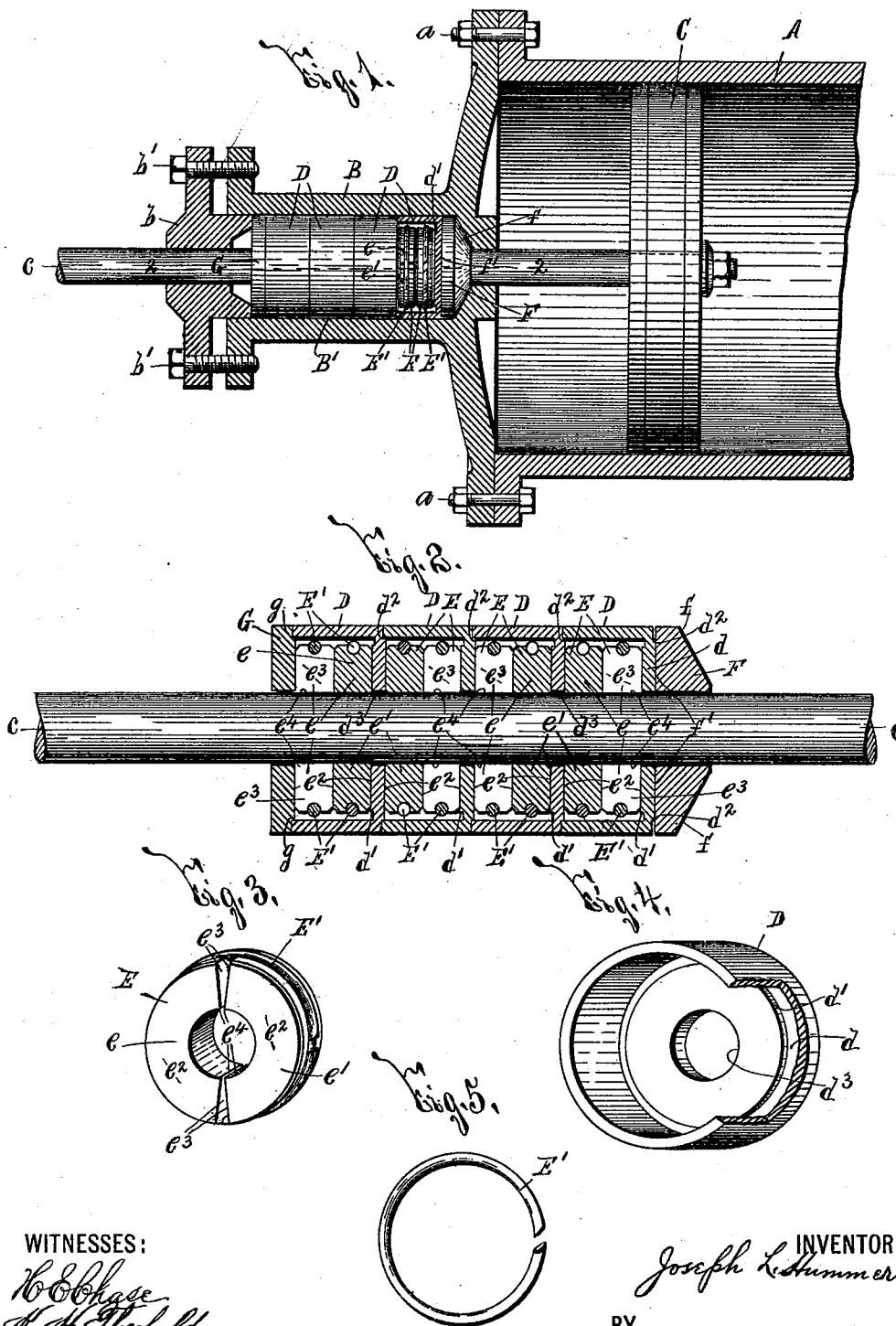


(No Model.)

J. L. HUMMER.
METALLIC PACKING.

No. 551,188.

Patented Dec. 10, 1895.



UNITED STATES PATENT OFFICE.

JOSEPH L. HUMMER, OF SYRACUSE, NEW YORK.

METALLIC PACKING.

SPECIFICATION forming part of Letters Patent No. 551,188, dated December 10, 1895.

Application filed February 11, 1895. Serial No. 537,957. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. HUMMER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Metallic Packings, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in metallic packings for piston and valve rods, and has for its object the production of a device which is economically manufactured, is readily placed in operative position, and is highly efficient and durable in use; and to this end it consists, essentially, in the general arrangement and construction of its parts, all as hereinafter more particularly described, and pointed out in the claims.

In describing this invention reference is had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is a longitudinal section of a cylinder end, its stuffing-box, a piston, and piston-rod shown in elevation, and my improved packing illustrated partly in elevation. Fig. 2 is a longitudinal section, taken on line 2 2, Fig. 1, of the detached piston-rod and packing, the piston-rod being shown in elevation. Fig. 3 is an isometric view of a detached metallic packing-ring. Fig. 4 is an isometric view of an outer ring of the packing having a portion thereof broken away; and Fig. 5 is a face view of an open spring-ring for encircling a metallic packing-ring.

The cylinder A, its stuffing-box B, the piston C, and its rod c are of any desirable form, size, and construction. As here illustrated, the stuffing-box is formed upon one of the heads of the cylinder, which is secured in position by clamps a, but it is obvious that said stuffing-box may be supported in any suitable manner. The stuffing-box B is provided with a cap b, which may be secured in position by screws b' or other suitable fastening means.

My improved packing is of such construction that it is readily arranged within the stuffing-box B without necessitating any changes therein, and it consists of a series of outer cup-shaped rings D, and inner pack-

ing-rings E. The outer rings D are arranged one in advance of the other, and are formed with smooth inner peripheral faces, and with flat endwalls d centrally pierced as at d³ for the passage of the rod c and having annular projecting inner and outer faces d' d². In turning out these cup-shaped rings D on a suitable lathe, it is a comparatively easy matter to make the outer face d² perfectly flat with an annular groove around its periphery as shown; but in order that the inner face d' shall also be perfectly flat and smooth without a fillet around its edge which would prevent the ring E from lying close against this face, a shallow groove is turned or cut in the inner corner or angle between the side and bottom of the cup-shaped ring D, after which the planing-tool can with ease be made to form the inner face d' perfectly flat. The outer faces d² are of such diameter that they closely fit within the cup-shaped mouths of the adjacent outer rings, and consequently the outer rings D form a series of closed chambers.

The metallic packing-rings E are composed of suitable soft material and consist of separate sections e e', having their side faces e² formed perfectly flat and their opposite ends provided with substantially flat faces e³ diverging from their inner edges e⁴. An open or split spring-ring E' is arranged within annular grooves e⁵, formed in the outer peripheral faces of the sections e e' and holds said sections firmly against the rod c, and the size of this split ring E' is preferably such that it fits rather closely within the outer ring D, so that the latter will exert some pressure upon the split ring and hold the sections of the inner rings in place, even if the split rings should become broken or weakened in use.

I preferably use two packing-rings E within each cup-shaped outer ring D, and, as clearly seen at Fig. 2, the adjacent side faces of said inner rings are in contact, and said outer rings are of sufficient width or depth so that their outer side faces or bottoms engage the adjacent faces or mouths of the corresponding outer rings. The outer and inner faces d' d² of the cup-shaped rings D and the side faces e² of the packing-rings are preferably flattened with considerable care in order that the joint between said faces may be tight and prevent the passage of steam or other fluids.

Moreover the two packing-rings E in each outer ring D are preferably so arranged that their sections are caused to break joint and the spaces between the ends of the sections stand out of alignment, and consequently there is no chance for steam to pass either between the packing-rings or through the spaces formed between the faces e^3 of their sections.

In providing a stuffing-box with my improved packing I preferably place in the inner end of its chamber B' a ring or washer F, composed of soft material and formed with a beveled inner face f and a flat outer face f' , which forms a bearing for the innermost outer ring. The outer rings, provided with their respective packing-rings, are then forced within the chamber B', along the rod c , and, if desired, a cap G is arranged at the outside of the outer ring D and is provided with an annular projecting bearing-face g , which enters said outer ring and engages the adjacent packing-ring. The cap b is then secured in position and its inner face engages the cap G and holds the packing in its operative position.

As the packing-rings E are formed of yielding sections, they automatically take up their wear, and also permit the rod c to move laterally a limited distance if slightly out of alignment. To facilitate this movement the apertures d^3 in the end walls of the outer rings, through which the piston or valve rod passes, are of slightly greater diameter than said rod.

In the manufacture of this packing the outer cup-shaped rings are readily and economically turned to the desired form and size, the packing-rings may be cut from a single cylindrical rod of the requisite diameter, and the springs for holding the sections in position are cheaply bent up from spring-wire.

This packing is obviously very durable, and if it should become so worn that the inner edges of the end faces of the packing-ring sections engage each other said sections may be easily withdrawn and their end faces slightly filed or ground.

The operation of my improved packing will be readily understood upon reference to the foregoing description and the accompanying drawings, and as the exact detail construction and arrangement of its parts may be somewhat varied without departing from the spirit of my invention I do not herein limit myself to such exact detail construction and arrangement.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a metallic packing, the combination with a packing ring consisting of separate sections having their outer peripheral faces formed with annular grooves and their adjacent ends provided with substantially flat

faces diverging from their inner edges, and an open spring ring arranged in said grooves for holding the sections in their normal position; of an outring closely surrounding said spring ring, substantially as and for the purpose described.

2. A packing comprising an outer cup-shaped ring formed with an end wall having a projecting flat inner face, with a surrounding groove, separate packing rings arranged within the outer ring at one side of said end wall and each consisting of separate sections having their outer peripheral faces formed with annular grooves, said rings having opposite flat side faces in contact, and a side face of one of the rings in contact with said projecting inner face of the outer ring, and springs encircling the packing rings for holding their sections in operative position, substantially as and for the purpose specified.

3. A packing comprising a series of outer rings arranged one in advance of the other and formed with end walls having annular projecting outer faces fitting within the next adjacent outer rings, and metallic packing rings with flat opposite faces arranged within the outer rings and consisting of yielding sections, combined with a box within which such series is arranged, washers at the opposite ends of the series, a cap bearing against the outermost washer, and means for tightening this cap, substantially as and for the purpose specified.

4. In a packing, the combination with a series of outer cup-shaped rings arranged one in advance of the other and formed with end walls having annular projecting flat inner and outer faces with surrounding grooves, the outer grooves fitting within the mouths of the next adjacent rings; of metallic packing rings within the outer rings formed with opposite flat side faces and each consisting of separate sections having their outer peripheral faces formed with annular grooves, and their adjacent ends diverging from their inner edges, said packing rings having their outer faces in contact with the inwardly projecting faces of the end walls of the cup-shaped rings and their adjacent faces in contact with each other and being arranged with their sections out of alignment, and springs encircling the packing rings for holding their sections in operative position, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 26th day of January, 1895.

JOSEPH L. HUMMER.

Witnesses:

E. A. WEISBURG,
K. H. THEOBALD.