No. 669,318. Patented Mar. 5, 1901.

L. CAUMONT.

METALLIC PACKING FOR STUFFING BOXES.

(Application filed Oct. 25, 1900.)

(No Model.)

FIG. 1

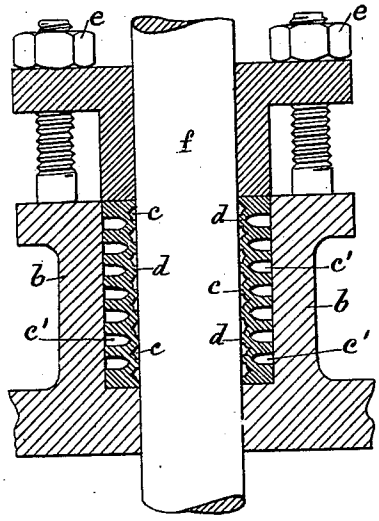


FIG. 2

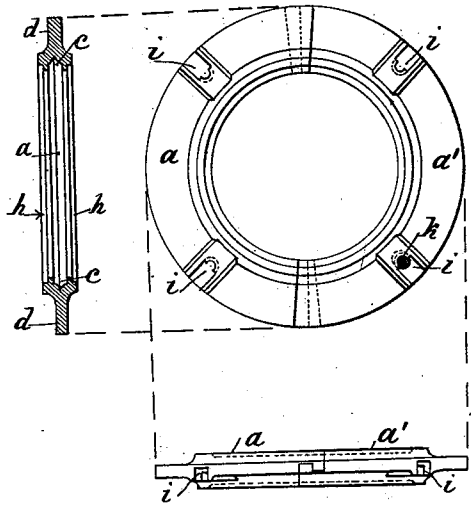


FIG. 3

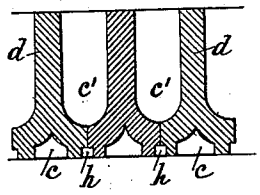


FIG. 4

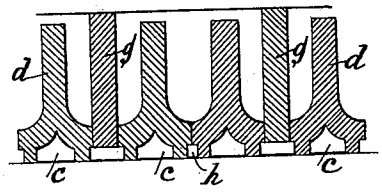
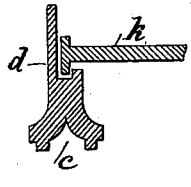


FIG. 5



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UNITED STATES PATENT OFFICE.

LOUIS CAUMONT, OF LUXEUIL, FRANCE.

METALLIC PACKING FOR STUFFING-BOXES.

SPECIFICATION forming part of Letters Patent No. 669,318, dated March 5, 1901.

Application filed October 25, 1900. Serial No. 34,386. (No model.)

To all whom it may concern:

Be it known that I, LOUIS CAUMONT, a citizen of the Republic of France, and a resident of Luxeuil-les-Bains, Haute-Saône, in the Republic of France, have invented a new and useful Improvement in Metallic Packings for Stuffing-Boxes, of which the following is a specification.

The metallic packing for stuffing-boxes which forms the object of the present invention consists of a packing-piece which is adapted to be placed in the stuffing-boxes of cylinders of steam-engines, drying apparatus, and the like, where steam enters under pressure, in order to make a tight joint in the movable parts of such apparatus which are in contact with steam.

The improved packing-piece is composed of antifriction metal of great softness to friction and a malleability which enables it to be compressed and has a form which will now be described with reference to the accompanying drawings, in which—

Figure 1 is a sectional view of a stuffing-box provided with my new metallic packing. Fig. 2 shows a plan view, a side view, and a diagonal section of a ring of my improved packing. Figs. 3 and 4 show horizontal sections of the packing-rings, and Fig. 5 shows a sectional view of a packing-ring and of the tool used for removing same.

The packing-piece *a* is bored to the diameter of the rod or journal which it is to inclose and is turned externally to the diameter and the form of the stuffing-box *b* or of the socket which is arranged to receive it, while its length is equal to that of the said box or socket or may even be shorter. It is formed internally and externally with annular grooves *c c'*, spaced at equal intervals, of variable width for the different pieces, the part between each groove forming a solid part *d* of equal or approximately equal width and the arrangement being such that the center of each internal groove *c* and the center of each external flat part *d* (and vice versa for the outer grooves and inner flats) are in the same plane perpendicular to the axis. The bottom of each internal groove is formed of two symmetrical curves which cut one another at reentering angles and which are so arranged as to touch successively at points which are gradually farther away from the apex of said angle in proportion as the gland is tightened up by means of the nuts *e* of the stuffing-box *b*, thus enabling the metal to adapt itself uniformly along all the points of said curves. The depth of these grooves should be the slightest possible that is sufficient to avoid the curved part terminating the bottom becoming worn at the end of the tightening up. The external grooves *c'* have the same width, which may be slightly different from that of the interior grooves. The bottom of each external groove is terminated by an ogive practically parallel to the adjacent curve of the bottom of the internal groove. These grooves penetrate into the metal sufficiently to give the desired yield to compression. The grooves thus arranged form between them a sort of hinged lever, which by bending when compressed forces the metal to expand diametrically toward the side where it is allowed to do so. This expansion is produced inevitably toward the interior by the compression of the glands when the nuts *e* are tightened up in proportion as required to take up the wear produced by the friction of the shaft or journal, as the outer periphery cannot extend through, being fitted exactly in the stuffing-box. The grooves of the packing-piece have for their object to allow the steam to expand in them successively and on condensing to lubricate the rods if the steam is greasy and to leave a great latitude for tightening up. The solid parts *d*, which lie in direct contact with the rod or journal *f*, touch them without gripping them. Hence friction and resistance are dispensed with and wear is reduced to the minimum possible, and consequently great durability is insured. Such is the principle of my invention.

Where the metallic packing cannot be placed in a single piece on the piston-rods of steam-engines of special form or design—for instance, where two pistons are keyed on the same rod—and as the dismounting of a steam-engine for the insertion of packing always presents considerable difficulties, the following arrangements are adapted for rendering it completely practicable.

By forming a division in the plane of the bottom of each external groove *c'* the packing-piece can be separated into independent

rings, Figs. 2, 3, and 4. Each of these rings is then cut diametrically. The two parts *a a'*, Fig. 2, of each washer thus separated have each the form of a half-ring, which may, as desired, be approached to or removed from one another, thus allowing of their being placed without difficulty around the shaft or journal. These half-rings *a a'* are checked or cut at each end in such a way that a flat part is formed on each to allow the half-rings to engage at their ends one in the other and by their contact to prevent steam passing.

In order to further increase the tightness of the packing, a small recess *h* is formed toward the shaft on the side of each ring. On placing two rings one on the other these recesses will form a small supplementary groove between the larger ones.

In order to enable the packing to be withdrawn from the stuffing-box, notches *i* are arranged on the side, so that a tool *k*, Figs. 2 and 5, of suitable dimensions can be engaged therein, said tool having a head adapted to engage in the notch. By exerting force on this tool the packing or ring can be removed without any difficulty.

In order to allow a certain latitude to the piston-rod *f* for play in the box, so as not to restrict it in its course even in case it acts eccentrically, particularly in the case of powerful steam-engines of high speed, the packing-rings *a a'* are turned externally to a diameter less by several millimeters than that of the stuffing-box. The half-rings may be checked at the ends to fit one in the other to prevent separation and maintain them in contact with the shaft *f*. Between these rings washers *g*, Fig. 4, of similar metal, may be placed, having about the same thickness as the external part of the packing-rings and turned externally to the exact diameter of the box and bored to a diameter some millimeters larger than that of the rod or shaft. Notches may also be formed therein, as in the other packing-rings, to allow of their extraction.

I declare that what I claim is—

1. A metallic packing consisting of an annulus of suitable metal having annular grooves on its inner and outer peripheries of a form and depth adapted to cause the metal to yield under compression of the glands and to thus expand diametrically and secure tightness of the flat parts intermediate of the groove against the parts to be packed, substantially as and for the purpose hereinbefore set forth.

2. A metallic packing of annular form having annular grooves with intermediate flats on its inner and outer peripheries, the inner grooves being opposite the outer flats and the outer grooves opposite the inner flats, substantially as and for the purpose set forth.

3. A metallic packing of annular form having annular grooves with intermediate flats on its inner and outer peripheries, the inner grooves being opposite the outer flats and the outer grooves opposite the inner flats, and the said inner grooves having each its bottom formed of two symmetrical curves cutting one another at reëntering angles, substantially as and for the purpose set forth.

4. A metallic packing consisting of an annulus of suitable metal in the form of superimposed rings having annular grooves on the inner and outer peripheries, adapted to cause the metal to yield under compression of the glands, substantially as and for the purpose set forth.

5. A metallic packing comprising an annulus of suitable metal in the form of superimposed rings, having annular grooves on the inner and outer peripheries, and intermediate washers located between the separate rings, said rings having an external diameter less than the internal diameter of the part receiving them, and said washers having an internal diameter larger than the part which they embrace, substantially as and for the purpose set forth.

6. A metallic packing comprising an annulus of suitable metal in the form of superimposed rings having annular grooves on the inner and outer peripheries and intermediate washers located between the separate rings, said rings and washers having lateral notches adapted to be engaged by a suitable tool for the purpose of withdrawal, substantially as hereinbefore described.

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of September, 1900.

LOUIS CAUMONT.

Witnesses:
EMILE COUCHOUD,
EDMOND LECOUTURIEOU.