E. F. WILLIAMS.

PISTON VALVE.

APPLICATION FILED SEPT. 18, 1911.

1,016,053. Patented Jan. 30, 1912.

Fig. 1.

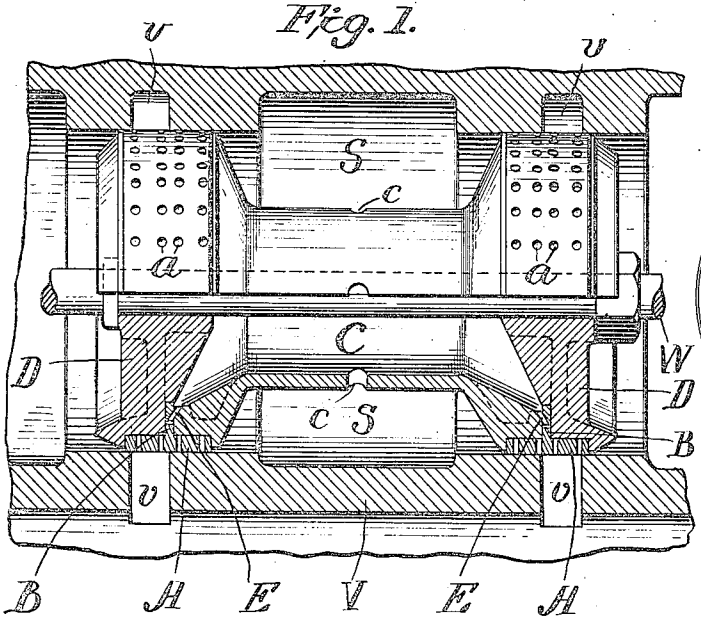


Fig. 3.

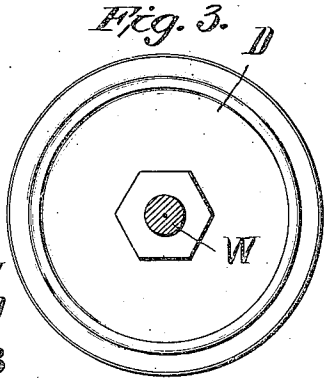


Fig. 2.

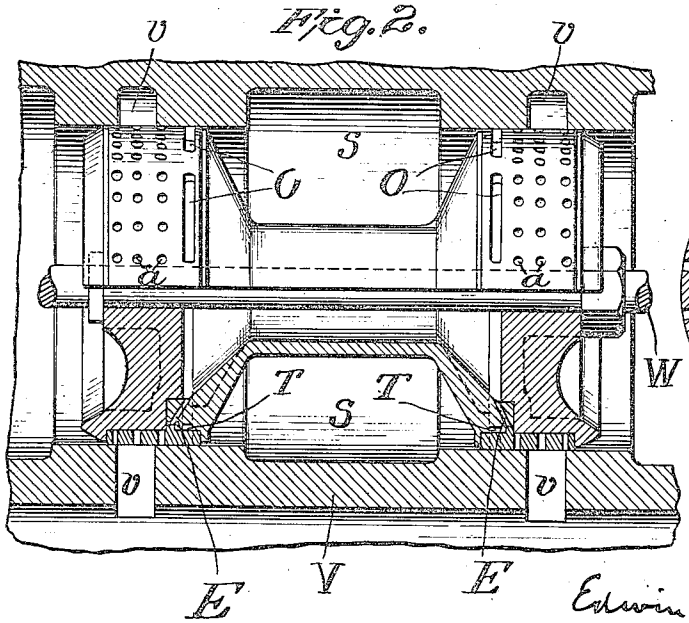
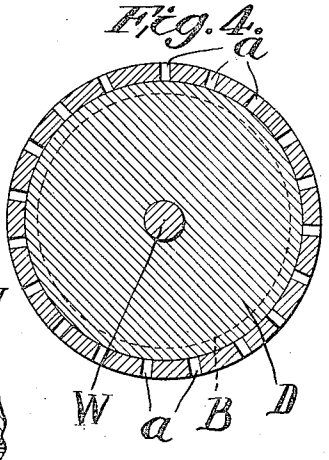


Fig. 4.



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PISTON-VALVE.

1,016,053. Specification of Letters Patent. Patented Jan. 30, 1912.

Application filed September 18, 1911. Serial No. 649,881.

To all whom it may concern:

Be it known that I, EDWIN F. WILLIAMS, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Piston-Valves, of which the following is a specification.

This invention relates to packing for piston valves and the like, and has for its object to provide improved means for holding the packing against the bearing surface of the chamber or casing in which the valve operates.

I am aware that nearly all packing rings, whether located in a piston or a piston valve, are forced out against the cylinder or valve casing by steam admitted under them in sufficient quantity to produce an outward pressure, the admission of steam under packing rings for this purpose being very old.

In my invention the steam is admitted freely under only a limited portion of the packing ring, in order to set it out, the remainder of the ring being relieved from either internal or external pressure by a number of holes extending radially through the ring. The result is a packing with a large surface for the steam joint and wear, but held out at all positions of the stroke by a limited steam pressure which will be sufficient to prevent steam leakage without causing unnecessary wear.

It is my intention to limit the steam pressure to such an extent that it will not be necessary to counteract it by friction or to otherwise neutralize the pressure.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a longitudinal section, partly in elevation, of the valve chest and valve. Fig. 2 is a similar view of a modification. Fig. 3 is an end view, and Fig. 4 is a cross section of the valve.

Referring specifically to the drawings, V indicates the cylinder wall and *v* the cylinder ports leading to the steam chamber S. The piston valve rod is shown at W, and carries the two heads D, between which is the hollow spool or barrel C. At each end these parts are grooved to receive the packing ring A. The interior of the barrel is open to the steam pressure through holes *c*. The packing ring A has an inwardly projecting rib B extending around the same and this rib fits in a groove formed to receive it at or adjacent to the joint between each head and the end of the barrel, and ports E, near the end of the barrel, open from the interior of the barrel into a slight annular space behind the rib B. The packing ring A has also a considerable number of radial holes *a* through the same.

The steam pressure within the barrel of the valve is admitted behind the rib B, instead of behind the whole ring, as heretofore, and the pressure on this rib will be found sufficient to force the valve against its seat or bearing surface with pressure enough to make a steam tight joint, without causing excessive wear or friction. The other parts of the packing ring are relieved from any pressure by means of the holes *a*, which admit steam on both sides of the ring at the remaining parts thereof.

In the modified form shown in Fig. 2 a double ported valve is illustrated, with supplementary ports O passing through the packing rings near their inner edges, in order to make increased steam port area for a given valve travel when limitations in valve diameter are necessary. Steam flows through these ports from the cylinder ports *v* as indicated by the arrows, and the steam pressure inside the barrel of the valve acts only on the limited section T of the packing ring the same as it does in the single ported construction, the ring having the same radial holes *a*. In either case the advantageous result above indicated is attained.

I claim:

1. A packing for piston valves or the like, comprising a packing ring, means for introducing live steam behind a limited part only of said ring, and means for relieving steam pressure on the remaining parts of said ring.

2. A packing for piston valves or the like, comprising a ring having an annular recess behind a limited part thereof, means for introducing live steam into said recess, and openings through the remaining part of the ring to equalize the pressure on both sides thereof.

3. A packing for hollow piston valves or

the like, comprising a comparatively wide ring, the valve being provided with an annular recess behind a limited part of said ring, ports connecting said recess with the hollow interior of the valve, and means to relieve steam pressure on the remaining inner surface of the ring.

In testimony whereof, I do affix my signature in presence of two witnesses.

EDWIN F. WILLIAMS.

Witnesses:
CHARLES G. BREVILLIER,
M. LEVANT DAVIS.