

No. 875,934.

PATENTED JAN. 7, 1908.

C. W. G. KING.
ROD PACKING.

APPLICATION FILED SEPT. 27, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

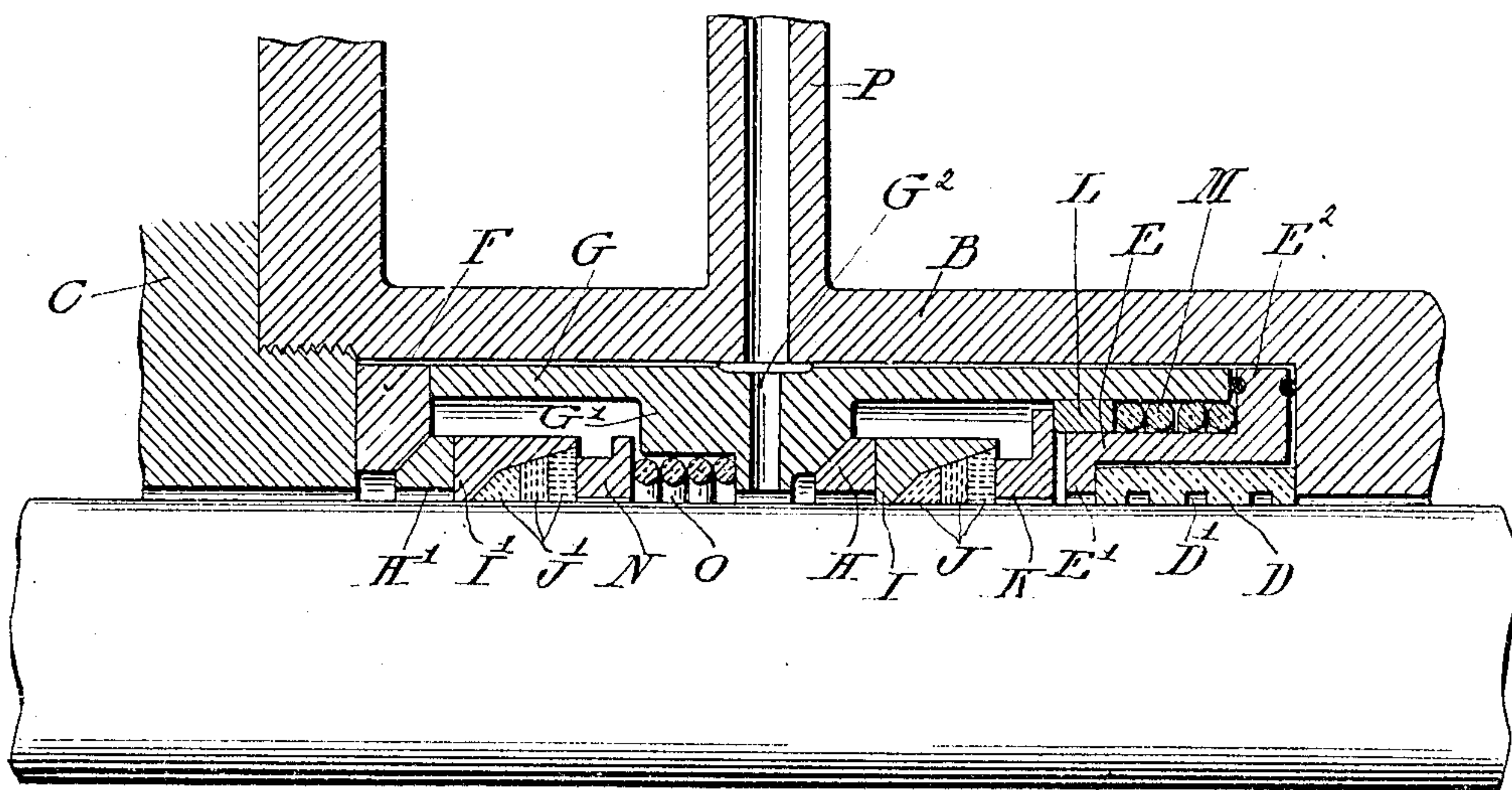


Fig. 2.

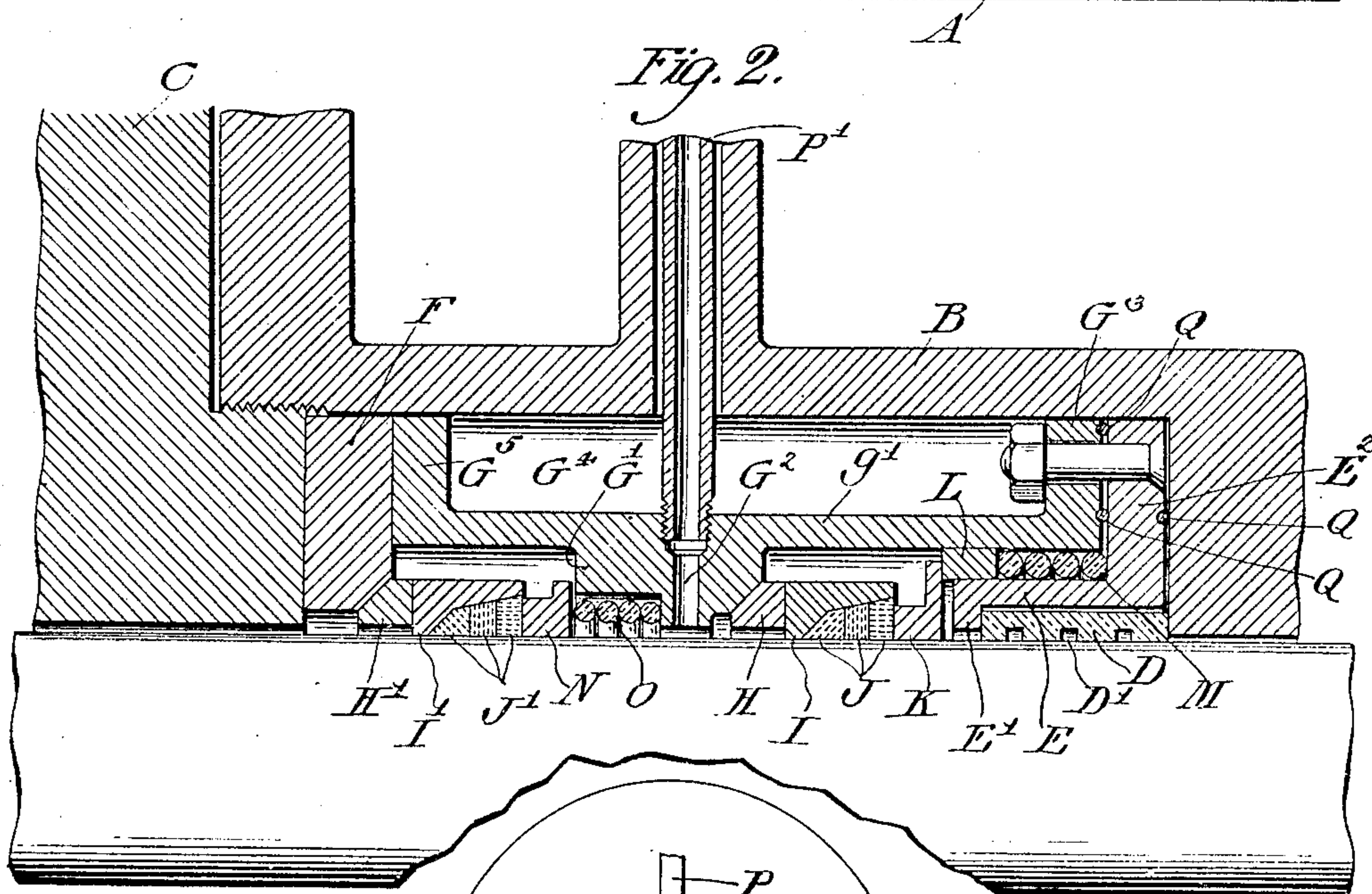
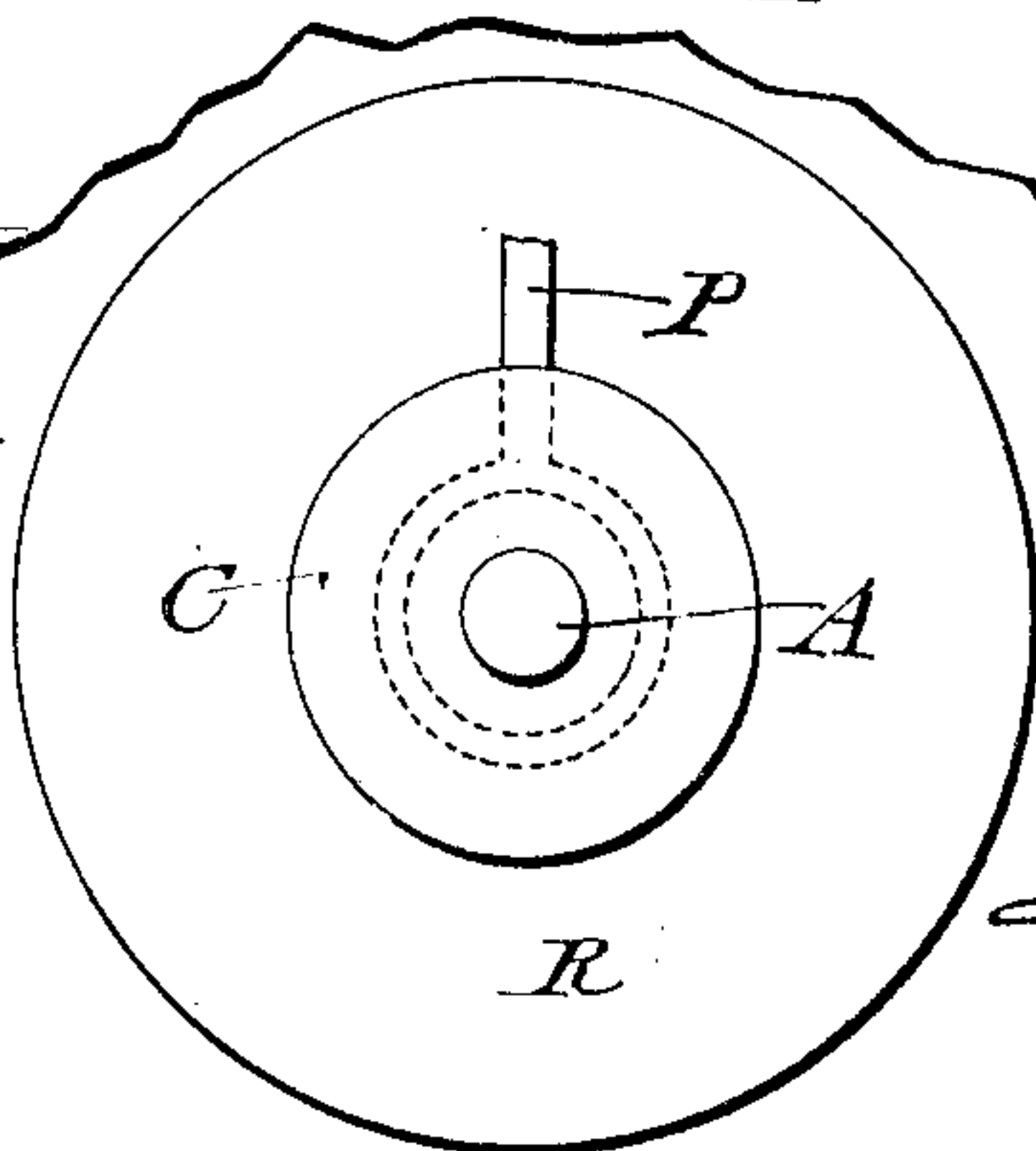


Fig. 3.

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2 SHEETS—SHEET 2.

Fig. 4.

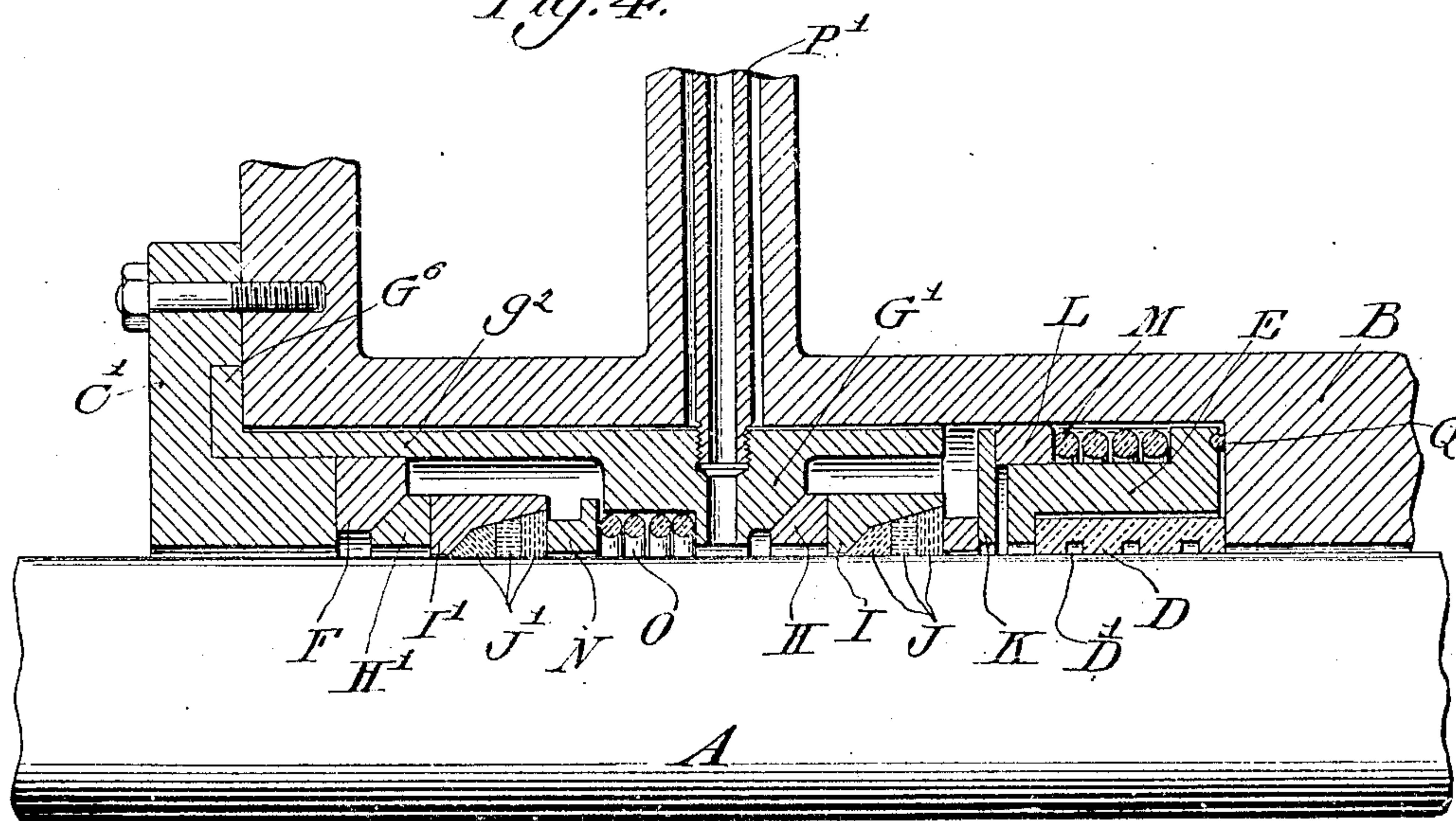


Fig. 5.

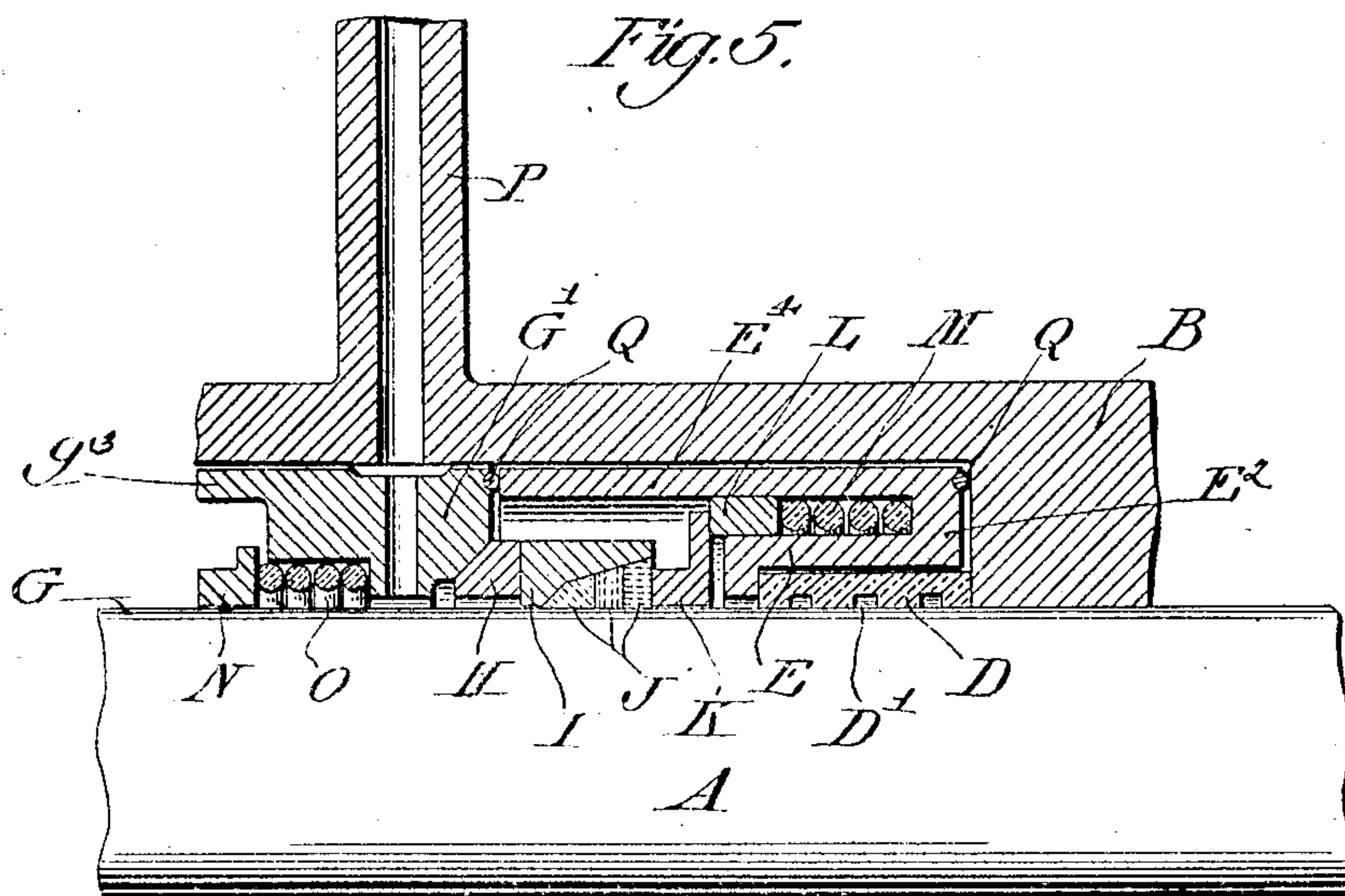
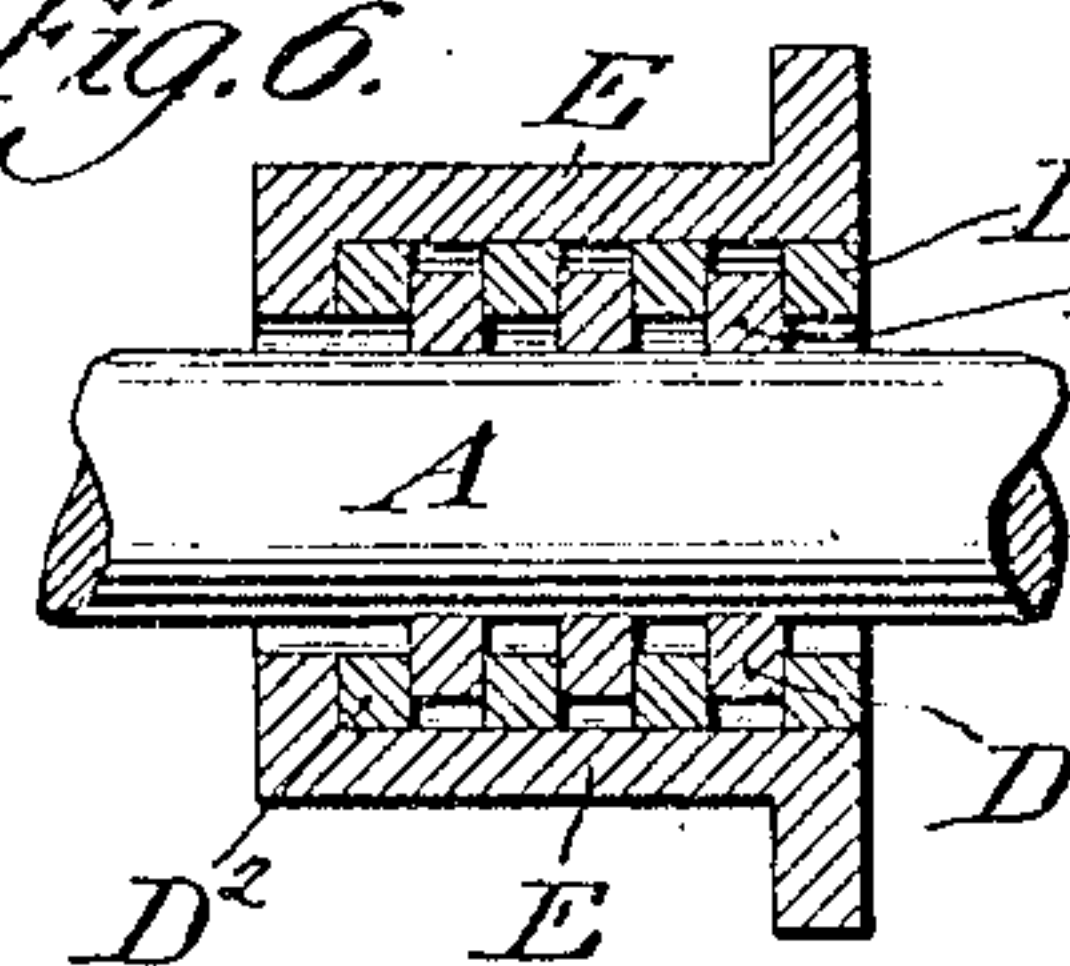


Fig. 6.



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UNITED STATES PATENT OFFICE.

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ROD-PACKING.

No. 875,934.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed September 27, 1906. Serial No. 336,391.

To all whom it may concern:

Be it known that I, CHARLES W. G. KING, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Rod-Packing, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My present invention relates to packings or stuffing-boxes for movable members, and particularly to metallic packings for the piston rods of gas engines or the like.

The object of my invention is to simplify and improve the construction of such packings and particularly to provide a construction in which packing rings are held in place by a spring and suitable provision is made for protecting the spring from injury by the heat and flame of the engine.

A further object of my invention is to provide simple and improved means for lubricating such packing.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of my invention, however, and the advantages possessed thereby, reference may be had to the accompanying drawings and descriptive matter in which I have illustrated and described forms in which my invention may be embodied.

In the drawings, Figure 1 is a sectional elevation of a portion of a packing box and packing contained by it, the section being taken on the vertical diameter of Fig. 3. Fig. 2 is a view taken similarly to Fig. 1, illustrating a modified construction. Fig. 3 is an end elevation of a portion of a gas engine. Figs. 4 and 5 are views taken similarly to Fig. 1, each illustrating a further modification, and Fig. 6 is a sectional view showing a further modification of my invention.

A represents a movable member which, in the particular construction disclosed, is the reciprocating piston rod of a gas engine.

B is a packing or stuffing box which, at its right hand end, as seen in Figs. 1, 2, 4 and 5, may be integrally or detachably secured to the cylinder head R of a gas engine.

Referring first to the construction shown in

Fig. 1, the left hand end of the box B is closed by an end member C in threaded engagement with the member B. At the cylinder head end of the box the shaft or rod A is surrounded by a floating bushing in the form of a tubular member D. The latter is held in place against the closed end of the box by a retaining member E which has a rib E¹ engaging the outer end of the bushing and an outwardly extending rib or flange E² adjacent the bottom of the box. Within the box and extending between the rib E² and a follower member F engaging the outer end member C is a gland G. Between its ends the gland G is provided with an inner circumferential rib G¹. The annular bearing member H, engaging one side of the rib G¹, is engaged on the opposite side by an annular member I, having tapered surfaces against which abut the outer edges of split soft metal packing rings J. The packing rings J are held in place by means of an annular follower member K surrounding the shaft A and an annular member L surrounding the member E. A helical compression spring M surrounding the body of the member E and extending between the rib E² and follower L, serves through the followers L and K to press the packing rings J in the proper position relative to the gland G. A packing comprising the members H¹ and I¹ and split metal packing rings J¹ similar to the parts H, I and J respectively, is pressed against the follower ring F by means of a ring N and spring O extending between it and the rib G¹. A conduit or pipe P which may be integral with member B and which registers with a passage G² formed in the gland G serves to convey lubricating material to the interior of the gland between the two sets of packing rings or seals. Copper wires Q, or the like, may be employed for making tight joints between the packing box and the retaining member E, and the retaining member and the end of the gland G. Preferably the cooperating contact surfaces of the members F and H¹ with the shoulder G¹ and member H respectively are spherical. It will be observed that with the construction described the floating bushing D, which closely embraces the shaft A and may vibrate laterally with it, and which is preferably provided with the annular grooves D¹, prevents leakage from the gas engine cylinder into the packing box proper and particularly it pre-

vents flame or hot vapor from the gas engine cylinder from coming into contact with the spring M. The spring M adjacent the cylinder head of the engine is protected from the heat of the cylinder and of the piston rod by the bushing D and the member E. It will be observed that the retaining member is in poor heat conducting relation with the floating bushing, because of the space necessarily existent between the periphery of the bushing and the retaining member to allow of the lateral movement of the bushing with the rod. Similarly the wire seal between the end of the retaining member and the cylinder end of the box, holding the end member out of direct contact with the end of the box diminishes the heat transfer from the end of the box to the member. These features assist in protecting the spring M against overheating. The gland G and the packings are arranged to readily give up heat to the wall of the packing box which is preferably surrounded by a water jacket. A film of oil normally fills any space which may exist between the outer surface of the gland G and the box B, thus preventing the presence of a film of air which would decrease the heat transference between the gland and the bearings. The rings J and J¹ and cooperating parts form two separate and independent seals located within a single gland and lubricated from a single source.

In the construction shown in Fig. 2, the gland g¹ corresponding to the gland G, in the construction first described, is provided with a shoulder G³ to which is secured the rib E² of the member E, the radial dimension of which is increased for the purpose. With this form it will be observed that the entire packing, with the exception of the floating bushing D, is removed when the gland g¹ is pulled out of box B. In this construction a space G⁴ is formed between the body of the gland, the flange G³ and a corresponding flange G⁵ at the opposite end of the gland and the inner wall of the box B. Water circulating through this space effectively keeps down the temperature of the packing, and may render unnecessary any other water jacket. A pipe P¹ screwing into the gland g¹ and registering with the passage G² is employed for supplying lubricating material to the packing. Otherwise this construction is substantially similar to that shown in Fig. 1. The construction shown in Fig. 4 differs from that of Fig. 1 principally in that the gland g² is secured against axial movement by means of a shoulder G⁶ clamped against the outer end of the box by an end member C¹ and the inner end of the gland does not extend to the member E, the spring M in this construction being entirely relied upon to hold the member E in place. A pipe P¹ similar to that of Fig. 2 is shown in this form.

The construction shown in Fig. 5 differs

from that shown in Fig. 1 only in the fact that the gland g³ ends with the rib G¹ and the member E is provided with a cylindrical shell like portion E⁴ which extends from the outer edge of the rib E² to the gland g³.

In all of the forms of my invention hereinbefore described, the single piece bushing D may be replaced by the construction shown in Fig. 6 where rings D³ closely surrounding the rod A are interleaved with large rings D³.

It will be readily understood by those skilled in the art that other changes than those indicated may be made in the form of my invention without departing from its spirit.

Having now described my invention, what I claim as new and desire to secure by letters patent is,

1. A rod, a packing box therefor, and a packing within the box, comprising a bushing surrounding the rod, a retaining member for holding the bushing at one end of the box, said member being provided with a portion surrounding the bushing and an outwardly projecting rib adjacent the end of the box, a gland in the box, and having a shoulder, split packing rings surrounding the shaft and means for holding them against said shoulder, comprising a follower engaging the packing rings and a spring surrounding the body portion of said retaining member and extending between the rib of the retaining member and said follower.

2. In combination with a reciprocating rod, a packing box through which the rod passes and packing for the rod located within the box and comprising a gland surrounding the shaft and provided with an inwardly projecting flange or rib, packing rings at one side of said rib, a spring for moving them toward the rib, a spring engaging the other side of said rib, and a set of packing rings held in place thereby and means for introducing oil within said gland between said packing rings.

3. In a packing box, a gland provided with an inner rib located between its ends, a set of one or more packing rings between said rib and each end of the box, and a positioning spring for each set of rings acting upon it in an axial direction, each set of rings and its spring being arranged so that the axial thrust of the spring in one direction is taken by said rib.

4. In a stuffing box for a movable rod or member, two separate and independent packing seals for said member, spaced apart from each other, separate resilient means for supporting each seal and means for lubricating said member between said seals.

5. In a stuffing box for a movable member, a floating bushing surrounding said member, one or more packing rings also surrounding said member and means for holding said bushing and rings in place, comprising a re-

retaining member surrounding said bushing, and a helical spring surrounding said member and exerting a thrust against said member and against said rings.

5 6. In a stuffing box for a movable member, a floating bushing surrounding said member and located within and at one end of the box, a retaining member surrounding the bushing and provided at its end adjacent the
10 box with an outer rib and at its end remote from the box with an inner rib which bears against the adjacent end of the bushing, one or more packing rings surrounding the movable member and a helical spring surrounding
15 said retaining member and bearing at one end against said outer rib and exerting with its other end a thrust against said rings.

7. In combination with a stuffing box, a packing, comprising a gland formed intermediate its ends with an inner rib and a packing or seal at each side of said rib, said rib having a passage formed in it through which lubricating material is admitted between
20 said seals.

25 8. In combination with a stuffing box for a movable member, a gland provided with an inwardly projecting rib and with outwardly extending ribs at its ends which engage the inner curved surface of the box, whereby a
30 space for a cooling fluid is formed between the box, the body of the gland and said outwardly extending rib, and packing rings inclosed by said gland and supported in an axial direction from said inwardly extending rib.

35 9. In combination with a stuffing box for a movable member, a floating bushing surrounding said member and movable laterally but not axially with said member, a retain-

ing member for holding said bushing against one end of the box, a gland within the box to
40 which said retaining member is secured, said gland being provided with an inner rib, packing rings surrounding said movable member, and means for pressing them toward
45 said inner rib, comprising a spring surrounding said bushing and a portion of said retaining member.

10. In combination with a stuffing box for the piston rod of a gas engine, a floating bushing within the box at its cylinder end, a
50 retaining member E having the ribs E² and E¹, a gland g¹ formed with the space G⁴ and having an outer rib G³ secured to the rib E² and an inner rib G¹, packing rings J and a spring supporting member M therefor, sur-
55 rounding the member E bearing at one end against the rib E².

11. In a stuffing box for a gas engine piston rod, a floating bushing closely surrounding the piston rod at the cylinder end of the
60 box, a retaining member surrounding the bushing and in poor heat conducting relation therewith and provided with means for preventing axial, but not lateral movement of the bushing with the rod, a wire seal between
65 the cylinder end of the box and the retaining member, whereby the end member is held out of direct contact with the end of the box, metal packing rings surrounding said rod, and a spring surrounding said retaining
70 member and bearing against the packing rings.

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Witnesses:

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JOHN E. HUBBELL.