

No. 743,666.

PATENTED NOV. 10, 1903.

R. M. SHAFFER.
PACKING.

APPLICATION FILED AUG. 19, 1902.

NO MODEL.

Fig. I.

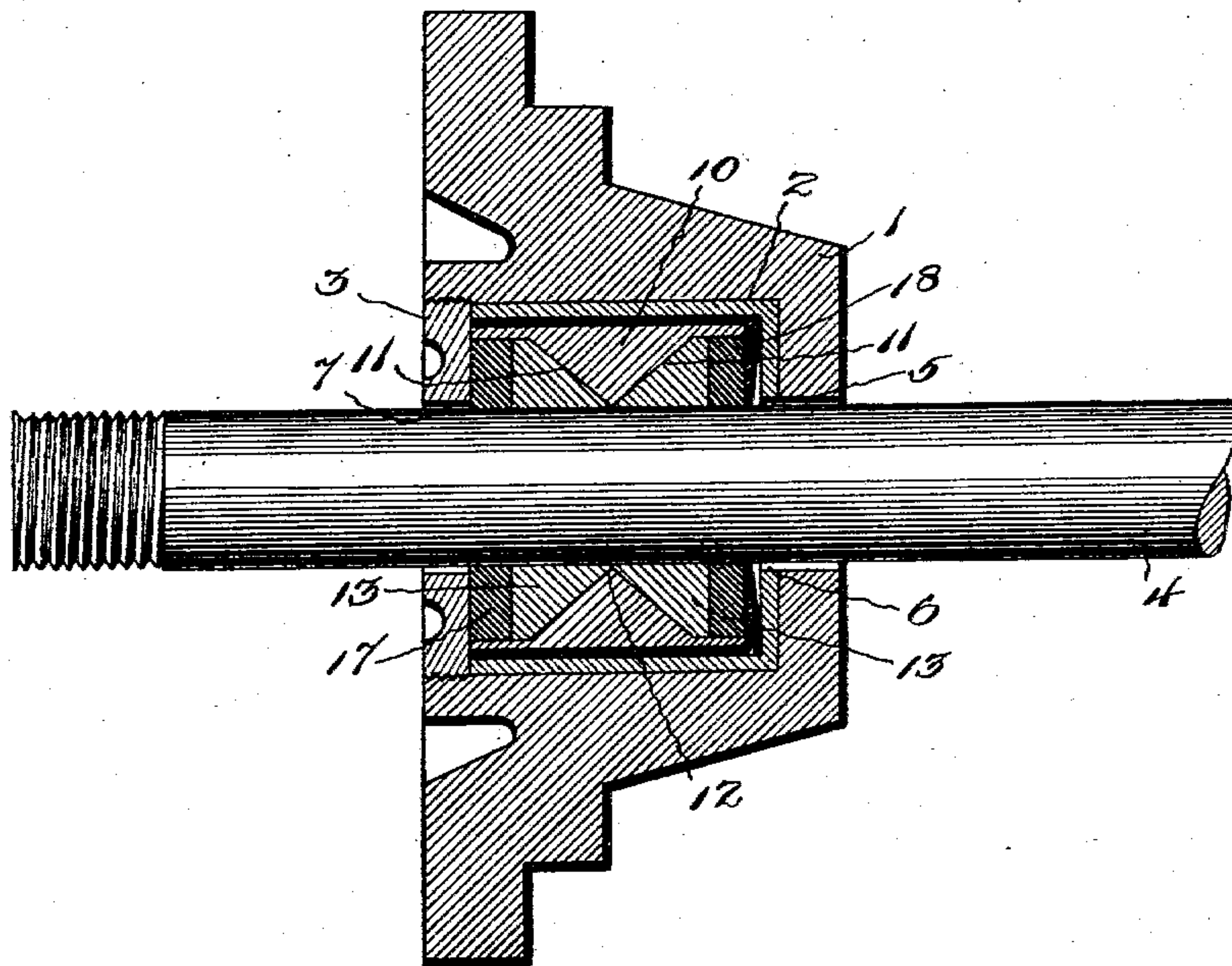


Fig. II.

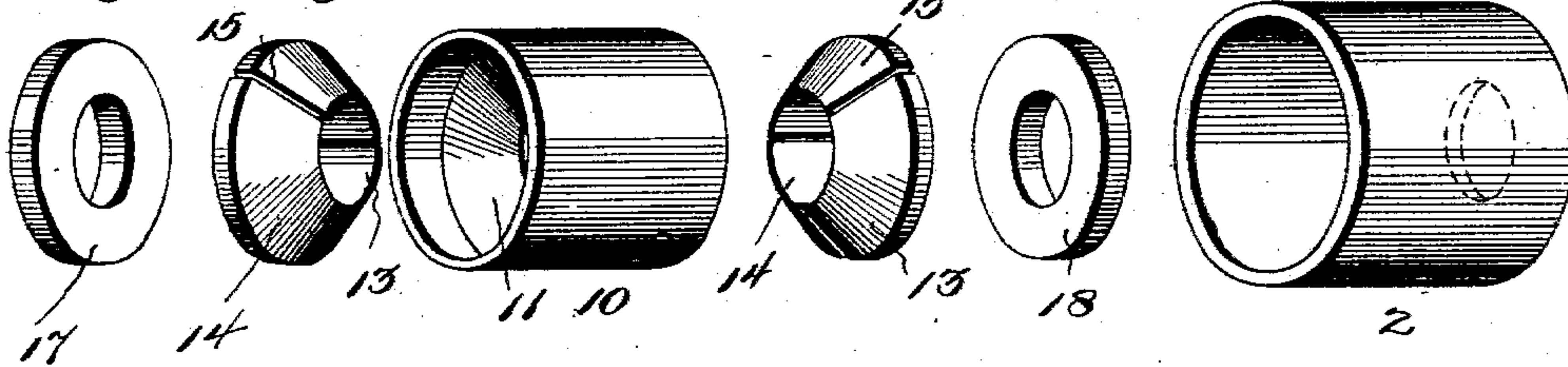
Fig. III.

Fig. IV.

Fig. V.

Fig. VI.

Fig. VII.



Witnesses

G. L. Mocham

Frank J. Kent

Inventor:

R. M. Shaffer

by *Joseph H. Atkins*

Attorney

UNITED STATES PATENT OFFICE.

RICHARD M. SHAFFER, OF BALTIMORE, MARYLAND, ASSIGNOR TO SHAFFER BOILER & ENGINE MANUFACTURING COMPANY, A CORPORATION OF DELAWARE.

PACKING.

SPECIFICATION forming part of Letters Patent No. 743,666, dated November 10, 1903.

Application filed August 19, 1902. Serial No. 120,171. (No model.)

To all whom it may concern:

Be it known that I, RICHARD M. SHAFFER, a citizen of the United States, and a resident of Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Packings, of which the following is a complete specification, reference being had to the accompanying drawings.

The object of my invention is to produce a simple, durable, and efficient packing for piston-rods or the like which is readily adaptable to all conditions in use.

In the accompanying drawings, Figure I is a diametrical section of a cylinder-head shown for the purpose of illustration and within the same one of my packing-joints disposed about a portion of a piston-rod shown in elevation. The following figures show in aggroupment all of the members that constitute my joint proper except the cap, which although perhaps not strictly a part of the joint must be in some form provided for the assembling of the remaining members. In that group, Fig. II is a perspective view of one terminal annulus. Fig. III is a similar view of one cone made up of a plurality of segments. Fig. IV is a similar view of the cylinder provided with an internal double-concave annulus against which the segmental cones are respectively seated. Fig. V is a similar view of a second cone corresponding to the one shown in Fig. III. Fig. VI is a similar view of the second terminal annulus corresponding to the one shown in Fig. II, and Fig. VII is a similar view of the case within which the above-illustrated members of the packing may be assembled.

Referring to the numerals on the drawings, 1 indicates as representative of a member with which my packing is to be assembled a cylinder-head provided with a recess for the reception of the case 2. The depth of the recess is sufficiently greater than the height of the case to admit within its internally-threaded end an externally-screw-threaded cap-ring 3.

4 indicates by way of example of a member to be packed a piston-rod.

With respect to the parts 1, 2, and 3 it is sufficient that provision be made in any practicable manner for the operative assembling

of the case 2 with a part fixed relatively to a movable member 4, and it should be understood that the parts 1 and 3 are merely representative of such provision. Where the parts 1, 2, and 3 encircle the rod 4, (see numerals 5, 6, and 7,) sufficient space is allowed to permit of slight or usual transverse vibration of the rod 4 without material impingement of the rod against the parts 1, 2, or 3.

Assuming that the head 1 is united properly to its cylinder and that steam or other gas is introduced into such cylinder, it will be obvious from the foregoing specification and drawings that it can escape through the cylinder-head 1 only around the outer edge of the ring 3 or around the inner edge thereof between it and the rod 4. It is well understood in the art that such difficulty as there may be in packing such joints as that between the ring 3 and the case 1 is readily surmountable, and therefore the only considerable problem presented in preventing leakage between such an assemblage of parts as that shown and described and the rod 4 is with respect to the inner edge of the ring 3 and the rod 4.

Such detailed specification as the foregoing is here introduced not because it is supposed to present any novel proposition to one skilled in the art, but only to render the terms of this specification and the relations of the parts of my device clear and unmistakable.

Coming now to the consideration of that which more essentially constitutes my present invention, 9 indicates a cylinder that preferably fits loosely on all sides within the case 2 and which constitutes an assembling member for the members of my packing proper. The cylinder 9 contains an annular internal projection 10, which being provided upon its opposite sides with concave faces 11 is preferably but not necessarily made integral with the cylinder 9, which contains it. The member 10, making knife-edge contact with the rod 4, as indicated at 12, is designed to closely constrict the segmental cones (shown in Figs. III and V) into perfect contact with the rod 4, and for that reason its faces 11 are made to fit snugly the external faces of said cones. The cones are identical in shape and dimensions, are each provided with bores, and are each composed of a plu-

5 reality of segments, preferably three in number—to wit, segments 13, 14, and 15. The segments are likewise severally identical and are only assigned separate reference-numer-
 10 als for convenience in specifying them. The characteristic feature of the cone-segments is that while they are adapted to make perfect contact with the rod 4 and the faces 11 of the projection 10, as above specified, they
 15 do not when newly assembled upon the rod to be packed, of which the rod 4 affords a representation, make a complete ring or annulus. In other words, the assembled seg-
 20 ments being non-contiguous essentially constitute a broken annulus, each of the segments being separated from its neighbor by a narrow slit, as clearly shown in Figs. III and V of the drawings. The means of as-
 25 sembling the broken annuli upon the rod 4 or corresponding member suffice to prevent leakage around the rod so long as the segments of the broken annuli are non-contig-
 30 uous. When by friction between the rod 4 and the inner bore of the assembled segments the segments are so far worn away as to permit them to make contact one with the
 35 other, they are then worn out and should be replaced in order to preserve a tight joint about the rod 4. After the cones are in place
 40 within the cylinder 9 the opposite ends of the cylinder preferably extend a short distance to accommodate annuli 17 and 18, which are preferably employed, and fit snugly against
 45 the inner surface of the cylinder 9 and the face of the rod 4, respectively. One annulus—for instance, annulus 17—is seated against the inner face of the cap-ring 3, making perfect contact therewith. It will be understood
 50 from the drawings and foregoing description that steam or other pressure against the annulus 18 will drive the parts of the packing together about the rod and that therefore
 55 such pressure may be relied upon solely to render my packing, as already specified, operative for the purpose for which it is designed;
 60 but in order to keep the parts snugly in position and to prevent a possible initial leakage, however inconsiderable, I prefer to employ an annular dished spring 19 between the bottom
 65 of the case 2 and the adjacent annulus, the one illustrated being 18, but which might be 17, as the cylinder 9 and its contents are reversible.

From the foregoing description and the

55 drawings the mode of operation of my device will clearly appear to one skilled in the art; but it may be well to state that my invention operates upon the principle of breaking joints between the several packing and packed
 60 members, whereby straight passages for the possible escape of steam are eliminated and continuing perfect contact between said parts is compelled. It may be also observed that
 65 the use of objectionable springs is dispensed with and that all the operative parts of the packing are loose and capable of taking up wear as it occurs in use.

What I claim is—

1. A packing comprising a pair of non-contiguously-segmental cones provided with
 70 bores, an intermediate concave annulus, a cylinder containing the same, and means of assembling the parts.

2. A packing comprising a pair of non-contiguously-segmental cones, provided with
 75 bores, an intermediate concave annulus, a cylinder containing the same, a pair of annuli upon opposite sides of the cones respectively and means of assembling the parts.

3. A packing comprising a pair of non-con-
 80 tiguously-segmental cones provided with bores, an intermediate concave annulus, a pair of annuli upon opposite sides of the cones respectively, a spring and means of assembling the parts, substantially for the purpose
 85 specified.

4. In a packing the combination with a cylinder provided with an internal double-con-
 90 cave annular projection adapted to present a knife-edge contact with a rod working in the packing, a pair of non-contiguously-segmental cones provided with bores, and means for compelling the parts into continuous operative contact with one another.

5. In a packing the combination with a re-
 95 cessed member, cap, ring and case, of a cylinder loose within the case, a pair of non-contiguously-segmental cones provided with bores and intermediate concave annulus and annuli in the opposite ends of the cylinder
 100 within the case.

In testimony of all which I have hereunto subscribed my name.

RICHARD M. SHAFFER.

Witnesses:

N. G. WHITE,
 P. R. M. CRUM.