readily removed therefrom when it becomes necessary to remove the packing-rings after the same have become worn and to replace them by new ones.

In practice my improved packing may be placed in position in the stuffing-box or gland of a locomotive or other engine in a very few minutes and without the use of tools other than a wrench for securing the gland in position on the stuffing-box. Since the packing-rings are somewhat closely confined in the casing 7 and since the packing-rings are connected together by the dowel-pins, they remain in place on the piston-rod under all conditions; but their pressure thereon varies with that of the steam in the cylinder, and hence my packing is automatic in its action and does not create unnecessary friction on the piston-rod. When the engine is running without steam, as in the case of a locomotive in descending a grade or approaching a station, after the steam has been cut off and the brakes applied the packing-rings are relieved of steam or other pressure and there is no friction between them and the piston-rod, hence avoiding overheating of the rod and the packing and effecting a corresponding economy of the lubricant.

Having thus described my invention, I claim—

1. The combination with a piston-rod, of a segmental packing normally loose thereon, means for holding the packing assembled and

means whereby when fluid-pressure is on the cylinder the packing will be brought into positive engagement with the rod.

2. The combination with a piston-rod, of a plurality of sectional packing-rings normally loose thereon, means for holding the rings assembled and means whereby when fluid-pressure is on the cylinder the rings will be brought into positive engagement with the rod.

3. The combination with a piston-rod, of a metallic sectional packing comprising a plurality of packing-rings normally loose upon the piston-rod, and a casing for holding the rings assembled, the said casing having a fluid-space exterior of the packing-rings and communicating with the interior of the cylinder, whereby when the cylinder is under pressure, the rings will operatively engage the piston-rod, and when the cylinder is relieved from pressure, the rings will be loose thereon.

4. A packing of the class described, comprising a plurality of fluid-pressure-actuated radially-variable packing-rings encompassing the piston-rod and normally out of frictional engagement therewith, but adapted to bear frictionally on the piston-rod with a pressure varied by that of the internal fluid-pressure in the cylinder, and a casing in which said packing-rings are confined, said casing having a fluid-space exterior of the packing-rings and communicating with the interior of the cylinder, whereby when the latter is relieved of internal fluid-pressure the friction between the packing-rings and the piston-rod is relaxed, substantially as described.

5. A packing of the class described, comprising fluid-pressure-actuated radially-variable packing-rings encompassing the piston-rod and normally out of frictional engagement therewith, but adapted to bear frictionally on the same with a pressure varied by that of the internal fluid-pressure in the cylinder, and a casing in which said packing-rings are confined, said casing having a fluid-space, exterior of the packing-rings and communicating with the interior of the cylinder, whereby when the latter is relieved of internal fluid-pressure, the friction between the packing-rings and the piston-rod is relaxed, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS SMITH.

Witnesses:

W. COCKFIELD,
M. W. O'BRIEN.