C. H. HUTCHINSON.

Balanced-Valves.

No. 157,286. Patented Dec. 1, 1874.

Fig. 1.

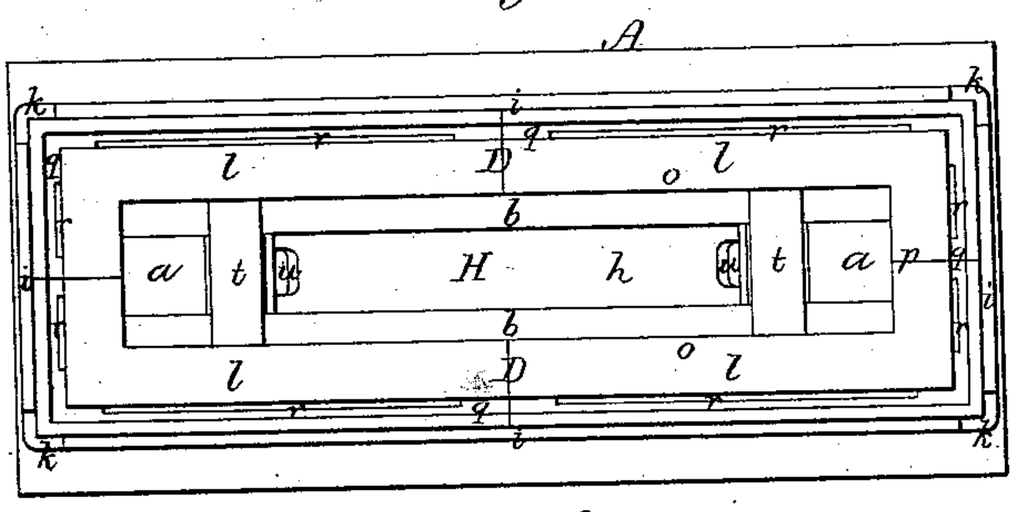


Fig. 2.

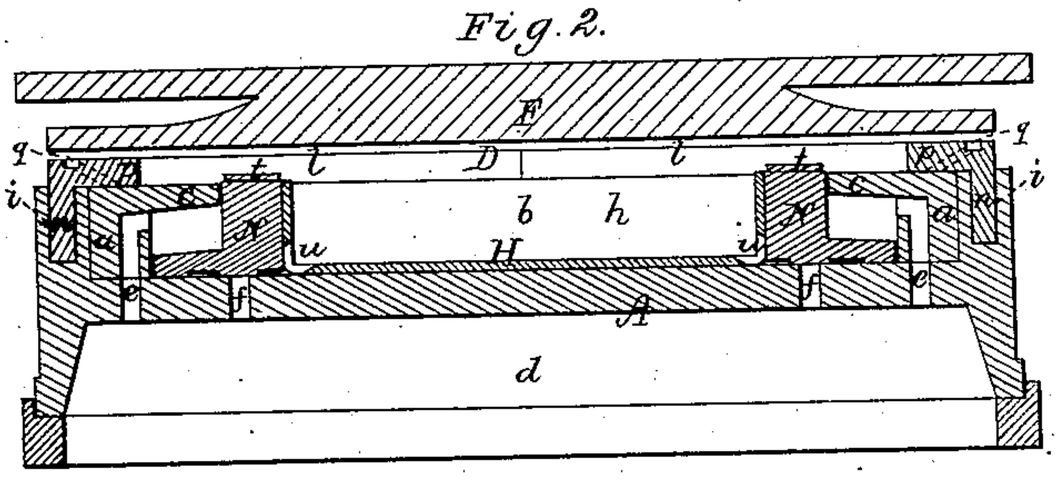


Fig. 3.

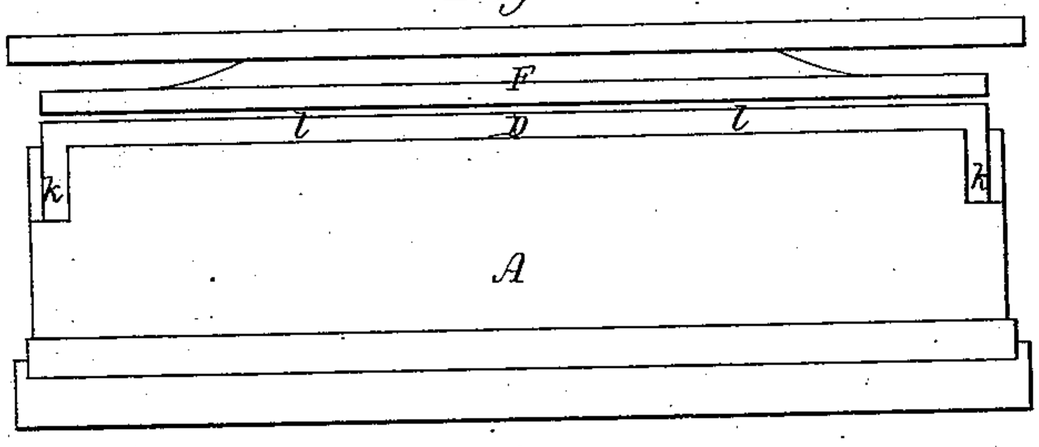


Fig. 4.

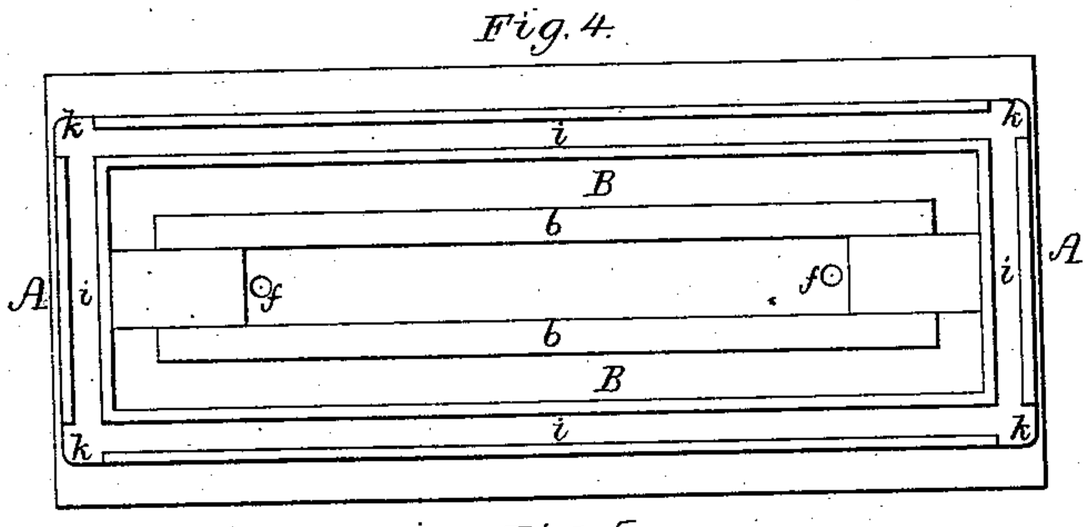


Fig. 5.

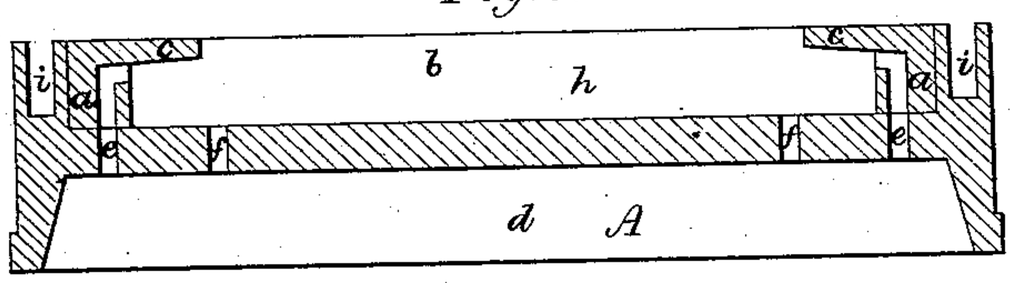


Fig. 7.

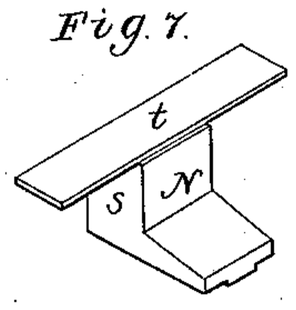


Fig. 8.

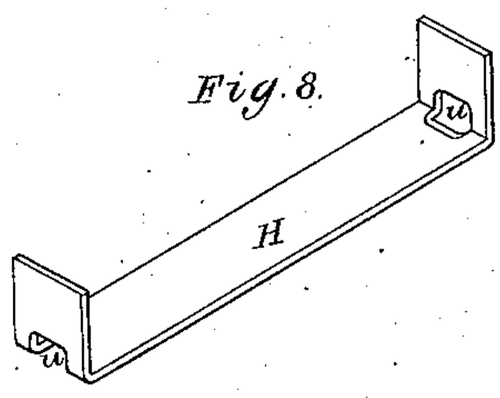


Fig. 9.

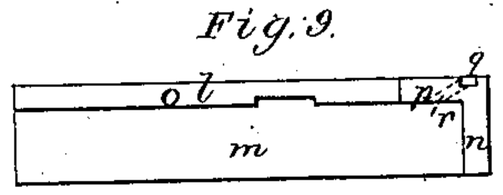


Fig. 10.

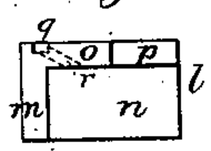
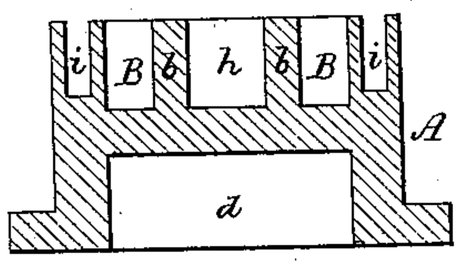


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES H. HUTCHINSON, OF MANCHESTER, NEW HAMPSHIRE.

IMPROVEMENT IN BALANCED VALVES.

Specification forming part of Letters Patent No. **157,286**, dated December 1, 1874; application filed August 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 a 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 side elevation, of the slide-valve and the mechanism applied thereto and to the steam-chest. Fig. 4 is a top view, Fig. 5 a longitudinal section, and Fig. 6 a transverse section, of the valve without its adjuncts—viz., the sectional frame, its elevators, and their separator, to be hereinafter explained. Fig. 7 is a perspective view of one of the said elevators. Fig. 8 is a perspective view of the separator.

In Letters Patent No. 152,950, dated July 14, 1874, and granted to me, the vertically-movable frame or balance of the valve is represented as solid or in one piece, and provided on its sides with a metallic or other proper packing, the valve having a chamber and two parallel guides or partitions erected therein.

In the accompanying drawings the slide-valve is shown at A with its chamber B and partitions *b b*. The space between such partitions is closed at their ends in manner as represented, the closures *a a* being provided with horizontal flanges *c c*. The partitions and closures serve to form a chamber or space, *h*, within the chamber B, the parts of the chamber B that are outside of the partitions being for no purpose except to save metal in making the valve. Extending up from the exhaust-chamber *d* of the valve, and through each of the said closures *a a*, is a hole or passage, *e*, which opens into the space beneath the next adjacent flange *c*. There are also two holes or passages, *f f*, made through the top of the chamber *d* into the space *h* that is between the partitions *b b*. The space or chamber *d* is the exhaust cavity common to balanced slide-valves. The space *h* constitutes a chamber to receive the elevators and retainer, to be hereinafter described.

Surrounding the chamber B on its sides and ends are vertical grooves *i i i i*, provided with openings *k k* at their junctions. These openings *k k* are made by the plane used in forming the grooves, and are of no special advantage.

The balance-frame D of the valve, composed of four sections or separate parts, *l l l l*, as shown, is received in such grooves *i i i i* and plays vertically therein.

Fig. 9 is an inner side view, and Fig. 10 an inner end view, of one of the sections *l*. Each of them is composed of two vertical plates, *m n*, arranged at right angles to each other, and to horizontal flanges *o p*, projecting from them in manner as represented. A groove, *q*, extends along in the said flanges, it being of a width less than the thickness of its plate, *m* or *n*, and said groove having one or more passages, *r*, leading from it into the space below the flanges. This groove is to intercept any steam that may leak by the edge of the balance-frame, and allow it to pass off without causing the frame to drop away from the plate F at the top of the steam-chest. The valve and its balance-frame, as shown in my aforesaid patent, were provided with a pair of rocker-levers, which I have dispensed with, and in their place use other means of elevating the balance-frame—viz., two elevators, N N, each being composed of a right-angular block, *s*, provided with a cross-bar, *t*, all being as shown. These elevators, arranged in the space *h*, extend underneath the flanges *c c* and across said space. The cross-bars *t* project underneath the flanges of the sectional balance-frame D. The elevators are kept in place and allowed to rise or fall by means of the separator or retainer H arranged between them, it being a flat plate bent up at right angles near its ends, and having holes *u u* through it at the bends, as shown. The separator or retainer insures the elevators being kept in place and rising and falling vertically.

The object of making the frame D in sections and with flanges, as described, and the valve with the grooves to receive such sections, is to avoid the necessity of packing as used in the sides of the balance, as shown in my said patent; also, to enable the frame to adjust itself to and to bear to better advan-

tage against the plate F, the top flanges of the frame operating to preserve the balance from wear, such as it would be liable to were it without such flanges. On steam being let into the chest, such steam will pass underneath the two elevators and force them upward, and cause them to elevate the sections of the frame D to the plate F. Any steam that at any time may be in the spaces within the elevators will escape through the passages *e e* of the closure. The steam acting on the lower edge of the frame D will also operate to elevate such frame.

I claim—

1. Each of the balance-frame sections *l*, as provided with the steam-intercepting groove *q*, and one or more passages, *r*, leading therefrom, as set forth.

2. In the valve A, having the chamber *d*, and the sectional balance D, arranged as set forth, the internal chamber or space between the partitions *b b*, provided with the horizontal flanges *c c*, the passages *e e*, *f f*, and the two elevators N N, all being arranged substantially as specified.

3. The slotted separator or retainer H, substantially as described, in combination with the elevators N N, applied to the valve A and the sectional balance-frame D, all being to operate as set forth.

CHARLES H. HUTCHINSON.

Witnesses:
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