(No Model.) 2 Sheets—Sheet 1.

V. W. BLANCHARD.

STEAM VALVE.

No. 413,900. Patented Oct. 29, 1889.

Fig. 3.

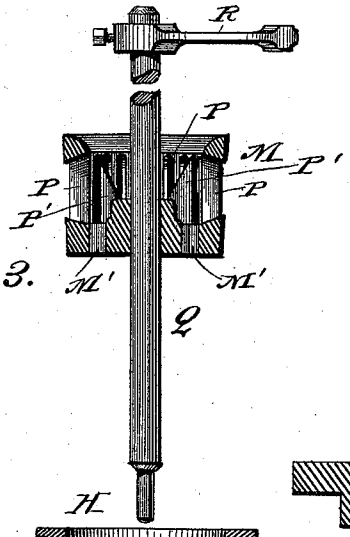


Fig. 6.

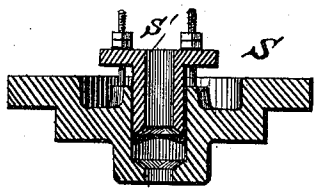


Fig. 2.

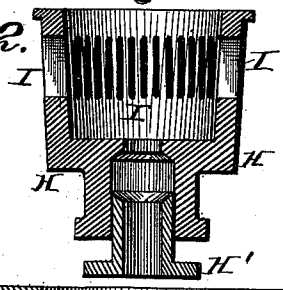
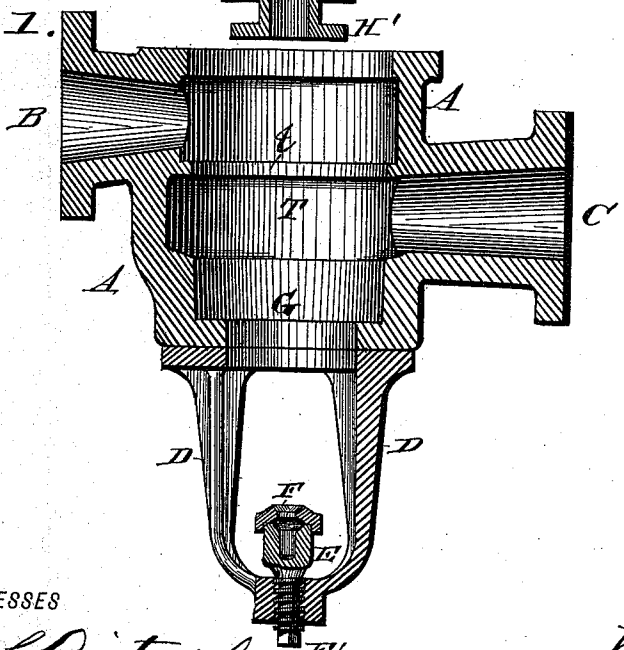


Fig. 1.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

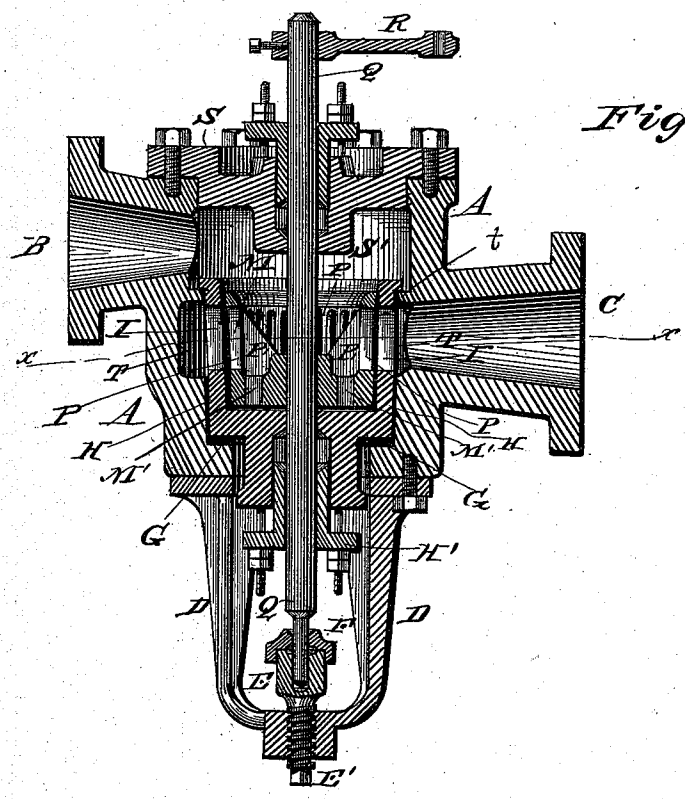
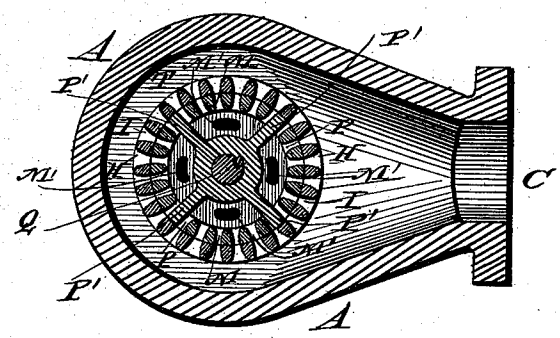


Fig. 5.



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UNITED STATES PATENT OFFICE.

VIRGIL W. BLANCHARD, OF NEW YORK, N. Y., ASSIGNOR TO JOSEPH A. DAVIS, OF SAME PLACE.

STEAM-VALVE.

SPECIFICATION forming part of Letters Patent No. 413,900, dated October 29, 1889.

Application filed April 4, 1889. Serial No. 305,970. (No model.)

To all whom it may concern.

Be it known that I, VIRGIL W. BLANCHARD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Steam-Valves; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figures 1, 2, 3, and 6 represent in vertical and central sections the several principal parts composing my balanced anti-friction valve separated from each other. Fig. 4 is a vertical diametrical section of the several parts of the valve in their proper places. Fig. 5 is a section through the valve, taken in the plane indicated by the dotted line *x x* on Fig. 4.

The object of this invention is to improve the balanced anti-friction valve for which I made application for Letters Patent on the 1st day of April, 1889, Serial No. 305,623; and my improvements consist in simplifying the construction of the valve casing or box in making the internal bore of the valve-box, the internal and external sides of the valve-seat wall, and the external surface of the valve proper tapering, in the manner and for the purposes which will be fully understood from the following description, when taken in connection with the annexed drawings.

A designates the valve-box, having an inlet-passage B and an outlet-passage C, arranged in different horizontal planes, the interior cavity of said box being securely closed by a cover S, provided with a stuffing-box S′, for the passage of the valve-stem Q, to which the valve M is interiorly secured, a steam-tight joint being formed by suitable packing at the angle between the annular shoulder G and the bottom of the valve-seat H, as shown in Fig. 4.

Within the cavity in the interior of the valve-box A, forming its lower part, is located the stationary cup-shaped valve-seat H, the wall of which is perforated in perpendicular lines by narrow radial slits I, arranged at regular intervals from each other, there being a circular peripheral channel T formed in the annular wall of the box A, exterior to the aforesaid slits in the valve-seat H and communicating with the outlet-passage C. The upper edge of seat H is flanged exteriorly, and said flange rests on an internal annular flange *t* of the casing, above channel T, and forms a close water-tight joint therewith.

The internal wall of the valve-seat H is formed with a slight taper in an outward direction from below upward, the lower lateral wall of its cup-shaped cavity forming the bottom of the interior cavity of the valve-box A, as shown in Fig. 4, it being centrally perforated for the passage of the valve-stem Q, and also being provided below with a stuffing-box H′, to secure a steam-tight joint between it and the said valve-stem.

The valve M is rigidly keyed to the stem Q, and, like the valve-seat, consists of a strong cylindrical cup, whose wall is perforated in a perpendicular line by the narrow slits P P at regular intervals from each other, and whose bottom is also perforated, as shown at M′ M′ M′ in Figs. 3, 4, and 5.

The wall of the valve M is preferably strengthened by radial flanges or ribs P′ P′. The perforated or slitted wall of the valve M should be formed with a slight taper in an inward direction from above downward to fit accurately the corresponding tapering cavity in the valve-seat H, leaving a space of suitable height between the lower surface of the valve M and the upper surface of the valve-seat H, which allows the valve to be adjusted downward to its seat, and thus compensate for wear.

The perpendicular slits through the wall of the valve M should be formed so that they will register with the greatest accuracy with the slits through the valve-seat H when the former is placed in proper position with the latter, as shown in Fig. 5. Hence, by a very slight movement of the valve about its vertical axis by means of a lever-arm R, keyed on the upper end of the valve-rod Q, the narrow perpendicular slits or apertures through the valve-seat H will be closed by the bars between the slits through the wall of the valve M, thereby closing the steam-channel between

the inlet-passage B and the outlet-passage C of the valve-box A.

By forming the tapered wall of the valve M of proper proportions in diameter and height, even for the largest engines, the perpendicular slits or apertures in said wall should not exceed one-eighth of an inch in width, thereby reducing the opening and closing movements of the valve at its periphery to three-sixteenths of an inch and still giving ample area for both the port and exhaust apertures of the cylinder.

The valve H is retained in proper position vertically by the end of the valve-stem Q, bearing in an adjustable lubricating-cup E, provided with a cover F, said cup being supported by the frame D, securely bolted to the valve-box.

It will be observed that by means of the screw E′ the lubricating-cup may be elevated or depressed, whereby a perfect steam-tight joint may always be maintained between the valve M and its seat H as a result of the tapered joint between them. Also, by means of the openings M′ through the bottom of the valve, a uniform steam-pressure is always maintained above and below the valve M, rendering its action always free from strain under every condition of pressure in its relation to the valve-seat H. It will also be observed that by elevating or depressing the valve-stem Q by means of the adjusting-screw E′ a corresponding close joint for a high steam temperature and pressure may be established between the valve M and its seat H whenever it is required.

The outlet C communicates directly and laterally with the annular channel T. I am thus enabled to dispense with the chamber below the valve-seat, as shown in my application referred to, and also the necessity of vertical passages in the walls of the valve-casing exterior to the valve-seat, since the water or steam passes out at the side of the seat and does not have to go below it. This construction greatly simplifies and cheapens the valve.

Having described my invention, I claim—

1. The combination of the valve-casing having an internal annular channel, and the annular flanges below and above said channel, an inlet-port above said flange, and an outlet-port from said channel, with a cup-shaped valve-seat H, constructed substantially as described, supported on said flanges and slitted substantially as described, and a cup-shaped slitted valve fitted in said seat, and the adjustable valve-stem carrying said valve, all substantially as specified.

2. The combination of the valve-casing and the cup-shaped slitted valve-seat therein with the cup-shaped slitted valve M, fitted in said seat and having strengthening-ribs p' p', and the valve-stem, all substantially as and for the purpose specified.

3. The combination of the valve-casing having channel T and annular flanges and inlet and outlet ports, substantially as described, the conical slitted valve-seat H, fitted in said casing, and the conical slitted valve M, fitted to said seat and having openings M′ in its bottom, with the valve-stem Q, carrying said valve, the stuffing-boxes therefor, and the bracket D and adjustable oil-cup F, all constructed and arranged to operate as specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

VIRGIL W. BLANCHARD.

Witnesses:
W. R. KEYWORTH,
F. O. MCCLEARY.