(No Model.)

C. E. BIDDISON.

BALANCED SLIDE VALVE.

No. 264,612. Patented Sept. 19, 1882.

Fig. 1.

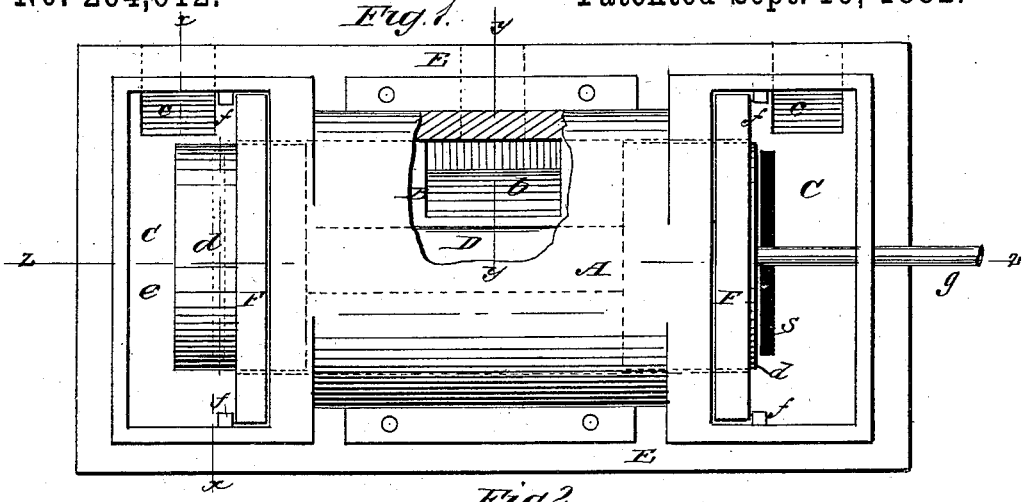


Fig. 2.

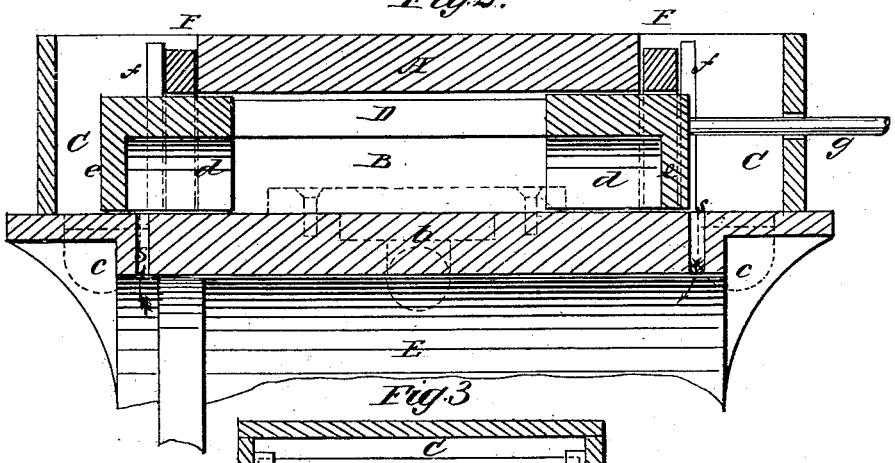


Fig. 3

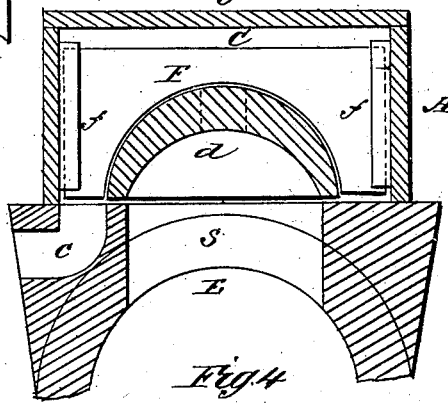
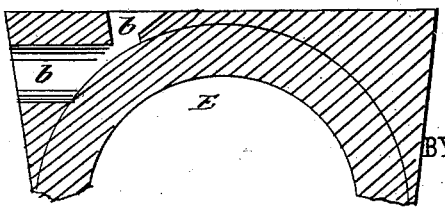


Fig. 4



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UNITED STATES PATENT OFFICE.

CLARENCE E. BIDDISON, OF ROCK ISLAND, ILLINOIS.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 264,612, dated September 19, 1882.

Application filed February 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE E. BIDDISON, of Rock Island, Rock Island county, Illinois, have invented a new and useful Improvement in Balanced Slide-Valves for Steam-Engines, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a plan of the valve-chest uncovered and having my improved valve within it; Fig. 2, a vertical-longitudinal section of the same on the line *z z* in Fig. 1, and showing the chest with its valve as mounted on an engine-cylinder. Fig. 3 is a transverse vertical section on the line *x x* in Fig. 1, showing the valve-chest covered; and Fig. 4, a vertical section of the engine-cylinder in part on the line *y y* in Fig. 1.

This invention consists in the combination of a slide-valve having opposite partially-cylindrical end portions or bonnets constructed to form receiving-spaces for the exhaust-steam, and a valve-chest divided by said valve to form a central exhaust-steam chamber and outer end live-steam chambers, and sliding packing-plates applied to said bonnets, whereby the valve is partially relieved from pressure bearing it down on its seat, and is exposed to equal end pressures, substantially as hereinafter described.

A is the valve-chest, which, when the valve is inserted, forms a central exhaust-chamber, B, and opposite-end live-steam chambers C C. The chamber B has an outlet, *b*, for the exhaust, and the chambers C C opposite-end live-steam inlets *c c*.

D is the valve, arranged to slide or reciprocate within the chest A, and serving to alternately admit steam to and exhaust steam from opposite ends of the engine-cylinder E by or through ports *s s* in the face of the valve-chest. The valve D, which may be made either in one piece or of several pieces, is of a hollow semi-cylindrical or partially-cylindrical form at its ends *d d*. These semi-cylindrical portions are closed at their outer ends, *e e*, but open at their inner ends and on their faces, which rest on the face of the valve-chest. Said end portions or bonnets *d d* are connected by a bar to form but a single valve, and the same constitute steam chambers or spaces within the chest, and may work at their rounded backs in close proximity with the valve-chest, but are not dependent upon such surface contact for preventing leakage.

To prevent leakage into the exhaust-chamber B from the live-steam chambers C C, a joint is established at each end of the valve by means of sliding packing-plates F F, fitted to slide within guides *f f* in the chambers C C, and made to straddle and rest upon the rounded exterior surfaces of the end portions or bonnets *d d* of the valve, and to closely hug the same. Said packing-plates may or may not have springs applied to their backs to keep them down on the valve.

The opening in the end of the valve-chest through which the valve-rod *g* passes is made sufficiently large to provide for the wear of the valve without straining its rod.

In the drawings, the valve-chest is shown as extending the full length of the engine-cylinder; but this is not necessary, as said cylinder may be made longer than the valve-chest, and the passages *s s* be bent or shaped to connect with said chest, having a central position relatively to the length of the cylinder.

From the description hereinbefore given of the valve D it will be observed that its end portions or bonnets, *d d*, form alternate receivers for the exhaust-steam to the chamber B of the chest A, and that the disposition of the packing-plates F F is such that the backs of the bonnets *d d* present but a very limited surface to pressure of the live steam to press the valve down on its seat; also, that both ends of the valve are exposed to an equal pressure. Consequently the valve is or may be approximately balanced, and, when operating, does not work against pressure of the steam.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

In combination with a chest having the end chambers, C C, provided with live steam inlets *c c* and ports *s s*, a slide-valve, D, consisting of two end closed bonnets, *d d*, open at bottom and inner ends, and forming a central exhaust-chamber, B, having movable packing-plates F straddling and resting upon the bonnets, as shown and described.

CLARENCE E. BIDDISON.

Witnesses:
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