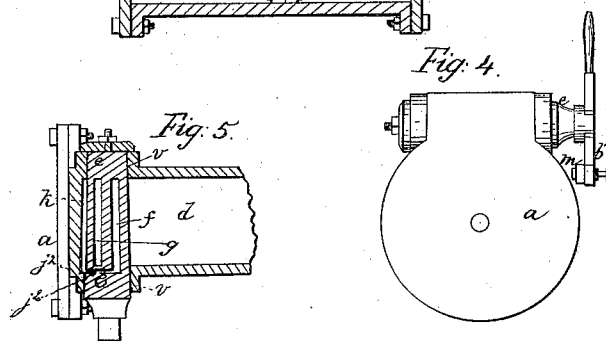
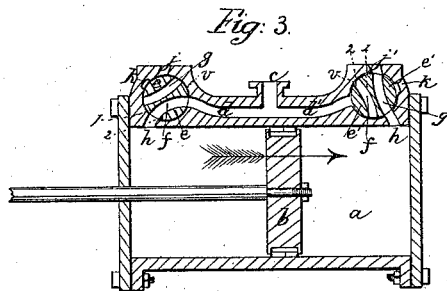
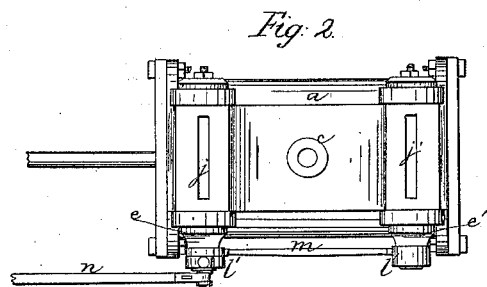
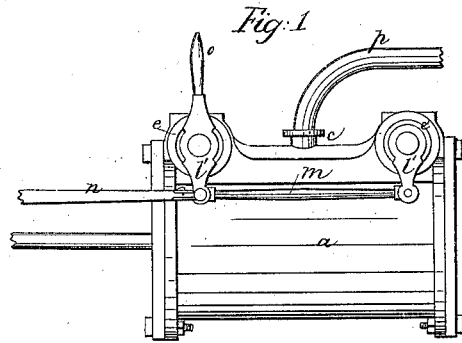


*T. C. Theaker,
Rotary Steam Valve.
Patented May 7, 1850.*



UNITED STATES PATENT OFFICE.

THOS. C. THEAKER, OF MANSFIELD, OHIO.

IMPROVEMENT IN OSCILLATING VALVES OF STEAM-ENGINES.

Specification forming part of Letters Patent No. 7,353, dated May 7, 1850.

To all whom it may concern:

Be it known that I, THOMAS C. THEAKER, of Mansfield, Richland county, and State of Ohio, have invented new and useful Improvements in Valves of Steam-Engines; and I hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation thereof, reference being had to the annexed drawings, making part of this specification.

The nature of my invention and improvement consists in forming side passages or steamways leading from the usual steamways in the oscillating valves and communicating with recesses formed in the valve-chambers, for the purpose of letting steam into said last-named recesses, in order to produce a pressure of steam against the side of the valve opposite to that on which the steam is admitted, so as to produce a counter-pressure on the oscillating valves for the purpose of reducing the friction on the same, as described. The general wear of the surface of the valve is rectified by occasional longitudinal adjustment, the valve-cylinder being made somewhat conical and furnished with a set-screw for that purpose.

In the annexed drawings, Figure 1 is an elevation of the cylinder, showing the attachment for operating the valves. Fig. 2 is a plan or top view of the same, showing the escape and supply openings. Fig. 3 is a longitudinal elevation, the piston advancing in the direction of the arrow. Fig. 4 is an end elevation. Fig. 5 is a section through one of the cylindrical valves and a portion of the steamway or receiving-chamber when the valve-cylinder is in the position as shown at *e'*, Fig. 3.

Similar letters in the several figures indicate the same parts.

A is the steam-cylinder, *b* the piston, and *p* the supply-pipe, of the usual construction.

c is the supply-opening immediately over the center of the cylinder and communicating with steamways or side pipe, *d d'*, which, diverging and extending to each end of the steam-cylinder *a*, meets the valve-cylinder *e e'* of its respective valve-seat *v*. Each valve-cylinder is traversed by two apertures, *f g f' g'*, so disposed that when the valve-cylinder *e* is turned to the position shown in Fig. 3 the aperture *f* shall form a continuous or connect-

ing channel between the supply-passage *c d* and the short passage *h*, opening into the cylinder near one end, and thus afford free entrance of the steam to that end of the cylinder, at the same time causing the exhaust-opening *g'* of valve-cylinder *e'* to be coincident with the openings *h' j'*, and thus to exhaust the steam from the opposite end of the steam-cylinder. The valve-cylinders *e e'* are then turned simultaneously a segment of a circle, (being connected by the arms *l' l'* and link or rod *m*,) causing the openings in the valve-cylinders to change positions, making the opening *g* to coincide with the exhaust-opening *j* and the opening *f'* with induction-opening *h'*, opening the steamway to the opposite end of the cylinder next said opening, while it escapes from the other end of the cylinder in the manner which is well understood by engineers and others.

The valve-cylinders are operated by the action of the usual eccentrics or cams and cam-rod of the steam-engine, a section of said rod being seen at *n*.

j', Fig. 5, is a small passage connecting the supply-opening with a recess, *k*, in the side of the valve chamber or seat opposite to the supply-opening, and having an equal area with said opening. It will readily be seen that when the valve-cylinder is in the position first mentioned the recess *k* presents an area of steam equal to the difference of the two opposite surfaces, 1 2, of the supply-aperture, and when it is in the second position the area of the former is exactly equal to that of the opposite supply-passage, and thus, whether the valve be in one position or the other, a complete equilibrium of pressure is maintained, and there exists, therefore, no tendency whatever in the cylinder to any one side more than another.

I cast the side pipes and valve-chamber either permanently on the cylinder or separate, at pleasure. If separate, it will be attached by means of screws to the cylinder in the usual way. All the openings or pipes, and also the chambers for the valves, are made by cores of the proper shape.

The openings in the pipes for an engine of, say, ten-inch bore I make about seven inches by one-half or five-eighths of an inch, and the chambers for the valves about three or three

and one-half inches diameter, and a little tapering or conical, to allow of their being ground with their respective valves. I then bore out the chambers and turn off the valve to correspond with each other, and grind their surfaces together with flour of glass or emery, in order to get them perfectly true and steam-tight. The openings in the valves are also cast in them by means of cores.

Having thus described the construction and operation of my invention and improvement, what I claim as new, and desire to secure by Letters Patent, is—

The recess f^2 , sunk in oscillating valve and communicating with the steam-passage f , in combination with the recess k , formed in the valve-chamber, the same acting in the manner and for the purposes herein specified.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

T. C. THEAKER.

Witnesses:

WM. P. ELLIOT,
D. A. CHAPIN.