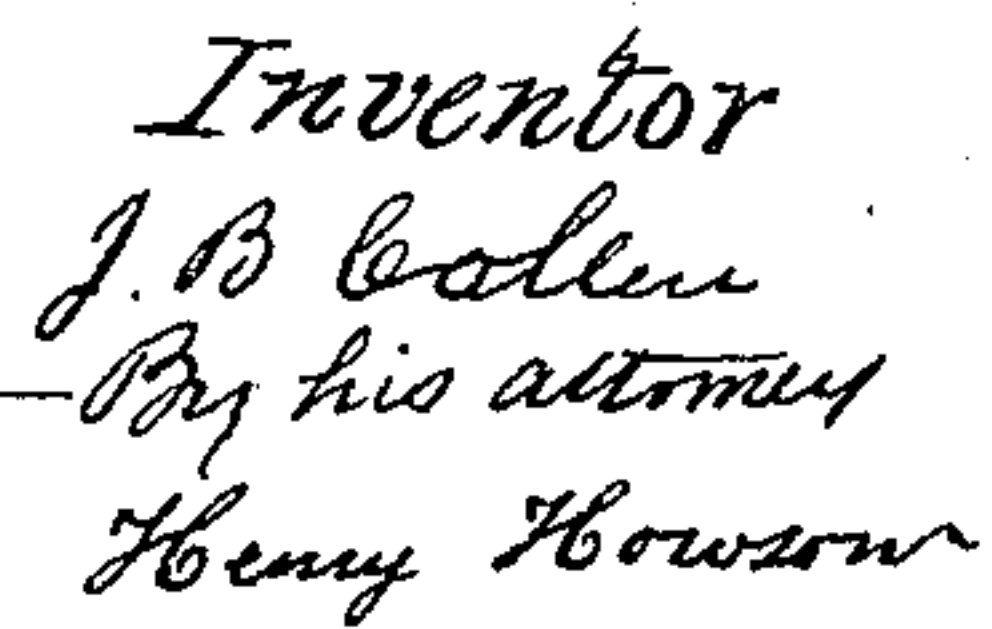


Patented Jan. 16, 1866.



UNITED STATES PATENT OFFICE.

JOHN B. COLLEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
HIMSELF AND JOHN MCGILL, OF SAME PLACE.

IMPROVEMENT IN AUTOMATIC-FEED APPARATUS FOR STEAM-GENERATORS.

Specification forming part of Letters Patent No. 52,111, dated January 16, 1866.

To all whom it may concern:

Be it known that I, J. B. COLLEN, of Philadelphia, Pennsylvania, have invented an Improved Feed-Water Apparatus for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists, first, of a reservoir, a supply-pipe, certain valves, and a float, the whole being constructed and operating, and applied to a steam-boiler, as fully described hereinafter, so that the proper quantity of water is always maintained in the boiler without the exercise of any supervision on the part of the attendant; secondly, of certain devices, constructed and arranged as fully described hereinafter, for facilitating the removal from the reservoir of the valves and float when the same have to be adjusted; thirdly, of devices, fully described hereinafter, for balancing the weight of the operating-valves and the parts attached to the same, and for indicating the operation of these parts to the attendant.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional elevation of my improved feed-water apparatus for steam-boilers, and Fig. 2 the same, showing the parts in different positions.

A is a spherical metal vessel, which is bolted to a steam-boiler, and to the top of the said vessel is secured a cap, B, in which are two openings, *x* and *y*. With the opening *x*, and with the steam-space of the boiler, communicates a pipe, Y, and with the opening *y*, and with a water-reservoir, communicates a pipe, W, in which is a valve, *e*.

Through the bottom of the vessel A, and through the top of the boiler, extends a tube, C, the lower end of which is below the water-line *g*, the upper end of the tube being secured to a plate, D, which is connected by rods *a a* to the cap B, so that when the latter is removed the plate D and tube C will be also withdrawn.

To a spindle, E, which is hung to a lever, I,

and extends through the pipe Y, the vessel A, and into the tube C, are secured two valves, *c* and *c'*, the former being adapted to a seat in the opening *x*, and the latter to a seat in the plate D. To threads on the lower end of the spindle E are adapted those in a nut at the upper end of a link, F, and to the latter is jointed loosely a hollow float, G.

Through the cap B passes a small pipe, H, the end of which bears against the side of the valve *c*, when the latter is in the position shown in Fig. 2.

The link F is so adjusted on the spindle B that when the water is at the proper level in the boiler the float G and the spindle will be raised to the position shown in Fig. 1, the valves *c c'* bearing firmly against their seats, and closing all communication between the vessel A and the boiler, while the water, by its pressure, opens the valve *c* and flows into and fills the vessel A. As soon as the quantity of water in the boiler is diminished in any degree, and the surface of the same falls below the line *g*, the float G and the spindle E descend, the valves *c c'* being withdrawn from their seats, while the side of the valve *c* is brought opposite to and closes the end of the pipe H. As soon as the valves are opened the water in the vessel A flows from the latter through the tube C and into the boiler, the pressure of the steam admitted from the pipe Y by the opening of the valve *c* insuring the free flow of the water and also closing the valve *c*, so that the further admission of water to the vessel A is prevented. As the water rises in the boiler the float and spindle will be gradually elevated until the water in the boiler is at the proper level, when all communication between the boiler and vessel A will be again entirely closed, as shown in Fig. 1. As the valve *c* is brought against its seat the end of the pipe H is uncovered, and the steam in the vessel A escapes through the said pipe, the pressure in the vessel and against the valve *c* being thus removed, so that the water can again flow into and fill the vessel A.

It will be apparent that the slightest diminution of the quantity of the water in the boiler will cause the float G to descend and open the valves, the boiler being thus continually replenished with water, (but only in such quan-

tities as will be sufficient to supply the deficiency occasioned by evaporation,) the water being thus always maintained at its proper level without the necessity of any supervision on the part of the attendant.

When the cap B is removed the float D, tube C, spindle E and its float G are also withdrawn, so that ready access may be gained to the valves and the float when the same have to be adjusted.

It will be seen that as the float G is jointed to the spindle E the float can readily accommodate itself to the surface of the water when the latter is in motion, as when the apparatus is used with locomotive or marine boilers, the tube C also guiding the float, so that it cannot swing to a sufficient extent to bend the spindle.

By the use of the weighted lever I the weight of the spindle and its valves is so balanced that a very slight motion in the water will be communicated to the spindle, while the constant vibration of the lever indicates to the attendant that the apparatus is working properly.

Without confining myself to the precise construction and arrangement of the parts herein described, I claim as my invention, and desire to secure by Letters Patent—

1. The reservoir A, its supply-pipe W, the valves *c c'* and float G, the whole being constructed and operating and applied to a steam-boiler, substantially as and for the purpose specified.

2. The combination, with the cap B, the spindle and its valves, of the plate D, tube C, and rods *a a*, or their equivalents, substantially as and for the purpose described.

3. The combination of the weighted lever I and screw-spindle E, with the sleeve *c* and float-sleeve *c'*, substantially as described, and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN B. COLLEN.

Witnesses:

JOHN WHITE,
W. J. R. DELANY.