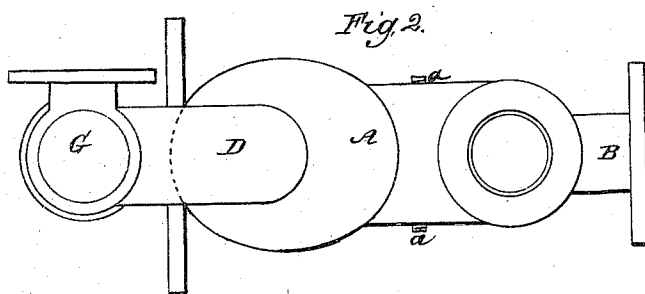
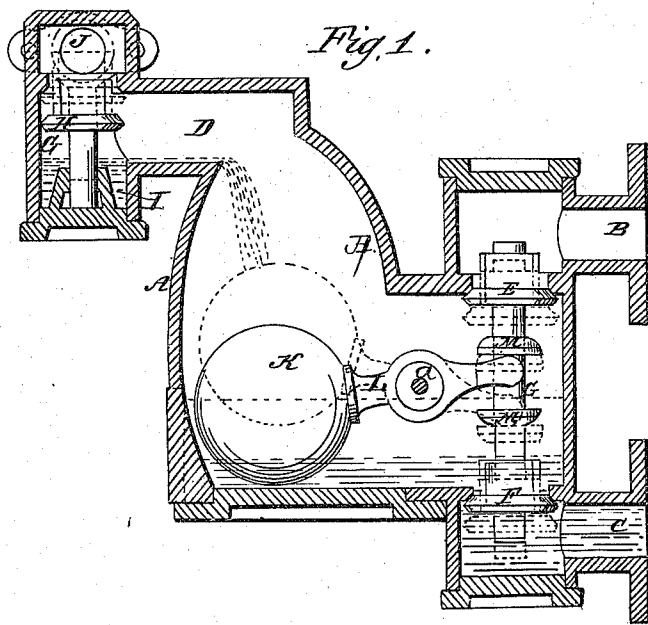


H. C. Sergeant,
Steam-Boiler Water-Feeder,
No 11,095, Patented June 13, 1854.



Witnesses.

Cha. C. Sergeant,
Joseph Sanders.

Inventor:

Henry C. Sergeant.

UNITED STATES PATENT OFFICE.

HENRY C. SERGEANT, OF CINCINNATI, OHIO.

FEED-WATER APPARATUS FOR STEAM-BOILERS.

Specification of Letters Patent No. 11,095, dated June 13, 1854.

To all whom it may concern:

Be it known that I, HENRY C. SERGEANT, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Apparatus for Feeding and Regulating the Height of Water in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a vertical section through the center of my improved apparatus. Fig. 2, is a top view of the same.

Similar letters of reference indicate corresponding parts in both figures.

My invention consists in a certain novel arrangement and combination of valves and a float within a box, which has means of communication with a reservoir of water, and with the steam and water spaces of the boiler, by means of which the boiler is continually supplied with water from the reservoir, and the desired level is maintained.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, is the box, which may be of cast iron or other metal. It is provided at the upper part of one side with a pipe, B, which is intended to communicate with the upper part or steam space of the boiler, and at the lower part of the same side with a pipe, C, which is intended to communicate with the boiler below the intended water line, or anywhere near the bottom. At the top of the box, there is a pipe, D, intended to communicate with the water reservoir, which should be placed somewhere above. The passages leading from the box to the pipes, B and C, are fitted with puppet valves, E, and F, which are attached to the same rod, G, and which open the passages by a downward motion, and close them by an upward motion. The valves are of equal size, and being both exposed to the pressure of the steam, when the pipes, B, C, are open, are perfectly balanced. There is intended to be a cock between each of these pipes and the boiler. The pipe, D, is enlarged just outside the box, A, to form a valve box, G, to receive a valve, H, and the box descends a little below the pipe, D, to form a cup, I, to retain a small quantity of water. The

valve, H, closes the pipe, D, by a movement outward from the box, and opens it by an inward movement. The valve box is furnished with a pipe, J, which leads to the reservoir.

The body or main part of the box, A, contains a float, K, consisting of a hollow metal ball, and this float is attached to one end of a lever, L, of the first order, which moves on a fulcrum, *a*, secured within the box, and is forked at the opposite end to embrace the valve rod, G, which is furnished with two collars, M, M, one above, and the other below the fork, at such distance apart, as to allow the first considerable play between the collars. The weight of the float must be such that when unsupported by water, it will overbalance, and raise the valves, E and F, and thereby close the pipes, B, and C.

To describe the operation of the apparatus, I will first suppose that the cocks in the pipes, B, C, are closed, as they would be when the boiler is not in operation, or the steam is not up, and that the water in the boiler is below the desired level. As soon as there is a sufficient pressure of steam in the boiler above that of the atmosphere, the cock in the pipe, B, may be opened, and then as only the upper valve, E, is exposed to the pressure, it is pressed down, and the steam, entering the chamber, D, closes the valve, H. The cock in the pipe, C, is then opened, and the valves, E, F, are balanced. If the box contains any water, it passes by gravitation through C, till the float falls far enough to close the valves, E, F. If it contains none, the valves close at once. The steam in the box then soon condenses, and a vacuum is formed therein, when the valve, H, opens, and water from the reservoir enters the box. The several parts are now in the condition shown in black in Fig. 1, of the drawing. When the box has received a sufficient quantity of water to lift the float high enough to open the valves, E, F, as shown in red outline in Fig. 1, the steam entering the box, closes the valve, H, as shown in red in the aforesaid figure and the water runs by gravitation from the box into the boiler, until the float has descended far enough to close the valves, when condensation is repeated and followed by the same results as before stated. The condensation is assisted

by the fresh supply of water which is left in the cup, I, every time the box is charged. The above operation is repeated so long as the water in the boiler is not above the proper level.

In order that the proper level may be maintained in the boiler, it is necessary that the apparatus be so placed, that when the water in the box is at the level at which it is desired in the boiler, the valves, E, F, shall be closed, but when the water rises, in the least degree, above that level, the side valves shall be opened by the float. Then if the water rises in the slightest degree above the proper level in the boiler, these valves are opened by a similar rise in the box, and the box is kept supplied with steam from the boiler, and there is no possibility of condensation taking place and opening the valve, H, until the water falls sufficiently for the float to close the other valves.

What I claim as my invention, and desire to secure by Letters Patent, is:

1. The combination of the balance valves, E, F, the float, K, and the valve, H, all arranged within, or applied in any manner, substantially as described, to a box, A, connected as described with the boiler and a reservoir.

2. I claim the cup, I, sunk below the pipe, D, which supplies the box with water, or otherwise applied inside of the valve, H, for the purpose of receiving and retaining a small quantity of water every time the box is charged, for the purpose of facilitating or expediting the condensation of the steam after the water has been discharged from the box.

HENRY C. SERGEANT.

Witnesses:

CHAS. E. SERGEANT,
JOSEPH H. SANDERS.