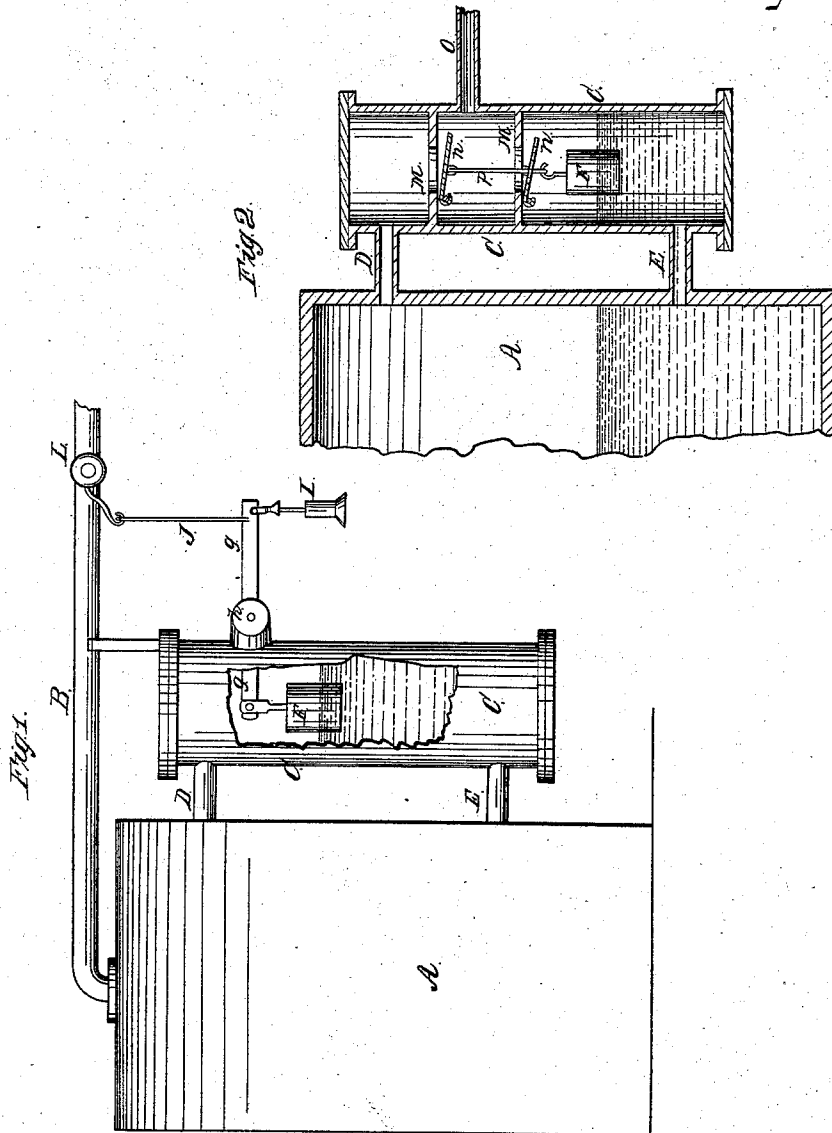


W. S. & S. B. Wells,

Steam-Boiler Water-Feeder,

No. 54,798,

Patented May 15, 1866



Witnesses:  
Charles Spear.  
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By their attorney,  
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# UNITED STATES PATENT OFFICE.

W. S. WELLS, OF NEW YORK, AND S. B. WELLS, OF MIDDLEBURG, N. Y.

## IMPROVEMENT IN BOILER-FEEDERS.

Specification forming part of Letters Patent No. 54,798, dated May 15, 1866.

*To all whom it may concern:*

Be it known that we, W. S. WELLS, of New York, State of New York, and S. B. WELLS, of Middleburg, of the county of Schoharie, in the State of New York, have invented certain new and useful Improvements in Automatic Feed Apparatus for Steam-Boilers; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Our invention relates to a new and automatic method of regulating the supply of water to steam-boilers by controlling from the boiler the steam-pump which supplies the boiler with water; and our invention consists in the employment, in combination with the boilers and the steam-feed pump, of a suitable chamber or vessel communicating with the water and steam spaces of the boiler, and provided with a suitable float mechanism which operates upon and controls the valve through which steam is supplied to the pump, all as hereinafter more fully set forth.

To enable those skilled in the art to make and use our invention, we will proceed to describe the construction and operation of the same, referring by letters to the accompanying drawings, forming part of this application, and in which—

Figure 1 is a side elevation of a boiler with our arrangement of automatic feed-regulator. Fig. 2 is a partial vertical section of same, showing a modification of our said invention.

It will perhaps be best to describe the two modes shown (of carrying out our invention) separately.

In Fig. 1, A is an ordinary steam-boiler, from which extends a steam-pipe, B, to supply steam to the feed-pump. (We have not shown the pump, which may be of any known construction.)

C is a cylindrical vessel arranged near the boiler and communicating with it by means of two pipes, D and E, the former connecting the upper portion of said vessel C with the steam-space of the boiler, and the latter, E, connecting the lower portion of vessel C with the water-space of the boiler.

F is a float suspended from one end of the lever *g*, which lever is pivoted at *h*, and has its other end weighted by a weight, I, to balance the float F, and also connected by a rod or

arm, J, to the bar of an ordinary throttle-valve at L in the pipe B.

The operation of this apparatus will be understood to be as follows, viz: Suppose the supply of water in the boiler to be sufficient, as seen by blue lines, and the valve at L closed, so that the steam-supply pump is not in operation. Now then, the moment the water in the boiler gets below the level shown the float F will descend in proportion, the lever *g* will be swung on its fulcrum *h*, whereby the rod J will be caused to operate upon the valve at L in such manner as to open or partially open it, and thereby admit steam to pass through the pipe B to the steam-feed pump and put it into operation. The working of the steam-pump replenishes the water in the boiler until it reaches its former level, as shown. The float F, meantime reascending to its former position, operates the lever *g* and rod J in an opposite direction to that just explained, gradually closing the valve L, and finally shutting off the supply of steam from pipe B to the feed-pump, and stopping, finally, the operation of the latter. Thus the steam is supplied to and cut off from the feed-pump alternately as the water rises and falls in the boiler. Of course the tendency will be to carry on this operation regularly, so that the water will always be maintained at just about a given level in the boiler.

The precise form and arrangement of the several parts is immaterial, so long as the mode of operation just explained is effected.

In the modification shown at Fig. 2, and which perhaps is the best form of practically applying our invention, A is the boiler, C the auxiliary vessel, D and E the connecting-tubes, all as shown in and described of Fig. 1. But in this form of our invention the steam for supplying the feed-pump passes through the vessel C and off by a pipe, O, extending from said vessel to the pump.

Within the vessel C, above the highest level of water and below the upper connection-pipe, D, are arranged two horizontal partitions, in each of which is a hole or opening provided with an ordinary valve, *nn*. These valves are connected by a rod, *p*, so as always to work together and operate as balance-valves, being within the steam-space of the vessel C, and both opening downward. To the lower valve is connected, beneath it, the float F, and the

pipe O, it will be seen, communicates with the steam-space of vessel C at a point between the two valves *n n*.

Now it will be seen that with this arrangement of the devices the same end will be accomplished in substantially the same manner as with the modification seen at Fig. 1.

In Fig. 2 the valves *n* are shown as open. In this condition of the parts steam is passing from the steam-space of the boiler A through pipe D to vessel C, thence through pipe O to the pump, which is supposed to be running and supplying water to the boiler. As water is pumped into the boiler the float F gradually rises and closes the valves *n n*, (when the water has reached the proper level,) thus shutting off the supply to pipe O, and consequently to the feed-pump.

It will be understood that by our invention the condition of the water in the boiler is perfectly and automatically regulated, and it will be seen that the arrangement of the parts may be varied in many ways without departing from the spirit of our invention. Of course the float F should be made of a material of the

proper specific gravity to act in the desired manner, and in the modification seen at Fig. 1 the weight I may be made adjustable if deemed expedient.

Having fully explained our invention, so that those skilled in the art can make and use the same, what we claim as new, and desire to secure by Letters Patent, is—

The combination, with a steam-boiler, of an auxiliary steam and water chamber provided with a float so constructed with the valves through which steam is supplied to the feed-pump as to cause the starting up and stopping of the said pump when the several parts are arranged as herein described.

In testimony whereof we have hereunto set our hands and seals this 20th day of October, 1865.

WALTER S. WELLS. [L. S.]

S. B. WELLS. [L. S.]

Witnesses to signature of W. S. Wells:

W. D. GEBHARD,

W. H. DE LANCEY, Jr.

Witness to signature of S. B. Wells:

H. D. WELLS.