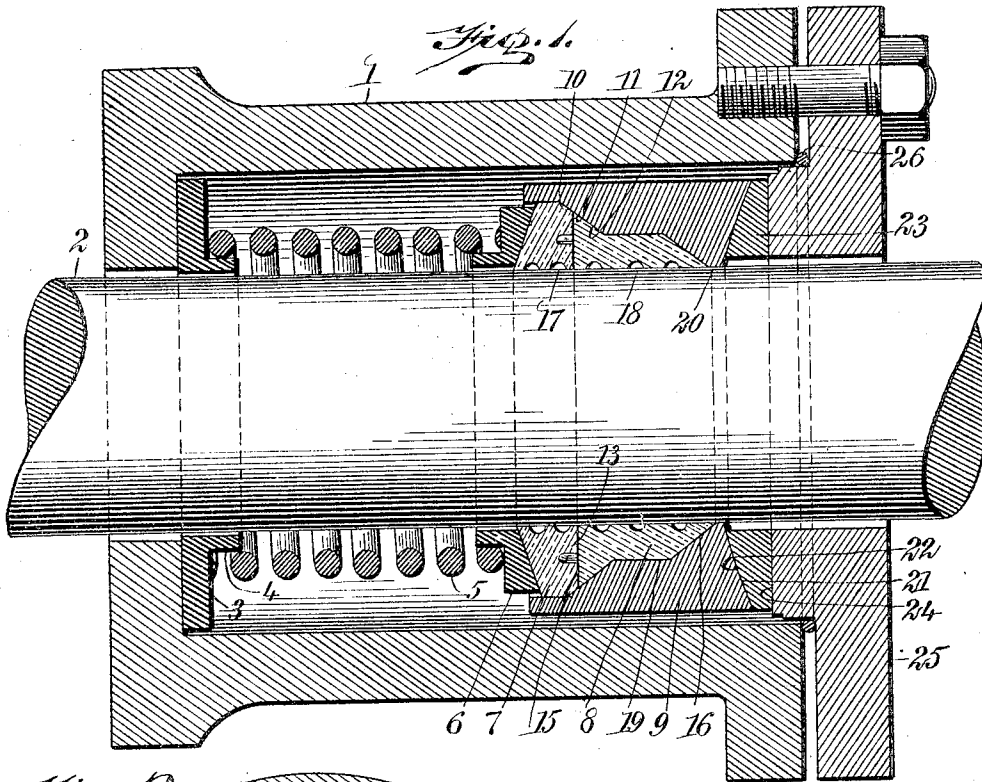
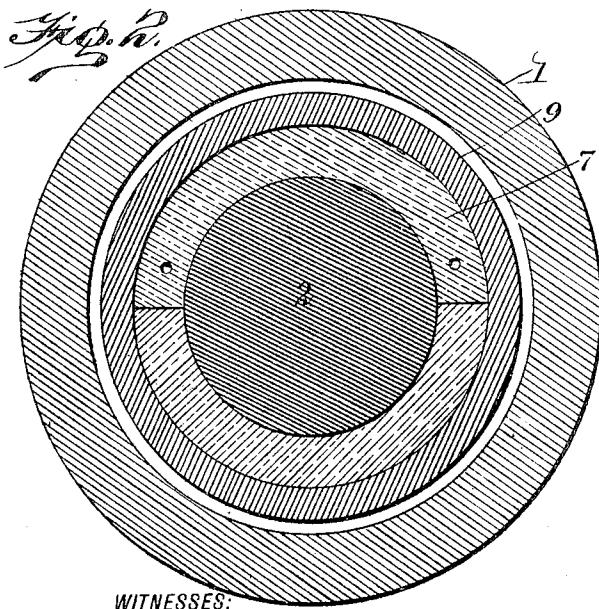
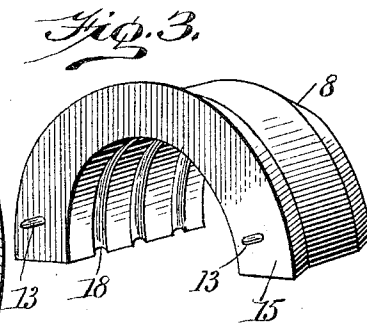


No. 808,512.

PATENTED DEC. 26, 1905.

C. L. COOK.
PISTON ROD PACKING.
APPLICATION FILED APR. 14, 1905.



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CHARLES LEE COOK, OF LOUISVILLE, KENTUCKY.

PISTON-ROD PACKING.

No. 808,512.

Specification of Letters Patent.

Patented Dec. 26, 1905.

Application filed April 14, 1905. Serial No. 255,501.

To all whom it may concern:

Be it known that I, CHARLES LEE COOK, a citizen of the United States, and a resident of Louisville, in the county of Jefferson and State of Kentucky, have invented a new and Improved Piston-Rod Packing, of which the following is a full, clear, and exact description.

This invention relates to improvements in packing devices for piston-rods or the like, the object being to provide a rod-packing having a triple-cone ring in the combination, thus giving to said ring a greater volume of metal, and therefore greater strength than would be possible in a ring having a continuous taper from its bore to its periphery.

Other objects of the invention will appear in the general description.

I will describe a piston-rod packing embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal section of a rod-packing embodying my invention. Fig. 2 is a cross-section thereof, and Fig. 3 is a perspective view of one of the segments of a ring.

Referring to the drawings, 1 designates a stuffing-box of the ordinary construction, through which the rod 2 passes. Within the stuffing-box and abutting against one end thereof is a guide-ring 3, of suitable yielding material, the said guide-ring having an inwardly-extended flange 4, with which the adjacent end coil of a spring 5 engages. This holds the spring 5 in central position and also prevents the spring from coming in contact with and cutting the rod. The spring 5 is designed to give sufficient tension to a follower-ring 6, with which it engages, to prevent the unseating of the packing when it is subjected to vacuum or to any other cause when the steam-pressure is not sufficient to retain the proper adjustment. The follower 6 holds the Babbitt-metal packing-rings 7 8 within a casing 9. The follower 6 has its face beveled to about twenty degrees, and the ring 7 has a corresponding bevel engaging with the bevel of the follower. The follower under the influence of the spring holds the ring 7 tightly against the ring 8, which is

in the form of a double cone, and at the same time compresses the ring 7 to the rod.

The ring 7 is made in segments of equal length, as is also the cone-ring 8. The ring 7 has a short bevel portion 10, which fills out the space of the outward bevel 11 of the casing, the remaining space being filled with the outwardly-inclined or bevel-surface 12 of the cone-ring 8. It will be noted that the coincidental taper or incline of the double-cone ring 8 is less in length than that of the taper 11 of the casing 9. By this means the inclined or beveled edge 10 of the ring 7 overlaps the opening of the double-cone ring caused by cutting said ring into two segments of equal length. The openings in the ring are left so that the ring may automatically adjust itself to wear. The overlapping of said bevel 10 hermetically seals said openings. The long bevel of the ring 8 seals the openings of the joint-ring 7, which is cut in the same manner and for the same purpose as above described for the double-cone ring 8.

On one segment of the double-cone ring 8 and equidistant from the ends are lugs 13, projecting from the plane surface 15 of the double-cone ring which serves to hold all the openings of the rings 7 and 8 in a transverse position, making it impossible for said openings to be disposed in a coincidental position which would allow a straight passage for steam.

The tapered walls 11 and 16 of the casing 9, the corresponding tapers of the double-cone ring 8, and the taper of the follower 6 all go to make up a triple cone compound segmental packing-ring comprised of four segments, two in each division 7 and 8. The ring 7 has interior annular channels 17, and the ring 8 has interior annular channels 18, these channels being designed to automatically carry or apply lubricant. The rings properly inserted in the casing 9 become as adjusted to the rod by the above-described arrangement when driven forward in the casing 9 or in a direction opposite the spring-guide ring 3 by the tension of the spring 5 and steam-pressure exerted on the follower 6.

It will be noted that the two tapers of the casing, which are about fifty degrees bevel, are separated by an intervening cylindrical wall 19. The purpose of the said two tapers separated by the cylindrical wall is first to allow the double-cone ring 8 a straight projection coincidental with the cylindrical wall

of the ring 8 between its bevels or inclines, thus giving to said double-cone ring 8 a greater volume of metal, hence greater strength, than would be possible in a ring designed with a continuous taper from its bore to its periphery. The second purpose allows a greater bearing on the rod than that resulting from the continuous-taper designed ring. This greater bearing insures greater durability and would be especially valuable in all severe service of engine operation. The volume of metal and length of bearing may be governed, as desired, by increasing or decreasing the straight cylindrical wall of the double-cone ring and accordingly the corresponding straight projection of the casing. The third purpose of the double-taper scheme in the casing and on the double-cone ring is to better guide or keep the casing central around the rod, and it has also been found that the arrangement is a better protection against the flaking through of the alloy of which the rings 7 and 8 are composed at the bore 20 of the casing and the rod.

The outer end of the casing 9 is concaved, as indicated at 21, and seated thereon is a convex surface 22 of a ring 23, practically forming a ball-and-socket joint which conforms to any angularity of the rod induced by ill alinement of the engine and, further, prevents leakage. The outer or plane surface 24 of the ring 23 engages against a corresponding surface of the gland 25, and these surfaces, like the concave and convex surfaces, are to be ground so as to form close contact. The flat abutting surface of the ring 23 and the gland allows a vertical or lateral play of the rod 2 without leakage. The gland 25 is shown as of the barrel type, but any design of gland that conditions make necessary may be used and fitted to the ring 23. A steam-tight joint is made between the gland 25 and the stuffing-box 1 by means of a copper ring 26, which is fitted to the gland. A joint at this point may also be made by grinding or using any approved gasket material when conditions are unfavorable to the copper-ring method.

Experience has proved that springs made of such material as is commonly used in spring-manufacture and requiring the ordinary process of tempering by oil, water, &c., do not retain their elasticity when continuously subjected to high steam or gas temperatures. Especially is this trouble met with and formidable or serious in superheated steam service, which has recently been introduced into mechanical practice. I therefore employ any spring-steel for the specific purpose of rod-packing springs which is hardened by the process of rolling, and thus made elastic. Such a spring is indicated at 5. The method of hardening is in the production of great molecular compactness, which results in the elastic properties men-

tioned and which are not susceptible to change when subjected to temperatures less than 700° Fahrenheit, as is the case with springs tempered in the ordinary way.

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

1. In a rod-packing, a double-cone packing-ring, a casing therefor consisting of a single piece of material and having correspondingly-shaped cones or inclines, and means for pressing the ring into the casing.

2. A piston-rod packing comprising a ring having oppositely-extended but parallel inclines at its ends and a cylindrical portion between said inclines, a casing having interior inclines corresponding to the inclines of the ring, and also having a cylindrical portion corresponding to the cylindrical portion of the ring, and means for pressing the ring into the casing.

3. In a piston-rod packing, a casing surrounding the rod and having an outwardly-flared or beveled portion at its inner end and an inwardly-flared or beveled portion at its outer end, a ring having an outwardly flared or inclined portion for engaging against a portion of the surface of the first-named incline of the casing, the said ring also having an incline or bevel for engaging with the second-named incline or bevel of the casing, a ring seated in the casing and engaging with the first-named ring, the said last-named ring having a short bevel or incline for completing the bearing-surface against the first-named incline of the casing, and a spring-pressed follower engaging with said last-named ring.

4. In a piston-packing, a stuffing-box, a double-cone ring surrounding the shaft within the stuffing-box, a casing within which the double-cone ring is seated, a follower, a yielding guide-ring engaging with the end of the stuffing-box opposite the double-cone ring, and a spring engaging with said yielding guide-ring and with the follower, the said spring being centered by the yielding ring.

5. In a piston-rod packing, a stuffing-box, a double-cone ring for surrounding the shaft extended through the stuffing-box, a casing for said double-cone ring, means for pressing the double-cone ring into the casing, the outer end of said ring being concaved, a gland on the stuffing-box, and a ring arranged between the gland and the casing, the said ring having a convex surface for engaging in the concave surface of the casing and a flat outer surface for engaging against the corresponding inner surface of the gland.

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

CHARLES LEE COOK.

Witnesses:

C. F. ADAE,
ARTHUR DOSS.