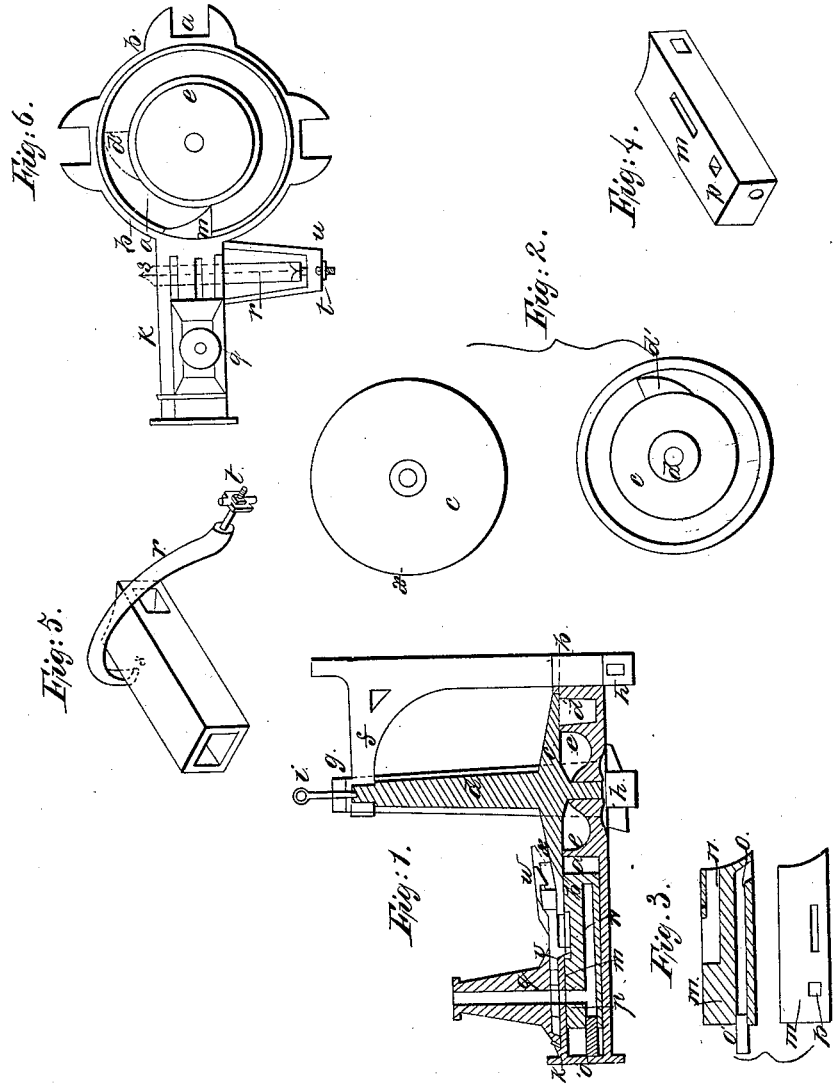
# J. P. Ross,

## Rotary Steam Valve.

No. 6,616. Patented July 31, 1849.



# UNITED STATES PATENT OFFICE.

J. P. ROSS, OF LEWISBURG, PENNSYLVANIA.

## VALVE OF ROTARY ENGINES.

Specification of Letters Patent No. 6,616, dated July 31, 1849.

*To all whom it may concern:*

Be it known that I, JAMES P. Ross, of Lewisburg, in the county of Union and State of Pennsylvania, have invented certain new and useful Improvements in Water-Power Machinery which are also Applicable to Steam, and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section Fig. 2, plans of the upper and lower side of the runner with the piston and cam attached Fig. 3 plan and section of the steam valve Fig. 4 isometrical view of the same valve Fig. 5, similar view of water valve Fig. 6 plan of apparatus with parts removed.

The nature of my invention consists in the mode of connecting the runner or piston with the annular chamber the construction, adaptation, and mode of operation of the valve and in the connection therewith of the cutoff when used.

The construction is as follows, the annular chamber *a* is nearly square in its cross section, but somewhat tapering at its sides, and at the top thereof on the outer circumference there is a rebate *b* also made inclined, the runner is composed of a disk *c*, on a shaft *d*, that fits like a cover upon the rebate, and is ground to it so as to make a perfect joint, the inner side or partition *e* of the chamber also fits tightly against the cover, or disk *c*, on this disk a piston *d'* is affixed that exactly fills the cross section of the chamber. This piston is wedge form as shown in Fig. 2, and its point or thinnest part runs first. The shaft has its upper bearing in a brace *f*, projecting from the base of the annular chamber, and over its end a bale or loop shaped frame *g*, extends, fastened by its two ends to the foundation at *h*, *h*. Opposite the end of the shaft *d*, a screw *i* runs through the frame *g*, and sets against the end of the shaft, by means of which the joints are tightened or relieved at any moment and can be adjusted and regulated to the expansion of the parts while the machine is in motion, a matter of great importance, especially in working steam. From one side of the annular chamber a square projecting pipe or chamber *k* opens in which an oblong valve *m* fits and slides into the annular chamber as shown in Fig. 6, so as to close it at that point, the heel of this valve is formed to suit the wedge shaped piston *d'* above named which once in every revolution comes in contact with the raises it, there is an opening *n* in the heel of the valve (see Fig. 3) that opens into the external medium around the chamber and discharges the water or steam, this is at all times open except when the piston comes in contact with the valve and closes it while the valve is raised and the piston passes, at which time the supply of steam or water is cut off, another opening is formed in the valve at *o* that affords a passage to the propelling medium, it has its egress port on the face of the valve and discharges the water or steam behind the valve. When steam is used to relieve the valve from a balance of pressure I continue the opening out to the end of any size that is found expedient for the purpose and insert a pin *o'* into it; if this opening and pin is the whole size of steam port, the valve will be forced inward with the pressure of the whole column, but if it is smaller the pressure will be in proportion. The steam or water way into the valve is through a hole *p* made therein, when the valve is down this opening is opposite the connecting pipe *q*, and when up it is cut off at both ends of the steam or water way *o*.

A stirrup *r* passes over the case in which the valve is situated and bears against it at a point *s* on the back side near the heel, the opposite end of the stirrup is connected with an axis *t* having its bearings in a frame *u* made for that purpose the connection between the stirrup and axis is by means of a set screw, by which the pressure on the valve can be regulated, and the friction relieved so as to cause it to slide easily.

When steam is used expansively I employ a cut off of the following construction, it consists of a flat plate valve *v* that slides between the sliding valve *m* and the connecting pipe *q* and when open as shown in Fig. 1, the steam has a free passage through it as a hole made therein is opposite the steam passage, the stem of this valve extends over the disk *c*, and has a hook *w* formed on its end, a cam *x* is attached to the disk to cut off at any distance from the piston, and this

comes in contact with the hook and closes the cut-off by drawing it into the position shown by the red lines in Fig. 1.

When the sliding valve again rises, a stud $w'$ that enters a mortise $x'$ on the valve, causes it to rise with it, and the valve again falls, leaving it in position to be drawn down by the next revolution of the cam; by this simple arrangement the steam may be cut off at any length of stroke. In the water valve shown at Fig. 5, these parts are dispensed with.

Having thus fully described my improved prime mover what I claim therein as new and for which I desire to secure Letters Patent, is—

The sliding valve, constructed as herein described, with an exhaust port therein which is stopped by the piston while it is opening the valve as above set forth.

J. P. ROSS.

Witnesses:
J. J. GREINONG,
THOMAS ADAMS.