J. C. WILSON.

Rotary Balance-Valves.

No. 130,683. Patented Aug. 20, 1872.

Fig. 1

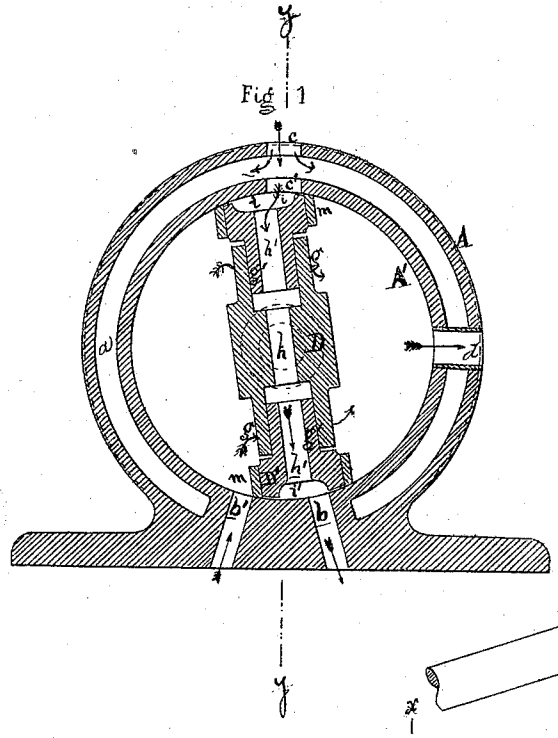


Fig. 3.

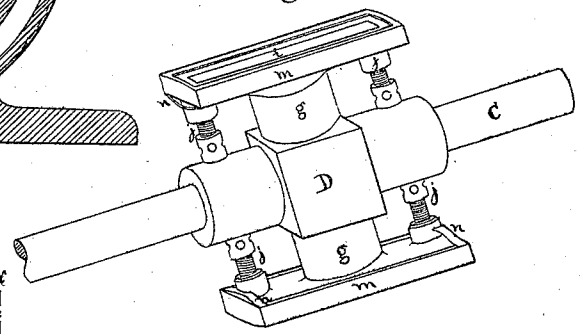
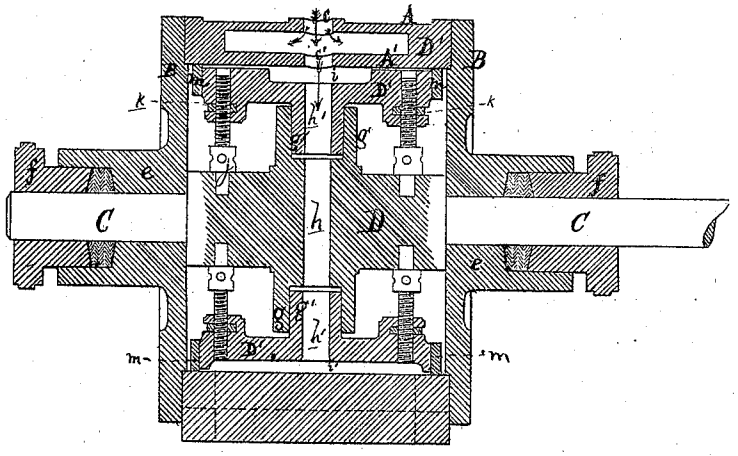


Fig. 2



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH C. WILSON, OF OSHKOSH, WISCONSIN.

IMPROVEMENT IN ROTARY BALANCE-VALVES.

Specification forming part of Letters Patent No. **130,683**, dated August 20, 1872.

To whom it may concern:

Be it known that I, JOSEPH C. WILSON, of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented a new and useful Improvement in an Oscillating Balance-Valve; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawing and the letters of reference marked thereon and being a part of this specification, in which—

Figure 1 is a cross-section through the steam-chest and valve at *x x* in Fig. 2, which is a longitudinal vertical section on the plane *y y* in Fig. 1; and Fig. 3 is a perspective view of the valve.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of this invention relates to an improvement in the construction of that class of steam-valves which oscillate within a cylindrical steam-chest, and which are balanced or have the pressure of the steam equally distributed on all sides; the object of the invention being primarily to provide the valve with an elastic packing on its bearing-faces; secondly, to provide for setting out the faces of the valve from the body thereof to take up the wear thereof; and, thirdly, to provide against unequal expansion of the valve and chest when steam is admitted therein, and thus prevent the valve from sticking or undue friction in its working. The invention consists, first, in the peculiar construction of the valve proper; and, second, in the peculiar packing applied to the valve to keep it steam-tight without undue friction.

In the drawing, A represents a cylindrical steam-chest, cored in molding so as to form a steam-jacket for an inner steam-chest, A^1, likewise cylindrical in form, the steam-space *a* extending nearly around the chest, leaving the necessary space for the ports *b b'*. A^2 are flanges through which the chest may be bolted to the cylinder of the engine. *c* is an opening in the top of the outer shell, and *c'* is a coincident opening in the inner shell of the steam-chest; to the former the steam-pipe from the boiler is connected, from which steam enters the inner chamber, first filling the jacket-belt *a* and exhaust-pipe *d*, takes the exhaust out of the inner shell at one side, passing through the steam-belt and outer shell. B B' are the covers to the steam-chest, the ends of which should be faced true by grinding on the covers to a steam-tight joint. Each cover is cast with a concentric opening, surrounded by an externally-projecting stuffing-box, *e*, which receives a gland, *f*, in which the shaft C of the valve oscillates, passing through one of said glands far enough to receive a rocker-arm, which is vibrated by an eccentric on the driving-shaft of the engine. D is the body of the valve, keyed on the shaft C, from which, at two opposite sides, project the arms *g g*, through which and the shaft there is a longitudinal steam-passage, *h*. The ends of the valve-body arms are counterbored, and each receives a stud, *g'*, on the back of a valve-plate, D', which stud is bored or slotted, as at *h'*, to form a continuous passage from one side of the valve to the other. The face of the upper valve is chambered, as at *i*, so that in the oscillation of the valve the communication from the steam-pipe to the passage through the valve will never be closed. The lower valve-face is also chambered, as at *i'*, lengthwise, as seen in Fig. 3, to include the opening of one port, and about one-half of the intervening bridge-piece. The chamber *i'* is so designed as to cut off the steam from the port by lap at the proper point in the throw of the eccentric. The valves are set out against the walls of the inner shell, which constitute their seats, by means of two set-screws, *j*, one at each end. The heads of these screws are stepped in sockets in the valve-body, while their ends are threaded in nuts *k*, embedded in the backs of the valves, so that a light contact of the valves with their seats may be thereby adjusted; but to insure the valves from leakage or blowing through I surround each with a frame, *m*, sliding on its four edges, which frame is pressed outward by a half-leaf spring, *n*, at each end, the middle of the spring being inserted in a groove cut in the side of a stud on the back of the valve, so that the outer edges of these frames being pressed against the walls of the steam-chest by the semi-elliptic springs *n*, serve as a spring-packing to prevent any steam which may pass the faces of the valves from blowing through. The valve being in the position shown in Fig. 1, steam will pass directly through it to the port *b*, first

filling the belt *a* and keeping it filled with live steam so long as the throttle-valve is open; at the same time the exhaust steam from the cylinder enters the steam-chest through the port *b'* and escapes through the pipe *d*, and when the valve is shifted steam will enter the cylinder through the port *b'* and escape through the port *b*. The pressure of the steam being exerted within the valve-passage *h h'*, the valve is of necessity balanced.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The valve-body D and plates D' D', provided with the chambers *i i'*, passages *h h'*, and adjusting-screws *j*, all arranged to operate within a cylindrical steam-chest, substantially as herein described.

2. As a packing device for oscillating steam-valves, the frames *m* sliding on the end edges thereof, and actuated by the springs *n*, substantially as shown and described.

JOSEPH C. WILSON.

Witnesses:
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