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Fred. Curtis. Atty.

UNITED STATES PATENT OFFICE.

JAMES T. GILMORE AND JOHN H. CARTER, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN METALLIC PACKINGS FOR PISTON-RODS, &c.

Specification forming part of Letters Patent No. **149,851**, dated April 21, 1874; application filed September 10, 1873.

To all whom it may concern:

Be it known that we, JAMES T. GILMORE and JOHN H. CARTER, of Boston, Suffolk county, Massachusetts, have invented certain Improvements in Metallic Packings for Piston-Rods, &c., of which the following is a specification:

This improvement is based upon a class of packings for piston-rods and other objects, in which a series of segmental plates are employed, disposed within a steam-tight box encircling the piston-rod, and pressed closely up to it by springs, in order to produce a steam-tight joint, and prevent waste of steam. A particular example of this class of valve, and one to which our improvement has especial reference, is that shown in Letters Patent of the United States numbered 132,024, and issued on the 8th day of October, 1872, to Phillip W. Richards, of Boston, Massachusetts, as inventor, in connection with other parties as assignees. In this Richards packing there is employed an annular plate or washer, laid flatwise upon each series of segmental plates, and fitted thereto with a ground or other perfect joint, to prevent passage of steam, springs being placed between the lower washer and the bottom of the box, which drive the entire series of segmental plates and rings outward, and so as to produce a steam-tight joint between the outer washer and the head or cap of the box which incloses the different parts, the abutting faces of the last-named washer and of the head of the box being ground or nicely fitted, in order that any steam which may clandestinely find its way to the interior of such box shall not escape about the piston-rod, which passes through its head. In the practical use of this packing, we have found that the washers or "following-rings," as therein employed, are practically useless, as steam escapes through or about them or the segments, and the wear upon them is one-sided, unequal, and very objectionable; therefore, in seeking for some remedy for this evil, we have devised our present improvement, which has been found to answer the purposes admirably. In carrying out our improvement, we employ a box or case to contain the parts, but we discard a cap or cover, and reverse the position of it shown in the Richards patent,

and bolt it directly to the stuffing-box cap, if applied to an old engine, or to the cylinder-head, if a new engine. We take no especial pains to exclude steam from the interior of the box, as no harm results from its presence.

The drawings accompanying this specification represent, in Figure 1, a vertical section of a rod-packing device containing our improvements, Fig. 2 being an end view of the rod and clasp embracing it, and the packing-rings.

In these drawings, A represents a circular box or case, the outer end or head of which is pierced with a hole, B, of a diameter considerably larger than that of the piston-rod C, which passes through it, the open end of said box A being securely bolted to the outer end or cap of the stuffing-box, if the device is applied to old engines, or to the cylinder-head when applied to new engines, as in the latter instance no stuffing-box exists, this device taking its place. F F and G G represent two sets of segmental plates, the inner concave faces of which hug closely up to the piston-rod C, such plates being so arranged as to break joints, and being impelled toward and against the periphery of the rod by suitable springs H H, arranged within a four-armed yoke or clasp, I, as shown in the drawings, such plates serving to effectually exclude steam, and prevent the same from creeping outward about the rod which passes through the yoke. The lower or inner part of the yoke I terminates in a concentric tapering or conical head, J, while embracing or inclosing this head is an annular plate, or flat ring, or washer, K, which encircles the rod, the joint between the ring and head J being a ground one, to prevent passage of steam at this point. The abutting faces of the head or teat J, and the opening of the ring K are not flat faces, but are curvilinear or bowl-shaped, as represented, in order that they may rock or sway upon one another, for purposes hereinafter stated. The orifice B in the head or closed end A' of the box A is, as before stated, of somewhat larger diameter than that of the piston-rod, and within the opening or seat B we dispose a second annular plate or flat ring, L, which encircles the piston-rod, the joint between the ring L and the orifice B being simi-

lar to that above described as existing between the teat J and plate K—that is to say, as composed of curvilinear faces, the joint in fact being, practically, a semi-ball-and-socket one.

It frequently happens, in the use of the valve above mentioned, that the tilting or swaying of the piston-rod out of axial alignment with the engine-cylinder and the box A, results in unequal wear upon the rings or plates which abut against the opposite inner ends of such box, and steam is allowed to escape through the orifices which receive the piston-rod, and wear, once having begun, oftentimes rapidly destroys the rings, or renders the packing-box inoperative.

Owing to the nature of the joints between the teat J and ring K, and the ring L and orifice B, the piston-rod is allowed to sway or tilt out of alignment with the axis of the cylinder or of the box A without injury, as the rings K and L follow its movements, and, owing to their semi-ball-and-socket character, always maintain the same steam tight joint. By

this means no steam is allowed to pass from the outer end of the box A, and the wear upon the parts is very slow, and is equal in all directions.

We claim—

1. The combination, with the inverted box A, and the segmental packing-plates F G, of the ring or washer L, constructed and operating in connection with said parts, substantially as and for the purposes described.

2. The combination, with the ring L, formed and operating as described, of the conical head or teat J, and ring K, substantially as and for purposes stated.

3. The yoke or clasp I, with its arms embracing the segments F G, and its conical teat J operating with the ring K, as explained.

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