

D. W. HUNTINGTON & WILLIAM A. HEMPSTEAD.

Improvement in Balanced Valves for Steam Engines.

No. 120,878.

Fig. 1.

Patented Nov. 14, 1871.

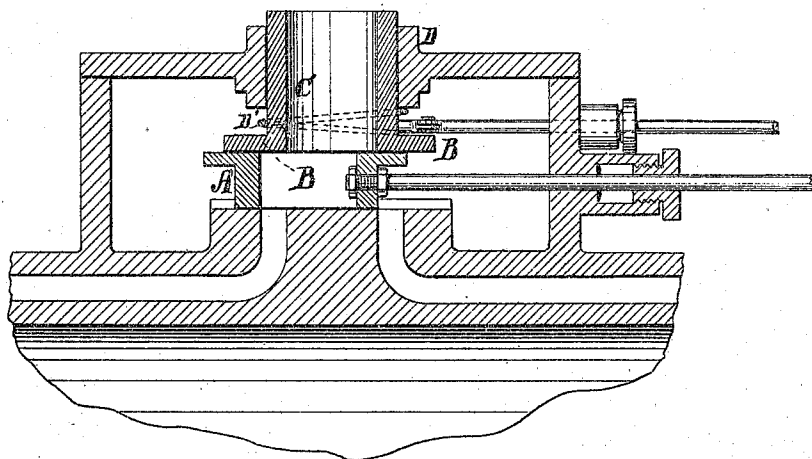
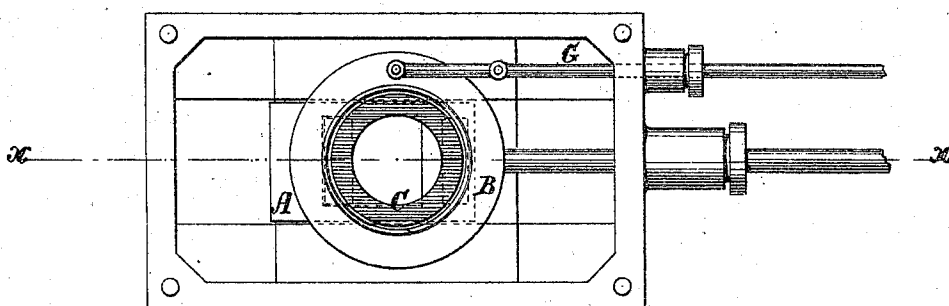


Fig. 2.



Witnesses:

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IMPROVEMENT IN BALANCED VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 120,878, dated November 14, 1871.

To all whom it may concern:

Be it known that I, DAVID W. HUNTINGTON and WILLIAM A. HEMPSTEAD, of South Coventry, in the county of Tolland and State of Connecticut, have invented a new and useful Improvement in Balanced Valve for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

The balanced valve to which our invention applies consists in a plate covering a slide-valve having a vertical exhaust-discharge opening through it, which plate, also having an opening for the exhaust, is provided with a hollow cylinder extending up into another cylinder in the top of the steam-chest, in which it fits steam-tight, which cylinder prevents the action of the down-pressure upon a portion of the plate nearly as large as that under the plate open to the atmosphere, so that there is only a slight preponderating downward pressure, merely sufficient to keep the joint of said plate with the top of the valve tight. Now, as this cylinder on the said plate is liable to bind in the cylinder of the steam-chest, in which it must fit steam-tight, and thus not always rest on the valve with sufficient pressure, we apply a bar or rod to it, having a slight forward and backward motion to oscillate said plate and prevent it from sticking in the cylinder of the valve-chest.

Figure 1 is a longitudinal sectional elevation of a valve-chest, valve, and part of a cylinder, showing our improvement, the section being taken on the line *x x* of Fig. 2; and Fig. 2 is a top view, the top of the valve-chest being removed.

Similar letters of reference indicate corresponding parts.

A is the valve with a large vertical opening, through which the steam exhausts. B is a plate resting on it, and having a hollow cylinder, C, extending from its upper side through a cylinder, D, in the top of the steam-chest, to exclude the down pressure of the steam from a portion of the upper side of plate B, nearly equal to the area of

the under side open to the atmosphere, so that there will only be sufficient pressure on the plate and valve to prevent the steam from blowing through between them to the exhaust, thus providing a simple and efficient balancing arrangement calculated to be very uniform in action under wide ranges of variations in pressure. A spring, D', may also be used in connection with the steam pressure to hold the plate down; or the arrangement may be such that there will be no down pressure of steam, the spring alone being relied on. As the cylinder C has to fit steam-tight in the cylinder D the friction is liable to be greater than the power drawing downward on it, so that in case it rises or is lifted off the valve by any cause it is liable to remain up, especially as the grease upon the surfaces which are in contact will tend to make them stick together. We therefore propose to connect a rod, G, having a slight to-and-fro movement, to said plate, as shown, to oscillate the cylinder C in the one D to keep it in motion, and thus prevent the sticking of the two together, and assist the downward force on the said cylinder in keeping said plate on the valve steam-tight. The rod G, which passes through a stuffing-box in the valve-chest, may be connected with the valve-gear or any other suitable means for moving it. The rod which oscillates the cylinder is so arranged as to hook on and take off the part by which it is moved, as it will only be necessary to work it but a small portion of the time.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The spring D', combined, as described, with the flanged cylinder C B to hold it down to a slide-valve A, as specified.

2. A steam-tight exhaust-cylinder, C, arranged on a vertically-exhausting slide-valve, A, provided with a rod, G, to oscillate it, as and for the purpose specified.

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WILLIAM A. HEMPSTEAD.

Witnesses:

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