

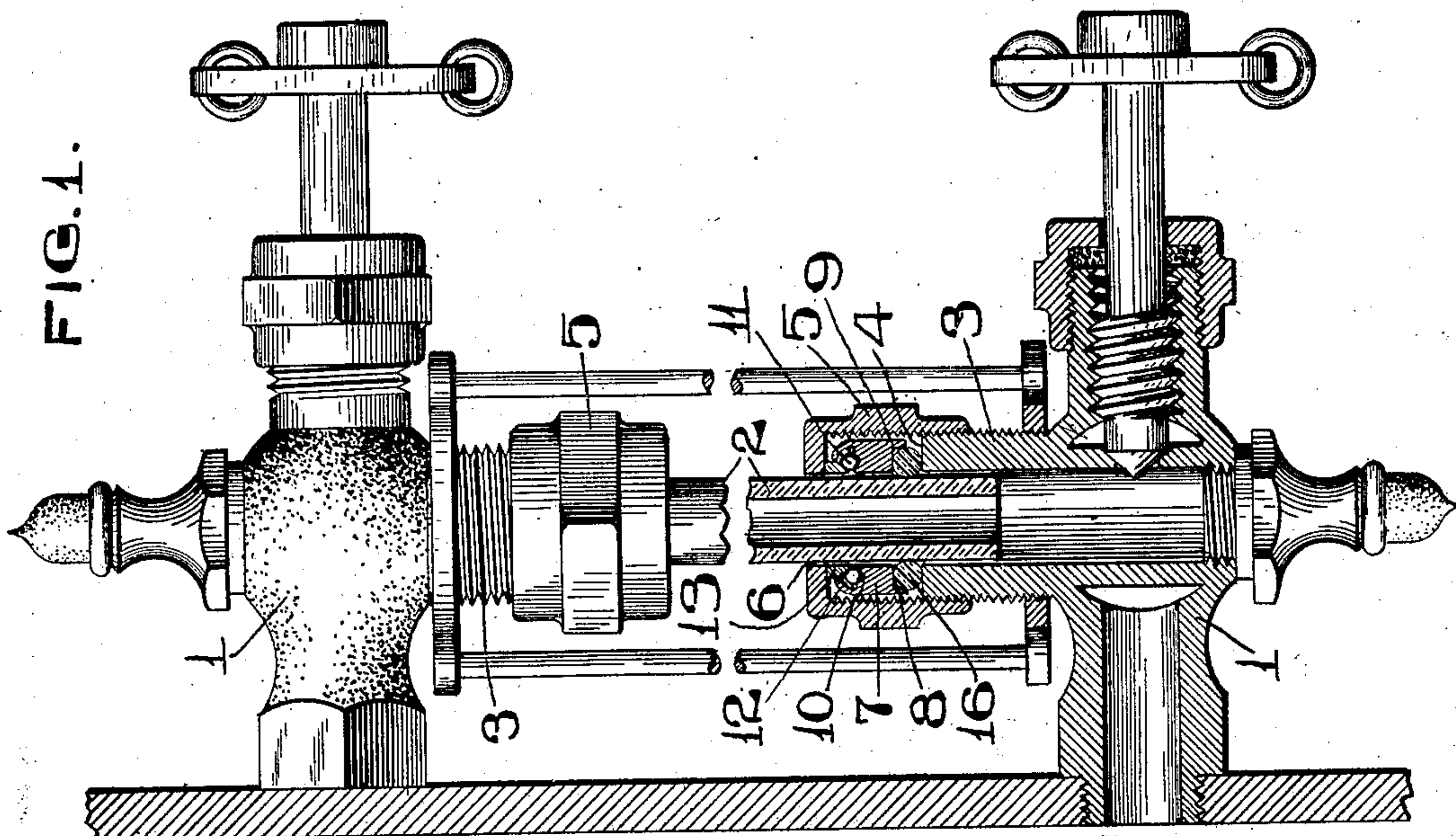
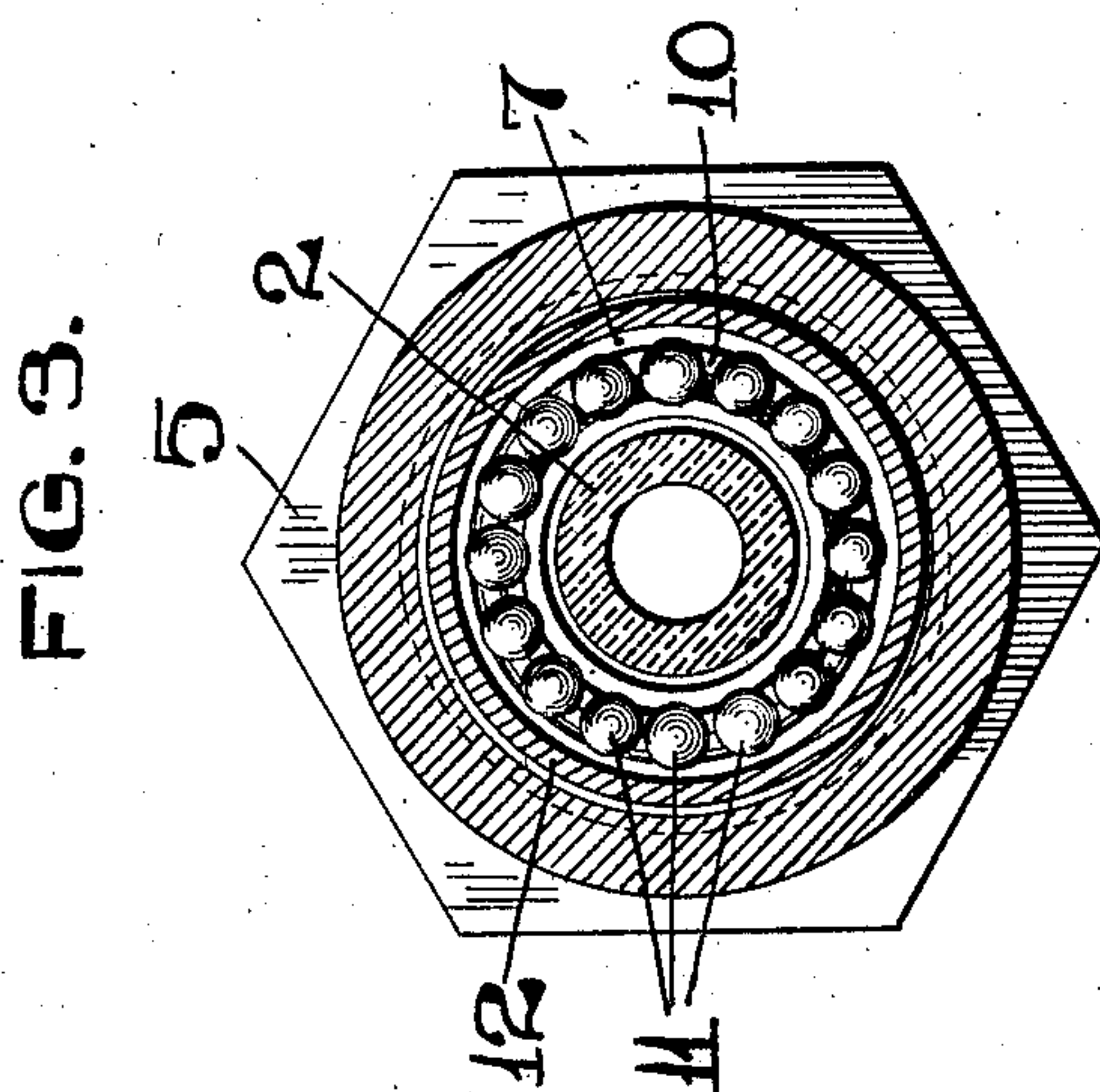
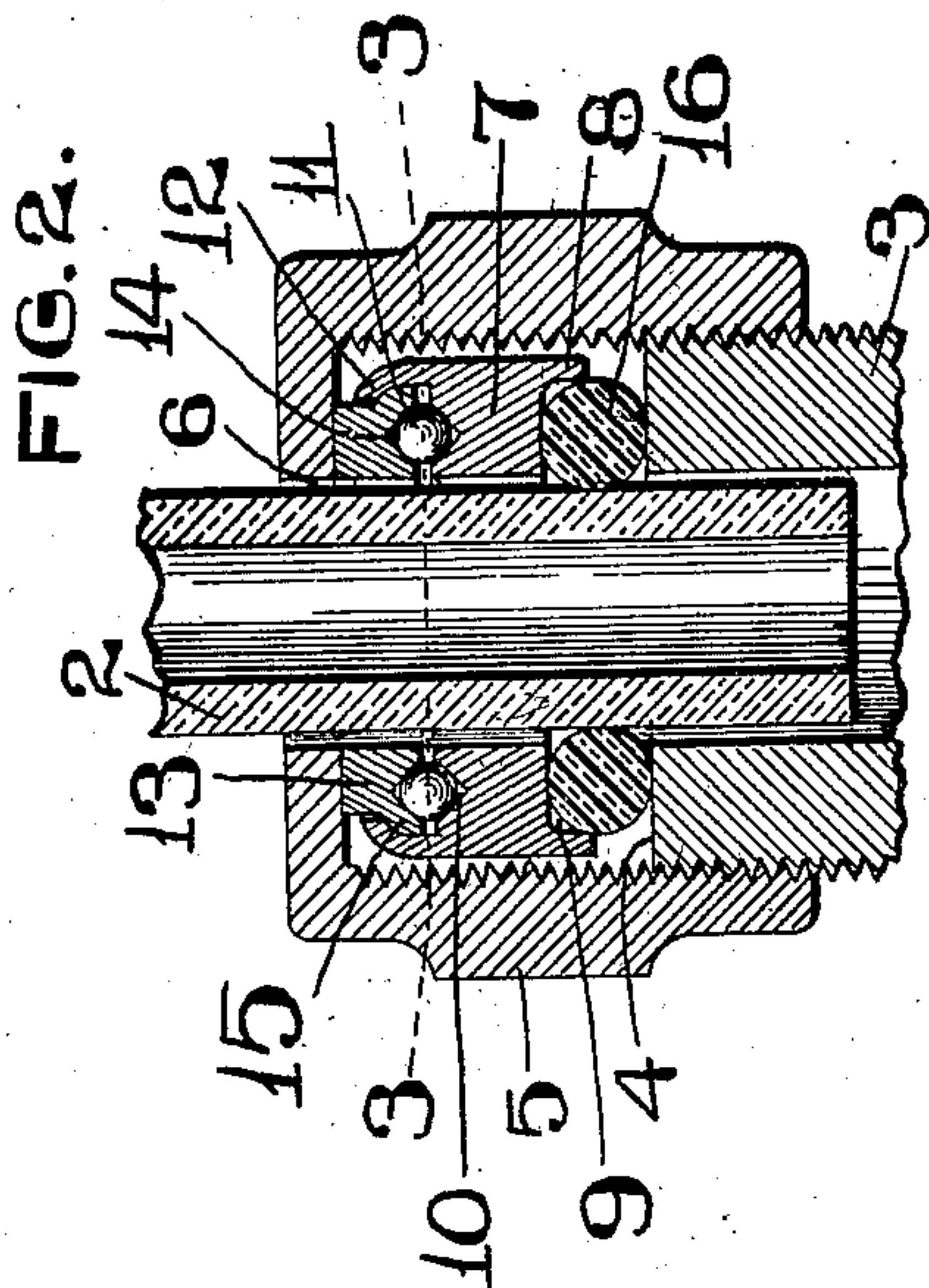
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PATENTED OCT. 23, 1906.

W. W. HICKS.

BALL BEARING GLAND FOR PACKING NUTS.

APPLICATION FILED OCT. 31, 1905.



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BALL-BEARING GLAND FOR PACKING-NUTS.

No. 833,784.

Specification of Letters Patent.

Patented Oct. 23, 1906.

Application filed October 31, 1905. Serial No. 285,356.

To all whom it may concern:

Be it known that I, WILLIAM W. HICKS, a citizen of the United States, and a resident of St. Louis, Missouri, have invented certain new and useful Improvements in Ball-Bearing Glands for Packing-Nuts, of which the following is a specification, containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a ball-bearing gland for packing-nuts; and one of the objects of my invention is to provide a ball-bearing gland for the packing-nuts that are used on gage-glasses that will readily permit the nut to be tightened, so that the packing-ring of rubber or analogous material will tightly engage upon the gage-glass to thoroughly pack the joint and to very efficiently hold the glass in proper position.

A further object of my invention is to provide a packing-nut with a ball-bearing gland in order that said nut may be properly tightened without the use of a wrench or like tool.

A further object of my invention is to so construct a ball-bearing gland as that the packing-ring of rubber or analogous material is forced directly against the surface of the gage-glass and is prevented from coming in contact with the screw-threads of the nut, which contact would naturally cut the packing-ring and render it unfit for service.

To the above purposes my invention consists in certain novel features of construction and arrangement of parts, which will be hereinafter more fully specified, pointed out in the claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of a gage-glass mounted for use with my improved ball-bearing gland in position on said gage-glass. Fig. 2 is an enlarged vertical section taken through the center of a packing-nut and showing the ball-bearing gland therein and around the lower end of a gage-glass. Fig. 3 is a horizontal section taken on the line 3 3 of Fig. 2.

Referring by numerals to the accompanying drawings, 1 1 indicate gage-valve casings of ordinary construction, which are arranged one above the other in the usual manner and connected by the gage-glass 2. These valve-casings are provided with vertically-disposed tubular members 3, which extend toward one another and in which the ends of the gage-glass 2 are located. The ends 4 of these

tubular members are made perfectly flat, and adapted to screw onto said members are the tubular nuts 5, in the ends of which are provided openings 6, through which the gage-glass 2 passes.

My improved ball-bearing glands are adapted to be positioned in the nuts 5, and each gland comprises a ring 7, provided on its outer edge with a downwardly-pending flange 8, thus forming an annular recess 9 in the under side of said ring. Formed in the top of the ring 7 is a groove 10, which is occupied by a series of balls 11. Formed integral with the outer edge of the top of the ring 7 is an upwardly-projecting flange 12. 13 indicates a ring which is somewhat smaller in diameter than is the ring 7, and formed in the under side of said ring 13 is a groove 14, which, together with the groove 10, forms a raceway for the balls 11. The lower end of the outer face of the ring 13 is provided with a shoulder 15, which shoulder is normally located within the upwardly-projecting flange 12. When the parts of the gland are assembled, the upper end of the flange 12 is bent over this shoulder 15, thus maintaining the two parts of the gland together and allowing the ring 13 to rotate freely independent of the ring 7.

16 indicates a packing-ring, of rubber or analogous material, which is preferably circular in cross-section and which packing-ring is positioned around the gage-glass and rests on the flat top surface 4 of the tubular member 3 and within the annular recess 9 in the under side of the ring 7. The nut 5 is now tightened upon the exterior of the tubular member 3, and in so doing the top of said nut engages against the outer face of the ring 13, and the same turns very freely upon the balls located between said rings and the ring 7. The tightening of the nut 5 naturally forces the entire gland toward the tubular extension 3, and as a result the packing-ring will be forced against the gage-glass, as it cannot spread outwardly by reason of the downwardly-pending flange 8. The pressure is equal at all points on the packing-ring, and therefore said ring will very tightly engage against the surface of the gage-glass, and as a result a very effective packing is produced, and said gage-glass is maintained in a central position in the opening in the tubular member 3. None of the metallic parts of the gland come in direct contact with the gage-glass, and as the packing-ring 16 does not ro-

tate there is no torsional strength upon the gage-glass which would tend to fracture the glass or twist it into an incorrect position.

By the use of my improved ball-bearing glands the packing-nuts 5 may be manipulated by the fingers to properly tighten the packing-rings, as the ball-bearings reduce the friction between said packing-nuts and that portion of the glands that bear upon the packing-rings. A gland so constructed is simple and inexpensive, is applicable for use in all packing-nuts, and very effectually holds the packing-rings in proper position and prevents their being cut by coming in contact with the screw-threads of the packing-nuts. The packing-rings maintain the ends of the gage-glass centrally in the tubular members 3, and as said packing-rings are pliable a universal joint is formed between the gage-glass and said packing-rings, which allows for a slight movement in any direction for the gage-glass to compensate for any variation of position of one valve-casing relative the other. The flange 8 forms a guard against the outward expansion of the rubber packing-ring, and also limits the movement of the gland toward the tubular member 3 when the nut 5 is tightened.

In practice I have demonstrated that when the gland is moved downwardly so that the lower end of the flange 8 contacts with the top surface of the tubular member 3 the rubber packing-ring will be very tightly compressed in the annular groove 9 without breaking the gage-glass.

I claim—

1. In a device of the class described, the combination with a packing-nut, of a ball-bearing gland arranged in said nut and a packing-ring arranged beneath the gland; substantially as specified.

2. In a device of the class described, the combination with a packing-nut, of a ball-bearing gland arranged in said nut, a downwardly-pending flange integral with the outer edge of the lower end of said gland, and a packing-ring arranged within said flange; substantially as specified.

3. In a device of the class described, a gland constructed of two members, ball-bearings arranged between the members, a downwardly-pending flange integral with the

lower end of the lower one of said members, and a packing-ring located within the flange; substantially as specified.

4. In a device of the class described, a gland constructed of two members, ball-bearings arranged between the members and a packing-ring arranged beneath the lower one of the members; substantially as specified.

5. In a device of the class described, a gland comprising a pair of members held together, ball-bearings arranged between said members, and a packing-ring arranged beneath the lower one of said members; substantially as specified.

6. In a device of the class described, the combination with a packing-nut, of a ball-bearing gland arranged in said nut, and being provided with an annular groove in its under side and a packing-ring located in said annular groove; substantially as specified.

7. In a device of the class described, a gland constructed of a pair of rings, one of which is arranged to rotate upon the other, ball-bearings arranged between the rings, there being an annular groove formed in the under side of one ring and a packing-ring arranged in said annular groove; substantially as specified.

8. In a device of the class described, the combination with a packing-nut, of a pair of rings arranged on the interior of said nut, ball-bearings arranged between said rings, there being an annular groove formed in the under side of one of said rings and a packing-ring arranged in the annular groove; substantially as specified.

9. In a device of the class described, the combination with a packing-nut, of a ball-bearing gland arranged in said nut, a packing-ring arranged on the under side of the gland, and means whereby the pressure of the gland on the packing-ring is limited when the packing-nut is tightened on the gland; substantially as specified.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

WILLIAM W. HICKS.

Witnesses:

M. P. SMITH,

E. M. HARRINGTON.