J. B. Roach,

Steam Balanced Valve.

No. 36,797. Patented Oct. 28, 1862.

Fig. 2

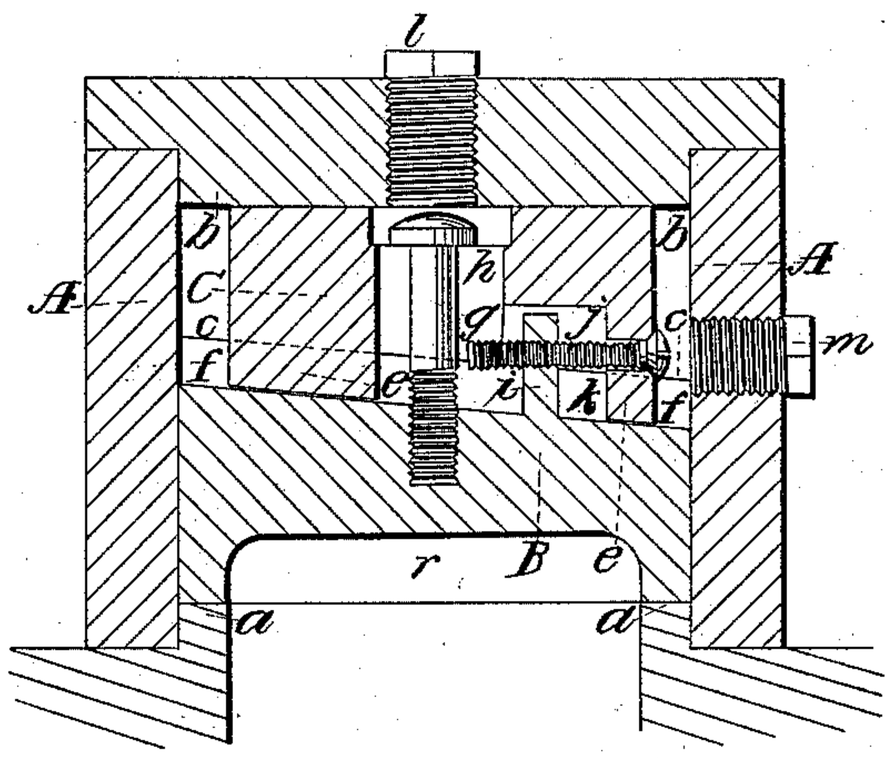
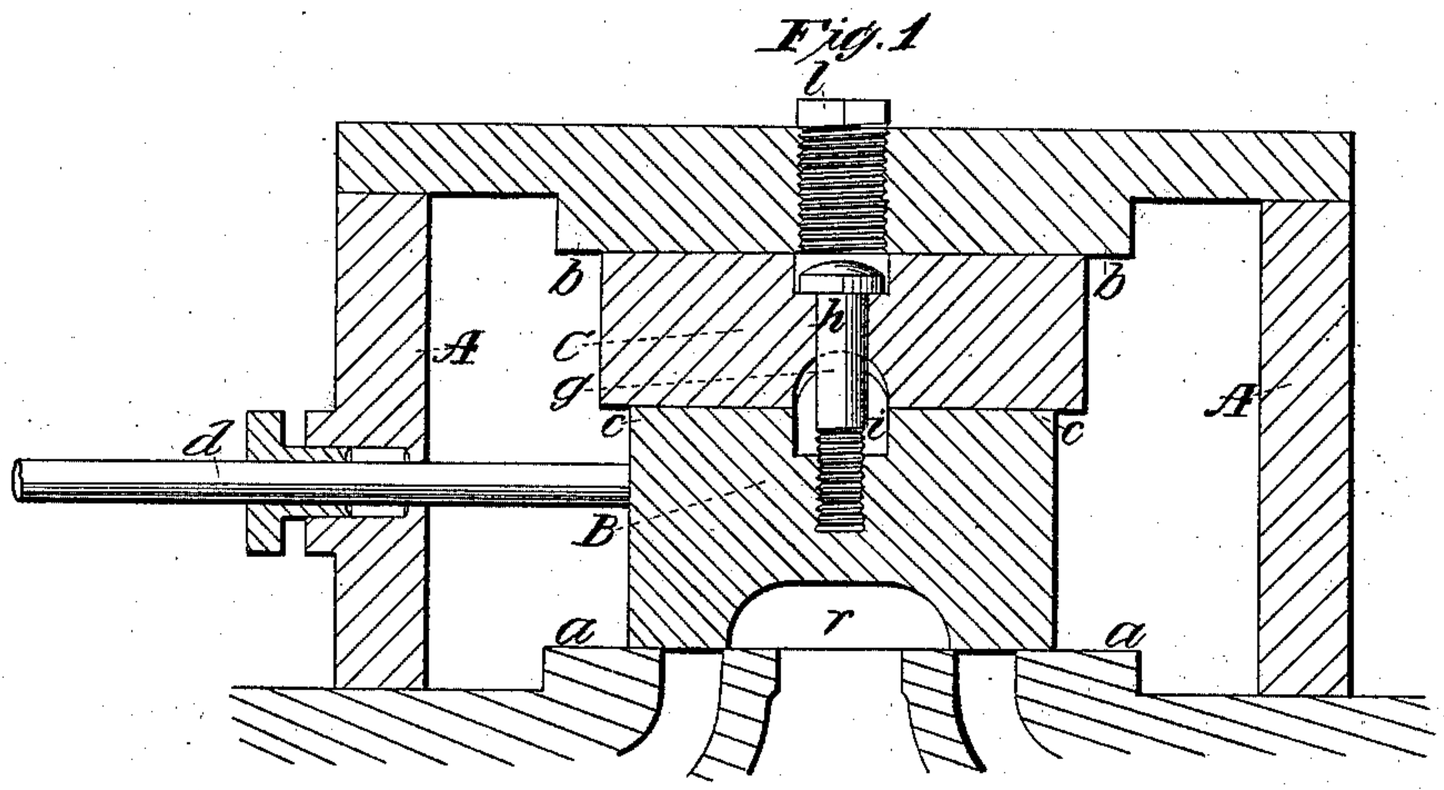


Fig. 1



Witnesses:

J. W. Coombs

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by Munn & Co

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UNITED STATES PATENT OFFICE.

JOHN B. ROACH, ELIZABETHPORT, NEW JERSEY.

IMPROVEMENT IN SLIDE-VALVES OF STEAM-ENGINES.

Specification forming part of Letters Patent No. **36,797**, dated October 28, 1862.

To all whom it may concern:

Be it known that I, JOHN B. ROACH, of Elizabethport, in the county of Union and State of New Jersey, have invented a new and useful Improvement in the Slide-Valves of Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central longitudinal section of the valve-chest and slide-valve of an engine, having my improvement applied. Fig. 2 is a transverse section of the same.

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

The object of this invention is to provide for what is termed the "balancing" of the valve—that is to say, to relieve it of unnecessary pressure toward its seat.

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

A is the valve-chest, *a a* the valve-seat, and *b b* a smooth plane surface provided inside the back or cover of the chest, parallel with the seat *a a*. The surface *b b* may be on the back or cover of the valve-chest, or upon a separate plate of sufficient stiffness secured within the chest at the back of the valve.

B and C are the two pieces of which the valve is composed. The piece B has its face, which works upon the seat *a a*, of a form corresponding with that of an ordinary short double slide-valve, and contains the usual exhaust-cavity, *r*. The sides and ends of the said piece B are perpendicular with its face, and its back, which is flat, has an inclination to the seat in a transverse direction, as shown at *c c* in Fig. 2, but is parallel therewith in a direction lengthwise of the valve, as shown in Fig. 1. The piece C, which is arranged between the piece B and the back of the valve-chest, is made with its two faces parallel in a direction lengthwise of the valve, as shown in Fig. 1, but inclined to each other in a transverse direction, as shown in Fig. 2, in such degree that it may fit accurately between the surfaces *c c* and *b b*, so that no steam may get between it and the surface *b b*. The said piece C, being so formed and fitted to the back of the piece B, with inclined plane surfaces, is capable of operating between the latter piece and the surface *b b* as a wedge, and thereby adjusting the latter to the seat *a a*, while it adjusts itself to the surface *b b*, and thereby, while it confines the face of the piece B to the seat, protects the back of it from steam-pressure. It should be observed that the area of B and C, measured in a direction parallel with their face and back, should be about equal. The drawings represent C as narrower than B, (see Fig. 2,) in order to allow it sufficient movement in that direction, but represent it as sufficiently longer (see Fig. 1) to compensate for the less width, so that the pressure on any uncovered portion of either may be balanced by that on the uncovered portion of the other.

To prevent the displacement of the pieces B and C relatively to each other by the working of the valve, which is effected by means of a stem, *d*, connected with the piece B, I fit the two pieces together with a transverse tongue, *e*, and groove *f*, and secure them together by means of a screw-bolt, *g*, which passes through a slot, *h*, in the piece C and screws into the piece B; and to provide for the setting of the piece C, to adjust the valve to the seat *a a* and face *b b*, I provide on the piece B a lug, *i*, in which there is a tapped hole for the reception of a screw, *j*, and provide in the piece C a mortise, *k*, for the reception of the said lug. The screw *j* is inserted through a hole provided for it on the thicker side of the piece C, and its head bears against the exterior of the said piece, as shown in Fig. 1. In the back of the valve-chest there is provided a tapped hole fitted with a screw-plug, *l*, which is movable for the admission of a screw-driver to turn the screw-bolt *g*, and in the proper side of the chest there is a similar hole fitted with a screw-plug, *m*, which is movable for the admission of a screw-driver to turn the screw *j* These holes provide for the adjustment of the valve without taking off the cover of the steam-chest.

When it is desired at any time to adjust the valve, the engine is stopped with the valve in such position that the bolt *g* and screw *j* are opposite to the plugs *l* and *m*, which will be known by the engineer. The screw-plugs are then removed, and the bolt *g* slackened to liberate the piece C, which in then adjusted by turning the screw *j*. When the adjustment has been made, the bolt *g* is screwed up tight again, and the screw-plugs replaced. The adjust-

ment may be so made that the valve will work steam-tight between the surface of the seat *a a* and the surface *b b*, and yet with so slight friction that there will be very little wear, either of the valve or of the said surfaces; but when sufficient wear has taken place to cause leakage of steam it may be easily compensated for by setting in the piece C, as above described. The great advantage of this construction of the valve is its extreme simplicity as compared with most of the balanced valves in which wear is provided for.

I do not claim making a valve of tapering form laterally, as that may be found described in Patent No. 13,923; neither do I claim, broadly, constructing a valve of two or more parts adjustable relatively to each other and to the valve-seat, and to a surface parallel to the valve-seat, as several examples of such construction may be found; but

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

The combination of the two inclined pieces, B C, and adjusting-screws *j g* with each other and with the valve-seat *a a* and back *b b*, in the manner herein shown and described.

JOHN B. ROACH.

Witnesses:

J. SEEPLE,

J. EDWARDS MARSH.