(No Model.)

T. B. PURVES.

PISTON PACKING.

No. 343,065. Patented June 1, 1886.

FIG. 1.

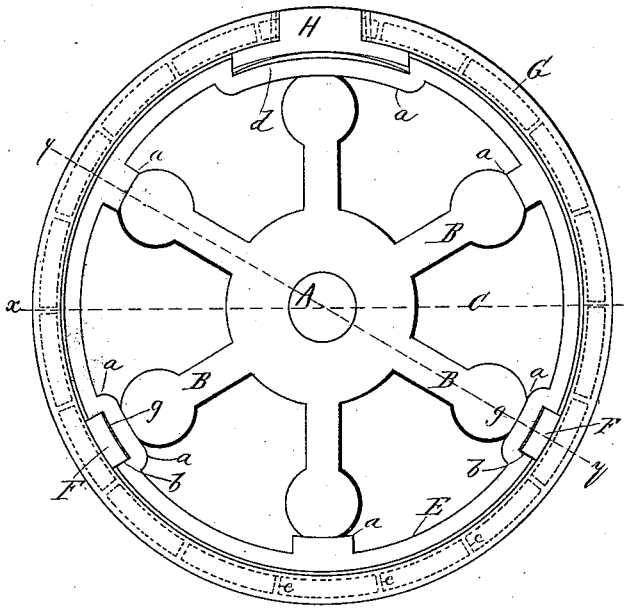


FIG. 2.

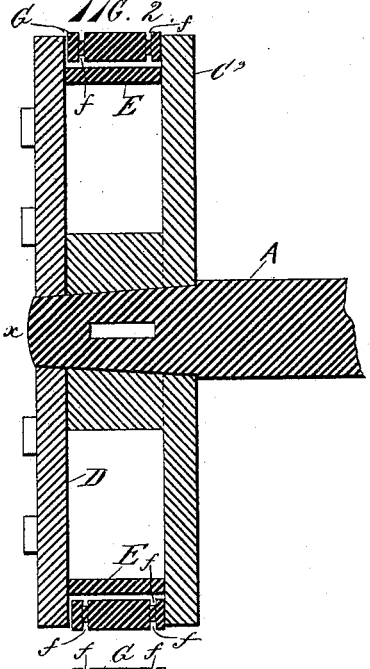


FIG. 3.

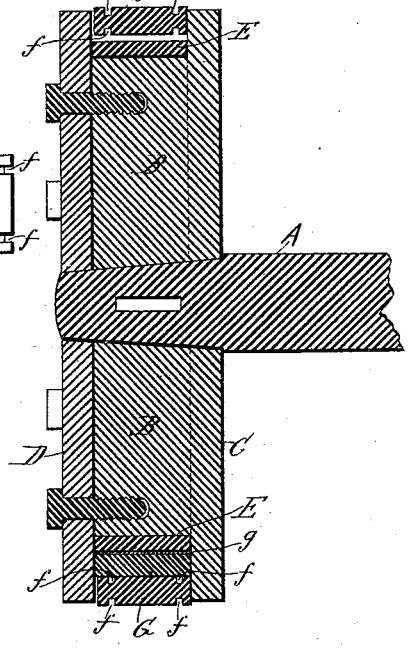
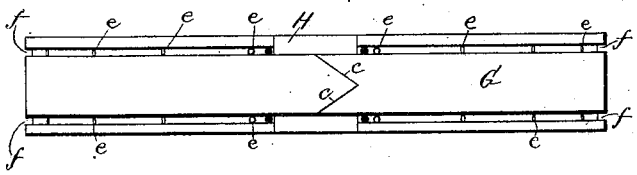


FIG. 4.



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UNITED STATES PATENT OFFICE.

THOMAS B. PURVES, OF GREENBUSH, NEW YORK.

PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 343,065, dated June 1, 1886.

Application filed April 16, 1886. Serial No. 199,063. (No model.)

To all whom it may concern:

Be it known that I, THOMAS B. PURVES, of Greenbush, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Piston-Packings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My improvements have relation to that class of piston-packings for steam and other engine-pistons wherein the steam-pressure upon the interior of the packing-ring is balanced or counterbalanced by steam-pressure upon the exterior, for the purpose of reducing friction and obviating undue wear and loss of power. This general class of packings is well illustrated in the United States Patent to Anthony and Purves, No. 93,578, dated August 10, 1869.

In former constructions one of the principal difficulties experienced with these self acting or balancing packing-rings is to keep the piston in a central position in the cylinder. This has been imperfectly done by use of "liners" placed between the spider-lugs and inside ring, or by use of set-screws suitably arranged for adjusting the ring. These means or methods are imperfect, for although they serve for a short time to keep the spider central vertically they do not prevent a lateral or side motion between the inside and outside rings, the effect of which motion is to cause wear upon the inside flanges of the spider and follower, and to chafe the steam edges of the outside or main packing-ring, as well as to wear the interior of the cylinder. Further, in these old forms as the main packing-ring and cylinder wear away the packing-ring opens, increasing its diameter, while the diameter of the inside ring remains unchanged, rendering it necessary to insert liners between the rings at their lowermost portions, and extending up to about the horizontal diameter of the cylinder.

The principal object of my invention is to obviate these prominent difficulties, making the piston, with its packing, to travel smoothly and accurately, and providing simple, cheap, effective, and easily-accessible means for adjusting the packing-ring to compensate for unavoidable wear, and to secure other advantages, as will hereinafter appear.

To accomplish all of this my improvements involve certain new and useful peculiarities of construction, relative arrangements or combinations of parts, and principles of operation, as will be herein first fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of an engine-piston having my improvements applied thereto, the follower being removed to show the interior parts. Fig. 2 is an axial section upon a plane passing through line *x x* of Fig. 1; and Fig. 3, a similar view upon a plane passing through line *y y*, both showing the follower in place. Fig. 4 is a side elevation of the packing-ring, the view being taken from a point directly above Fig. 1.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

A is the piston-rod, connected with the piston in any approved manner. B B are the spider-lugs; C, the spider flange or piston, and D the follower.

E is the inside ring, made uncut or solid. This has, in the example shown, interior projections, as *a a*, corresponding with the number of spider-lugs, and these projections and the ends of the lugs are so trued that when the ring is in place it will fit perfectly tight and solid, same as if the ring and lugs were cast together. This form is only used in connection with old spiders or pistons. In new work the ring is cast solid with the lugs. In the lower part of this inside ring I form two cavities, as at *b b*, distant from each other about one-third or one-fourth the circumference of the cylinder, and extending across the face of the ring. These cavities are for the purpose of receiving solid metal liners, as F F, which operate to maintain the piston in a central position at every point of its travel within the cylinder, thereby avoiding vibration of the piston, preventing unnecessary wear of the flanges of the piston or spider and follower, as well as the chafing of the steam-edges of the main packing-ring and inner surface of the cylinder.

G is the packing-ring located between the spider-flange and follower and outside of the ring E. This ring is cut as along the lines *c*

c, Fig. 4, and supplied with a "break-joint," H, made movable within a cavity formed for it in ring E, and calculated to close the space between the ends of the packing-ring, when they are separated, in such manner as to prevent passage of steam. Any form of spring, as at *d*, may be used to force the break-joint into contact with the inner surface of the cylinder.

As in the above-named patent to Anthony and Purves, the packing-ring is made slightly less in width than the distance between the follower and spider-flange, or than the width of the inside ring, E, so that steam may enter between the two rings passing over the steam edge of the packing-ring. Near each edge of the packing-ring are a series of perforations, as at *e e*, through which steam passes from inside to outside of the ring, and these perforations are joined by grooves or channels, as *f f*, inside and outside, and extending nearly to the ends of the ring.

The principles upon which the balancing or counterbalancing is effected, and the advantages thereof, are well understood and need not be here explained. The solid liners F F are intended to be originally fitted in place so that they will bring the piston to its true central position. After long use, and when the piston requires adjustment, thin metal liners, as *g g*, are inserted between F F and the inner wall of the cavity in which they are situated. They may be applied originally, if desired. These are easily and quickly located, and may be easily and quickly replaced by others whenever necessary.

When constructed and arranged for operation substantially in accordance with the foregoing explanations, the improvements will be found to answer the purpose or object of the invention as previously set forth.

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

1. In a piston-packing of the character herein set forth, a balanced packing-ring, combined with an interior ring rigidly mounted upon the spider, the packing-ring being made adjustable with respect to the rigid or immovable interior ring, substantially as and for the purposes set forth.

2. In a piston-packing of the character herein set forth, the interior ring rigidly mounted upon the spider, said ring being provided with cavities at its lower part for the reception of liners, and combined with an outer ring, substantially as shown and described.

3. The combination of the outer ring, the rigid inner ring, the solid liners located in cavities formed in the inner ring, and the thin metal liners, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

THOS. B. PURVES.

Witnesses:
THOS. B. PURVES, Jr.,
JAMES A. BUCKBEE.