

V. H. HIGGINS.
Metallic-Piston Packings.

No. 146,591.

Patented Jan. 20, 1874.

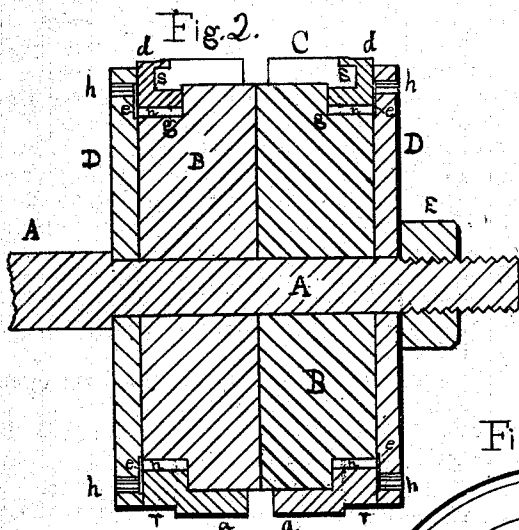
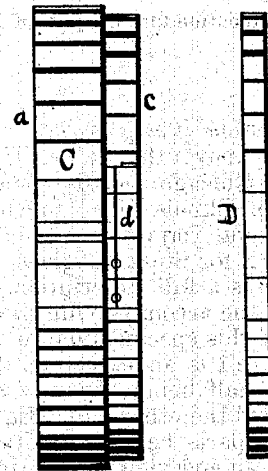
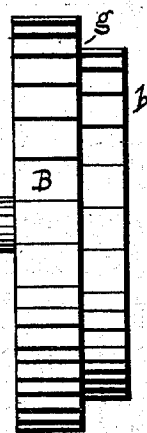
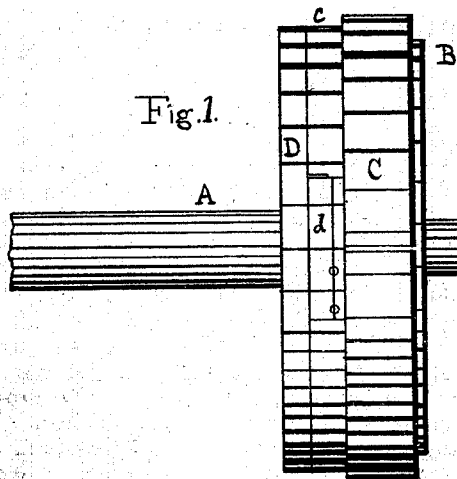


Fig. 3.

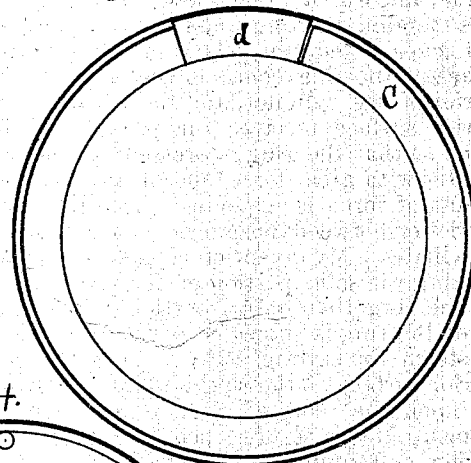


Fig. 4.

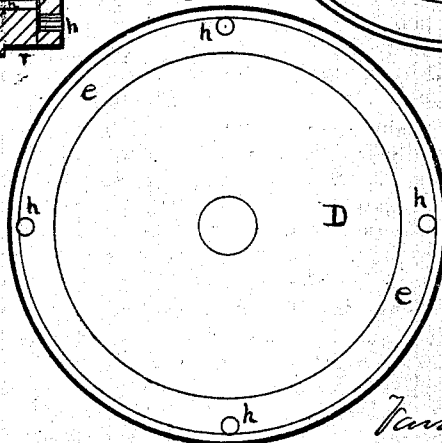


Fig. 5.

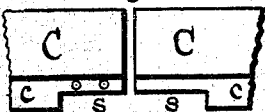


Fig. 6.



Witnesses:

E. A. West
O. W. Bond

Inventor:

V. H. Higgins

UNITED STATES PATENT OFFICE.

VAN H. HIGGINS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN METALLIC PISTON-PACKINGS.

Specification forming part of Letters Patent No. **146,591**, dated January 20, 1874; application filed April 5, 1873.

To all whom it may concern:

Be it known that I, VAN H. HIGGINS, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Metallic Piston-Packing for Steam-Engines, of which the following is a full description, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is an elevation, the several parts of one half being separate from each other, and from the other half; Fig. 2, a section, the several parts being in position ready for use; Fig. 3, an end view of the ring; Fig. 4, an inside view of the end plate; Fig. 5, a plan view of that portion of the ring which receives the tongue, and Fig. 6 a plan view of the tongue.

As metallic packing-rings have heretofore been constructed, the whole of the exterior surface of the ring comes in contact with the interior of the cylinder, and the whole of the interior surface receives the pressure of the steam, so that the ring is pressed against the cylinder with great force, and an unnecessary amount of force is expended in overcoming the friction between the exterior of the ring and the cylinder. My invention consists in so constructing the solid portion of the piston-head and the ring that only a portion of the interior of the ring is subjected to the pressure of the steam; in cutting away a portion of the exterior surface of the ring, so that the steam acts upon the recessed part, partly counterbalancing the pressure upon the interior of the ring, and diminishing the friction between the ring and cylinder; and in the devices and combinations herein claimed.

In the drawings, A represents the piston-rod; B B, the solid or so-called "spider" portions of the piston-head, the interior of which may be made as usual. A part, *b*, of B is smaller than the main portion, forming a shoulder at *g*. C C are the metallic packing-rings surrounding the parts B B. They have on the inside a shoulder, fitting the shoulder *g*, forming a steam-tight joint, and preventing the passage of the steam to the inside of that part of the ring marked *a*, which surrounds the main part of B. Between the remaining part *c* of the ring and the smaller portion *b* of B there is a space, *n*, into which steam enters.

A portion, *r*, of the exterior of the rings is cut away, to which steam passes. There is an opening between the two ends of the rings, as usual, (see Fig. 5,) and a part of each end of that part of the ring marked *c* is cut away, as shown in Fig. 5, to receive the tongue *d*, the form of which is shown in Figs. 2, 3, 6, its inner surface having a recess, *i*, fitting the parts *s s*, Fig. 5, to one of which it is secured. A portion of the outer surface of this tongue *d* comes up flush with the exterior surface of the main portion of the ring, preventing the passage of steam into the opening between the ends of the ring, but the remainder of the tongue is cut away somewhat, so as to allow steam to pass between it and the cylinder. D D are end covers or followers—one over each end. On the inside of each is a recess, *e*, which communicates with the space *n* between the interior of the ring and the part *b* of B. Steam enters the recess *e* through the holes *h*. The portion *r* of the exterior of the ring which is cut away is less in width than the width of the interior portion of the ring which receives the steam behind it, and the amount of pressure upon the interior of the ring depends upon the difference in width of these two parts. The several parts are held in position by the nut E.

In operation, steam passes through the openings *h* into the recess *e* on the inside of the cover D, thence into the space *n* between the portion *c* of the ring and the part *b* of B. At the same time steam passes to the part *r* of the exterior of the ring, and so far as the surface of *r* equals the interior surface of the ring which receives the pressure of the steam, to that extent the pressure upon the interior and exterior of the ring is counterbalanced. At the same time the tongue *d* prevents the passage of steam into the opening between the ends of the ring, and, the shoulder upon the inside of the ring forming a steam-tight joint with the shoulder *g* on B, steam cannot pass between the part *a* of the ring and the main part of B, but the tongue *d* being secured to one end of the ring only, the ring is free to expand. I prefer to leave a little space between the free end of the tongue *d* and that portion of the end of the ring opposite thereto, into which space steam can pass as soon as it

enters the cylinder, aiding in expanding the ring.

What I claim as new is as follows:

1. The solid portion B of a piston-head, when provided with a shoulder, *g*, in combination with a packing-ring having a corresponding shoulder on its inside, forming, with the shoulder *g*, a steam-tight joint, substantially as and for the purposes specified.

2. The packing-ring C, recessed upon the exterior, and constructed upon its interior so as to allow the steam to have access to only a portion of its interior, and used in connection

with the parts B and D of suitable construction, substantially as and for the purpose set forth.

3. The packing-rings C, when recessed upon the outside and provided with tongues *d*, in combination with the parts B and covers D, all constructed and operating substantially as and for the purposes specified.

VAN H. HIGGINS.

Witnesses:

E. A. WEST,
O. W. BOND.