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R. C. LOCHRIDGE & A. P. FARRIS.

METALLIC PACKING FOR RODS.

(Application filed June 2, 1902.)

(No Model.)

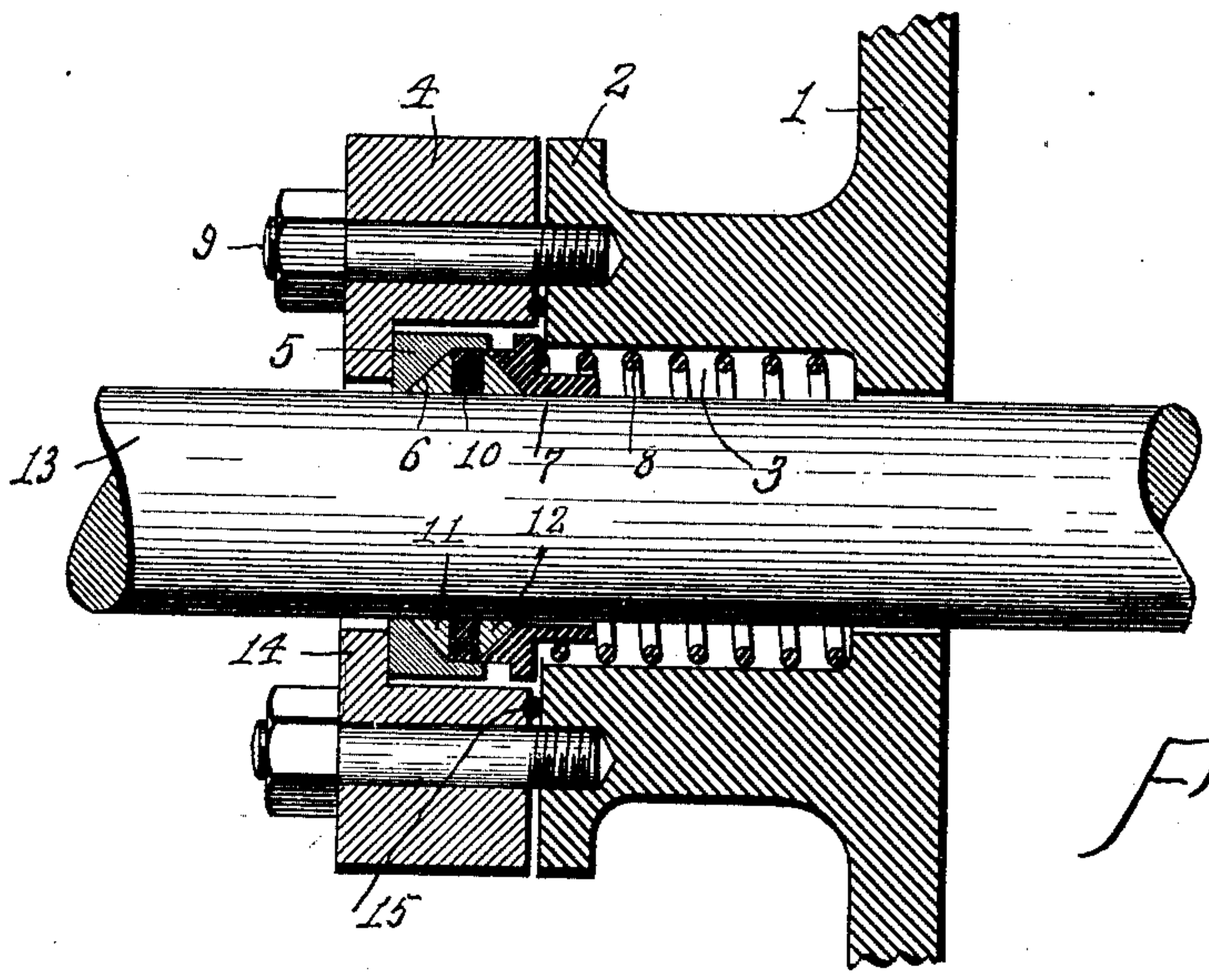

FIG. 1.

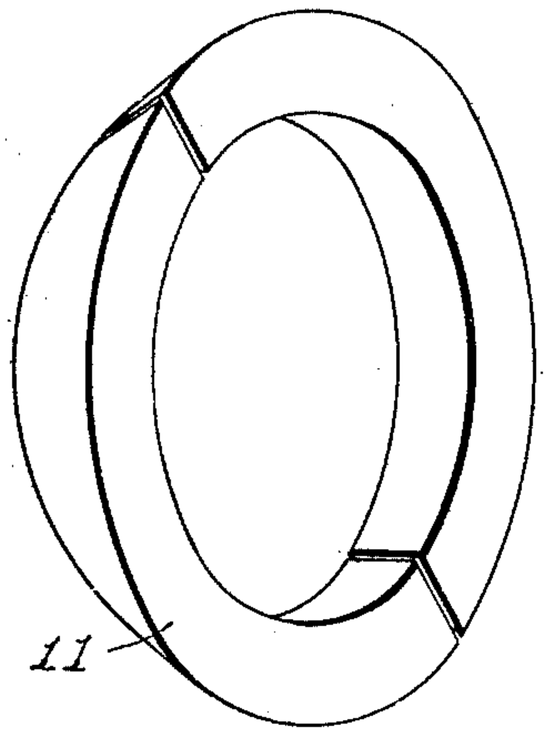

FIG. 2.

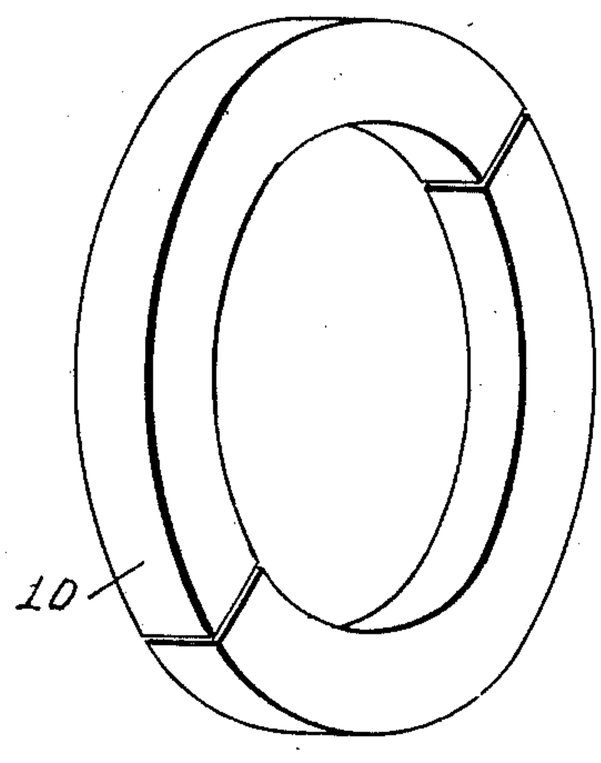

FIG. 3.

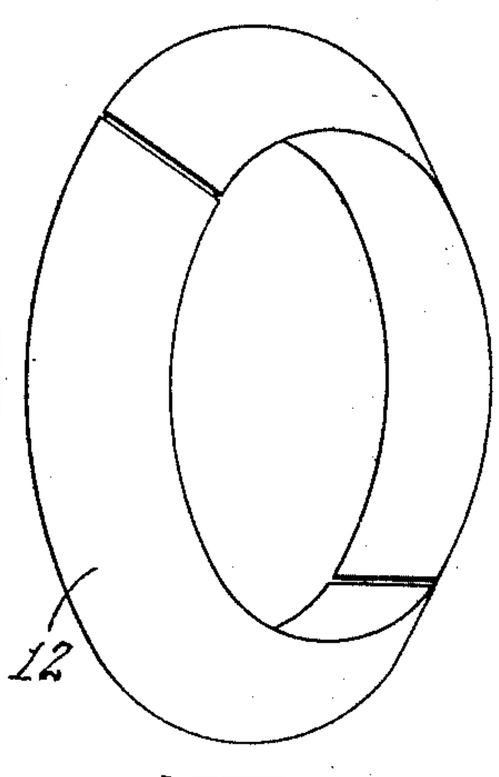

FIG. 4.

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METALLIC PACKING FOR RODS.

SPECIFICATION forming part of Letters Patent No. 717,008, dated December 30, 1902.

Application filed June 2, 1902. Serial No. 109,831. (No model.)

To all whom it may concern:

Be it known that we, ROBERT C. LOCHRIDGE and ARTHER P. FARRIS, citizens of the United States, residing at Paris, Henry county, Tennessee, have invented certain new and useful Improvements in Metallic Packing for Rods, of which the following is a specification.

This invention pertaining to improvements in metallic packing for the rods of pistons, valves, and the like will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a diametrical section of a packing-box fitted with our improved packing; and Figs. 2, 3, and 4 perspective views of the soft-metal rings.

In the drawings, 1 indicates a portion of the head or wall of the chamber in connection with which the packing is to be employed on a rod reciprocating into and out of that chamber; 2, the packing-box projecting therefrom as in ordinary stuffing-boxes designed for fibrous packing; 3, the usual packing-chamber therein; 4, a cap separably secured with a tight joint against the face of packing-box 10 by any suitable means—as, for instance, by bolting, as shown in the illustration—this cap having an inner counterbore considerably larger than the rod which the device is to pack; 5, a ring disposed within the counterbore of cap 4, its outer face seating against the inner face of the end wall of the counterbore in cap 4, this ring 5 having a counterbore with a sharply-beveled root, the exterior of ring 5 being considerably smaller than the counterbore in cap 4; 6, the beveled root of the counterbore in ring 5; 7, another ring disposed within the counterbore of cap 4, its inner face lying contiguous to the face of packing-box 2, its outer face being internally beveled like the root 6 of the counterbore in ring 5, the outer end of ring 6 fitting within the counterbore of ring 5; 8, a spring disposed within packing-chamber 3 and serving, if employed, to urge ring 7 outwardly; 9, studs serving as an exemplification of means for securing cap 4 firmly to packing-box 2; 10, a soft-metal ring of rectangular cross-section and having smooth flat side faces disposed within the counterbore of ring 5, this ring 10 nicely fitting the rod which is to be packed and being diametrically divided, as illustrated in Fig. 3; 11, a soft-metal ring of triangular cross-section disposed at the outer side of ring 10 and having a smooth flat side fitting against its outer face and having a beveled face fitting against the beveled root 6 of the counterbore in ring 5, this triangular ring fitting the rod to be packed and being diametrically divided, as indicated in Fig. 2; 12, a second soft-metal ring of triangular cross-section, this ring fitting the rod and having a smooth flat face fitting against the inner face of ring 10 and having a beveled face fitting the beveled outer face of ring 7 and being diametrically divided, as indicated in Fig. 4; 13, the rod to be packed; 14, the outer lip or wall of cap 4, which engages the outer face of ring 5; and 15, a gasket-ring disposed between cap 4 and packing-box 2 to make the joint tight.

While this packing is adapted for use with steam or air or liquids, I will use the term "steam" alone for the sake of brevity. Steam leaking outwardly along the rod past wall 1 is prevented from proceeding on outwardly to the atmosphere by reason of the tight steam-joint formed by the engagement of the packing-rings with the rod and by reason of the steam-tight engagement of the face of ring 5 with cap-wall 14 and by reason of the steam-tight engagement of cap 4 with packing-box 2. The steam presses outwardly upon ring 7, thus tending to contract the packing-rings 10, 11, and 12 upon the rod. Spring 8 is not essential to the functional provisions of the packing, but will be found useful in restraining the inward displacement of the group of rings. The group of rings 5, 7, 10, 11, and 12 are free for motion in a direction transverse to the axis of the rod, thus permitting the use of the packing in cases where the rod is subject to more or less vibration. In cases where such vibration is not likely to be present, as in direct-acting pumps and engines, such free motion of the group of rings need not be provided for. Rings 5 and 7 should preferably have a trifle of looseness upon the rod, though this looseness is not essential; but the actual packing-contact upon the rod is gotten from rings 10, 11, and 12.

It is to be noticed that the construction

illustrated provides for the adaptation of metallic packing to a packing-box of ordinary form with no substantial change in the packing-box itself. The securing of cap 4 tightly to the packing-box by means of studs and a gasket is a mere exemplification of methods of attachment which will in practice vary with the character of the projecting portion of the packing-box, ordinary packing-boxes being in some cases arranged with their glands to be drawn inward by studs, while in other cases the glands are drawn in by cap-nuts screwing upon the packing-box.

The projection of ring 7 into the counter-bore of ring 5 causes these two rings to form an inclosure for the packing-rings 10, 11, and 12, and any vibration of the rod as it works through the packing causes the packing to vibrate with it as a whole, none of the rings changing their relationship to each other during such vibration. This plan of construction for the rings 5 and 7 also provides for the assemblage of the packing as a self-contained structure before it is put into use in the stuffing-box, the soft-metal rings being virtually boxed in by the intermembering exterior rings 6 and 7. These packings are very often made up and held for application and use on sudden calls, as in locomotive work, and the nicely-fitted soft-metal rings, if unprotected, are much liable to serious injury by contact with hard bodies. The rings 5 and 7 form a protecting-case for the soft-metal packing-rings when the latter are not in use, and they serve in uniting the packing-rings in their vibrating motion when employed on rods not having true movements.

It will be observed that steam cannot pass within the packing-rings around the rod and that it cannot detour externally around these rings, and that the non-leaking quality of the packing-rings is secured without the necessity for any steam-tight circumferential fits and without the necessity for any soft elastic gaskets, as of rubber, between the metallic packing-rings.

We claim as our invention—

1. In metallic packing for rods, the combination, substantially as set forth, of a diametrically-divided soft-metal packing-ring having a rectangular cross-section and smooth flat sides, a diametrically-divided soft-metal packing-ring of triangular cross-section disposed at each side of the first-mentioned ring and having smooth flat faces fitting thereagainst, and a confining structure to hold said three rings in the stated relationship to each other upon the rod with which the packing is to coöperate.

2. In metallic packing-rods, the combination, substantially as set forth, of a diametrically-divided soft-metal packing-ring having a rectangular cross-section and smooth flat sides, a diametrically-divided soft-metal packing-ring of triangular cross-section disposed at each side of the first-mentioned ring and having smooth flat faces fitting thereagainst, a ring having a counterbore with a beveled root engaging the beveled face of one of said packing-rings, and a ring engaging the beveled face of the other packing-ring of triangular cross-section and projecting into the counterbore of said counterbored ring.

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