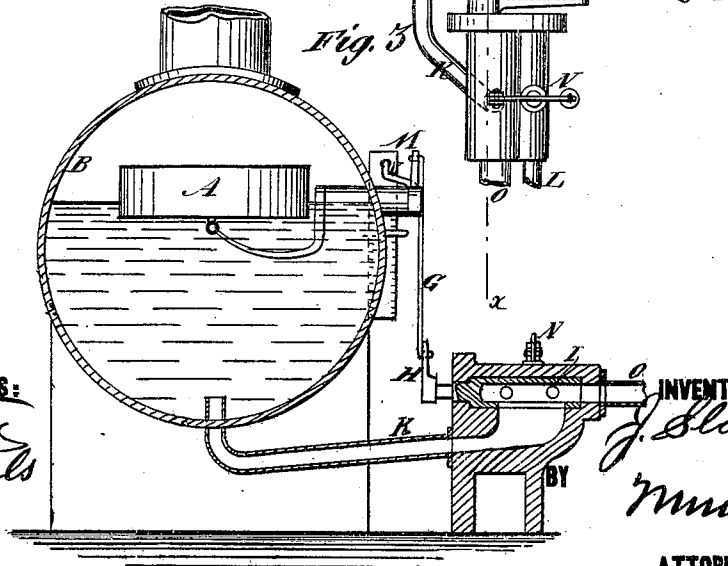
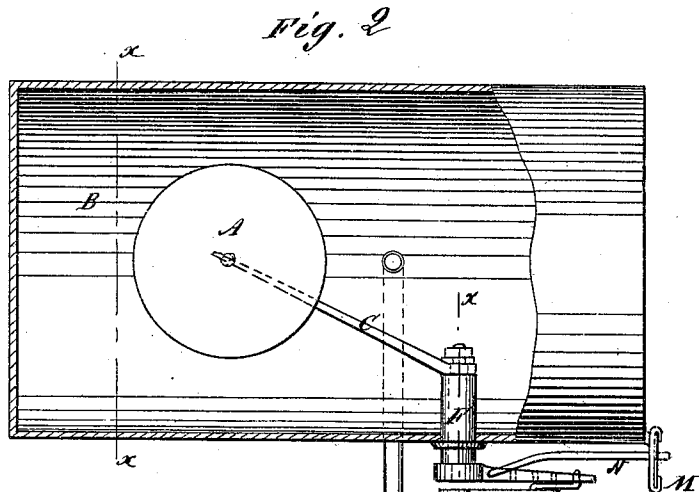
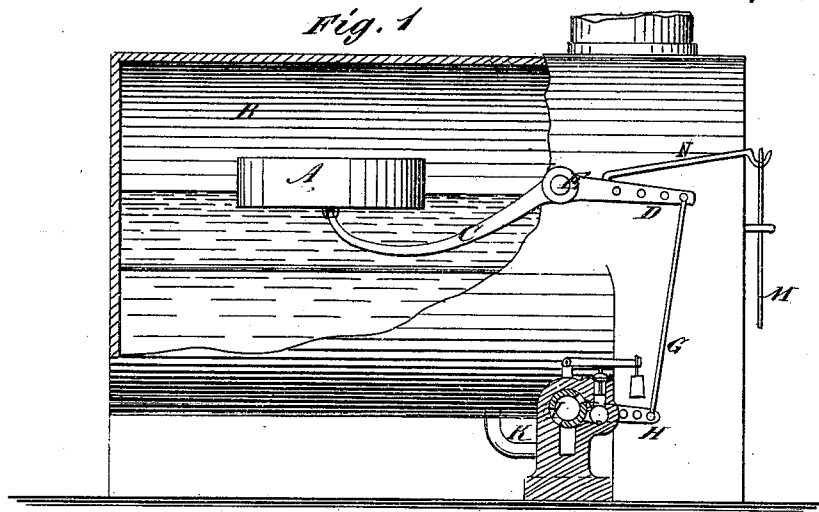


J. SLADE.
FEED-WATER REGULATOR.

No. 179,618.

Patented July 4, 1876.



WITNESSES:
C. Severin
J. Goethals

INVENTOR:
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ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN SLADE, OF BAY CITY, MICHIGAN.

IMPROVEMENT IN FEED-WATER REGULATORS.

Specification forming part of Letters Patent No. **179,618**, dated July 4, 1876; application filed March 25, 1876.

To all whom it may concern:

Be it known that I, JOHN SLADE, of Bay City, in the county of Bay and State of Michigan, have invented a new and Improved Feed-Water Register, of which the following is a specification:

My invention is an improvement in the class of feed-water regulators in which the pump is continuously operated, and means are provided by which, when a sufficient quantity of water has been at any time supplied to the boiler, the current may be shut off and caused to return to the pump.

The invention relates to the construction and arrangement of the devices for indicating the height of water in the boiler, and the adjustable connection between the arm of the rock-shaft, which is operated by the float, and the arm of the valve or plug, by which the entrance of the water into the boiler and return of the same to the tank or immediate source of supply are regulated, as hereinafter described.

Figure 1 is a longitudinal sectional elevation of a boiler with my improved regulator. Fig. 2 is a horizontal section, and Fig. 3 is a transverse section taken on line *x x*.

Similar letters of reference indicate corresponding parts.

A is the float in the boiler B, connected by lever C with the outside lever D by the rock-shaft E, which extends through the shell of the boiler in a steam-tight tube, F. Lever D connects, by rod G and lever H, with the plug-cock I, to which the feed-water is supplied from the pump through pipe O, and from which it passes to the boiler through pipe K, when the water is low in the boiler; but when it is at the required height, the cock is made to close, causing a safety-valve placed near the pump to rise, allowing the water to escape to the well until needed again, when the cock

will be reversed, and the boiler will again be supplied.

The shell or case of the plug has a lateral chamber, into which the water flows when shut off from the boiler, and to which the pipe L is attached. When the water is thus diverted into the lateral chamber by adjustment of the plug I, the pressure is, in general, suddenly increased.

To prevent bursting of the chamber or return-pipe, I provide the former with a safety-valve, N, which will instantly relieve the pressure whenever it passes beyond a dangerous limit.

M is a graduated plate, working in a vertical guide, and suspended from the free end of a rod, N, which is rigidly attached to the lever-arm H of the plug. The rotation of the plug will cause the plate M to rise or descend in its guide, and thus indicate the exact position of the plug, as well as the height of the water in the boiler. The levers D and H are provided with a number of holes, to permit adjustment of the rod G, and thereby limit the effect on the plug of a variation in the position of the float, and thus gage the water-level in the boiler higher or lower.

What I claim is—

1. The lever-arm D of float A, the rod N, rigidly attached thereto, and the suspended graduated plate M, working vertically in a guide or keeper, all combined and arranged to operate as shown and described.

2. The combination of plug I, float A, levers D H, provided with perforations, as specified, and the adjustable rod G, all as shown and described, for the purpose specified.

JOHN SLADE.

Witnesses:

W. F. PRICE,
JOHN McCLELLAN.