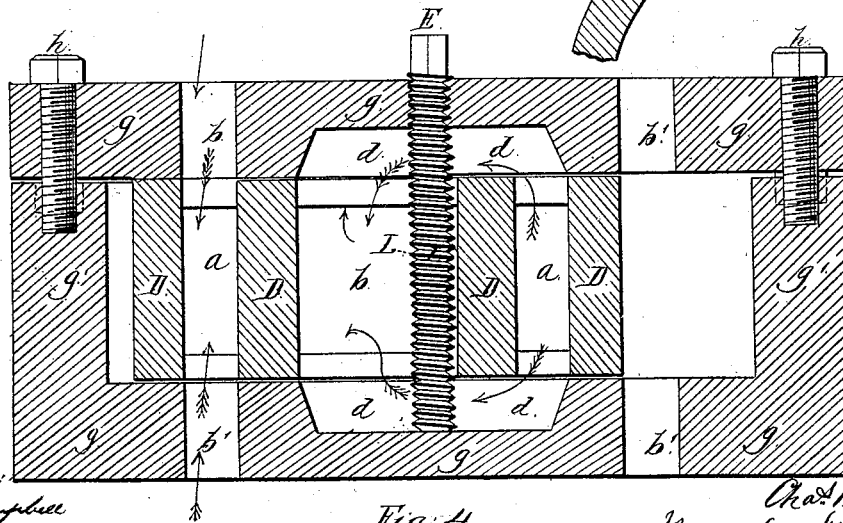
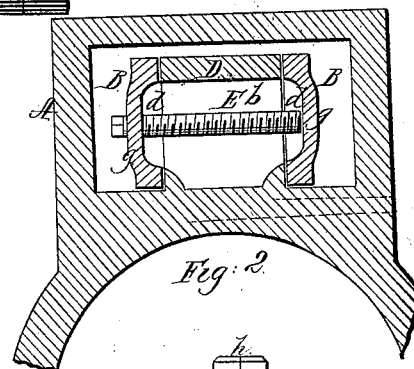
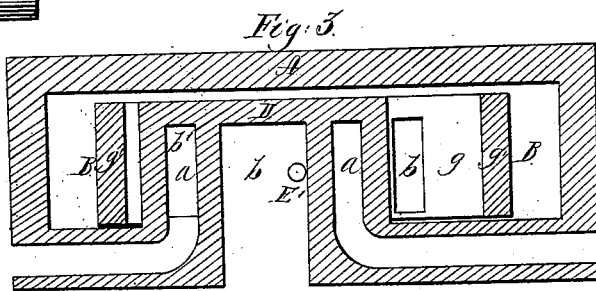
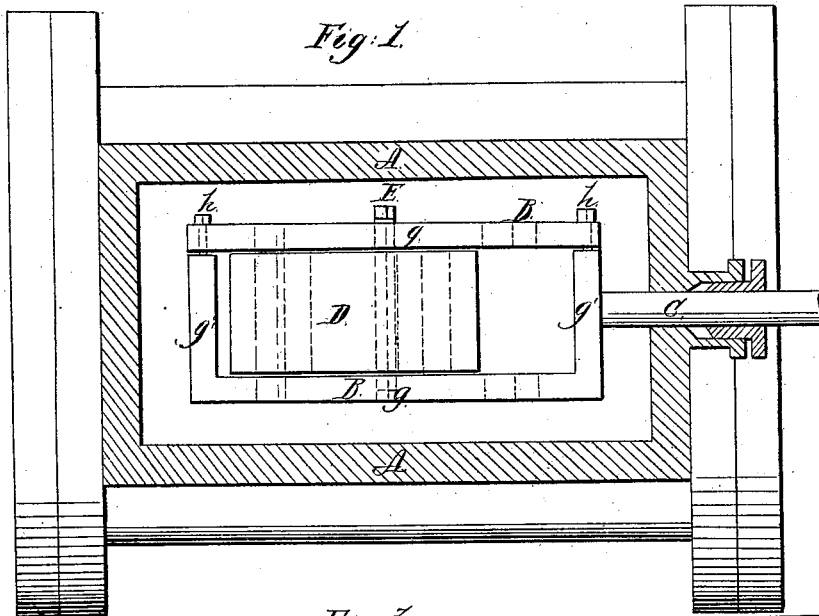


C. H. Brightly,
Steam Balanced Valve.

N^o 46,991.

Patented Mar. 28, 1865.



Witnesses:
B. F. Campbell
E. Schaefer

Inventor:
C. H. Brightly
by his atty.
Wm. H. H. H. H. H.

UNITED STATES PATENT OFFICE.

CHARLES H. BRIGHTLY, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SLIDE-VALVES.

Specification forming part of Letters Patent No. 46,991, dated March 28, 1865.

To all whom it may concern :

Be it known that I, CHARLES H. BRIGHTLY, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and Improved Slide-Valve; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a top view of the valve applied to a steam-cylinder. Fig. 2 is a vertical transverse section of the valve. Fig. 3 is a vertical longitudinal section through the valve and port-box. Fig. 4 is an enlarged horizontal section through the valve and port-box.

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

The object of my invention is to prevent a slide-valve from being forced so hard down upon its seat by the pressure of steam in the steam-chest as to occasion much friction, by so constructing the valve that the pressure of steam upon one side will be counteracted by the pressure of steam upon the opposite side, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the valve-chest, and B a rectangular slide-valve, which is arranged therein in such manner as to receive a rectilinear reciprocating movement from a valve-rod, C, in the usual manner. D is a rectangular port-box which projects up from the base of the valve-chest as high as the vertical sides of the slide-valve B, which surrounds this box, as shown in Figs. 1 and 4.

The port-box D is provided with three ports or passages, *a a* and *b*, which extend laterally through it and communicate with the steam-cylinder through steam-passages leading from the bottom of the box D, and arranged in any suitable manner. The ports *a a* receive steam alternately from the steam-chest, when the valve B is reciprocated, through the lateral passages *b' b' b' b'*, which are made through the longitudinal sides of the valve B, as shown in the horizontal section, Fig. 4, and the exhaust-chamber *b* receives the exhaust-steam from the cylinder through the ports *a a* and side passages, *d d*, which latter are made in the sides of the valve, as shown in Fig. 4.

It will be seen, by reference to the drawings, that my valve B is in the form of an elongated rectangular box having four vertical sides, *g g* and *g' g'*. This valve-box should be made of sufficient length to admit of its being moved backward and forward the required distance to effect the alternate introduction of steam into the steam-cylinder on both sides of the piston. The width of this box B between the inside surfaces of the sides *g g* should be equal to the width of the port-box, so that these sides will work closely in contact with this box and prevent the ports from leaking steam. When the rectangular valve-box is applied to the elevated port-box, as I have described, the pressure of steam in the steam-chest will act on the outside surfaces of the two longitudinal plates *g g*, and have a tendency to press these plates against the vertical ported sides of the port-box D, but this pressure is resisted by the ends *g' g'* of the valve-box and also by a rod, E, which is tapped through the side *g* of this box, and which passes through the exhaust-port *b* and abuts against the inside surface of the opposite side plate *g*, as shown clearly in Figs. 2, 3, and 4. This rod E acts as an intermediate brace for preventing the plates *g g* from collapsing at their middle and pressing hard against the faces of the port-box. One of the longitudinal plates of the valve-box is applied by means of set-screws *h h*, which enter transversely the ends *g' g'* and secure said plate thereto.

By thus attaching one of the plates of the valve-box I am enabled to adjust both plates *g g* snugly against the surfaces of the port-box and compensate for any irregularity in the impinging surfaces. In practice adjustable bearings will be introduced into the ends of plates *g' g'*, against which the plate *g* will abut when set up by means of the screws *h h*. The object of these adjustments is to enable me to make the impinging surfaces of the plates *g g* and port-box parallel, so that a perfect freedom of movement will be obtained.

By my invention I conduct the live steam from the valve-chest through both sides of the valve-box into ports which are formed in a box that is elevated above the base of said chest, and that serves as a guide for keeping the valve-box in place laterally. After entering this box the steam descends below the

chest and enters passages leading to the cylinder. In passing from the cylinder the exhaust-steam enters the ports *a a*, thence passes through the side passages in the plates *g g* into the port *b*, from which it may be conducted to the atmosphere or condenser in any desirable manner.

I have described and represented my valve as being arranged on top of a horizontal cylinder, and consequently in a horizontal plane, but do not desire to confine myself to such location, as the valve may be placed on the side of a cylinder in a vertical plane, or arranged in any other position. As above described, the weight of the valve is sustained upon the base of the valve-chest, but it may be supported upon one side of the port-box or

upon the valve rod, if the valve is differently arranged.

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

1. The arrangement of the port-box *D*, box-valve *B B*, and brace *E*, substantially as and for the purposes herein described.

2. The arrangement of the port-box *D*, box-valve *B B*, screws *h h*, and screw-threaded brace *E*, substantially as herein described.

3. The manner herein described of arranging the adjusting-screws *h h* with the valve *B B* and port-box *D*, for the purpose set forth.

CHAS. H. BRIGHTLY.

Witnesses:

R. T. CAMPBELL,
E. SCHAFER.