G. HENRY.

Feed-Water Regulator.

No. 164,559. Patented June 15, 1875.

Fig. 1.

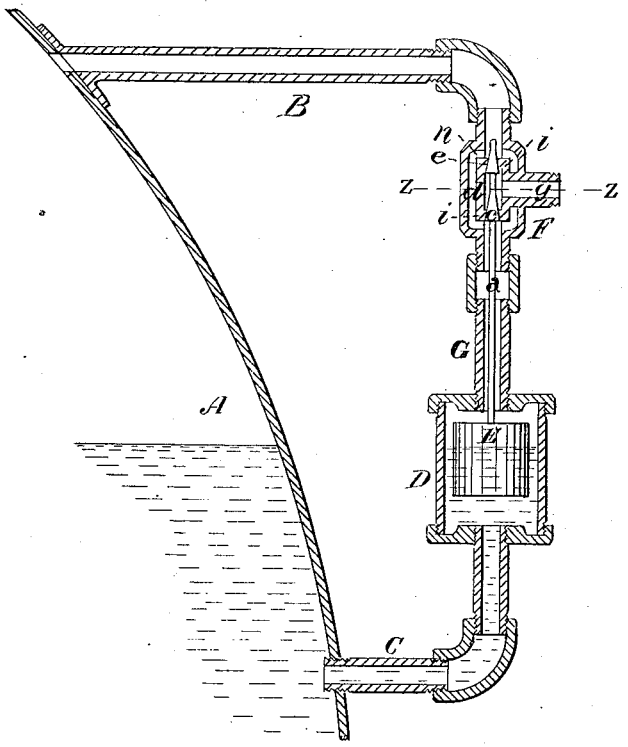


Fig 3

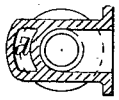
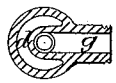


Fig 2



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE HENRY, OF LENNOXVILLE, CANADA.

IMPROVEMENT IN FEED-WATER REGULATORS.

Specification forming part of Letters Patent No. **164,559**, dated June 15, 1875; application filed May 11, 1875.

To all whom it may concern:

Be it known that I, GEORGE HENRY, of the village of Lennoxville, in the county of Compton, in the Province of Quebec, Dominion of Canada, manufacturer of watches, have invented Improvements on Regulators for Feed Apparatus of Steam-Boilers, of which the following is a specification:

The object of my invention is to obviate the danger to which steam-boilers are frequently exposed for the want of a proper supply of feed-water, by regulating the supply of steam from the boiler to the pump, by which it is fed, and thus insure the requisite quantity to maintain it at the proper level in the boiler.

Reference being had to the annexed drawings, where similar letters indicate like parts, Figure 1 represents a sectional elevation of a regulator embodying my invention. Fig. 2 represents a cross-section of valve-chamber on line *z z*. Fig. 3 represents a modification of the same.

In the drawings, letter A represents a section of the side of a boiler, to which the regulator is attached by the pipes B and C. The regulator itself consists of a chamber, D, fixed in such a position that it will be partially full of water when the water in the boiler is at its proper height, the pipe C affording a communication between them, and maintaining it at the same level in both, containing a float, E, extending from the top of which is the spindle *a*, having on its upper extremity the valves *e e*. These valves fit steam-tight to the valve-seats *i i* in the valve-chamber F.

The valve-chamber F is composed of an inner and outer casing, having an annular space between, the branch *g* being connected to the center chamber between the valve-seats *i i*, and the annular space *d* is connected to the center chamber above and below the valve-seats *i i* by the ports *n*. The pipe B connects the valve-chamber F to the boiler A above the water-level, and keeps it supplied with steam, and the pipe G, through which the spindle *a* passes, also affords a communication between the valve-chamber F and water-chamber D. The branch *g* connects to the pipe, by which the feed-pump is supplied with steam.

The operation of the regulator is as follows: The steam entering through the pipe B passes through the ports *n*, and fills the annular space *d* and pipe G, but is prevented from entering the center of the valve-chamber F and passing out through the branch *g* by the valves *e e*. In consequence of space *d* being connected by the ports *n*, above and below the valve-seats *i i*, it allows a free passage to the steam, which thus exerts a pressure on the lower side of the bottom valve, as well as on the upper side of the top one, one force counteracting the other, and thus keeping the valves balanced, or nearly so.

As the water in the chamber D becomes lower, in conformity with the water in the boiler, the float E sinks with it, drawing down the valves *e e* (by means of the spindle *a*) away from the valve-seats *i i*, and allows the steam to pass through, and thence through branch *g* to the pump. The quantity of steam supplied to the pump, and consequently its speed, is regulated by the height of water in the chamber D. Thus, when the water is low, the valves are full open, allowing sufficient steam to pass to work the pump to its full capacity, and as the water rises the valves close, diminishing the supply of steam, until the water is at the highest point desirable, when the valves are entirely closed, which stopping the pump altogether, the supply of water to the boiler ceases, until its level again falls, when the pump is again set in motion. By this means it is impossible for the water to become either too high or too low, but is maintained at the proper level by its own action, without requiring any attention from the person in charge of the boiler.

The modification shown in Fig. 3 has reference to the valve-chamber F, and consists simply in having a passage, *d*, on one side only of the valve, in place of the annular space *d*, for the sake of economy in the larger sizes, the passage being connected by ports in a similar manner to the annular space.

What I claim as my invention is—

The water-chamber D, float E, stem *a*, and valves *e e*, in combination with the valve-chamber F, having steam-passage *d*, communicating openly by pipe G with the water-chamber D, and provided with valve-seats *i i* and branch *g*, all substantially as and for the purpose specified.

GEORGE HENRY.

Witnesses:

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