No. 844,525. PATENTED FEB. 19, 1907.

H. W. LEE.

PISTON ROD PACKING.

APPLICATION FILED FEB. 5, 1906.

FIG. 1.

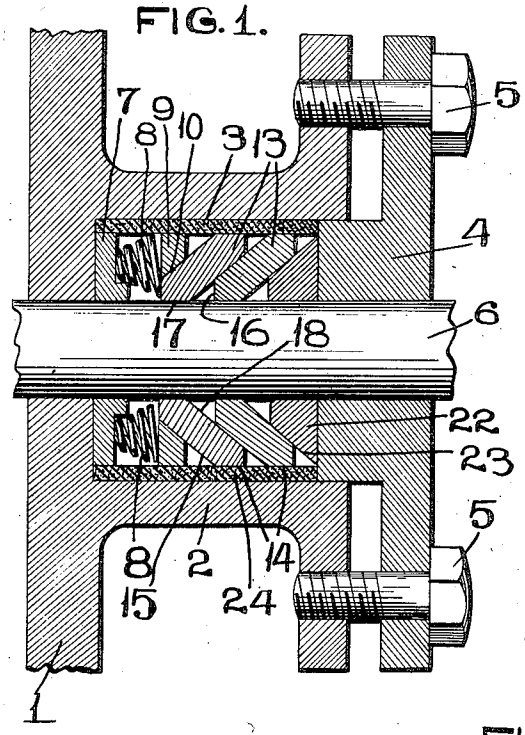


FIG. 2.

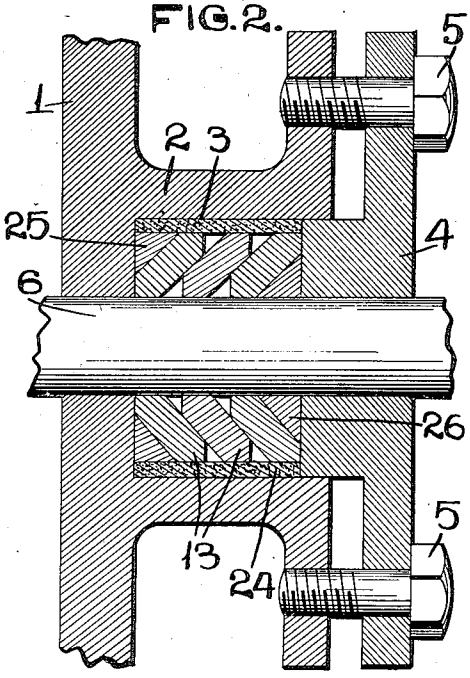


FIG. 3.

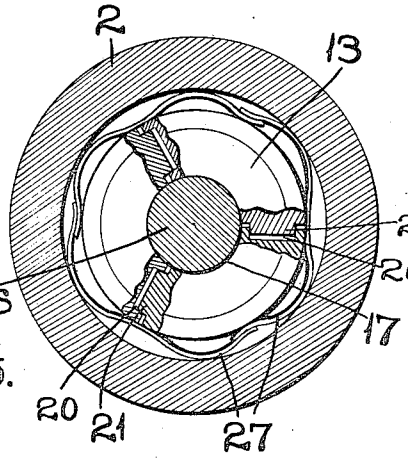
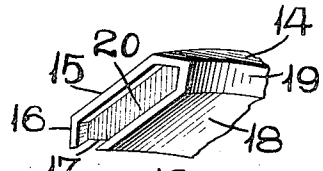


FIG. 4.



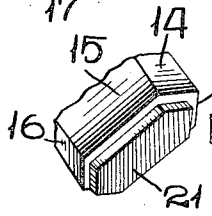
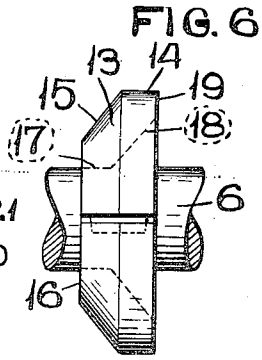


FIG. 5.

FIG. 6



ATTEST—

E. M. Harrington.

M. D. Smith.

INVENTOR—

Henry W. Lee.

By Kigdon & Longan attys.

UNITED STATES PATENT OFFICE.

HENRY W. LEE, OF ST. LOUIS, MISSOURI.

PISTON-ROD PACKING.

No. 844,525. Specification of Letters Patent. Patented Feb. 19, 1907.

Application filed February 5, 1906. Serial No. 299,464.

To all whom it may concern:

Be it known that I, HENRY W. LEE, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Piston-Rod Packing, 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 piston-rod packing; and the object of my invention is to construct a simple inexpensive packing for piston-rods which may be readily applied to stuffing-boxes inside the glands thereof and which will very effectively pack said rod, and which packing will continue to snugly fit against the surface of the rod even when the packing-surfaces of the packing or the surface of the rod becomes worn from continued use.

A further object of my invention is to provide a packing-ring composed of a number of segments, the ends of which are fitted together by a tongue and groove, which arrangement very effectively prevents the passage of steam or other fluid-pressure past the packing-ring when in operative position within the stuffing-box.

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

Figure 1 is a vertical section taken through the center of a stuffing-box and gland in which is located a series of my improved packing-rings. Fig. 2 is a vertical section similar to Fig. 1 and illustrating a modified arrangement of the packing in the stuffing-box. Fig. 3 is a vertical transverse section through a stuffing-box, showing one of the packing-rings therein and a modified form of the spring for pressing said ring onto the piston-rod. Fig. 4 is a perspective view of the end of one of the segments of the packing-ring, in which is formed a recess. Fig. 5 is a perspective view of the opposite end of the segment and which is provided with a tongue or projection which is adapted to fit in the recess in the end of the adjacent section. Fig. 6 is a side elevation of one of the segmental portions in position on the piston-rod.

Referring by numerals to the accompanying drawings, 1 indicates the head of a cylinder; 2, the stuffing-box integral therewith; 3, the annular chamber in said stuffing-box; 4, the gland in the outer end of the stuffing-box, and 5 the bolts which maintain the gland in the stuffing-box and by means of which the packing-rings are tightened in the stuffing-box.

Arranged within the annular chamber 3, against the head 1 and upon the piston-rod 6, which operates through the stuffing-box and gland, is a ring or washer 7, the diameter of which is slightly less than the internal diameter of the chamber 3. Positioned against the outer face of this ring or washer is the small end of expansive conical coil-springs 8. Arranged against the outer large ends of these coil-springs is a ring or washer 9, equal in diameter to the ring or washer 7 and provided on its inner side with an inclined or beveled face 10.

The segmental conical packing-rings that are made use of in the stuffing-box each comprise a series of segmental sections 13, each having a flat periphery 14, the inclined front face 15, the straight forward end 16, an inner curved surface 17, which bears directly on the surface of the piston-rod, an inner inclined surface 18, parallel with the outer inclined surface 15, and the straight rear end 19, which is parallel with the straight forward end 16. One end of each segment is provided with a recess 20, which extends all the way to the inner bearing-surface 17, and the opposite end of each segment is provided with a projecting lug 21, which corresponds in shape with the adjacent recess 20 and in which it is adapted to fit when the segments making up a ring are fitted together. A number of these segmental rings are fitted together, with the smaller end of each conical ring arranged in the larger end of the adjacent ring, which arrangement brings the inclined faces 15 and 18 into contact with one another. The rings are so arranged as that the joints between the segments of the adjacent rings are offset, thus effectively preventing the passage of any steam or liquid pressure between the ends of the segments. The diameters of the rings when fitted together in the stuffing-box are approximately equal to the diameters of the rings or washers 7 and 9. Fitted into the outer one of the conical rings is a conical ring or washer 22, having an inclined outer face 23, which snugly fits within the larger end of the outermost segmental packing-ring. Fitted

around all of the packing-rings and the rings or washers 7, 9, and 23 is an elastic cylinder or gasket 24, of rubber or analogous material, the tendency of which is to yieldingly press the segments of the conical packing-rings inwardly onto the surface of the piston-rods 6, and this gasket also serves as an elastic packing between the outer portions of the packing-rings and the interior surface of the annular chamber 3. The inner end of the gland 4 bears against the outer face of the ring or washer 22, and when the screws 5 are tightened to force the gland into the stuffing-box the segmental rings are tightly forced together and are yieldingly opposed by the resistance offered by the coil-springs 8. Thus said segmental conical packing-rings are very snugly fitted onto the piston-rod and will continue to tightly engage against said rod, even when the inner surfaces 17 or the surface of the rod becomes worn, and thus steam or liquid pressure is at all times effectively prevented from passing through the stuffing-box.

In Fig. 2 I have shown a construction wherein the washers 7 and 9 and the springs 8 are dispensed with, and where this construction is made use of a ring 25, triangular in cross-section, is arranged outside the innermost conical packing-ring, and a similar smaller ring 26, triangular in cross-section, is arranged within the outermost conical packing-ring, thus filling up the corners of the annular chamber 3 between the inner and outer packing-rings. In some instances, where the stuffing-boxes are subjected to extreme heat, which would affect the rubber gaskets 24, each packing-ring is provided with a series of leaf-springs 27, the ends of which overlap on the outer surface 14 at the center of each segment, and the centers of which springs bear upon the joints between said segments. These springs very effectively hold the rings in position on the piston-rod and cause said rings to snugly fit thereon when the inner surfaces 17 or the surface of the rod becomes worn.

A piston-rod packing of my improved construction is very simple, strong, and durable, easily applied to stuffing-boxes without necessitating the removal of the piston-rod from the cylinder, and very effectively packs the stuffing-box and prevents the escape of steam or other fluid pressure from the cylinder through the stuffing-box.

I claim—

1. A piston-rod packing, comprising a series of overlapping conical packing-rings arranged on the interior of a stuffing-box, each of which packing-rings comprises a series of segmental sections, each provided with the curved periphery 14, the inclined front face 15, the straight forward end 16, the inner curved surface 17 parallel with the periphery 14, the inner inclined surface 18 parallel with the inclined front face 15, and the straight rear end 19 parallel with the straight forward end 16; substantially as specified.

2. A piston-rod packing, comprising a series of overlapping conical packing-rings arranged on the interior of a stuffing-box, each of which packing-rings comprises a series of segmental sections, each provided with the curved periphery 14, the inclined front face 15, the straight forward end 16, the inner curved surface 17 parallel with the periphery 14, the inner inclined surface 18 parallel with the inclined front face 15, the straight rear end 19 parallel with the straight forward end 16, and the meeting ends of the segmental sections of each ring overlapping one another; substantially as specified.

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

HENRY W. LEE.

Witnesses:
M. P. SMITH,
JOHN C. HIGDON.