

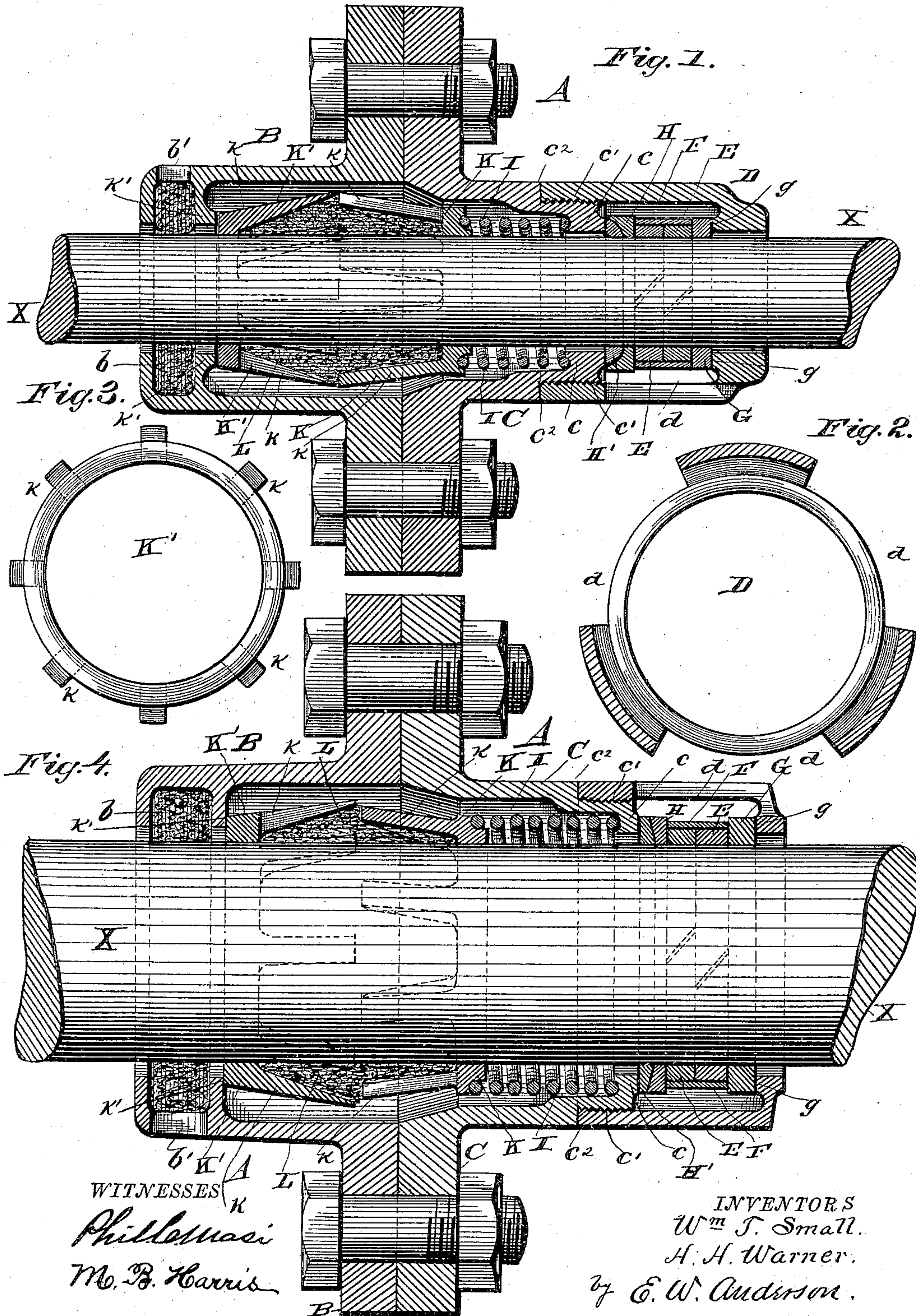
(No Model.)

W. T. SMALL & H. H. WARNER.

PISTON ROD PACKING.

No. 369,562.

Patented Sept. 6, 1887.



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WILLIAM T. SMALL AND HENRY H. WARNER, OF TACOMA, WASHINGTON TERRITORY.

PISTON-ROD PACKING.

SPECIFICATION forming part of Letters Patent No. 369,562, dated September 6, 1887.

Application filed April 27, 1887. Serial No. 236,385. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM T. SMALL and HENRY H. WARNER, citizens of the United States, residing at Tacoma, in the county of Pierce and Territory of Washington, have invented certain new and useful Improvements in Valve-Stem and Piston-Rod Packing; and we do declare the following to be a full, clear, and exact description of the invention, such as it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a vertical longitudinal section as applied to a valve-stem. Fig. 2 is a transverse vertical section through the cage D. Fig. 3 is a plan view of the cage K', and Fig. 4 is a vertical longitudinal section as applied to a piston-rod.

Our invention, which is an improvement on a patent to us on the 11th day of January, 1887, and numbered 356,014, relates to stuffing-boxes or glands, and more particularly to the means of packing a piston-rod or valve-stem passing through such a gland; and its objects are to provide a simple and effective ring-packing in which the rings will not be broken by the lost motion of the cross-head or stem passing through the stuffing-box, and to prevent the slight escape of steam from the stuffing-box, which steam, by condensing in cold weather, is often of great annoyance to the engineer.

These objects we effect by the construction and novel arrangements of parts hereinafter described, illustrated in the drawings, and pointed out in the appended claims.

Referring to the drawings by letter, A designates a stuffing-box composed of the outer section, B, and the inner section, C, which sections are flanged around their meeting ends, fitted to each other, and secured by bolts and nuts in the usual manner. The cylinder of the outer section, B, is provided near its end with the internal circumferential recess, *b*, having a slot, *b'*, opening through the side of the section, through which to pack waste or similar material into the recess for the purpose

of wiping the rod or stem X as it passes outward from the stuffing-box.

The inner end of the inner section, C, of the stuffing-box is flanged inwardly at *c*, for a purpose hereinafter explained, and above said flange is externally threaded at *c'* up to the circumferential shoulder *c''* to engage the internally-threaded outer end of a cylindrical cage, D, which screws thereon up to said shoulder. The said cage, together with the inner section of the packing-box, is within the stuffing-box, and is provided with the openings *d d*, to allow steam-pressure upon the packing-rings within the cage.

The rings within the cage are as follows: The similar cut or inclosed rings E, which directly surround the piston-rod or valve-stem, and which are provided with inclined cuts, so that their ends slide on each other as the rings accommodate themselves to the wear of said rod or stem or when the steam is pressing them thereon; the inclosed ring F, surrounding the rings E and closing tightly thereon under steam pressure; the closed ring G, resting upon a circumferential inwardly-standing flange, *g*, on the inner end of the cage, and upon which the adjacent ring E and the ring F rest; and the two closed rings H H', the former of which rests upon the adjacent edges of the outer ring, E, and the ring F, and the latter of which bears against the flange *c* of the inner section, C, of the stuffing-box. The outer surface of the inner ring, H, is concave, and the meeting surface of the ring H' is convex to fit thereon, so that the rings can turn on each other when packing gets down in cylinder, or lost motion becomes so great that piston-rod or stem is not working parallel with cylinder and stuffing-box, but at an angle.

I is a coiled spring surrounding the rod or stem X, with its inner end supported in a groove on the outer surface of the flange *c*, and its outer end bearing in a similar groove on the inner surface of the base-plate of the cage or frame K.

K K' are similar frustum-shaped cages or frames, situated in the outer interior portion of the stuffing-box enlarged to receive them. They stand in opposite positions, as shown, with their fingers *k k*, which diverge slightly

from their bases, facing each other. The rod or stem passes through suitable openings in said bases, and the base of the frame K' rests upon the diaphragm *k'* of the outer section, B, to the interior of the recess *b*. The fingers of the said frame are not in contact with each other, and the purpose of the said fingers is to hold and force inward against the rod or stem the light packing material L—such as waste—contained between them, so as to prevent the slight escape of steam that might condense outside of the stuffing-box and annoy the engineer. The frames K K' also prevent the packing L from coming in contact with the interior of the stuffing-box and being torn and scattered thereby.

As the packing L gradually escapes or is worn out of the frames, the latter are pressed closer together by the spring I, and the remainder of the packing is pressed tightly against the rod or stem, and does not become loose or ineffective.

The packing-rings in the cage D are compressed by steam and have very little longitudinal movement, and the cage D, being screwed to the section C of the stuffing-box, has no movement; hence it cannot be bumped or thrown against the rings within it by the lost motion of the cross-head and break said rings.

Having described our invention, we claim—

1. In a stuffing-box, the combination of the frames standing in opposite positions within the said box around the rod reciprocating therein and provided with fingers diverging from their bases, with the fingers of each facing those of the other, the light packing material between the rod and said fingers, and the coiled spring bearing against the base of the inner frame and against a fixed support within the stuffing-box, substantially as specified.

2. In a stuffing-box, the combination of the sections B and C, bolted together, the frame K', with its base resting against a diaphragm, *k'*, on the front portion of said box, with its fingers *k* looking inward, the frame K, with

its fingers *k* looking outward and facing those of the frame K', but not opposite thereto, the packing L between said fingers, and the rod within the box and the coiled spring I, bearing against the base of the frame K and against the flange *c* of the section C, substantially as specified.

3. In a stuffing-box, the combination of the outer and inner sections thereof bolted together at their meeting ends, the cage provided with openings in its sides and an inwardly-standing flange around its inner end and screwing upon the inner end of the inner section of the stuffing-box, the closed rings resting against the inwardly-flanged end of the inner section of the stuffing-box, inside the cage, the closed ring resting upon the flange at the inner end of the cage, and the cut packing-rings between said closed rings, substantially as specified.

4. In a stuffing-box, the combination, with the inner section, C, thereof, provided with the flange *c* and shoulder *c'*, of the cage D, screwing on the end of said section and provided with the openings *d d* and flange *g*, the closed rings G, H, and H', the cut inclosed rings F, surrounding the rings E, substantially as specified.

5. The herein-described packing-box, composed of the outer section, B, provided with the recess *b* and diaphragm *k'*, the inner section, C, provided with the flange *c* and the shoulder *c'*, the cage D, provided with the openings *d* and flange *g*, the frames K K', provided with the fingers *k*, the coiled spring I, the closed rings G, H, and H', and the cut rings E E and F, all constructed and arranged substantially as and for the purpose specified.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM T. SMALL.
HENRY H. WARNER.

Witnesses:

C. B. EATON,
T. C. SEARS.