(No Model.) 4 Sheets—Sheet 1.

C. S. DETRO.

STEAM VALVE.

No. 259,827. Patented June 20, 1882.

Fig. 1.

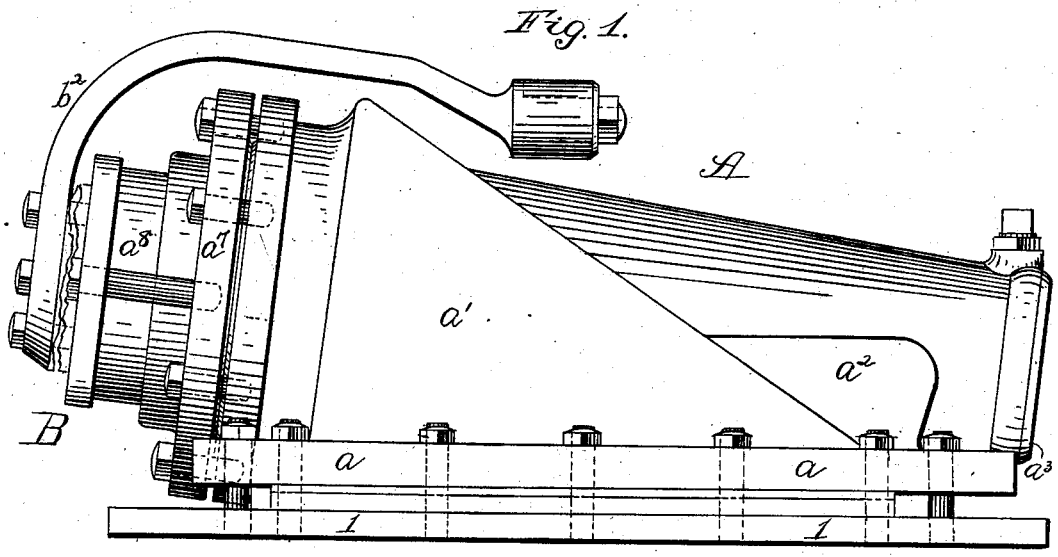


Fig. 2.

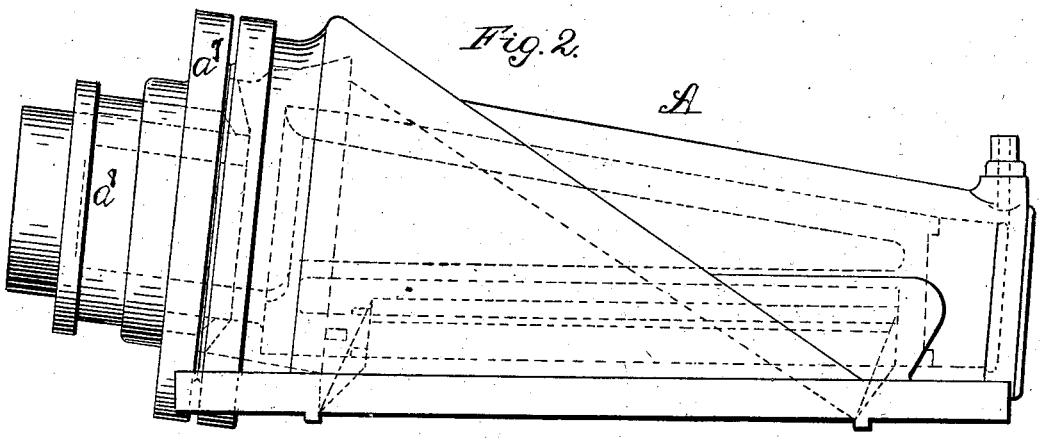
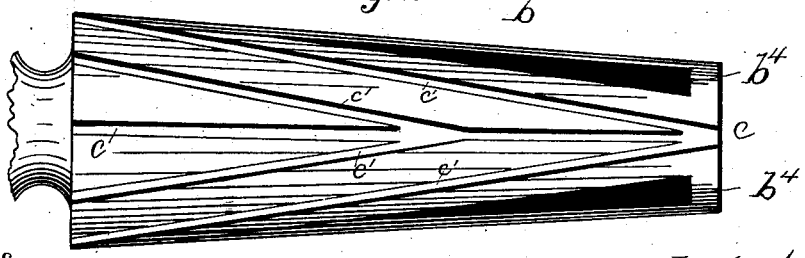


Fig. 3.



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his Attorney.

(No Model.) 4 Sheets—Sheet 2.

C. S. DETRO.

STEAM VALVE.

No. 259,827. Fig. 4. Patented June 20, 1882.

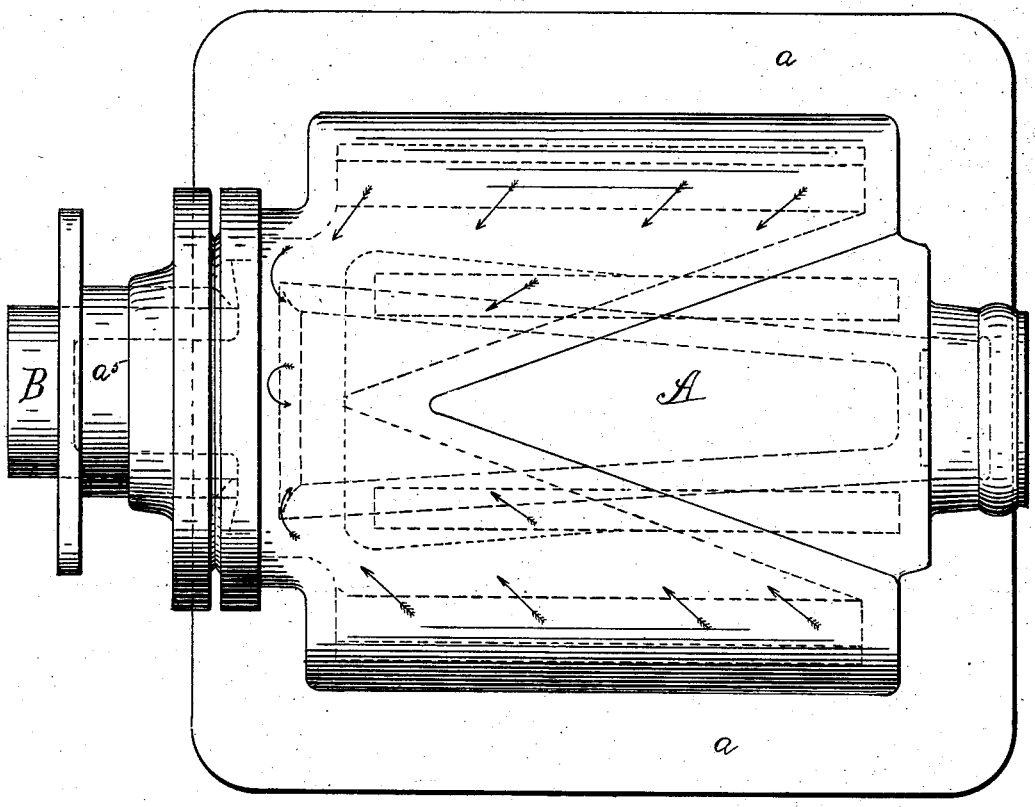
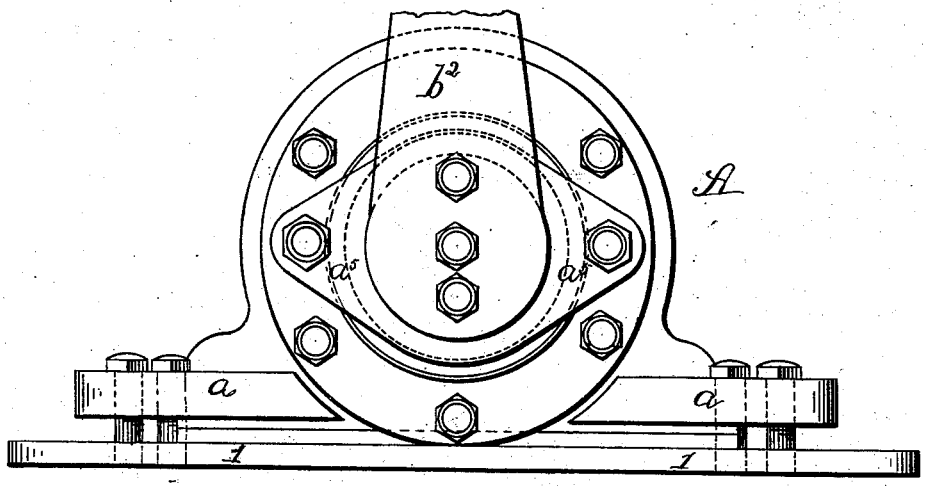


Fig. 5.



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(No Model.) 4 Sheets—Sheet 3.

C. S. DETRO.

STEAM VALVE.

No. 259,827. Patented June 20, 1882.

Fig. 6.

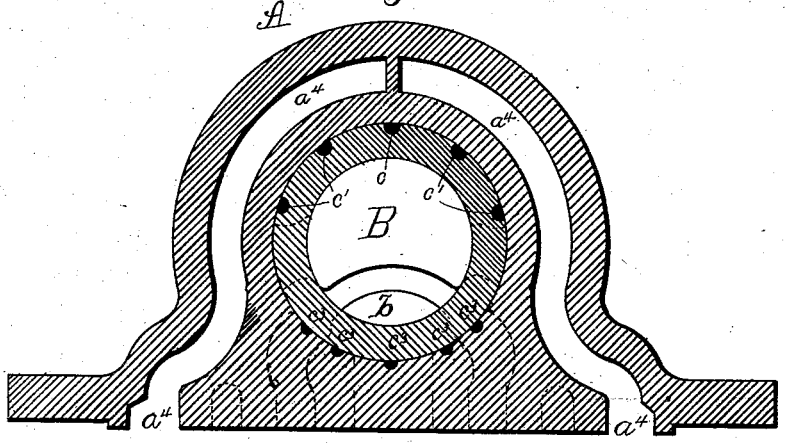


Fig. 7.

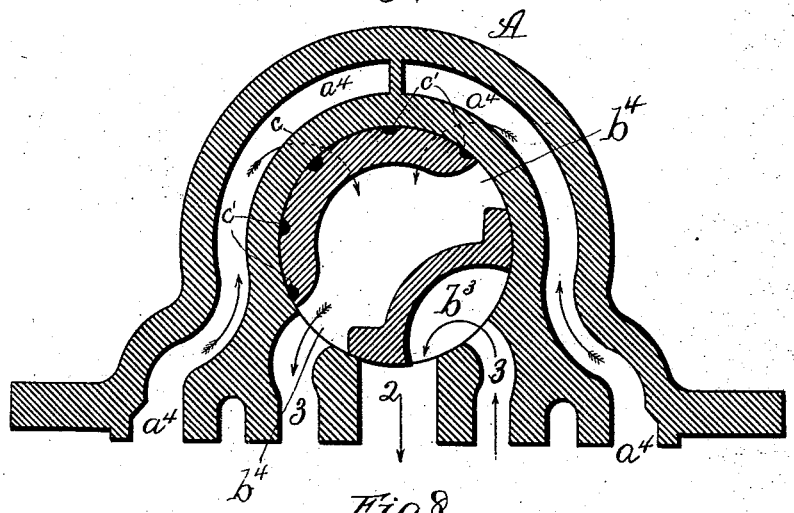
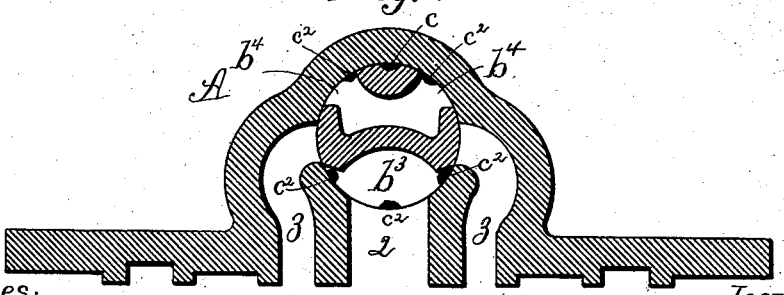


Fig. 8.



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(No Model.) 4 Sheets—Sheet 4.

C. S. DETRO.

STEAM VALVE.

No. 259,827. Patented June 20, 1882.

Fig. 9.

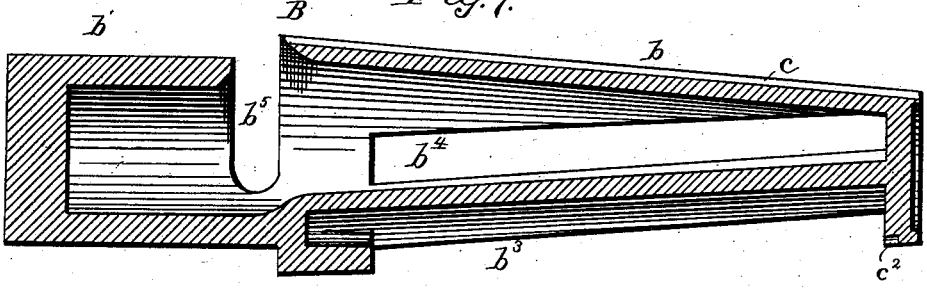


Fig. 10.

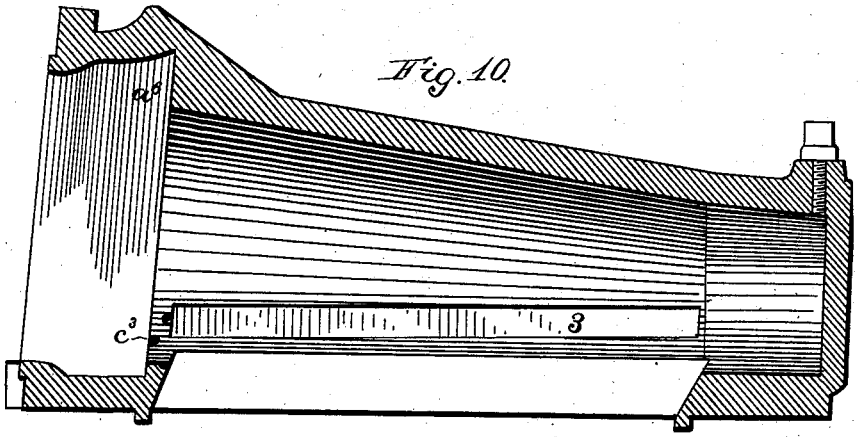
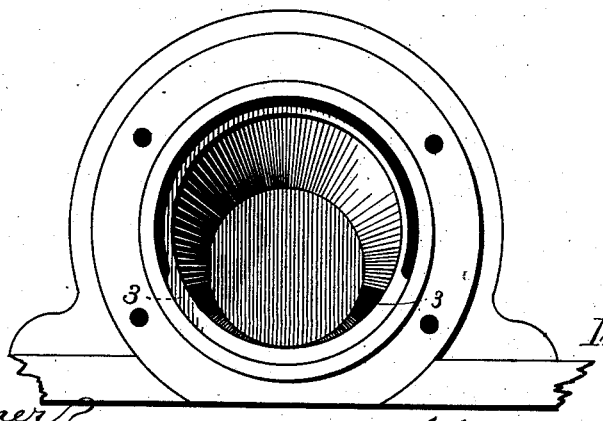


Fig. 11.



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his Attorney

UNITED STATES PATENT OFFICE.

CLARENCE S. DETRO, OF ASHLEY, PENNSYLVANIA.

STEAM-VALVE.

SPECIFICATION forming part of Letters Patent No. 259,827, dated June 20, 1882.

Application filed March 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE S. DETRO, of Ashley, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to rotary balanced valves; and it consists in the construction and arrangement of its several parts, as will be hereinafter fully set forth, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of the exterior of the valve-chest; Fig. 2, a view of the same, showing the position of the interior parts in dotted lines; Fig. 3, a top plan view of the plug; Fig. 4, a top plan view of the casing, showing in dotted lines the arrangement of the interior parts; Fig. 5, an end elevation; Fig. 6, a vertical cross-section of the large end of the valve and chest; Fig. 7, a vertical cross-section taken a short distance to the rear of Fig. 6; Fig. 8, a vertical cross-section at the rear end of the valve. Fig. 9 is a vertical longitudinal section of the plug. Fig. 10 is a vertical longitudinal section of the valve-casing, and Fig. 11 an end view of the same.

A is the valve-casing, and is made of the form shown and of sufficient size to afford space within it for the plug and necessary steam and exhaust ports, as will be hereinafter fully set forth. Its lower portion is extended outwardly in the form of a plate, a, and bolts onto the cylinder-saddle, the upper edge of which is shown at 1, Fig. 1. Increased thickness of metal is shown in the surface of the casting at a' and a^2 for the passage of the steamways mentioned above. The rear end of the cylindrical portion of the chest or cylinder is closed by a head, a^3, which may be bolted or cast to it, as shown. The forward end of the chest or cylinder is larger than the rear end, in order to accommodate the tapering form of the plug, and has bolted to it the head a^7, through which operates the large end of the plug. Within the head is arranged a suitable stuffing-box and a flange, a^8, to prevent leakage. The forward portion of the cylinder is also provided with an annular recess, a^6, which affords sufficient space to prevent wire-drawing of the steam. The interior of the cylinder tapers from the forward end of its upper side the entire length the plug penetrates it, when it continues straight, as shown.

Extending along the bottom of the cylinder is the exhaust-port 2, and arranged each side of the exhaust-port, a suitable space intervening, are the cylinder-ports 3. They extend downwardly through the bottom portion, a, of the chest, and connect with the steamways in the cylinder-saddle. The entrance-ports a^4 extend from the outer lower edges of the cylinder upwardly around its sides, and have inlet into the steam-space a^6 in the forward portion of the cylinder through ports a^5 in its upper portion, as shown.

B is the plug. It consists of a round tapering hollow portion, b, and a round hollow head, b', which projects through the head of the cylinder and has attached to it the rocker-arm b^2. The lower side of the portion b is made solid, and has arranged in its lower side the exhaust-cavity b^3. The cut-off ports b^4 are arranged upon each side, and above the exhaust-cavity communicate with the interior of the plug, and are arranged slightly in a diagonal position, that they may communicate along their entire length with the cylinder-ports, which are also arranged in like manner, as shown. Steam is admitted to the interior of the plug through a recess, b^5, cut between the body b and head b' of the plug, and shown in Fig. 9. When the plug is in position this recess is upward and communicates freely with the space a^6. The head b' of the plug is also made hollow, so that additional steam-room may be secured, and also to prevent the entire pressure of the steam from pressing the plug into the casing. Upon the upper side of the plug, and running its entire length, is a groove, c, and extending from the large end of the plug, upon each side of the groove c, and connecting with it at different points along its course, are supplementary grooves c'. Around the small end of the plug, and communicating with the steam, are arranged short notches c^2, as shown. There are also notches c^3 cut in the large end of the cylinder, as shown. The object of these notches and grooves is to counteract the force exerted by the steam to press the plug into the valve by exerting a pressure in the opposite direction, and thus making a perfectly-balanced valve. The steam entering the large end of the valve through the recess b^5 travels along

the grooves *c* and *c'* into the steam-space behind the small end of the valve, and exerts a counteracting pressure against the plug. The notches c^2 and cylinder-notches c^3 also aid in preventing the valve from binding. The notches *c c'* also act as lubricators, an oil-cup being situated at any convenient place upon the medium line of the cylinder. In the operation of the valve a rocking motion is communicated to the plug by the rocker-shaft. The steam enters the interior of the plug, passes into the cylinder-ports through each cut-off port alternately, and escapes through the exhaust-cavity. The pressure on the valve is equalized by the admission of the steam to the rear end of the valve and by the notches, so that a free motion is secured. As the parts wear, the plug will of course sink farther into the cylinder. This is provided for by having the large end project slightly out of the bore.

In the wearing of the plug a shoulder is prevented from forming in the small end of the cylinder, where the plug terminates, by the continuance of the bore parallel from that point, as shown.

What I claim is—

1. The plug B, having a central groove, *c*, and supplementary grooves *c'*, adapted to admit steam into the space behind the plug, and with notches c^2, arranged around its small end, substantially as and for the purposes set forth.

2. The combination of the casing A, having entrance-ports a^4, inlet-ports a^5, steam-space a^6, cylinder-ports 3, and exhaust-cavity 2, head a^7, stuffing-flange a^8, and notches c^3 with the plug B, having a hollow head, *b'*, which projects from the large end of the cylinder and has attached to it the rocker-arm b^2, which connects with the actuating machinery, having steam recess or inlet b^5, cut-off ports b^4, and exhaust-cavity b^3, and notches *c*, *c'*, and c^2, all arranged to operate substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

CLARENCE S. DETRO.

Witnesses:
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