

*J.F. Holloway,*  
*Oscillating Valve.*  
*No. 110041.      Patented Dec. 13. 1870.*

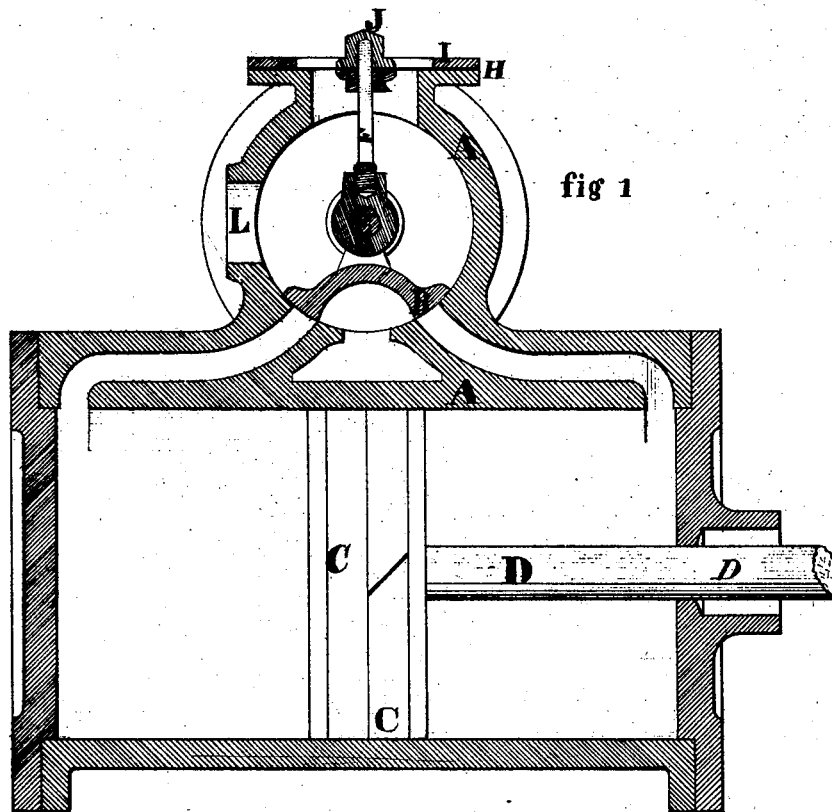


fig 1

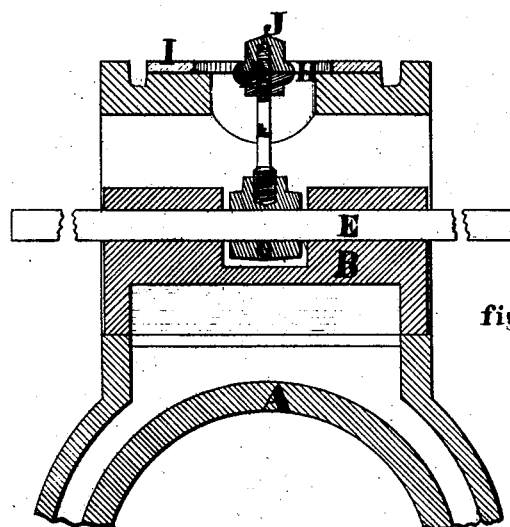


fig 2

Witnesses

*Robt. Barwright*  
*W. H. Cullen*

Inventor

*Josephus F. Holloway*

# United States Patent Office.

JOSEPHUS F. HOLLOWAY, OF CLEVELAND, OHIO.

Letters Patent No. 110,041, dated December 13, 1870.

## IMPROVEMENT IN SEMI-ROTARY VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

I, JOSEPHUS F. HOLLOWAY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and improved mode of constructing Slide-Valves for Steam or other Engines, of which the following is a specification.

### *Nature and Object of the Invention.*

The purpose of my invention is so to construct and make the slide-valve of a steam or other engine, as that a portion of the pressure upon the back of the valve may be counterbalanced, thus reducing the friction, and consequently the wear upon the face of the valve, and upon the face of the valve-seat.

My invention is intended to apply to that class of steam or other engines in which the valve-seat or chamber is bored out cylindrical, and the main or slide-valve is fixed upon a round spindle or valve-stem, which is concentric with the valve-chamber, and the face of the valve is turned truly to fit upon the valve-seat, and semi-rotates within and upon the valve-seat.

### *Description of the Accompanying Drawing.*

Figure 1 is a side elevation of the steam-cylinder, showing an end view of the valve-chamber and of the valve, the whole being a cross-section through the center of the steam-cylinder.

Figure 2 is an end elevation of the steam-cylinder, showing a longitudinal cross-section through the center of the valve-chamber, and the valve-spindle and valve.

Similar letters refer to the same parts in both figures.

### *General Description.*

- A is the steam-cylinder.
- B is the main or slide-valve.
- C is the piston-head and packing.
- D is the piston-rod.
- E is the valve-spindle or stem.
- F is a connecting screw-bolt or rod.
- G is a loose sleeve on the valve-stem.
- H is a thin circular metallic disk.
- I is a metal ring to fasten the disk H.
- J is a broad-faced nut closed at top.
- K is a broad-faced nut.
- L is the steam-opening into the chamber.

The steam-cylinder A, as shown in the drawing, has a circular steam-chest cast on it, and the steam-chest is bored out truly, and at right angles with the bore of the cylinder.

The steam-chest may be cast separately and bolted onto the steam-cylinder if it is more convenient to do so.

Within the steam-chest is the main or slide-valve B. This valve is keyed, or otherwise fastened to the

valve-spindle E, and is made to semi-rotate within the steam-chest by means of a crank on the end of the valve-spindle, this crank being actuated by an eccentric in the usual manner; thus admitting and discharging the steam through the ports into the cylinder in the same manner as is done by the common slide-valve.

For the purpose of relieving the valve of a portion of the pressure which is upon it when steam is admitted into the steam-chest, I place on the valve-spindle E, midway from each end, a loose sleeve, G, which is bored out a little larger than the spindle, so that the spindle may turn freely within it.

In the top of this sleeve G is attached a bolt, F, and on the top of the steam-chest, or opposite the exhaust port of the steam-cylinder, is an opening, which I cover with a thin flexible plate of metal, marked H in the drawing. This plate is held in its place and made steam-tight by the ring I, which is bolted to the steam-chest.

This flexible plate H has in its center a hole, through which the bolt F projects, and it is prevented from being blown out by the pressure of steam within the steam-chest by the broad-faced nut or a broad washer and nut J, which is screwed onto the bolt F, and rests on the outer face of the plate.

K is also a nut, screwed on the bolt F, within the steam-chest, and on the under side of the plate H, having between it and the plate a thin gasket of rubber cloth, which prevents the escape of steam through the hole in the plate H.

It will be obvious to any one that the amount of pressure exerted upon the under side of the flexible plate H, will be governed by the amount of its outer surface exposed to the atmosphere, or, in other words, by the area of the plate not covered by the ring I; thus the amount of pressure it is desirable to take off the main valves can be regulated by the size of the inner diameter of the ring I.

Precisely how much should be thus counterbalanced or taken off the valve B is, to some extent, a matter of experiment, but in practice I make the area of the plate within the ring I to equal the area of the exhaust-chamber under the main valve, thus relieving the face of the valve of a large portion of the pressure, and consequently the friction upon it.

I do not confine myself to the use of a single sleeve, bolt, and plate, for one valve, but use two or more sleeves, bolts, plates, and rings, when the valve is large enough to warrant it. Neither do I confine myself to the peculiar method, as shown, by which to connect the sleeve G and the plate H.

### *Claims.*

I claim as my invention—

1. The combination of the bolt or connecting-bar F, in connection with the sleeve G, and the nuts J and K, on either side of the flexible plate H, substantially as and for the purpose hereinbefore set forth.

2. The combination of the flexible plate H, in connection with the connecting-bar F and the loose

sleeve G, substantially as described, and for the purposes set forth.

JOSEPHUS F. HOLLOWAY.

Witnesses:

ROBT. CARTWRIGHT,  
WILLIAM W. CASTLE.