

(No Model.)

J. PATTEN.

METALLIC PACKING FOR STEAM CYLINDER PISTONS.

No. 384,272.

Patented June 12, 1888.

Fig. 1.

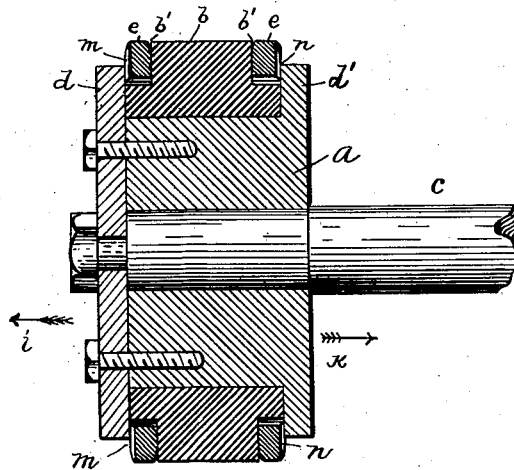


Fig. 2.

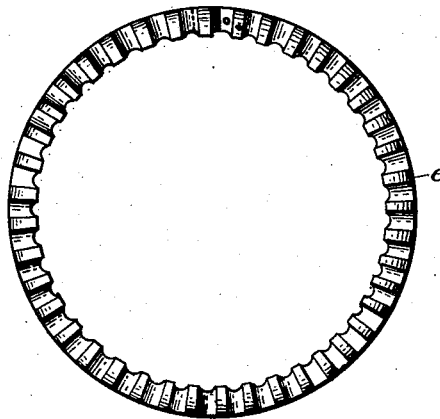


Fig. 3.



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METALLIC PACKING FOR STEAM-CYLINDER PISTONS.

SPECIFICATION forming part of Letters Patent No. 384,272, dated June 12, 1888.

Application filed March 17, 1888. Serial No. 267,469. (No model.)

To all whom it may concern:

Be it known that I, JEFFERSON PATTEN, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Metallic Packing for Steam-Cylinder Pistons, of which the following is a specification.

The object of my invention, which is disclosed in the following description and claims, is to provide a perfectly steam-tight metallic packing for the pistons of steam-cylinders by constructing the metallic rings forming the packing and combining them with the piston-head in such a manner that the steam in the cylinder will be admitted under the packing-rings, which will be pressed outward against the inner surface of the cylinder, and thereby insure a close fit and steam-tight connection between the packing and cylinder, while at the same time allowing for the easy movements of the piston.

To enable others skilled in the art to construct and use my improvement, I will proceed to describe its construction and operation by the aid of the accompanying drawings, in which like letters of reference designate like or equivalent parts wherever found throughout the several views, and in which--

Figure 1 is a central vertical section of a piston provided with my improved packing-ring; and Figs. 2 and 3 are face and side views, respectively, of the ring.

In the drawings, *a* is the piston-head; *b*, the piston or bull-ring; *c*, the piston-shaft, and *d*, the plate or follower, which is secured to the head *a*, and by which the piston-ring *b* and packing-rings *e* are held in place. The outer rim of the head *a* is cut away, as shown, in such a manner as to leave a flange, *d'*, on one side, and within or upon this cut-away portion is placed the ring *b*.

The ring *b* is provided with circumferential grooves or recesses *b'*, which extend a determined distance below the outer surface or edge of the flange *d'* and the follower *d* when these parts are in position. The ring *e*, which forms the principal feature of my invention, is substantially rectangular in cross-section, and is provided on one of its front or pressure sides and on the inner face or side with corruga-

tions, as shown, the corrugations on the outer or pressure side and those on the inner face or side being in communication or coincident. At a point, as *e'*, the ring *e* is cut, and one end thereof is provided with a tongue, *h*, which is secured thereto by rivets, as shown, and the other end movably fits within a groove, *h'*, formed in the opposite end of the ring. The ring *e* may be made of any metallic substance preferred, and the tongue *h* should be made of some metal having a higher degree of expansion under the influence of heat than the material of which the ring is composed. This is not, however, absolutely necessary, as it is evident that the parts may be made of the same material and operate successfully. The outer edges of the packing-ring may also be slightly beveled, as shown in Fig. 1, if desired, and thus the friction-surface be reduced.

My invention is not limited to the means herein shown and described for uniting the ends of the packing-ring, as any form of connection, including the well-known lap-joints, may be employed, if preferred.

The packing-rings *e* should be made of such thickness that they will be held closely and firmly by the flange *d'* and the follower *d* when the latter is in place. With this construction the friction-surface on the front or pressure side of the packing-ring is reduced by means of the corrugations formed thereon. The corrugations on the under or inner face of the ring, coincident with the corrugations on the side thereof, increase the elasticity of the ring, and also the surface area of the inner face of the ring, upon which the steam acts to cause the expansion thereof, whereby greater force to press the ring against the cylinder is obtained, and I am enabled to employ a ring with much less impinging surface and still have a perfectly steam-tight fit between the cylinder and ring.

The operation is as follows: When the piston is making its forward or upstroke in the direction of arrow *i*, the live steam rushes through the corrugations at *m* on the side of the ring *e* down and into the corrugations on the under or inner face thereof, and its expansive force operating in said corrugation and upon the entire inner face causes the ring to

expand and forces it outward against the surface of the cylinder, thus securing a perfectly steam-tight packing. On the reverse stroke of the piston in the direction of arrow *k* the operation is the same. The steam is forced into the corrugations at *n*, and passing into the corrugations on the under or inner face of this ring causes its expansion as in the first instance, and this operation or action of the parts is repeated as long as the engine is running.

I am aware that steam has been employed to cause the expansion of the piston-packing rings in steam-cylinders by admitting the steam under the ring in various ways, that this has been done where two rings were used by causing the steam to press out the upper ring on the downstroke and the lower ring on the upstroke of the engine, and also by causing the steam to operate upon and expand both of the rings at once, and do not claim, broadly, such construction. It is evident, however, that corrugations might be formed upon the inner surface of the flange *d'* and the follower *d*, and upon the bottom of the grooves or recesses *b*, and the packing-ring made with plain surfaces without departing from the spirit of my invention.

Having fully described my invention, its construction and operation, what I claim, and desire to secure by Letters Patent of the United States, is—

1. As an article of manufacture, a packing-ring for steam-pistons, having its outer or pressure side provided with corrugations, whereby steam is admitted beneath the ring, substantially as shown and described.

2. As an article of manufacture, a packing-ring for steam-pistons, having its outer or pressure side and its inner face provided with communicating or coincident corrugations, substantially as shown and described.

3. The combination, with a steam-piston provided with grooves or recesses, as *b*, of a packing-ring having its outer or pressure side radially corrugated, substantially as shown and described.

4. The combination, with a steam-piston having grooves or recesses, as *b*, of a packing-ring having its outer or pressure side and its inner or under face provided with coincident or communicating corrugations, substantially as shown and described.

5. The combination, with a steam-piston having grooves or recesses, as *b'*, of a packing-ring, as *e*, and corrugations for admitting steam at the side of and under the ring, substantially as shown and described.

6. A packing-ring for steam-cylinder pistons, cut as shown, provided with a tongue fixed to one end thereof and moving in a groove or recess formed in the other end, the tongue being formed of a metal having a higher degree of expansion under the influence of heat than that of which the ring is composed.

Signed at New York, in the county of New York and State of New York, this 6th day of March, A. D. 1888.

JEFFERSON PATTEN.

Witnesses:

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C. C. SKINNER.