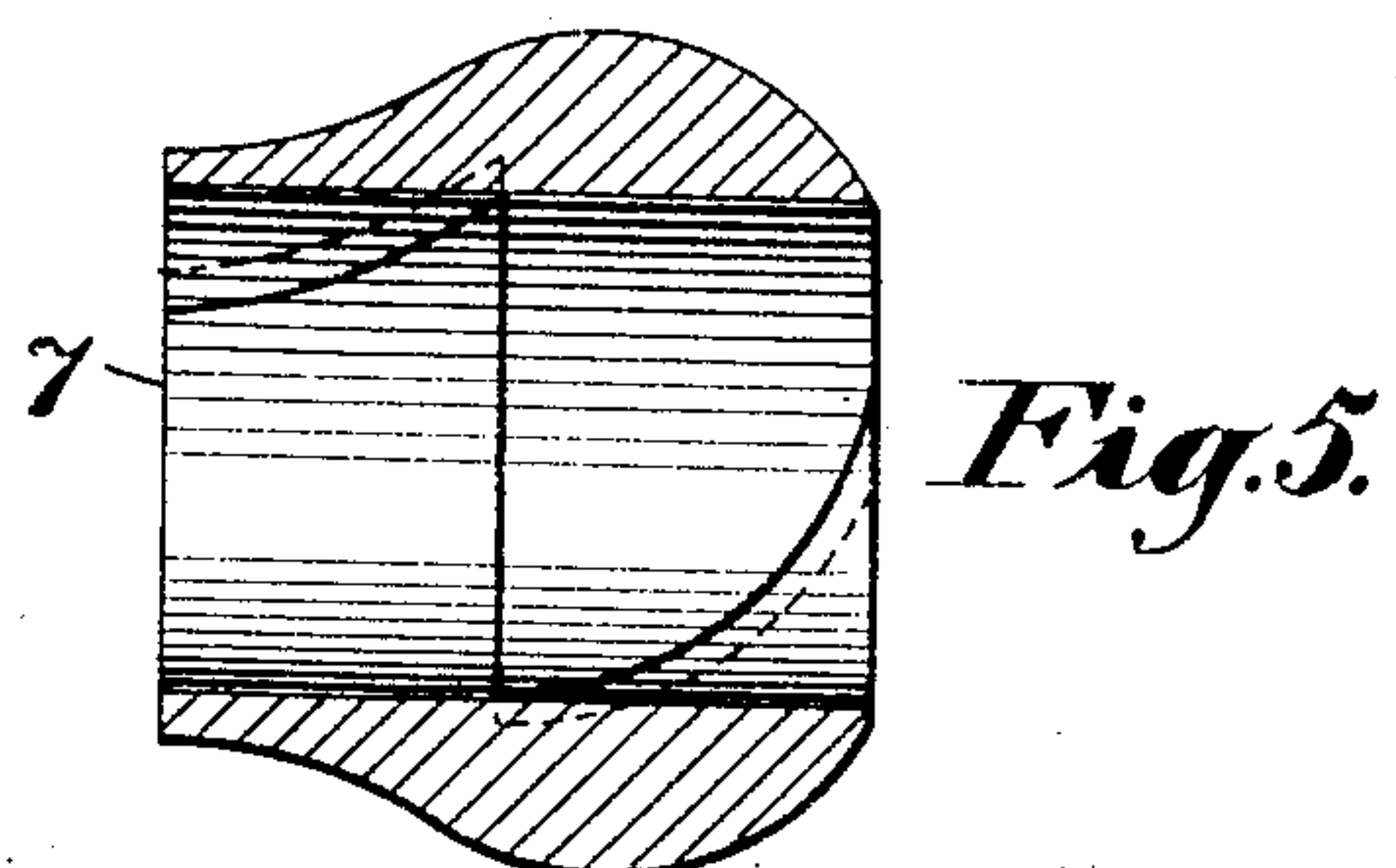
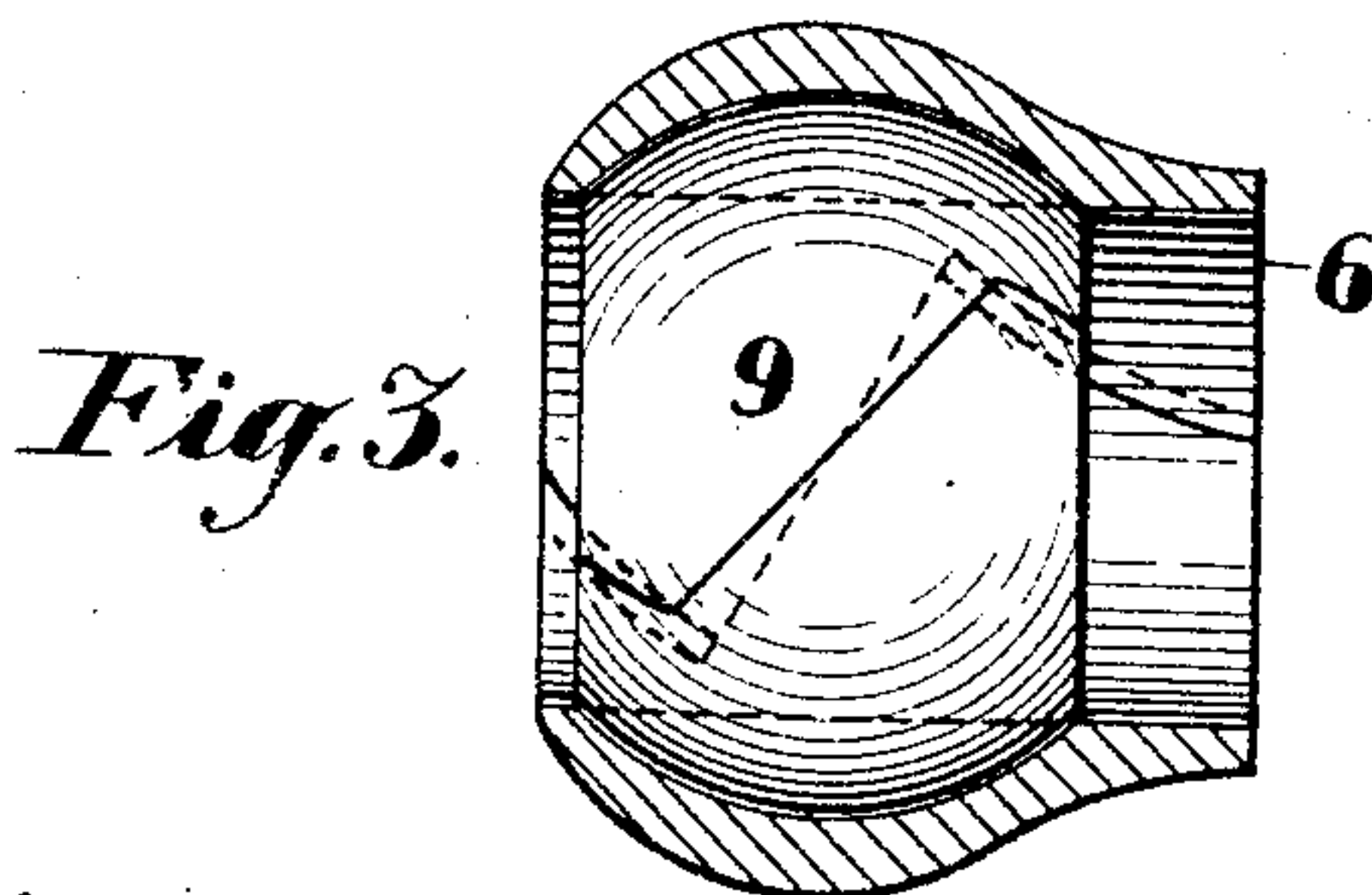
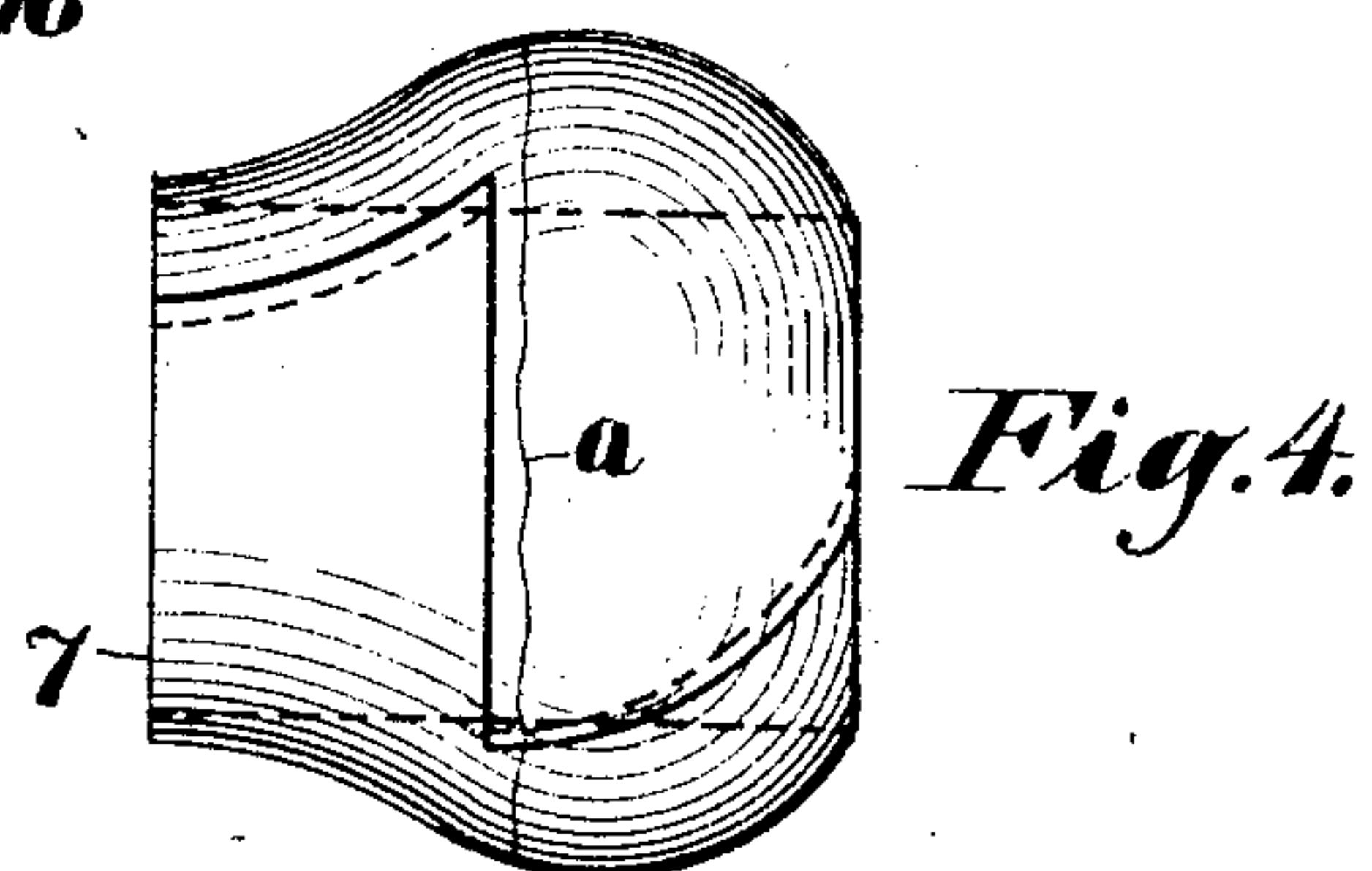
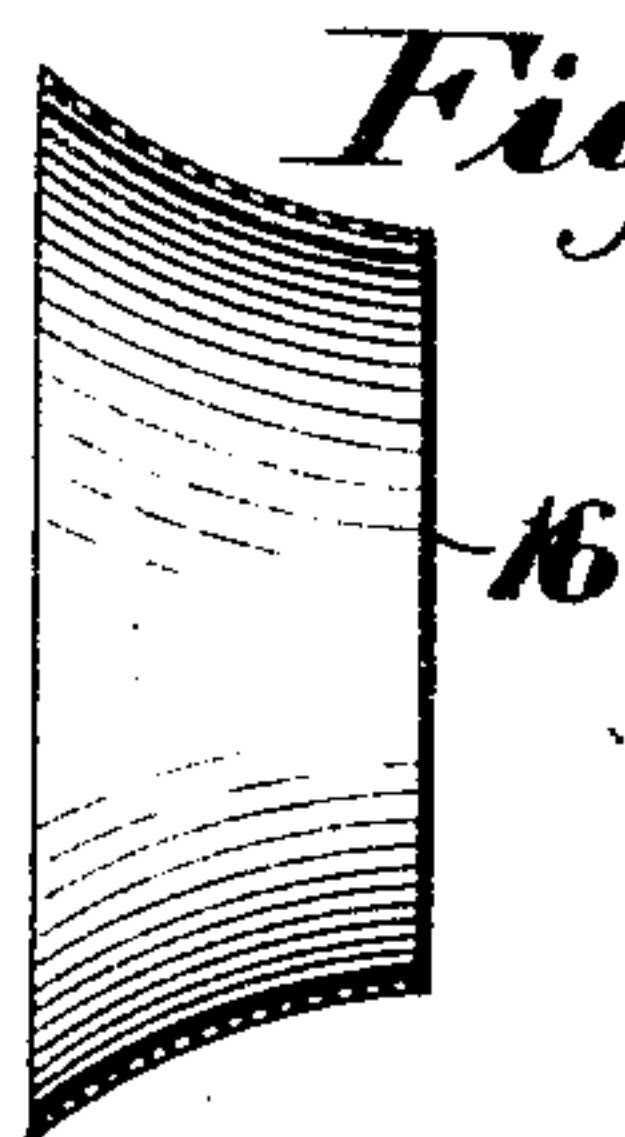
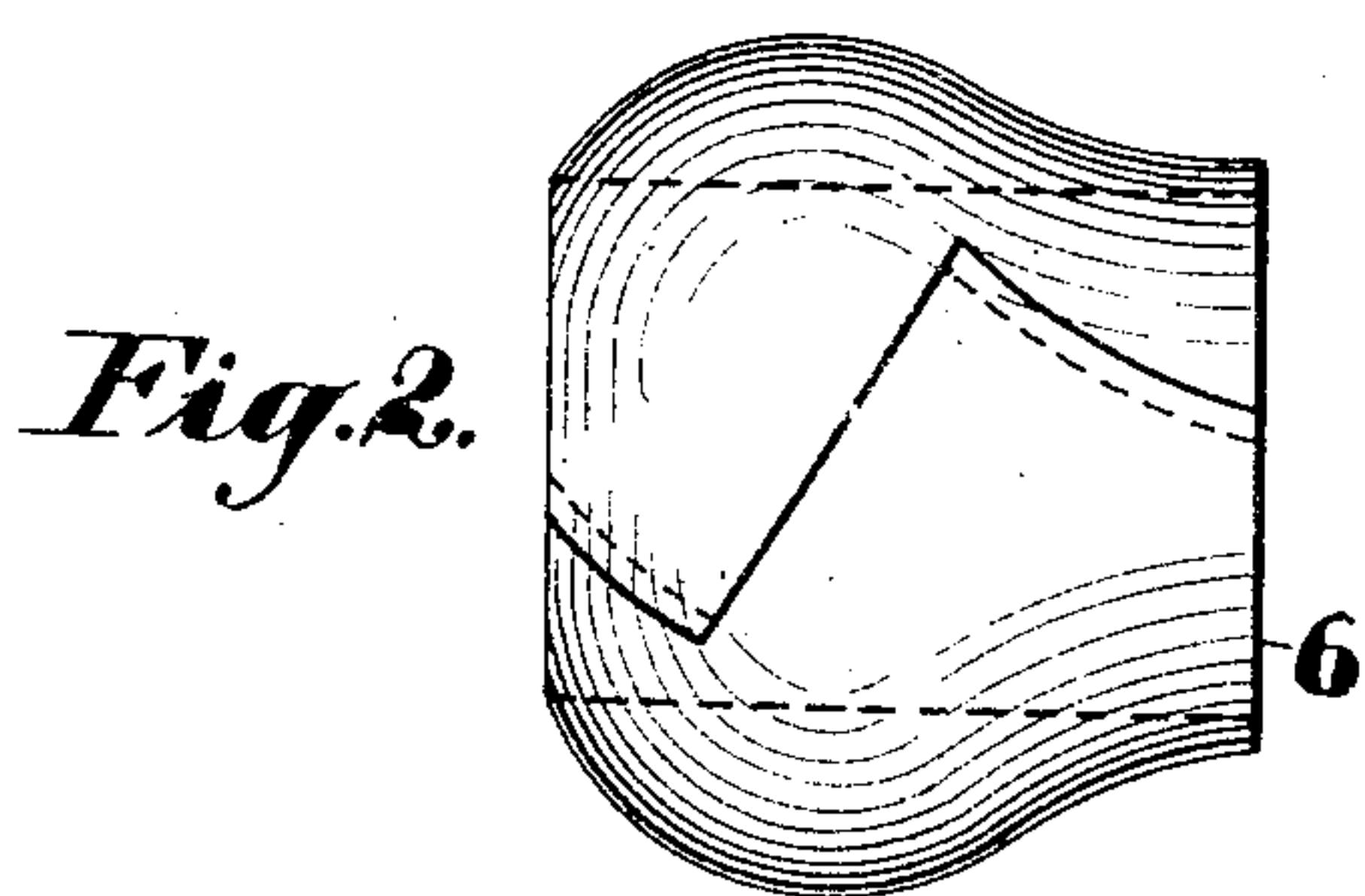
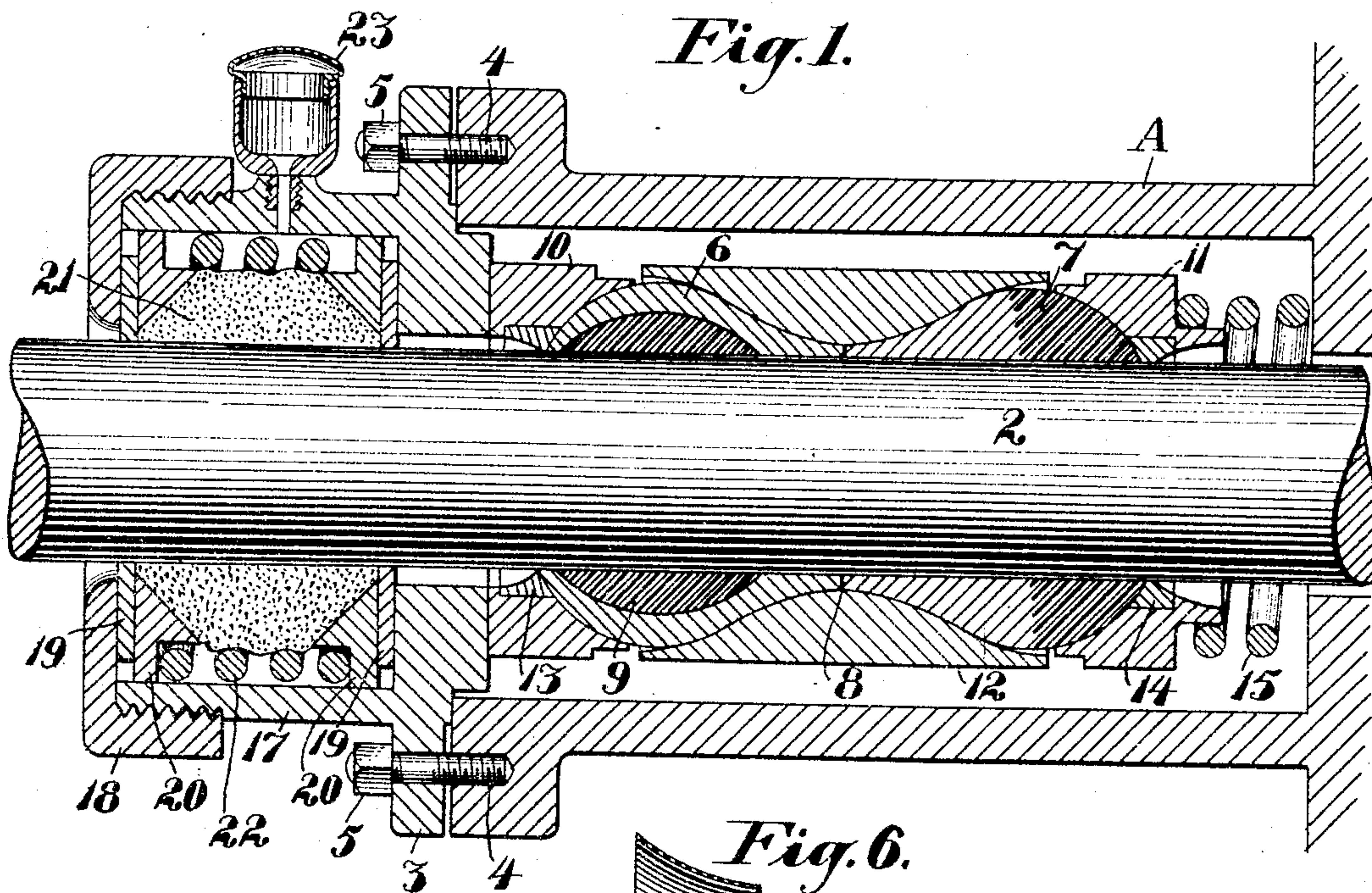


No. 779,700.

PATENTED JAN. 10, 1905.

C. P. FOGH.
PISTON ROD PACKING.
APPLICATION FILED MAY 5, 1904.



Witnesses:-
F. C. Fiedner
G. A. Morse

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By E. W. H. Strong atty

UNITED STATES PATENT OFFICE.

CHRISTIAN P. FOGH, OF WADSWORTH, NEVADA.

PISTON-ROD PACKING.

SPECIFICATION forming part of Letters Patent No. 779,700, dated January 10, 1905.

Application filed May 5, 1904. Serial No. 206,456.

To all whom it may concern:

Be it known that I, CHRISTIAN P. FOGH, a citizen of the United States, residing at Wadsworth, in the county of Washoe and State of Nevada, have invented new and useful Improvements in Piston-Rod Packing, of which the following is a specification.

My invention relates to improvements in packings for piston-rods and the like. Its object is to devise a packing particularly adapted for ice-machines and marine engines, which will be durable, which will form a vapor-tight joint, and which will be self-adjusting and self-oiling.

It consists of the parts and the construction and combination of parts, as hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is a central sectional view of my invention. Fig. 2 represents one of the packing-rings, showing division-lines between the sections. Fig. 3 is a sectional view of ring shown in Fig. 2 with inclosed annulus. Fig. 4 represents the other packing-ring. Fig. 5 is a sectional view of ring of Fig. 4, showing sectional division-line. Fig. 6 is a sectional view of repair-shim.

A represents a suitable stuffing-box, 2 a piston-rod or like reciprocating part, and 3 a gland secured to the end of the stuffing-box by suitable means, as the studs 4 and nuts 5. Within the stuffing-box is contained my improved tandem packing. This packing comprises two sectional rings 6 7 more or less pear shape in outline, with their narrow contracted ends contiguous to each other, as shown at 8. Ring 6 and the attenuated portion of ring 7 are preferably of some soft contractible metal, as lead. The larger spherical end of ring 7 is preferably of some relatively harder material, as babbitt, the harder and softer parts being united, as indicated by the irregular line *a*. The purpose of this construction will be noted later. The part 6 is in the form of a shell and embraces the harder sectional spherical babbitt ring 9. The rings 7 and 9 and the lateral portions of ring 6 on either side of ring 9 have a snug steam-tight sliding fit on rod 2.

10 11 are cups or collars having concaved

inner surfaces fitting the convexities of the opposite and harder ends of the respective rings 6 7, and 12 is a sleeve having a thickened central portion and gradually increasing in interior diameter toward its ends, disposed intermediate cups 10 11, and embracing and conforming to the more attenuated and contiguous and softer ends of rings 6 7.

The cups 10 11 and sleeve 12 have a limited relative telescopic movement and are preferably of steel or other hard resistant metal. Cups 10 and 11 are of slightly greater diameter than the rod 2, so as not to come in contact with and cut it. The spaces intermediate of the cups, piston-rods, and outside ends of rings 6 7 are occupied by the babbitt rings 13 14.

Cup 10 has a snug sliding steam-tight fit with the gland, and a spring 15 exerts a pressure on cup 11 in opposition to cup 10 to press the two toward each other to compress the packing-rings 6 7 9 upon the piston-rod and take up wear as it may occur, and so automatically maintain a tight joint. The sleeve 12 retains the packing-rings in contact with the piston-rod and resists the end thrust exerted by the cups 10 11. The ring 7 is made of two metals or alloys or other suitable material of different degrees of hardness, for the reason, first, that it is desired to have a sensitive section which will always hug the rod. This is afforded by the soft attenuated contiguous lead ends of the rings. Second, provision should be made for a certain swivel movement of the cups upon the rings to take place or provide a true "ball-joint packing," and for this reason the outer larger end of the ring 7 is made spherical and of relatively harder material than the rest of the ring and also for the reason that some firm backing or resistance for the soft metal of the attenuated contractible part is necessary to keep it from squeezing out behind.

The various rings are each made with their segments symmetrical, insuring the parts always being set up right, while the joints between their respective segments are irregular to prevent escape of steam and to permit the parts being put together without having to be slipped over the rod from one end.

The ring 9 is for resistance to keep the attenuated part of ring 6 from squeezing out and

serves to break joint with the inclosing shell 6. The latter is employed and is made entirely of soft metal, because it readily adapts itself to the pressure of the cups to close its joints and offers the soft "shaving" end at the point 8. These attenuated soft portions or shavings of the rings 6 7 are very sensitive and readily expand and contract to make always a tight joint on the rod, while the ring 9 and the harder end of ring 7, coöperating with the interiorly-tapered sleeve 12, afford the necessary resistance to keep the softer metal from squeezing out at either end or sidwise. I may employ two segmental shim-pieces 16, as shown in Fig. 6, to be put in on the soft "shaving" end of one or the other, or both, of rings 6 7 when the packing has worn down somewhat, though not sufficient so as to require new packing altogether. By this style of tandem packing I maintain always a tight fit on the rod and prevent the soft metal from squeezing through and out, which is a fault with single packing.

In conjunction with this packing I have shown a combination oil-cellar and swab-holder which is necessary to the successful operation of the rest of the invention. Accordingly the gland 3 is formed with an outwardly-projecting annular flange 17, forming the cellar-wall, and having an exterior thread to receive a perforated cap 18. 19 19 are two washers close fitting on the rod and of less diameter than the interior diameter of the flange to allow them to vibrate with the rod and at the same time keep a tight joint with the ends of the oil-cellar. Intermediate of the washers are two rings 20, having upwardly-convergent adjacent surfaces between which a suitable swab or oil-absorbent 21 is contained. A helical spring 22 surrounds and compresses this swab and exerts an end pressure against rings 20 to maintain always an oil-tight joint between the washers and the ends of the oil-cellar. 23 is a suitable oil-cup. This construction insures a perfect lubrication of the parts, and the oil cannot leak out around the bottom or lower part of the collar, as is the case with most of the swab-holders now in use.

An important feature to be noted of the invention is that a true ball-joint packing is produced which allows the rod to have a swivel movement in the box without leak. This is effected since, first, the outer bearing ends of rings 6 and 7 are essentially segments of spheres and the corresponding bearing-surfaces of the respective cups 10 and 11 are concentric with these segments. If the outer end of ring 6 or ring 7 were continued in an arc across the opening made for the piston-rod, the end of the ring would be a true ball as distinguished from merely "rounding" the corners of the packing with the curve of these corners struck from different centers. In the latter case a swivel or rocking movement of a ring on the packing is impossible without causing

a leak. The present construction allows a cup and a corresponding spherical end to have a free sliding movement one on the other on lines transverse to the piston-rod. Secondly, it is essential that the retaining parts for the packing not only envelop and retain the packing, but that they have room for a limited rocking movement out of axial alinement relative to one another. This is accomplished by having the abutting ends of the retaining parts arranged not only to telescope, but to have the male member of appreciably less exterior diameter than the interior diameter of the female member.

As shown, for instance, in the drawings, the adjacent ends of cups 10 11 are enough smaller than the corresponding ends of sleeve 12 to permit the cups even when shoved into the sleeve to rock so that their axes may be thrown out of alinement. By this means a true ball-joint packing results, so that no undue strain is put on the packing no matter if the rod should operate out of its normal line.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A piston-rod or like packing comprising in combination with a suitable stuffing-box, of two contractible metallic packing-rings having contiguous attenuated tapered ends and having enlarged opposite ends, cups extending over and inclosing the enlarged ends of the rings, means embracing the portions of said rings intermediate of said cups to hold the rings against the end thrust of said cups and means tending to press said cups together.

2. A piston-rod or like packing comprising in combination with a suitable stuffing-box, of two contractible metallic packing-rings having contiguous tapered ends and the opposite ends enlarged, cups embracing the outer ends of said rings, means for pressing said cups toward each other, and a sleeve telescoping said cups and embracing the rings intermediate of the cups, and partially inclosing the enlarged ends of the rings.

3. A piston-rod or like packing comprising in combination with a suitable stuffing-box, of two contractible metallic packing-rings having contiguous tapered attenuated ends and outer spherical ends, cups circumferentially embracing said spherical ends, means for pressing said cups toward each other, and an exterior annular support for the rings intermediate of the cups.

4. A tandem packing comprising two contractible metallic rings having adjacent attenuated ends, the attenuated end of one of said rings of relatively softer material than the rest of the ring, means for exerting pressure in opposite directions to press the rings toward each other and means embracing the rings to resist the thrust of said pressure means.

5. A tandem packing comprising two contractible axially-alined metallic rings having their adjacent ends of relative soft material, means for exerting pressure on the outer ends of the rings to press them toward each other, and means embracing the rings to resist said end thrust.

6. A tandem packing comprising two contractible axially-alined rings having their adjacent ends of relatively soft material, a resistance for said soft material whereby the harder material serves to prevent the softer material from squeezing out, means for pressing the rings toward each other and means embracing the rings to resist said pressure means.

7. A tandem packing comprising two contractible axially-alined rings having their adjacent ends tapered and of relatively soft material, the outer ends of said rings being spherical, cups embracing said ends to circumferentially compress the rings, means for pressing the cups toward each other and a sleeve embracing the rings intermediate of said cups.

8. A tandem packing comprising two contractible axially-alined rings having their adjacent ends tapered and of relatively soft material, the outer ends of said rings being spherical, cups embracing said ends to circumferentially compress the rings, means for pressing the cups toward each other, and a sleeve embracing the rings intermediate of said cups, and having a limited telescopic movement with said cups.

9. A tandem packing comprising two sectional contractible axially-alined rings having tapered adjacent ends, a sectional ring of relatively harder material concentric with and inclosed by one of said rings, telescopic parts bearing on the ends and sides of said rings, and means for exerting pressure on said parts to circumferentially compress said rings.

10. In a piston-rod or like packing, a sectional contractible annulus having a tapered attenuated end of relatively softer material than the rest of the ring.

11. In a piston-rod or like packing, a sectional annulus, a second sectional annulus embracing the first and of relatively softer material than the first annulus, said annuli being essentially coaxial, and said second annulus having an attenuated end of the same interior diameter as the first annulus.

12. In a piston-rod or like packing, a sectional annulus, a second sectional annulus embracing the first and having an end of relatively softer material than the first annulus, said annuli being essentially coaxial, and said softer end of the second annulus being of the same interior diameter as the first annulus, said annuli being arranged to break joint with each other.

13. The combination with a piston-rod and a stuffing-box having a gland with an out-

wardly-extending annular flange, a cap forming a closure for the outer end of the flange, opposing spaced rings within the annular flange, an oil-absorbent within the flange and contained between said rings, means compressing circumferentially said absorbent said rings in a direction parallel with the piston-rod to form an oil-tight joint between the cap and gland.

14. The combination with a piston-rod and a stuffing-box, of a perforated gland-plate having an external annular flange forming an oil-cellar, a perforated cap fitting the end of said flange and forming the closure for the outer end of said cellar, opposing spaced rings in said cellar, washers having a snug sliding fit on the piston-rod and arranged one to bear against one of said rings and the gland-plate and the other against the other of said rings and the inside of the cap, an oil-absorbent intermediate of said rings and means for compressing said absorbent circumferentially and for spreading said rings to maintain an oil-tight chamber within said flange.

15. A ball-joint packing comprising an annulus having essentially a spherical end, a cup closing over said end and having a concaved surface concentric with said spherical end, said cup adapted to have a free sliding movement on said end on lines transverse to the axis of the annulus, and means supporting the opposite end of the annulus in opposition to said cup.

16. A ball-joint packing comprising an annulus having an essentially spherical end, a cup embracing said end circumferentially, said cup adapted to have a free sliding movement if necessary on said end on lines transverse to the axis of the annulus, and a support for the opposite end of the ring arranged to telescope said cup.

17. In a piston-rod or like packing, two axially-alined contiguous packing-annuli having adjacent tapered exterior surfaces, a sleeve or like retaining means embracing said tapered surfaces and having a correspondingly-tapered bore, and means to press said annuli toward each other.

18. In a piston-rod or like packing, two axially-alined packing-annuli having adjacent tapered and attenuated ends, a sleeve embracing said tapered parts and having a correspondingly-tapered bore, and means to press the two annuli toward each other.

19. In a piston-rod or like packing, two axially-alined annuli substantially convexed in cross-section, cups circumferentially engaging the outer ends of said annuli, means to press the cups together, and a sleeve intermediate of the cups embracing said annuli, said sleeve having a reduced bore intermediate of its ends and gradually increasing in size toward said ends.

20. A metallic packing-annulus having one

end of relatively harder material than the other.

21. A metallic packing-annulus having an attenuated end of relatively softer material
5 than the other.

22. A metallic packing-annulus substantially pear shape in outline and having one end softer than the other.

23. A metallic packing-annulus substantially pear shape in outline and having its at-
10 tenuated end of softer material than the other.

24. A metallic packing-annulus substantially pear shape in outline having its attenu-
15 ated end contractible and of relatively softer material than the other end.

25. A metallic packing-annulus having one

end spherical and of relatively harder material than the other end.

26. A metallic packing-annulus having a
20 spherical end and a tapered attenuated end, one end being relatively softer than the other.

27. A metallic packing-annulus having a spherical end and a tapered attenuated end, the latter being contractible and of relatively
25 softer material than the other end.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHRISTIAN P. FOGH.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.