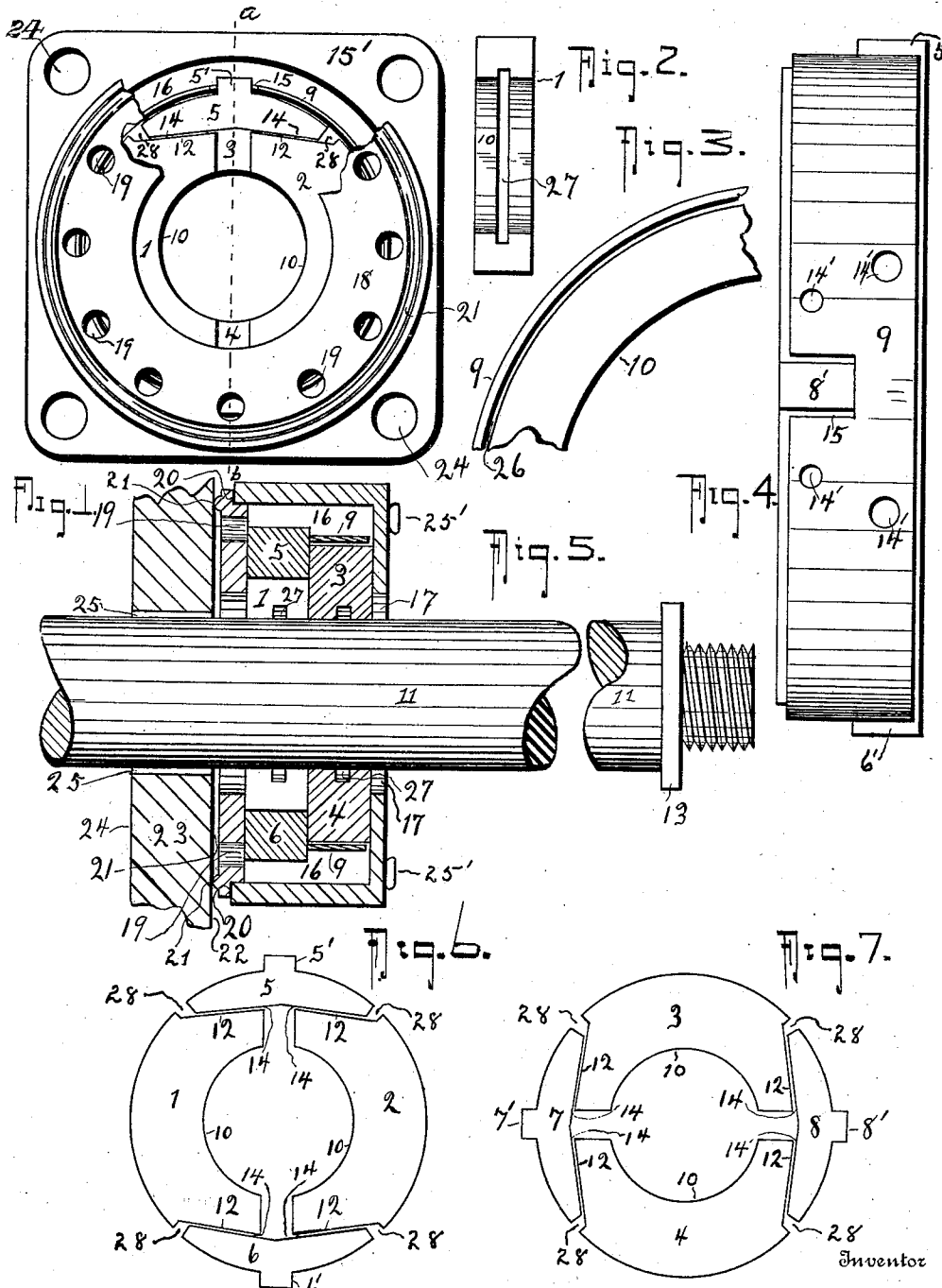


No. 858,119.

PATENTED JUNE 25, 1907.

H. THOMPSON.
METALLIC PACKING.

APPLICATION FILED MAR. 7, 1906.



Witnesses

Arthur Sturges

Pauline E. Sturges

By

Harry Thompson

Hiram A. Sturges
Attorney

UNITED STATES PATENT OFFICE.

HARRY THOMPSON, OF COUNCIL BLUFFS, IOWA.

METALLIC PACKING.

No. 858,119.

Specification of Letters Patent.

Patented June 25, 1907.

Application filed March 7, 1906. Serial No. 304,692.

To all whom it may concern:

Be it known that I, HARRY THOMPSON, a citizen of the United States, residing at Council Bluffs, in the county of Pottawattamie and State of Iowa, have invented certain new and useful Improvements in Metallic Packing, of which the following is a specification.

My invention relates to improvements in metallic packing for use in connection with a steam cylinder and piston rod, my object being to present a metallic packing which will be more simple and economical in construction than heretofore employed and which will be fully effective for the purposes intended.

The invention is designed to utilize steam pressure upon the surface of the packing to effect a contact thereof upon the surface of the piston rod and prevent escape of steam at all times, and which, by reason of the devices employed, operates very materially to avoid friction and to reduce the wear upon the surface of the piston rod.

With these and other objects in view, the invention presents a novel construction and arrangement of parts fully described herein, and shown by the drawings, wherein,—

Figure 1 represents a face or inner-end view of the invention, the contact plate being partly broken away to disclose other parts in operative position. Fig. 2 represents a view, somewhat reduced, of the inner or concave surface of a segmental portion to exhibit lubricating groove. Fig. 3 represents an end-view of a portion of a segment and inclosing-band, somewhat enlarged, to clearly show the annular chamber 26. Fig. 4 is a view intended to illustrate the means for sustaining the segmental portions in a relative position, by means of the angularly formed recesses adapted to receive the heads of the shoes. Fig. 5 represents portions of a cylinder head and piston rod, the invention being shown operatively mounted and bisected on the line *a b* of Fig. 1. Figs. 6 and 7 are details of Fig. 1, illustrating segmental parts and compression shoes employed, showing their relative position.

I employ the mutilated segments 1, 2, 3 and 4 and the compression shoes 5, 6, 7 and 8 shown in Figs. 6 and 7 and assemble them within the annular inclosing band 9 as shown in Figs. 1, 3, 4 and 5. The mutilated segments are similar in form as compared with each other and are employed in pairs for the

formation of two bifurcated rings or collars, the concave walls 10 thereof making contact, as a metal packing, upon the surface of the piston rod 11. The compression shoes 5, 6, 7 and 8 are comparatively similar in form, and one pair of said shoes are employed in connection with each pair of segments for the purposes of assisting a movement of the segments in a direction toward each other and of preserving the continued relative position of each pair of segments with reference to each other, more particularly described hereinafter.

The outer ends of each segment is mutilated or incised to form the inclined walls 12, and when assembled, the highest point of this wall is nearest the apex and recedes as it approaches the circumference. Each shoe is formed with a head-portion, as the heads 5', 6', 7' and 8', a truncated segmental body and the inclined inner walls 14, and when mounted in operative position in connection with the bifurcated collars, the inclination of the inner walls of the compression-shoes corresponds to the inclination of walls 12.

The inclosing-band 9 has circular outer and inner walls and is provided with a suitable number of apertures 14' to permit steam to pass freely therethrough, and is provided with the angularly formed recesses 15 one of said recesses being provided for and adapted to contain one of the heads 5', 6', 7' and 8' of a compression shoe.

I provide a housing-box 15' having a circular chamber 16 of greater diameter than that of band 9 and of somewhat greater depth than the combined thickness of both bifurcated collars, and the devices thus far described are placed within the housing box in a manner to be presently described. It will be noted that two of the angularly formed recesses 15 are incised upon the same edge of the annular inclosing band 9 diametrically opposite each other, two other similar recesses being formed upon the opposite edge of said band also diametrically opposite each other; and as thus placed these recesses are 90 degrees apart, and, as already mentioned these recesses are adapted to contain the heads of the compression-shoes. Segments 3 and 4 are placed within the inclosing-band 9 opposite each other and occupy the same plane with their convexed-walls closely adjacent to the inner wall of the inclosing-band 9. Shoes are then inserted within the inclosing band, a shoe occupying a part of the space ad-

jacent to the inclined faces 12 of the segmental portions, the heads 7' and 8' coming each within a recess 15, and as thus placed, the shoes 7' and 8' are upon the same plane as the segmental portions 3 and 4. The compression-shoes 5 and 6 are similarly disposed on one plane and placed within the band 9 and seated parallel with and contactingly upon the first pair of segments and shoes in a manner so that the heads 5' and 6' will enter a recess 15, and as thus arranged the parallel sides of the segmental portions are adapted to make close contact with each other but are free to have a sliding movement while making this contact; the respective heads within the recesses 15, during such sliding movement, preserve an approximate distance apart of 90 degrees of each compression-shoe.

The piston rod 11 is usually provided with an integral collar 13 and I provide a circular opening 17 (Fig. 5.) within the outer wall of the housing-box having a diameter equal in extent to the diameter of the collar 13. I also construct the circular plate 18 having the series of ports 19 near the outer rim. The plate 18 is provided with an inner annular groove 20 adapted to be seated contactingly upon the face of the housing-box 15', also is provided with an outer annular ridge 21 adapted to make a contact upon the outer surface 22 of the cylinder-head 23. The housing-box 18 is provided with convenient openings 24 through which are passed screw-bolts 25' to sustain the invention rigidly and operatively upon the cylinder-head 23.

From the description thus given it will be understood that steam passes from the side 24 of the cylinder-head 23 through the annular aperture 25 and is forced through the openings 19 of the plate 18, and within the annular recess 26, and is forced upon the outer surfaces of the segmental portions and compression-shoes, driving these parts toward a common center. The inner circular surfaces 10 of the segmental portions make close contact upon the surface of the piston-rod, thereby preventing the escape of steam which otherwise would escape by passing along the surface of the piston-rod.

I provide the annular lubricating grooves 27 upon the inner surfaces of each bifurcated collar which operate as storage wells for oil for lubrication of piston rod 11. It is advantageous to allow a close contact of the outer parallel faces of the segmental portions with the confining inner walls of the housing-box and plate 18, and therefore the band 9 has a somewhat less width than the combined thickness of the segmental portions, as clearly shown in Fig. 4. Also this construction permits of a more ready passage of steam to a point between the inner surface of band 9 so that steam pressure may be entered upon the convexed surface of the segmental

portions; also this difference in widths operates largely to prevent the wear of the edges of said band 9.

It will be noted that the segmental portions are pressed upon the surface of the piston rod, by this construction, transversely and simultaneously from opposite directions; the relative positions of the segmental portions with reference to each other are preserved uniformly at all times; and it will be observed that the pressure of the shoes and segments upon the piston rod is relaxed, when steam-pressure is removed, thereby resulting in a moderate degree of wear; and on account of the inclination of the inner faces 14 of the shoes when pressed upon faces 12 of the segments the closure of the segmental-portions upon the piston-rod is greatly facilitated. As the inner circular surfaces of the segments become worn because of continued friction upon the rod, they gradually approach each other, and provision is therefore made of compression-shoes having a length and shape to provide the divergently formed recesses 28 provided at the ends of the segmental portions.

The parts employed are few and easily constructed and highly effective as a metal packing for the purposes designed.

What I claim as my invention is,—

1. In combination, a packing as described, a packing-box, a piston-rod; rings formed with flat end-surfaces contactingly seated in the packing-box and making a closure upon the piston-rod; an annular inclosing-band provided with intake ports and angularly-formed recessed portions and seated within the packing-box in a manner to inclose said rings and to form a chamber between the annular inclosing-band and the wall of the packing-box; each of said rings being composed of inner segments having oppositely-disposed flat and convergent end-portions and of outer segmentally-formed shoes seated upon oppositely-disposed flat and convergent end-portions of said segments; each of said outer segmentally-formed shoes having an outer head seated in one of the angularly-formed recessed portions of said annular inclosing-band, and having flat transverse inner walls formed convergently and extending centrally from the circumference.

2. In combination, a packing as described, a packing-box, a piston-rod; rings formed with flat end-surfaces contactingly seated in the packing-box and making a closure upon the piston-rod; an annular inclosing-band having a less width than the combined thickness of said rings and provided with intake ports and angularly-formed recesses and seated within the packing-box in a manner to inclose said rings and to form a chamber between the annular inclosing band and the wall of the packing box; each of said rings comprised of inner segments formed with a

groove on its concave surface and having oppositely-disposed flat and convergent end-
 portions and of outer segmentally-formed
 shoes seated upon said oppositely-disposed
 5 flat and convergent end-portions of said seg-
 ments; each of said outer segmentally-formed
 shoes having an outer head seated in one of
 the angularly-formed recesses of said annular
 inclosing-band and having inner bearing
 10 faces formed parallel with the oppositely-dis-
 posed flat and convergent end-portions of the
 inner segments.

3. In combination, a packing as described,
 a packing-box, a piston-rod; rings formed
 15 with flat end-surfaces contactingly seated in
 the packing-box and making a closure upon
 the piston-rod; each of said rings being com-
 posed of inner segments having oppositely-
 disposed flat and convergent end-portions
 20 and of outer segmentally-formed shoes seat-
 ed upon said oppositely-disposed flat and con-
 vergent end-portions of said segments; each
 of said outer segmentally-formed shoes hav-
 ing flat transverse inner walls formed con-
 25 vergingly and extending centrally from the
 circumference.

4. In combination, a packing as described,
 a packing-box, a piston-rod; rings formed
 with flat end-surfaces contactingly seated in

the packing-box and upon the piston-rod; 30
 each of said rings consisting of inner segments
 formed with a groove upon its concave sur-
 face and having oppositely-disposed flat and
 convergent end-portions and of outer seg-
 35 mentally-formed shoes seated upon said oppo-
 sitely-disposed flat and convergent end-por-
 tions of said segments; each of said outer seg-
 mentally-formed shoes having inner faces
 formed parallel with the oppositely-disposed
 flat and convergent end-portions of said inner 40
 segments.

5. In metallic packing, the combination of
 duplicate packing-ring segments and seg-
 mentally-formed shoes; each end of each seg-
 ment having flat bearing-faces formed con- 45
 vergently from its inner perimeter to its cir-
 cumference; said segmentally-formed shoes
 seated adjacent to and having inner bearing-
 faces formed parallel with said convergently-
 formed flat bearing-faces of said packing seg- 50
 ment.

In testimony whereof I have affixed my
 signature in presence of two witnesses.

HARRY THOMPSON.

Witnesses:

HIRAM A. STURGES,
 W. E. JOHNSON.