

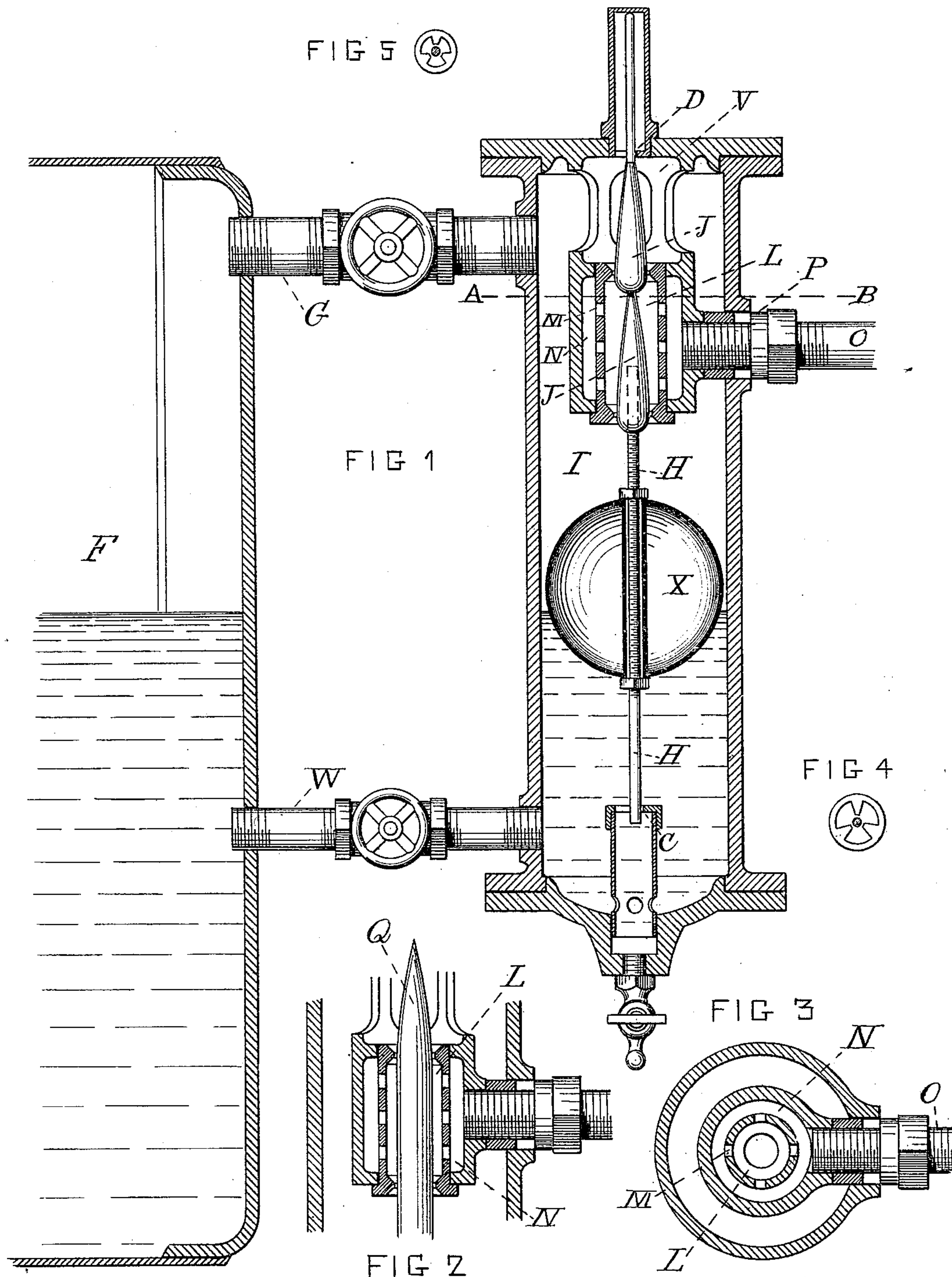
(No Model.)

2 Sheets—Sheet 1.

F. COOK & B. THOENS.
FEED WATER REGULATOR.

No. 354,099.

Patented Dec. 14, 1886.



WITNESSES

Henry Duffie.
J. H. Ferguson

INVENTORS

Fredrick Cook
Burchard Thoens

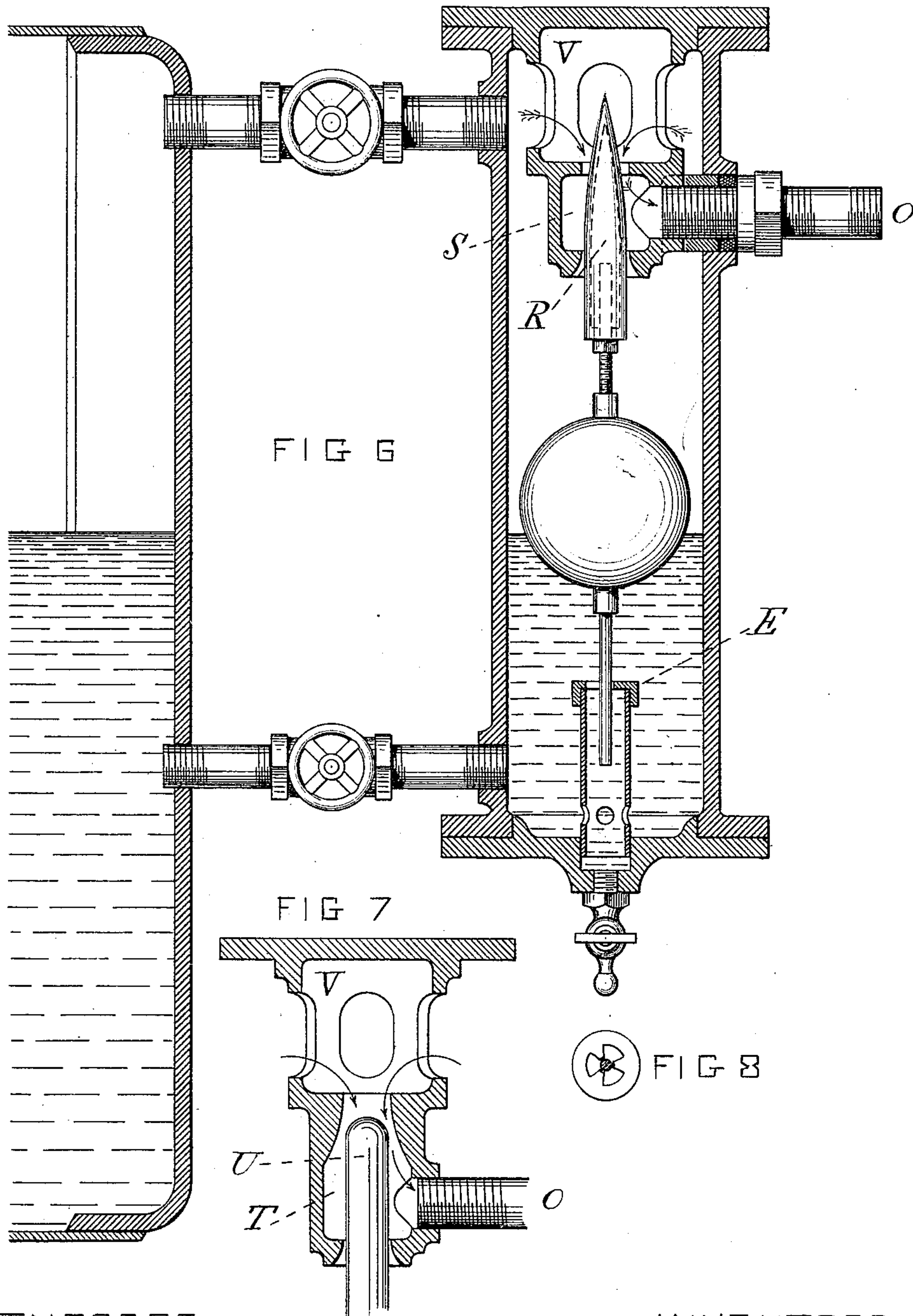
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UNITED STATES PATENT OFFICE.

FREDERIC COOK AND BURCHARD THOENS, OF NEW ORLEANS, LOUISIANA.

FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 354,099, dated December 14, 1886.

Application filed May 6, 1886. Serial No. 201,375. (No model.)

To all whom it may concern:

Be it known that we, FREDERIC COOK, a citizen of the United States, and BURCHARD THOENS, a citizen of the Empire of Germany, both residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and useful Feed-Water Regulator, of which the following is a specification.

Our invention relates to certain improvements in feed-water regulators, on the patent allowed us November 24, 1885, Serial No. 177,170.

The object of the present improvement is to more perfectly balance the steam-pressure on the regulating-cone, so that a more perfect equilibrium may be established around the cone in all positions, and an exact action of the upward and downward motion of the float be established to perfectly regulate the water-level in the boiler by controlling the speed of the pump. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the regulator with double conical obstructer. Fig. 2 is a portion of vertical section of the regulator, showing a single regulating conical obstructer. Fig. 3 is a horizontal section through line A B of Fig. 1. Fig. 4 is a plan view of lower guide, C. Fig. 5 is a plan view of upper guide, D. Fig. 6 is a vertical section of the regulator with a single cone working in a single steam-chamber, S. Fig. 7 is a vertical section of a portion of regulator, showing a parallel regulator working in a conical steam-chamber. Fig. 8 is a plan view of guide E.

The steam and water from boiler F are connected by pipes G W to the regulator-chamber I, so that the water will rise to same level as in the boiler F. A float, X, rests on water-surface, and has a stem, H, extending through guides C and D, the friction being reduced to a minimum by the stem H working loosely within three points, as shown at Fig. 4 and 5. On the stem H is a double conical obstructer, J J, each of which works vertically in steam-openings in the inner chamber, L, which is provided with steam-exit holes M around its circumference.

The steam enters equally around both upper and lower cones, J J, in equal rings at all positions of the cones J J, working through

the upper and lower openings of chamber L. Thus the upward and downward pressure or flow of steam around cones is balanced. The steam passes out of chamber L through exit-holes M into chamber N, from which it passes out through pipe O to a steam feed-pump, (that feeds the boiler,) whose speed is thus regulated by the water-level, causing the float X to work the double cones J J, which regulate the flow of steam to pump to a nicety. Thus a perfect balance above, below, and around the regulating-cones J J, both of steam-pressure and friction from flow of steam, is obtained. The openings in which the cones J J work are slightly larger than the largest diameter of cones, so as to allow always enough steam to flow through at high water to just keep the steam feed-pump from stopping.

The pipe O is secured from leaking where it passes out of chamber I by a stuffing-box, P, of suitable construction, as shown.

Fig. 2 shows the same double chamber L and N as at Figs. 1 and 3, but only a single cone, Q, regulating the flow of steam through the top opening only; the lower opening acting as a guide for the regulator Q.

Fig. 6 shows also a single cone, R, working in but one chamber, S, and in upper opening only, the lower opening acting as a guide to regulating-cone R.

Fig. 7 shows the reverse arrangement, a parallel regulator working in a tapering or conical chamber, T, and as the float rises or falls the stem U regulates the flow of steam by increasing or diminishing the ring of steam around the stem U.

V is the upper cover of chamber I in all the views.

In the modifications shown at Figs. 2, 6, and 7, it will be seen that although they are improvements as to balancing the pressure on the regulator-cones on the original invention, the patent for which was allowed us November 24, 1885, Serial No. 177,170, yet none of them are as perfect a balance of steam-pressure and friction of flow of steam around the regulator cones or stem U, as shown in Figs. 1 and 3, first described.

What we claim, and desire to secure by Letters Patent, is—

1. In a feed-water regulator, the combination, with the boiler, of a regulator-chamber

having communication with the steam and water space at its upper and lower end, respectively, a steam-chamber within the regulator-chamber having communication with a
5 pipe leading to the pump, an inner chamber within the steam-chamber having lateral openings, a double conical obstructer moving vertically in openings in the ends of the inner chamber, a float connected with the obstructer,
10 and guides for the float in both ends of the regulator-chamber, the conical obstructers being a little less in diameter than the openings in which they move, substantially as described.

2. A feed-water regulator having in combination
15 a chamber connected to boiler above and below the water-line, a float resting on

water-line, a double or single cone for regulating supply of steam to steam-pump, a double steam-chamber around the cone or cones, the inside chamber being provided with an
20 upper and a lower steam-opening, and side holes for exit of steam, a steam-pipe leading to steam-pump supplying the boiler, which pipe opens into the second or outside chamber encircling cone or cones, substantially as described,
25 and for the purpose specified.

FREDERIC COOK.
BURCHARD THOENS.

Witnesses:

HENRY DUFILHY,
J. H. FERGUSON.