L. MANGOLD.

OSCILLATING-VALVES FOR STEAM-ENGINES.

No. 193,981. Patented Aug. 7, 1877.

Fig. 6.

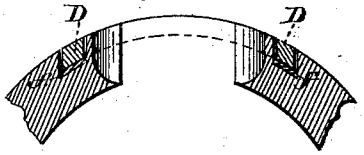


Fig. 1.

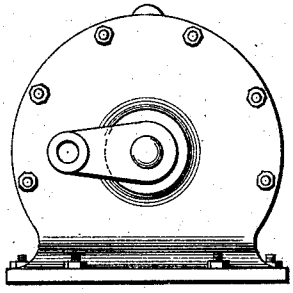


Fig. 2.

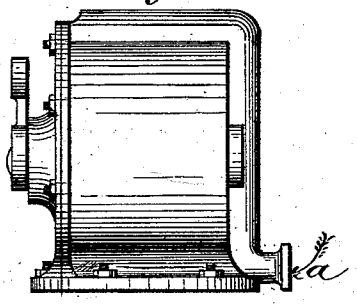


Fig. 3.

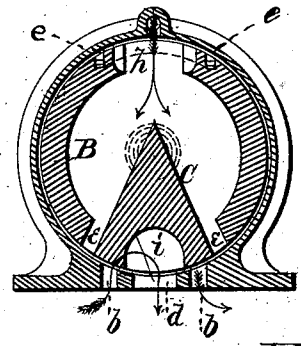


Fig. 4.

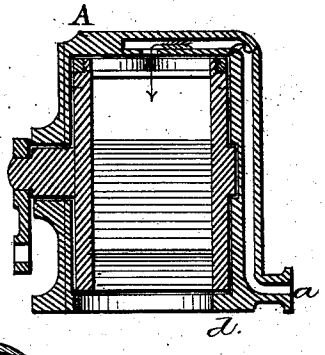
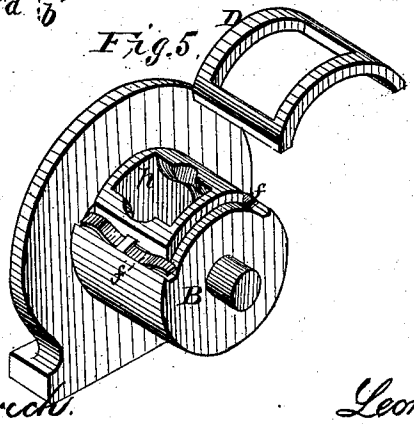


Fig. 5.



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UNITED STATES PATENT OFFICE.

LEONARD MANGOLD, OF CHATTANOOGA, TENNESSEE.

IMPROVEMENT IN OSCILLATING VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **193,981**, dated August 7, 1877; application filed November 10, 1875.

To all whom it may concern:

Be it known that I, LEONARD MANGOLD, of Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Rotary Valves; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

The nature of my invention consists in the construction and arrangement of a rotary valve, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, which forms a part of this specification, and in which—

Figure 1 is an end elevation of my valve. Fig. 2 is a side view of the same. Fig. 3 is a transverse vertical section, and Fig. 4 a longitudinal vertical section thereof. Fig. 5 is a perspective view of the valve proper, and Fig. 6 is an enlarged section of a part thereof.

A represents the valve-case, provided with the steam-ports *b b* and exhaust *d* between the same. It is also provided with the steam-inlet *a*, running up one end of the case and entering the same at the top, as shown in Fig. 4.

The valve-case A is made in cylindrical form, and within the same is placed the oscillating cylindrical valve B, provided at the top with steam-inlet *h*, and at the bottom with steam-outlet ports *e e*. Between these latter ports is a triangular partition, C, extending the entire length of the valve and upward above the center thereof. In the base of this partition C is a recess, *i*, which forms the passage for the exhaust-steam to the exhaust-port *d*.

Around the steam-inlet port *h* in the top of the valve B is made a groove of suitable depth to receive a metal frame, D, which is curved to correspond with the curvature of the valve, and is forced outward by means of two or more springs, *f*, placed under it within the groove. This metal frame forms the packing for the valve, and surrounding as it does all four sides of the port *h*, it forms a bearing entirely around the same, and thus prevents the escape of steam in every direction.

The steam entering the valve through the port *h* strikes the apex of the triangular partition C, and is thereby divided in such a manner as to pass with equal force through either of the ports *e*, accordingly as the valve is turned to make said ports coincide with the ports *b b*.

The packing-frame D may be made of any suitable metal, and when the same is worn out it can be easily removed and another put in its place again.

The entire valve is simple and cheap in construction, works easily, and is not liable to get out of order.

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

The combination of the cylindrical valve B, having ports *h* and *e e*, with groove around the port *h*, the metal frame D, and springs *f*, the valve-case A, with its ports, and the partition C, with recess *i*, all substantially as and for the purposes herein set forth.

LEONARD MANGOLD.

Witnesses:

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JOHN BULL.