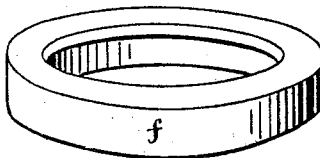
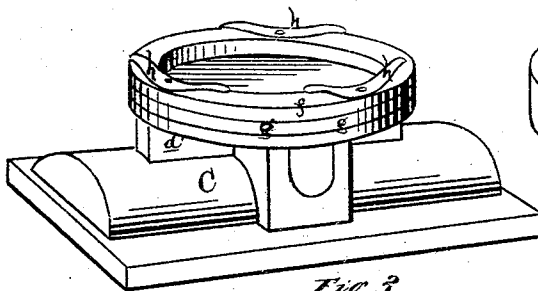
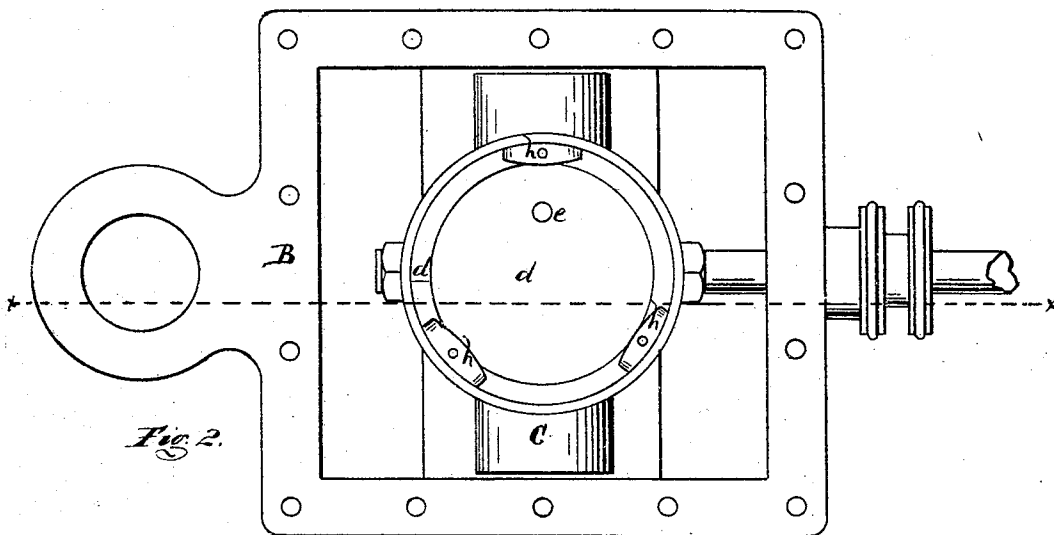
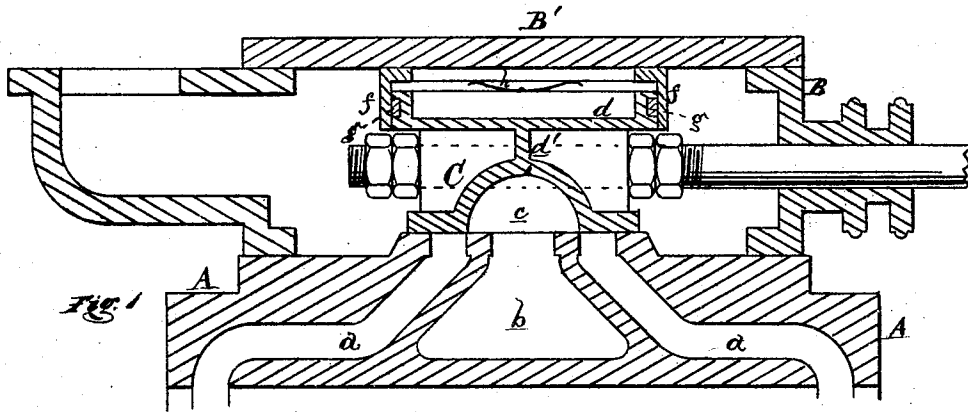


E. HEYDE.
Balanced Slide-Valves.

No. 147,131.

Patented Feb. 3. 1874.



Attest:
H. F. Clark,
C. E. Gustis

Fig. 3.

Inventor
Edward Heyde,
per attorney
Wm. Sprague

UNITED STATES PATENT OFFICE.

EDWARD HEYDE, OF EAST SAGINAW, MICHIGAN.

IMPROVEMENT IN BALANCED SLIDE-VALVES.

Specification forming part of Letters Patent No. **147,131**, dated February 3, 1874; application filed July 11, 1873.

To all whom it may concern:

Be it known that I, EDWARD HEYDE, of East Saginaw, in the county of Saginaw and State of Michigan, have invented a new and useful Improvement in Balanced Slide-Valves; and I do 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 longitudinal vertical section through a steam-chest fitted to my improved balance-valve on *xx* in Fig. 2. Fig. 2 is a plan of the chest and valve, the steam-chest cover being removed and the sleeve of the valve being shown in cross-section. Fig. 3 is a perspective view of the valve. Fig. 4 is a detached perspective view of the sleeve, which is fitted to the piston of the valve.

Like letters refer to like parts in the several figures.

The nature of this invention relates to an improvement in that class of slide-valves in which the pressure of the steam is taken off a portion of the area of the back of the valve; and it consists in constructing the valve with a ring on its back, which is inclosed by a flanged piston or sleeve working steam-tight under the cover of the steam-chest, being kept in contact therewith by leaf-springs interposed between the top of the ring and the flange of the sleeve. An aperture is made through the back of the valve, communicating with the exhaust-port, forming a vacuum in the ring-chamber, as more fully hereinafter set forth.

In the drawing, A represents the upper portion of the cylinder of a steam-engine, in which *a a* are the steam-ports and *b* the exhaust-port.

B is the steam-chest fitted with a cover, B'. C is the slide-valve, and *c* is its exhaust-port. *d* is a cylinder, open at the top, closed at the bottom, cast with the valve, to whose back it is connected with a transverse rib, *d'*, through which is drilled an aperture, *e*, communicating with the exhaust-port. *f* is an internally-flanged sleeve, fitted accurately, but easily on the cylinder *d*; a packing-ring, *g*, being inserted in a groove in the latter to cause the sleeve to work steam-tight thereon. The under side of the steam-chest cover should be planed true, as well as the upper surface of the sleeve-flange, so that the latter may work steam-tight against the former, it being kept in contact therewith by several leaf-springs *h* interposed between the top of the cylinder and the flange of the sleeve. The area included in the cylinder *d* is relieved of steam-pressure, and by connecting the chamber with the exhaust a partial vacuum is formed therein, which tends to lift the valve from the seat. In condensing-engines, this vacuum will be still more perfect. By making the area of the cylinder *d* nearly equal to that of the exposed back of the valve, the latter will be practically balanced.

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

The slide-valve C cast with the cylinder *d* on its back, with the aperture *e* connecting it with the exhaust-port, the flanged sleeve *f* and springs *h*, constructed, arranged, and operating substantially as and for the purposes set forth.

EDWARD HEYDE.

Witnesses:

GEO. A. FLANDERS,
H. B. HAMILTON.