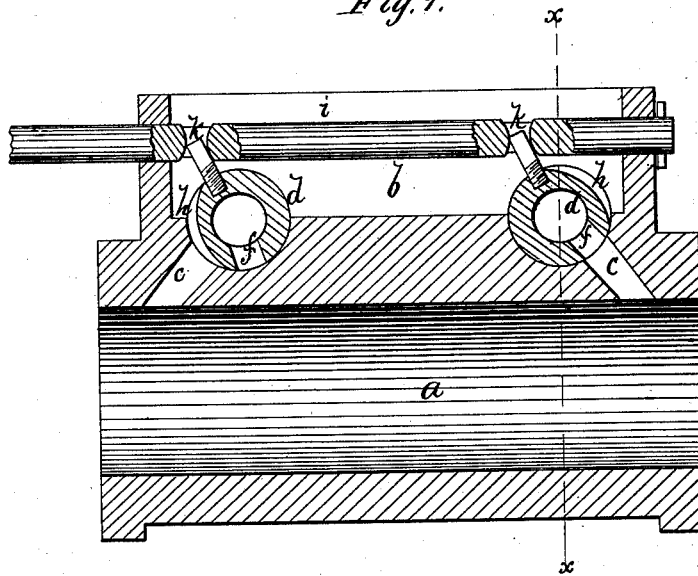


W. REDMOND.  
Rotary Valves.

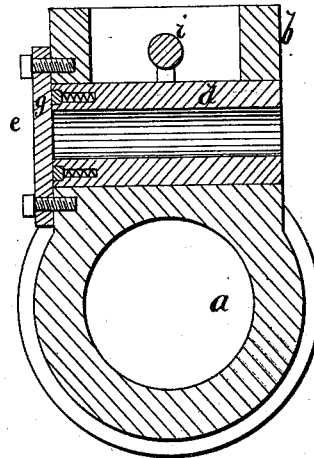
No. 216,457.

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*Fig. 1.*



*Fig. 2.*



WITNESSES:

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# UNITED STATES PATENT OFFICE

WILLIAM REDMOND, OF GREENVILLE, SOUTH CAROLINA.

## IMPROVEMENT IN ROTARY VALVES.

Specification forming part of Letters Patent No. **216,457**, dated June 10, 1879; application filed December 7, 1878.

*To all whom it may concern:*

Be it known that I, WILLIAM REDMOND, of Greenville, in the county of Greenville and State of South Carolina, have invented a new and useful Improvement in Valves for Steam-Engines, of which the following is a specification.

The object of my invention is to dispense with long induction ports or passages and to place the valve-openings as near as possible to the piston-head without weakening the cylinder in any part.

I make use of two tubular valves, fitted in concave seats at opposite ends of the steam-chest, and communicating with the steam-pipe through the side of the chest. The valves are fitted to be turned axially, to permit steam to pass from the interior of the valve to the steam-passages of the cylinder, or permit the exhaust-steam to escape to the chest.

The exhaust-passage is formed by a flattened portion in the surface of the valves, that coincides with the steam-passage of the cylinder when the live steam is cut off.

In the accompanying drawings, Figure 1 is a longitudinal section of an engine-cylinder and steam-chest fitted with my improved valves. Fig. 2 is a cross-section on line *x x*.

Similar letters of reference indicate corresponding parts.

*a* is the cylinder; *b*, the steam-chest; *c* *c*, the steam-passages in the cylinder *a*; and *d* *d* are the steam-valves, which are fitted transversely of the chest *b* in seats cut in the bottom of chest *b*, and at opposite ends, where the passages *c* terminate, so as to bring the valves as close as possible to the cylinder-heads, thereby shortening passages *c*.

The valves *d* are short cylindrical tubes passing through the sides of the steam-chest, one end being connected to the steam-pipe in any desired manner, so that the passage through the valves forms a steamway, and at the other end of the valve a cap, *e*, is placed, to close the opening steam-tight and prevent lengthwise movement of the valve in that direction.

*f* is a radial opening in each valve *d*, which, when turned to coincide with passages *c*, admits steam to cylinder *a*.

The valves *d* turn freely in the concave seats,

and to render them more completely balanced may be fitted with curved bearing-plates, held to the outer surface of valves *d* by a spring. The end of valves *d* next to cap *e* is formed with an annular groove, in which are placed spiral springs and a packing-ring, *g*, so as to bear upon cap *e*, to make the joint steam-tight at that point and press the valve tightly to its connection with the steam-pipe at the other end.

A portion of the surface of each valve *d* is flattened or cut away, as seen at *h*, so that as the valves are turned to bring the flattened portion coincident with passages *c* a passage is opened to the interior of chest *b*.

The valves are turned axially by the reciprocation of valve-rod *i* through the medium of pins *k*, that project from valves *d* into slots in rod *i*.

The steam enters through the valves from the steam-pipe, and exhausts into the steam-chest *b*, which will have an exhaust-pipe connected to its cap or sides. By this construction the chest *b* will contain exhaust-steam only, and the engine will operate with the cap of the steam-chest removed, and leakage in the valve may thereby be detected. The exhaust will be free and direct, and the valves are simple, and may be readily replaced when necessary.

The absence of numerous exhaust and steam ports in the valves and cylinder reduces the clearance and waste to a minimum, and is a great advantage.

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

1. In combination with the cylinder *a*, having steam-passages *c*, the tubular valves *d*, provided with radial openings *f* and a flattened surface, *h*, and fitted in concave seats in the cylinder, for operating substantially as described and shown.

2. In combination with the tubular valves *d*, fitted transversely of the steam-chest, the cap *e* and packing-ring *g*, substantially as and for the purposes set forth.

WILLIAM REDMOND.

Witnesses:

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GEO. PUTNAM.