

O. KROMER.
Slide-Valves for Steam-Engines.

No. 152,653.

Patented June 30, 1874.

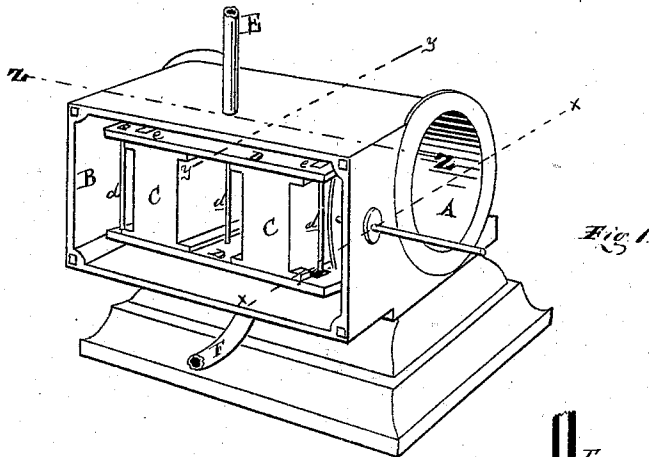


Fig. 1.

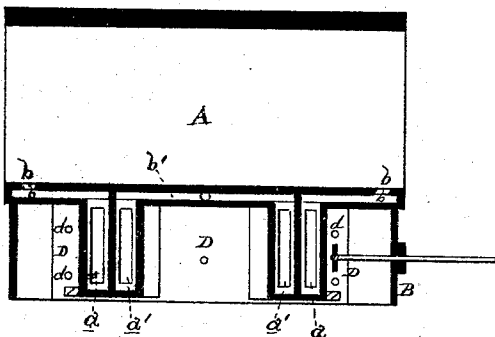


Fig. 2.

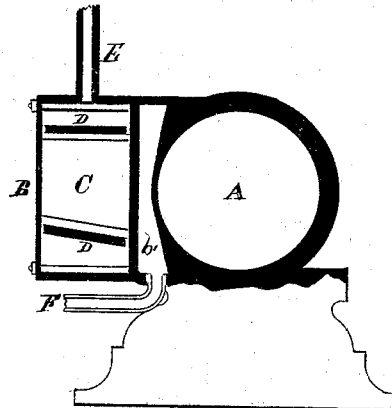


Fig. 3.

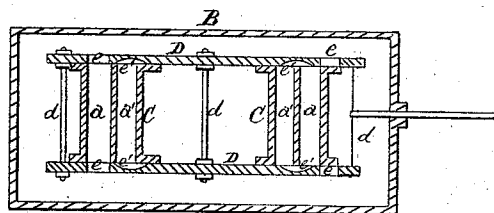
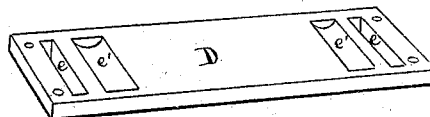


Fig. 4.

ATT E S T.

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OTTO KROMER, OF SANDUSKY, OHIO.

IMPROVEMENT IN SLIDE-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 152,653, dated June 30, 1874; application filed June 27, 1873.

To all whom it may concern:

Be it known that I, OTTO KROMER, of Sandusky, in the county of Erie and State of Ohio, have invented a new and useful Improvement in Slide-Valves for Steam-Engines, (Case A;) and I do hereby declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, and being a part of this specification, in which—

Figure 1 is a perspective view of an engine fitted with my improved valve-seats and balanced slide-valve. Fig. 2 is a horizontal section on the plane xx in Fig. 1. Fig. 3 is a cross-section on line yy , Fig. 1. Fig. 4 is a longitudinal vertical section through the steam-chest, valve-seats, and valve-plates, on the plane zz in Fig. 1. Fig. 5 is a perspective view of the inner face of one of the valve-plates.

Like letters refer to like parts in the several figures.

The nature of this invention relates to an improvement in the construction of that class of steam-engines in which the admission of steam to the interior of the cylinder and the eduction of the exhaust steam therefrom is governed by a single slide-valve. The object of the invention is to construct the valve-seats and the valve as that the latter will be balanced, and the seats relieved from all friction but that due to the weight of the valve; also, to so construct the valve and seats as that they will take up the wear between the faces of the seats and those of the valve; and to these ends it consists, first, in forming two projections on the bottom or seat of the steam-chest, with transverse double ports in each, the one communicating with the cylinder-port and the other with the exhaust-belt, and in connection therewith a valve composed of two double-ported plates connected by pressure-bars at their ends beyond the ends of the projecting seats, the valve-plates being adjusted to their seats by temper-nuts on the pressure-rods; also, in making one or both faces of the seat projections inclined or taper-

ing, and the valve to correspond, whereby, under the pressure of the steam, the valve will be kept seated, as more fully hereinafter set forth.

In the drawing, A represents a horizontal steam-cylinder, with a steam-chest, B, at its side, in the bottom of which would be the valve-seats in engines of this type as ordinarily constructed. Near each end of the cylinder, within the chest, is a projection, C, cast with the cylinder, the two projections forming seats for a valve formed of two plates, D D. The seats have two vertical transverse ports, $a a'$, cored in them, the former connecting with the steam-port b leading into the cylinder, and the latter with an exhaust-belt, b' , cored between the bottom of the chest and the cylinder, this exhaust-belt connecting the exhaust-port a' of each valve-seat. E is the steam-pipe, which supplies the cylinder, and F is the eduction-pipe connected with the exhaust-belt. The valve-plates are secured together by the bars d , having check-nuts on their ends on both sides of the plates, for adjusting the plates, and, in addition, the inner ones sustain and resist the pressure of the steam, tending to force them together in the area of the seats, which they inclose. Two pressure-bars are placed between the plates at each end of the valve, and one or more intermediately between the projecting seats. The plates project beyond the seats at the ends so far that the latter will not arrest the throw of the valve by the bars striking them. Each valve-plate has a port, e , through it across and near each end, and nearer the middle is an exhaust-recess, e' . One valve-plate lies on the upper surface of the projecting seats, and the other under their lower faces.

Referring to Fig. 4 of the accompanying drawing, the valve is seen to be in such position that steam will pass through its left-hand ports $e e$ into the vertical steam-port a of the left-hand seat, thence through the port b into the left-hand end of the cylinder, to propel the piston toward the right-hand end. By referring to the other or right-hand seat, the ports $e e$ have been moved away from the port

a, which, with the exhaust-port *a'*, is included by the recesses *e' e'* of the valve-plates; hence the exhaust steam passes from the advancing piston through the right-hand ports *b*, *a*, and *a'* into the exhaust-belt *b'*, thence through the eduction-pipe to the atmosphere or into a condenser. The pressure of steam being exerted upon both exterior faces of the valve, it is scarcely necessary to add that it is balanced.

The under surfaces of the seats are sloped, and so is the lower valve-plate, to the same angle, in order that some little steam-pressure may be exerted on the valve to keep it seated and cause it to wear steam-tight. In engines

having their steam-chests on top of the cylinder, both faces of the seats should be tapered to the same angle.

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

The steam-chest provided with two projections, *CC*, having transverse double ports and tapering faces, with the valve composed of two double-ported plates united by pressure-bars and nuts, as described.

OTTO KROMER.

Witnesses:

AUGUST KLOTZ,
J. P. MERRIAM.