J. C. HORTON & J. BRADY.

Elastic Packing for Pistons, &c.

No. 207,871. Patented Sept. 10, 1878.

Fig. 1.

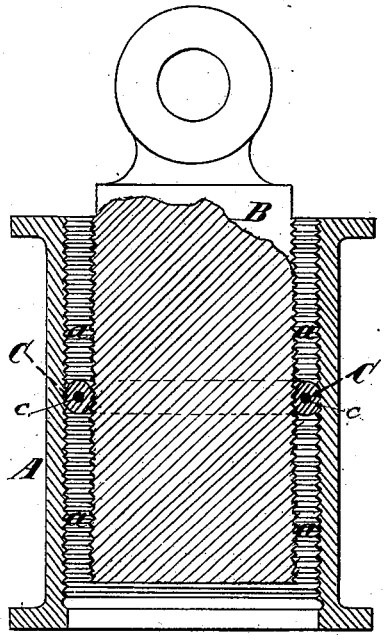


Fig. 2.

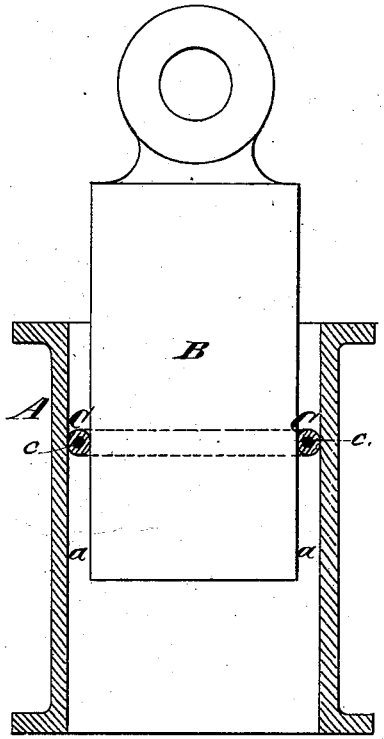
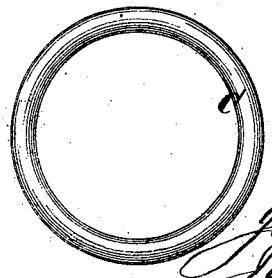


Fig. 3.



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UNITED STATES PATENT OFFICE.

JACOB C. HORTON, OF NEW YORK, AND JAMES BRADY, OF BROOKLYN, N. Y.

IMPROVEMENT IN ELASTIC PACKINGS FOR PISTONS, &c.

Specification forming part of Letters Patent No. **207,871**, dated September 10, 1878; application filed August 22, 1878.

To all whom it may concern:

Be it known that we, JACOB C. HORTON, of the city, county, and State of New York, and JAMES BRADY, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Elastic Packing for Pistons, Plungers, and Rods; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

The object of our invention is to obtain a packing for pistons, plungers, and their rods, which is easy of application, tight, inexpensive, and durable.

The invention consists in a ring composed of a core of metal or fibrous material covered with india-rubber or other suitable elastic material, and having a circular or approximately circular transverse section so applied between the exterior surface of a piston or plunger and the interior surface of the cylinder or barrel in which it works, or between the exterior of a piston-rod or plunger-rod and the interior of the box in which it works, that by the movement of the piston, plunger, or rod the said ring will be caused to rotate about the center of the transverse section of its mass and roll between the exterior surface of the plunger, piston, or rod and the interior surface of the surrounding cylinder, barrel, or box in a direction parallel with the axis of the latter. The exterior surfaces of the piston, plunger, or rod and interior surfaces of the cylinder, barrel, or box may be smooth, or may be corrugated or ridged and grooved in a circumferential direction, the corrugations or ridges and grooves serving to retain the ring in place against the pressure of the fluid contained in the cylinder or barrel.

Figure 1 in the drawings is an axial section of a cylinder and contained plunger or piston, illustrating the application of our improved packing with grooved or corrugated working-surfaces. Fig. 2 exhibits an axial section of a cylinder and an exterior view of a plunger or piston, illustrating the application of the packing with smooth working-surfaces. Fig. 3 is a plan of the packing-ring.

A is the cylinder, B is the plunger, and C is the interposed rolling packing-ring. The exterior of the plunger is of a diameter sufficiently less than that of the interior of the cylinder to leave room between them for the packing-ring.

The packing-ring, C, represented is of circular form in its transverse section, having its thickness or the diameter of its circular transverse section, when in its normal condition, so much greater than the width of the annular space *a a* between the cylinder and the piston or plunger that the said ring may be somewhat compressed in the direction of its axis by being inserted between the cylinder and the piston or plunger. The exterior diameter of the ring, measured across its main axis, is a little greater than the interior diameter of the cylinder, and its interior diameter is a little less than the exterior diameter of the piston or plunger. The said ring may be composed of a ring of steel, *c*, or other metal thickly covered with or incased within india-rubber or other elastic material, or of a ring of fibrous cord similarly coated or incased.

This packing-ring having been inserted tightly between the cylinder and the piston or plunger, and a reciprocating motion within and in relation to the cylinder having been imparted to the said piston or plunger, the ring will be caused to roll between the interior surface of the cylinder and the exterior surface of the piston or plunger, and so to move lengthwise of the cylinder, being all the time tightly pressed inwardly against the piston or plunger and outwardly against the cylinder by the pressure of the liquid or gaseous body within the cylinder, which tends to compress the ring in a direction parallel with its main axis, and thereby to produce its expansion in the direction of its diameter, both toward the cylinder and toward the piston or plunger.

In the case of a cylinder and piston or plunger having plain surfaces, as shown in Fig. 2, the ring is maintained in place by its friction against the said surfaces; but in the case of a cylinder and piston or plunger having their surfaces corrugated or ridged and grooved in circumferential lines, as shown in Fig. 2, the ring is more securely retained by being also indented into the grooves or corrugations of the cylinder and the piston or plunger; and therefore in apparatus in which the piston or

plunger is intended to act upon or be acted upon by a fluid under a high pressure, we prefer to make the cylinder and the piston or plunger corrugated.

This packing is applicable to steam, air, or gas engines, to pumps for aeriform or liquid bodies, to water elevators or rams, to fluid-meters, and to cylinders and plungers or pistons for other apparatus. One of its merits is that the cylinder and piston or plunger do not require in all cases to be bored and turned absolutely true, provided that the surfaces are smooth, and therefore it may be applied with especial advantage to apparatus in which the cylinders and pistons or plungers are made of sheet metal.

We are aware that rubber packing has been used in a similar manner to ours; but such packing is easily twisted and displaced, and is also easily severed, while with our packing the central core prevents the twisting and displacement, and renders the packing very strong. We do not therefore claim a simple rubber packing; but

We claim—

The combination, with a cylinder, barrel, or box and a contained plunger, piston, or rod, of a rolling elastic packing-ring composed of a core of metal or fibrous material covered with india-rubber, and applied and operating substantially as specified.

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Witnesses:
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