C. H. HUTCHINSON.

Balanced Valves for Steam-Engines.

No. 152,950. Patented July 14, 1874.

Fig. 1.

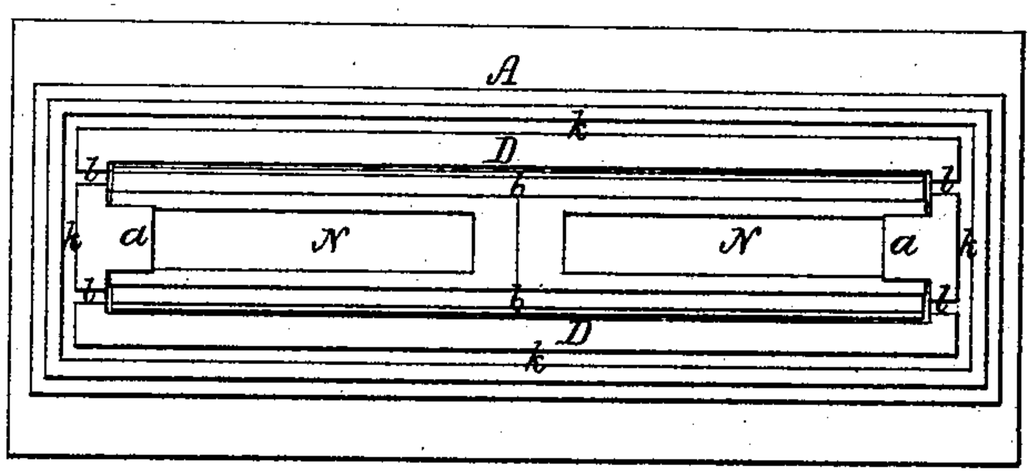

Fig. 2.

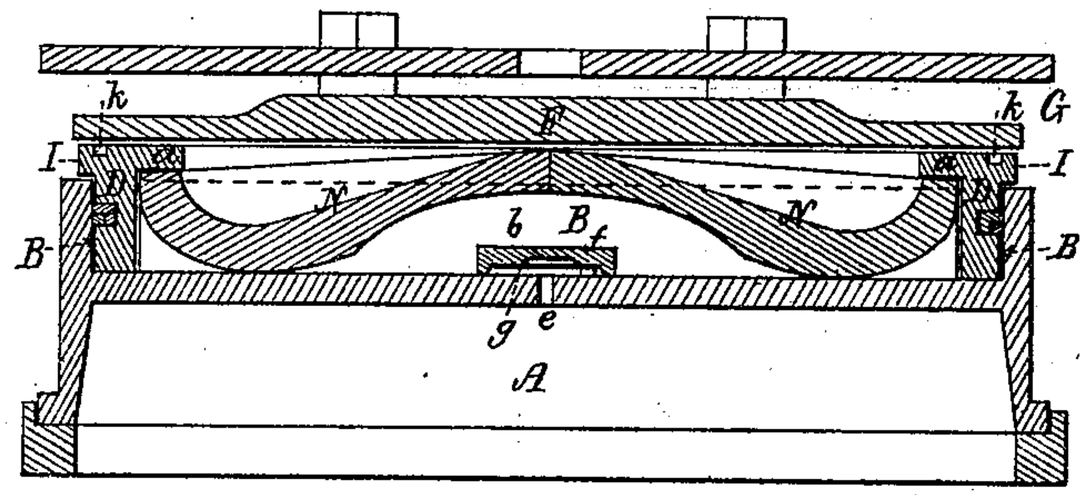

Fig. 3.

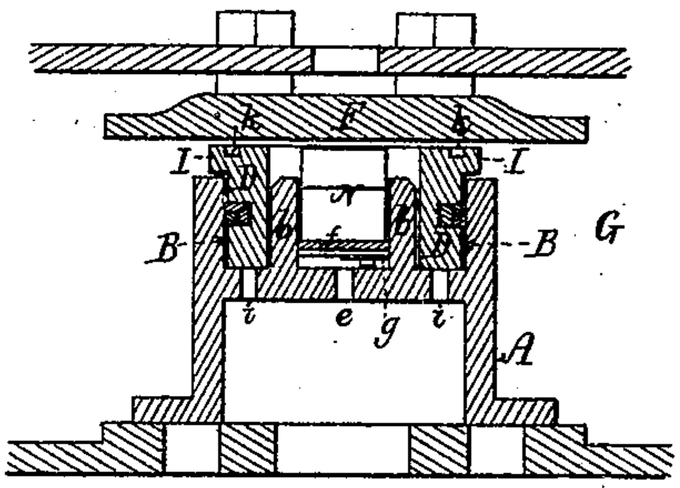

Fig. 4.

Fig. 6.

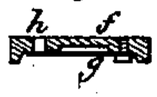

Fig. 5.

Witnesses.

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by his attorney

R. H. Eddy

UNITED STATES PATENT OFFICE.

CHARLES H. HUTCHINSON, OF MANCHESTER, NEW HAMPSHIRE.

IMPROVEMENT IN BALANCED VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **152,950**, dated July 14, 1874; application filed May 27, 1874.

To all whom it may concern:

Be it known that I, CHARLES H. HUTCHINSON, of the city of Manchester, of the State of New Hampshire, have invented a new and useful Improvement in Balanced Valves for Steam-Engines; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 denotes a top view of the slide-valve and the mechanism carried by it, and constituting my invention in whole or in part. Fig. 2 is a longitudinal section, and Fig. 3 a transverse section, of the slide-valve and the mechanism applied thereto, and to the top and bottom of the steam-chest.

In such drawings, A denotes the slide-valve, provided on its top with a rectangular chamber, B, within which a rectangular and flanged frame or balance, D, fits so as to slide vertically, such frame being provided on its sides with a metallic or other proper packing. The frame is also furnished with two ears, *a a*, extended inward from its ends, as shown. Furthermore, there are two parallel guides or partitions, *b b*, erected within the chamber B, they being parallel to its longer sides, and extended up within the balance D, in manner as represented. They aid in guiding the balance in its vertical movements, and also save the necessity of making the rocker-levers N N to extend entirely across the frame D. They may do so, however, and the two guides or partitions be dispensed with. The two levers, formed as shown, rest on the floor of the chamber, and extend underneath the two ears *a a*. The said levers abut together at their inner ends, there being formed underneath them an arched chamber having a small hole, *e*, leading from it through the top of the valve. Over the said hole is a bridge, *f*, provided with a reed or elastic valve, *g*. This valve is fixed on the inner surface of the bridge, and extends across and covers a hole, *h*, made down through the bridge.

Fig. 4 is a top view, Fig. 5 a bottom view, and Fig. 6 a longitudinal section, of the bridge and its reed or valve.

Furthermore, there are two other holes, *i i*, made through the top of the valve and directly underneath the balance D. On and around its top the balance D is grooved, as shown at *b*, with passages *l l l l* extended laterally out of the groove, as represented. The groove should be narrower than the extension of the flange I of the balance D.

My present valve mechanism is somewhat analogous to that described and represented in the United States Patent No. 144,458, dated November 11, 1873, and granted to me. In carrying out my present improvement, I have dispensed with the small cylinder and piston-weight applied to the levers and the middle of the valve, as shown in my said patent, and I have extended the levers laterally across the entire frame or balance D, or the space between the partitions or guides *b b* thereof.

The steam-chest is shown at G as provided at top with the extension F for the top of the frame or balance D to work against.

On steam being let into the chest, such steam will press upon the tails of the levers, and depress them so as to cause such levers to force the frame or balance D up to its seat at the top of the chest. The steam, acting on the lower surface of the flange I, will also press the frame up to its seat.

On the steam being shut off, the frame D will drop through the action of gravity, and cover the holes *i i*. The object of this falling of the frame D is twofold—that is to say, it is to allow the valve to rise off its seat, in order to prevent vacuum obstruction of the piston; also, to close the holes *i i*, in order to close communication between the exhaust and the chamber B, such holes being to effect such communication in order for the balance D to freely rise up to the plate F.

The purpose of the hole *e*, bridge *f*, and its hole *h* and reed-valve *g*, is to relieve the arched space beneath the levers or between their fulcrums of steam. The said valve will also prevent any return of steam or flowage of it from the exhaust into the chamber B. Such passage of steam into the chamber would tend to put the levers in vibration, whereby they would soon become worn, so as to be more or less inefficient.

I claim—

1. In the described balanced valve, the rocker-levers N N, arranged with a close joint

at their inner ends, and combined with the valve A, the balance D, and the plate F, all substantially as specified.

2. The slide-valve A, provided with the chamber B and the passages *i i*, and with the balance D arranged in said chamber, all substantially as represented.

3. The bridge *f*, provided with the reed *g* and hole *h*, and arranged in the chamber B, as described, in combination with the valve A, provided with the hole *e*, the levers N N, and balance D, all being substantially as specified.

4. The valve A, provided with the partitions *b b*, arranged in its chamber B, and with the levers N N, and the balance D, applied to such valve, all being essentially as specified.

CHARLES H. HUTCHINSON.

Witnesses:
R. H. EDDY,
J. R. SNOW.