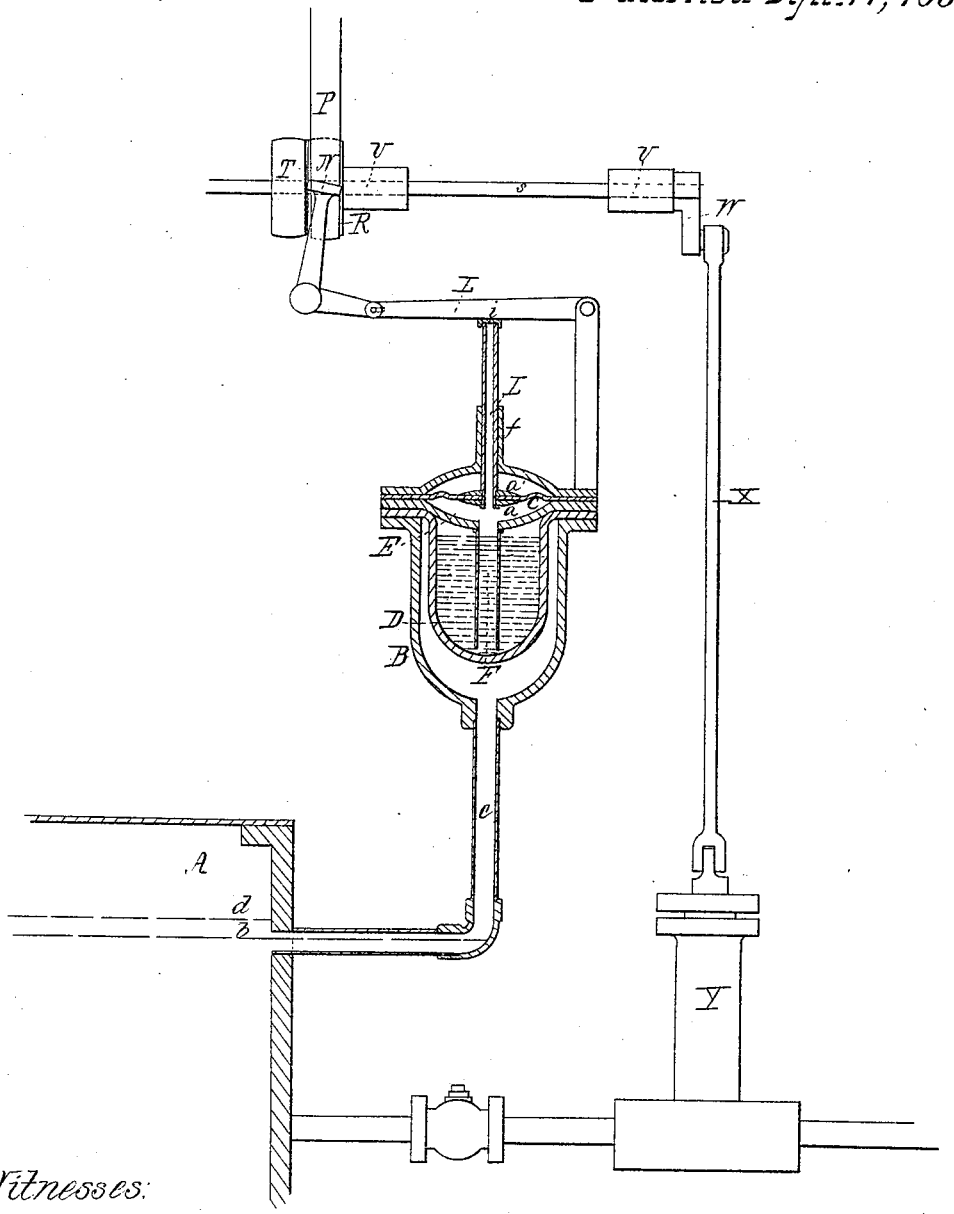
J. W. Bishop,

Steam-Boiler Water-Feeder,

No. 47,180. Patented Apr. 11, 1865.



Witnesses:

John E. Earl.

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UNITED STATES PATENT OFFICE.

J. W. BISHOP, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN BOILER-FEEDERS.

Specification forming part of Letters Patent No. 47,180, 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 Feeding 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 drawings and the letters of reference marked thereon, and which said drawings constitute part of this specification, and represent a section of a steam-boiler with my improvement as attached thereto.

My invention is designed to operate a mechanism to connect or disconnect the power from the pump used for forcing water into a steam-boiler as occasion may require.

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

A represents a section of a common steam-boiler; *d*, the proper water-line; *b*, the lower water-line. B is a hollow vessel connected with the boiler A by a pipe, C, entering or opening into the boiler at low-water line or below high-water line. The 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. The said vessel D has no communication with its surrounding vessel B. 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 and opening into the vessel D, and also through the plate E, to the chamber *a*. Over the said plate E, I form and fix a diaphragm, *c*, of any suitable flexible material, then cover the whole with a plate, H, constructed so as to form a second chamber, *a'*, the whole bolted or otherwise secured together steam-tight. The second chamber *a'* should have one or more small openings, through which air may pass to or from the said chamber, accordingly as the diaphragm is lowered or raised, increasing or decreasing the capacity of the said chamber. To the said diaphragm I attach a hollow spindle, I, which extends up through the plate H in a suitable guide, *f*, to a lever, L. The upper end of the said spindle is closed by a cap, *i*. The said lever L is separated on its fulcrum at one end, the other end connected to a shipper, N, through which a belt, P, passes to a loose pulley, R, on a shaft, S. T is a fixed pulley on the same shaft, which said shaft is supported in bearings U. W is a crank fixed to the said shaft and connecting by a rod, X, to a common or other force pump, Y.

Fill the inner vessel, D, by removing the cap *i* from the spindle I, pour the fluid through the said spindle until the vessel D is nearly full, as denoted in blue. Replace the cap *i* upon the spindle and set the lever thereon, as shown in drawings, and my invention is complete, ready for operation, which is as follows: When the boiler is filled to the line *d* or higher, the lower part of the pipe C will also be filled to the same level; but when steam commences to generate in the boiler the pressure upon the water in the boiler will force the water up into the vessel B, around the vessel D before the water shall have become sufficiently heated to materially affect the fluid in the vessel D. The vessel B will remain filled until the water in the boiler from the generation and consumption of steam therefrom shall have sunk below the opening into the pipe C, as denoted by the line *b*. The cool water from the vessel B will, by its own gravitation, now fall into the boiler and instantly be replaced by hot steam from the boiler, which will quickly generate steam in the vessel D, from which the steam cannot escape, consequently will force the fluid in the vessel D up through the tube F, fill the chamber *a*, and force the diaphragm *c*, with the spindle thereto attached, up, raising the lever L, turning the shipper N from the loose pulley R to the fixed pulley T, carrying the belt P with it. The power driving the belt will cause the shaft S to revolve, and, through the crank thereto attached, operate the pump to force water into the boiler, until so much has been forced in as to rise above the opening of the pipe C, when the water from the boiler will gradually rise to fill the vessel B, as before, condensing the steam in both vessels B and D, in consequence of which the diaphragm *c* will fall, and with it

the lever L, returning the shipper N and belt onto the loose pulley R, when the shaft S will cease revolving and the pump stop until, from the same or other causes, the water in the vessel B is displaced by hot steam.

The construction of the mechanism connecting to operate the pump will depend somewhat upon the pump itself. Therefore, I do not confine myself to the construction shown whereby the vessels B and D and diaphragm *c* are combined to operate or connect or disconnect the power from the boiler-supplying pump; but

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

The combination of the vessels B and D, diaphragm *c*, or its equivalent, with a steam boiler-supplying pump, when constructed and arranged to connect or disconnect the power operating said pump, as and for the purpose substantially as herein set forth.

J. W. BISHOP.

Witnesses:
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