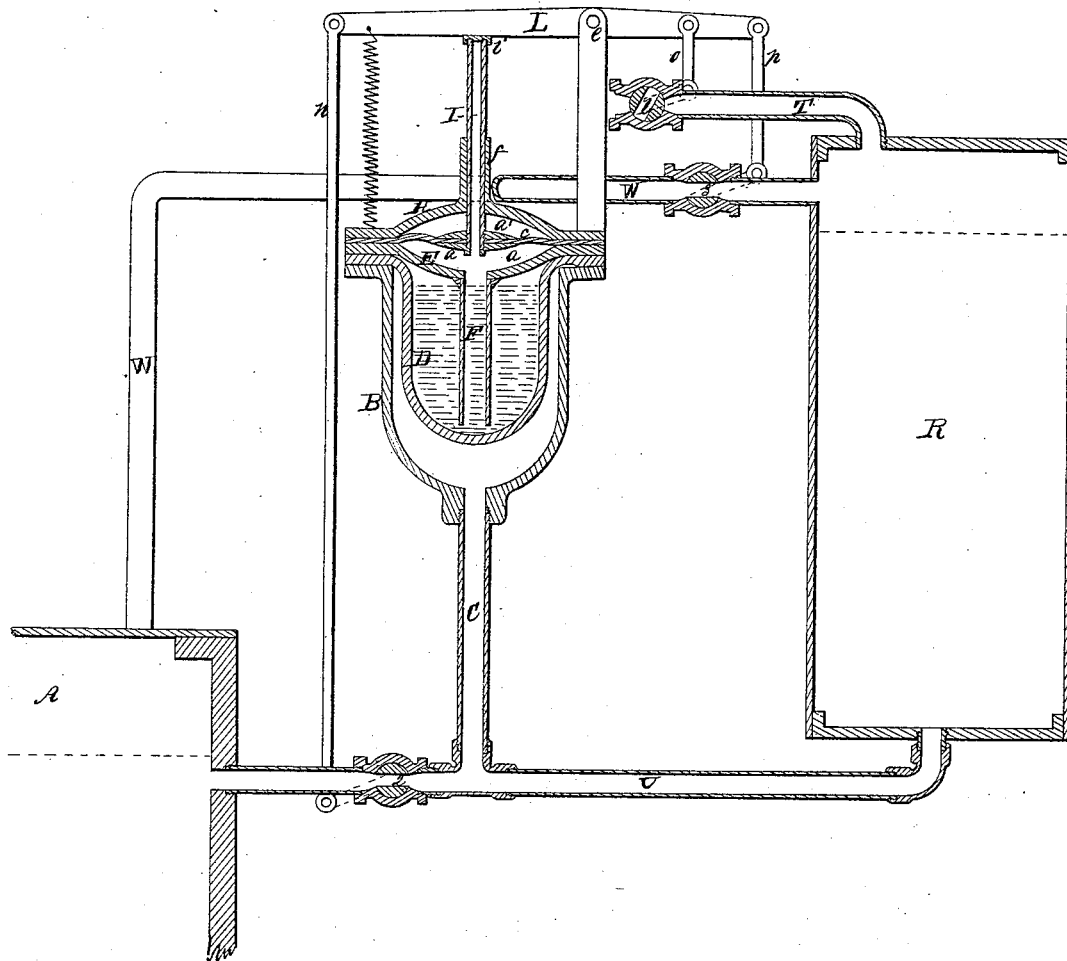


J. W. Bishop,
Steam-Boiler Water-Feeder,
No. 47,181, Patented Apr. 11, 1865.



Witnesses.

John E. Earle
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J. W. BISHOP, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN AUTOMATIC BOILER-FEEDERS.

Specification forming part of Letters Patent No. 47,181, dated April 11, 1865.

To all whom it may concern:

Be it known that I, J. W. BISHOP, of New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Water-Feeders for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the same, when taken in connection with the accompanying drawing and the letters of reference marked thereon, and which said drawing constitutes part of this specification, and represents a vertical central section of a steam-boiler with my invention attached thereto in like sectional drawing.

The object of my invention is the construction of a boiler-feeder for supplying water to the boiler, and operated automatically by the steam in the boiler.

To enable others skilled in the art to make and apply my invention, I will proceed to describe the construction and operation of the same as illustrated by the accompanying drawing.

A represents the section of a steam-boiler to be supplied with water.

R is a water-tank supplied with water through a pipe, T, in which is a cock, 1, by which to cut off or let on the water. The said tank is connected with the boiler A by a pipe, U, in which is placed a cock, 2, to connect or disconnect the tank from the boiler. Another pipe, W, also connects from the upper part of the boiler with the upper part of the tank, to admit steam from the boiler to the tank. A cock, 3, is placed in the said pipe W, to cut off or let on the steam from the tank. From the pipe U a pipe, C, extends up to and communicates with a vessel, B, which said vessel should be elevated above the boiler, as shown. Within the vessel B and supported by a rim resting on the rim of the vessel B, I set a second vessel, D, of such size as to leave a space around the inner vessel, D. Over the second vessel, D, I place a plate, E, resting on the rim of the second vessel, D, and constructed so as to form the lower part of a chamber, *a*. Into the said plate E, I insert a tube, F, which extends nearly to the bottom of and opens into the vessel D, and also through the plate E to the chamber *a* above. Over the said plate I form and fix a diaphragm, *e*, of any suitable

material, (flexible,) and cover with a plate, H, constructed so as to form a second chamber, *a'*. The said chamber *a'* should have an opening to communicate with the atmosphere to allow the air in the chamber to pass out or in as the diaphragm is raised or lowered, decreasing or increasing the space in the said chamber. Bolt or otherwise secure the whole together, steam-tight, as shown in drawing. To the said diaphragm I attach a spindle, (hollow,) I, which extends up through the plate H in a suitable guide, *f*. The upper end of the said spindle is closed by a movable cap, *i*, upon which rests a lever, L, having its fulcrum at *e*.

Fill the inner vessel, D, with water or other fluid through the tube or spindle I, replace the cap *i* thereon, set the lever L onto the cap; from one end of the said lever make a connection, *n*, with the cock 2, which rises to close the said cock, and from the other arm of the lever L connect by rod *o* with the valve 1, and rod *p* with valve 3. The depression of this end of the lever closes the valve 3 and opens the valve 1. This completes the construction of my boiler-feeder. Its operation is as follows:

The cocks or valves 2 and 3 being open, steam from the boiler passing through the cock 2 to the vessel B will cause steam to be generated in the vessel D, which, pressing upon the surface of the fluid in the said vessel D, will cause the fluid to rise through the tube F to the chamber *a*, raise the diaphragm *e*, which forms its connection with the lever L, raise it sufficiently to close the valves 2 and 3, and at the same time will open the valve 1 to admit water to the tank R from the supply. Water thus running into the tank will flow through the pipe C to the vessel B, condensing the steam therein and cooling the vessel D, until by the time the tank is filled the diaphragm, aided by a spring attached to the lever, as denoted in red, or other device, to overcome the friction of the valves, will have settled, so as to allow the lever to close the valve 1 and open the two steam-valves 2 and 3. Steam enters the tank above the water and equalizes the pressure above and below the water, so that the water descends from its own gravity into the boiler. As soon as the

water has all passed into the boiler, steam will take the place of the water in the vessel B and operate as before, and so continue to do until the boiler is filled to the pipe U, when, as no steam can escape from the boiler through the pipe U to operate the valves by action on the vessel D, the diaphragm will settle to a point of rest, as denoted in the drawing. Thus the boiler will always be filled to a given point, and the operation of the mechanism is so positive that there is no danger of failure to supply.

The attachment of the lever L with the several cocks or valves, as also the position of the several parts, may be varied to suit the circumstances under which they are used. The

arrangement and position shown in the drawing are adapted to convenience of illustration.

Having, therefore, fully described my invention, what I claim therein as new and useful, and desire to secure by Letters Patent, is—

The combination of the vessels B and D and I diaphragm *c* with a water tank or reservoir and steam-boiler constructed and arranged to operate the valves connected therewith, substantially as and for the purpose herein set forth.

J. W. BISHOP.

Witnesses:

RUFUS SANFORD,
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