

C. DRADER & R. R. CANDEE.
 APPLIANCE FOR FORMING A NON-LEAK JOINT.
 APPLICATION FILED APR. 17, 1915.

1,217,859.

Patented Feb. 27, 1917.

Fig. 1.

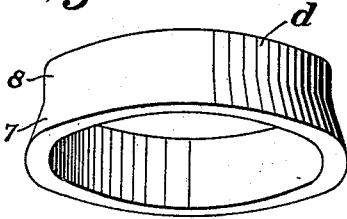


Fig. 2.

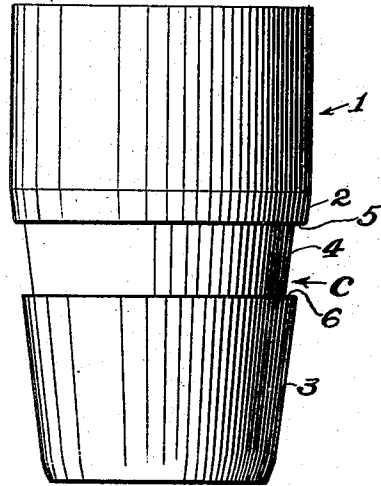


Fig. 3.

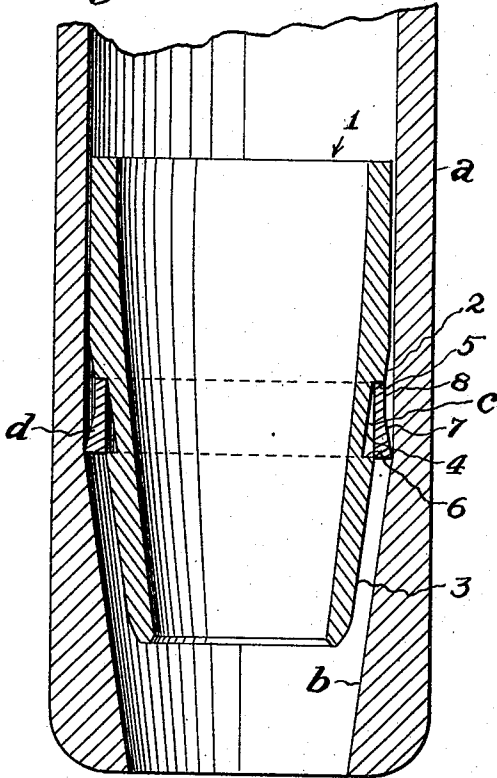


Fig. 4.

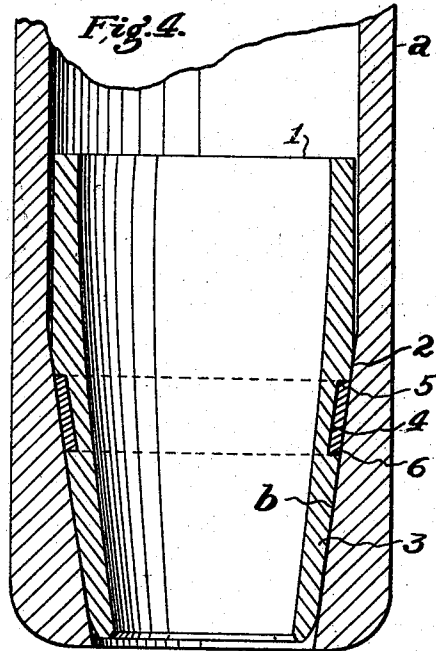
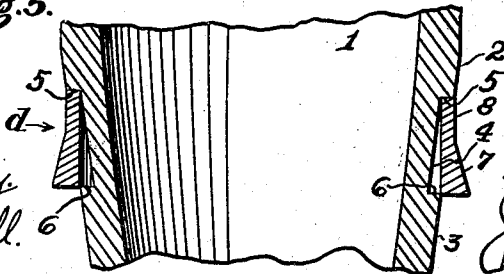


Fig. 5.



Witnesses:

J. M. Keeney
 Estrella Hill.

Inventors:

Charles Drader.
 Raphael Rogers Candee.

James R. Townsend
 Their Attys.

UNITED STATES PATENT OFFICE.

CHARLES DRADER AND RAPHAEL ROGERS CANDEE, OF BAKERSFIELD, CALIFORNIA.

APPLIANCE FOR FORMING A NON-LEAK JOINT.

1,217,859.

Specification of Letters Patent.

Patented Feb. 27, 1917.

Application filed April 17, 1915. Serial No. 22,207.

To all whom it may concern:

Be it known that we, CHARLES DRADER, a subject of the King of Great Britain, and RAPHAEL ROGERS CANDEE, a citizen of the United States, both residing at Bakersfield, in the county of Kern and State of California, have invented a new and useful Appliance for Forming a Non-Leak Joint, of which the following is a specification.

This invention relates to the class of inventions set forth in our application for Letters-Patent of the United States, for non-leak seat and anchor for liner pumps, Serial No. 806,631, filed Dec. 13, 1913, in which we have shown a combination seat and anchor for liner pumps comprising a female member, a male member having an annular groove in its outer face and a ring of ductile metal provided in its groove; said ring being adapted to spread into frictional contact with said female member when said male member is forced into said female member thus to form a non-leak seat.

An object of the present invention is to provide an appliance for forming a joint of the character described which will be adapted for ready and easy assembly in the field without the use of special tools. The present invention relates most particularly to the construction of a novel joint ring although it also includes a novel construction of the male member for combination with such ring and also the combination of parts forming the joint hereinafter set forth and claimed.

The invention includes a specific joint ring as a new article of manufacture to be supplied and kept in stock by the dealer and by the user, and capable of quick application to the liner pump or liner pump extension from time to time as occasion may require to form a non-leak joint and anchor seat where required.

The invention may be variously constructed and applied and is not limited to specific construction.

The accompanying drawings illustrate the invention.

Figure 1 is a perspective view of an anchor ring constructed in accordance with this invention.

Fig. 2 is a side elevation of the shoe of a removable barrel constructed in accord-

ance with this invention for use in liner pumps.

Fig. 3 is an axial section of a tubing shoe, a barrel shoe and an anchor ring constructed in accordance with this invention with parts in position just before the anchoring has been effected.

Fig. 4 is a view of the parts shown in Fig. 3 as they may be after the anchoring has been effected.

Fig. 5 is an enlarged axial section of the anchor ring in place on the male member.

In the views no attention has been directed toward the internal construction of the male member to which the ring is applied; and it is here noted that the male member may be constructed with or without internal threads and both the male and the female members or either of them may be constructed to differ from such members as shown in the drawings, provided the features hereinafter described and claimed be present.

The male and female members for the joint may be of any suitable character and in the drawing a male member 1 is shown having a taper portion as at the faces 2, 3, to seat in the female member *a* having a taper seat *b* into which the taper faces 2, 3, may come to rest. Above the smaller taper face 3, a taper neck 4 is formed; the male member being thus provided with an annular groove *c* having walls 5, 6, which are shown extending in planes normal to the axis of the taper portion 2, 3; the wall 6 being of less diameter than the wall 5. A ring *d* of compressible condensible ductile metal, such as lead, copper, Babbitt metal, or the like, is mounted in said annular groove as shown in Figs. 3 and 5, the orifice through the ring being of such diameter as to fit tightly on and to slip friction tight over the taper portion adjacent the lower annular wall 6; the orifice of said ring being cylindrical and equal in diameter to the diameter of said lower annular wall 6, and said orifice also being equal in diameter to the larger end of the neck 4.

The ends of the ring are of different external diameters so that the terminal face at one end of the ring is broader than at the other end; and when the ring is in place at the groove 4 of the male member 1, the

larger end of said ring projects outwardly from the taper surface of the male member at the lower side of the groove. Preferably the walls of the groove are of equal depth or height and the ring is twice as thick at its thick end as at its thin end, so that when the ring is in place preparatory to being seated in the female member it projects considerably beyond the taper of the adjacent external faces 2, 3.

Said ring *d* is preferably constructed with a taper portion 7 at its larger end and a cylindrical portion 8 at its smaller end; said portions being about equal in length and joined midway between the ends of the ring so that the angle of the outside face of the larger portion 7 to the taper face 3 is greater than the angle of the outside face of the smaller cylindrical portion 8 to said taper face 3.

Viewed in another way it may be said that the ring is externally hollowed out between its ends, one end being thicker than the other end, and the thicker end 7 is externally tapered and the thinner end 8 is cylindrical; the external taper face 7 tapering down to the external cylindrical face 8.

The purpose of this is to allow the lower end of the ring to pass freely into the taper seat *b* after the upper end of the ring is seated into the groove, and to give room for the metal to flow back under pressure to fill the groove with an excess of metal that is thus condensed.

The practical application of the invention will be understood by comparison of Figs. 3 and 5 with Fig. 4.

The ring *d* being in place on the male member 1 as shown in Fig. 5 fits with sufficient tightness thereon to be held by friction or by resting on wall 6 while being inserted down into the female member *a* until the seat *b* is reached as shown in Fig. 3, whereupon further downward movement will swage the ring to a reduced diameter; possibly condensing the thicker portion of the ring to a greater extent than the thinner portion of the ring, and also sweeping a portion of the thicker part of the ring over into the space originally vacant in the angle between the larger taper portion 2 of the male member and the taper seat *b* of the female member.

When the male and female members are thus seated together with considerable force such as that exerted by the weight and momentum of pump tubing, for instance, lowered into a deep well, the ring will be molded into the groove and against the seat *b* around the neck, and the male member 1 will be firmly anchored; and there will be no likelihood of leakage through the joint thus made.

Although the joint thus formed is free from leakage and forms a satisfactory an-

chor for the well tubing or the like to be thus anchored, still it is susceptible to removal when sufficient upward force is applied for that purpose.

It is noted that the longitudinal traces of the inner face of the ring are straight and the longitudinal traces of a part of the exterior face as at 7, are in angular relation to said longitudinal traces of the inner face so that there is, as it were, a cavity or vacant space between the inner surface of the ring and the surface of the neck and also between the outer surface of the ring and the seat in the female member therefor, so that the ring may be swaged and changed in form under pressure to form a non-leak closure for the seat.

By this construction in its preferred form, room is provided to allow metal of the thicker portion to be spread back over the thinner portion of the ring, and the cylindrical portion 8 is made of sufficient thickness not to crumple under the pressure so as to allow metal to be swaged in a manner to defeat the purpose of this invention and the excess metal is so disposed that as the swaging proceeds the metal is compressed and condensed into the groove and does not flow over onto the taper external face of the male member.

It is understood that the ring may be reversed and serve a good purpose, and we do not limit our use to the specific mode of application illustrated in the drawing as the reversing of the ring would not wholly defeat the objects aimed at.

We claim:

1. An appliance for forming a non-leak anchor joint comprising a male member having a taper portion forming an external face to seat in a female member, said male member being provided adjacent said face with an annular groove; and a ring of ductile metal for said annular groove; the orifice through the ring being of such diameter as to slip over said taper face to bring the ring into position to seat in said annular groove; the end of the ring at one side of the groove being of greater thickness than the depth of the groove at such side.

2. An appliance for forming a non-leak anchor joint comprising a male member having a taper portion forming an external face to seat in a female member, said male member being provided adjacent said face with an annular groove; and a ring of compressible ductile metal for said annular groove; the orifice through the ring being of such diameter as to slip over said taper face to bring the ring into position to seat in said annular groove; the end of the ring at that side of the groove next said taper external face being of greater thickness than the depth of the groove at such side.

3. An anchor ring formed of compressible

ductile metal having two annular external faces, one of which tapers toward the other.

4. A condensable ductile metal ring for the purpose set forth having a taper portion
5 and a cylindrical portion, the cylindrical portion being of less diameter than the taper portion.

5. An anchoring device comprising a male member having a taper portion adapted to
10 insert into a taper seat and provided with an annular groove having annular side walls, the annular wall at one side being of greater diameter than the annular wall at the other side of said groove; and a ring
15 adapted to slip over the taper portion of the male member to position with one end of said ring against said wall of greater diameter, the end of said ring in engagement with said wall being of about the same
20 thickness as the width of said wall and the other end being of greater thickness than the width of such wall so that when the parts are seated in the taper seat therefor, said taper seat will compress the thicker
25 portion of said ring to a smaller diameter.

6. A ring of ductile metal having a cylin-

dricul inner surface, a cylindrical outer surface at one end and a taper face at the other end.

7. A joint-forming ring of ductile metal 30 having a cylindrical outer face and an outer face tapering toward the cylindrical outer face.

8. In a joint-forming appliance a male member to seat in a female member; said 35 male member having a reduced neck formed by an external groove; and a ductile metal ring larger than the groove and adapted to engage the male member at the ends of the neck, and moldable by external pressure to 40 seat in said groove to fill the same and complete the joint when the male member is forced into a female member adapted to receive it.

In testimony whereof, we have hereunto 45 set our hands at Bakersfield, California, this 6th day of April, 1915.

CHARLES DRADER.

RAPHAEL ROGERS CANDEE.

In presence of—

F. E. SMITH,

J. A. TAYLOR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."