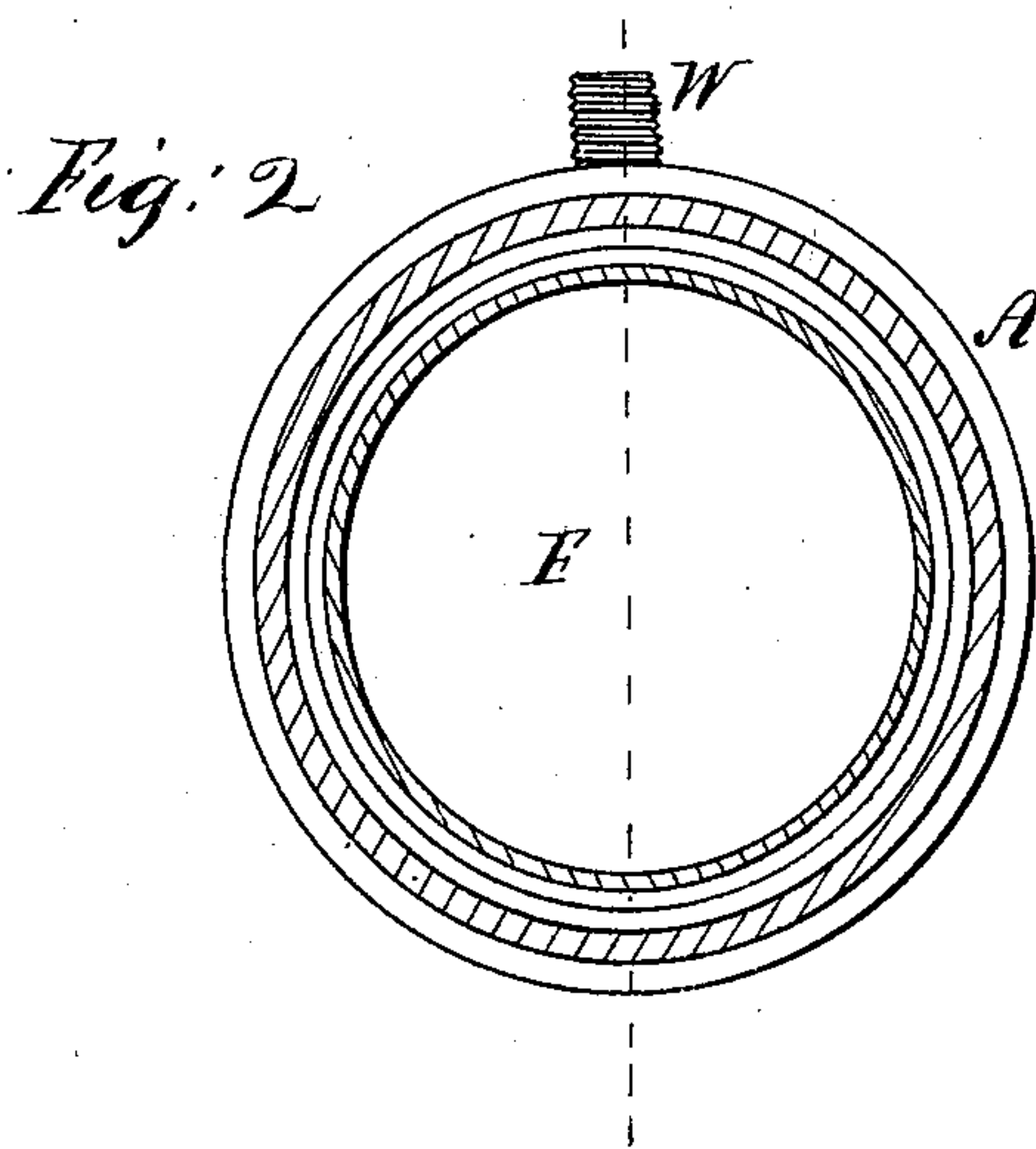
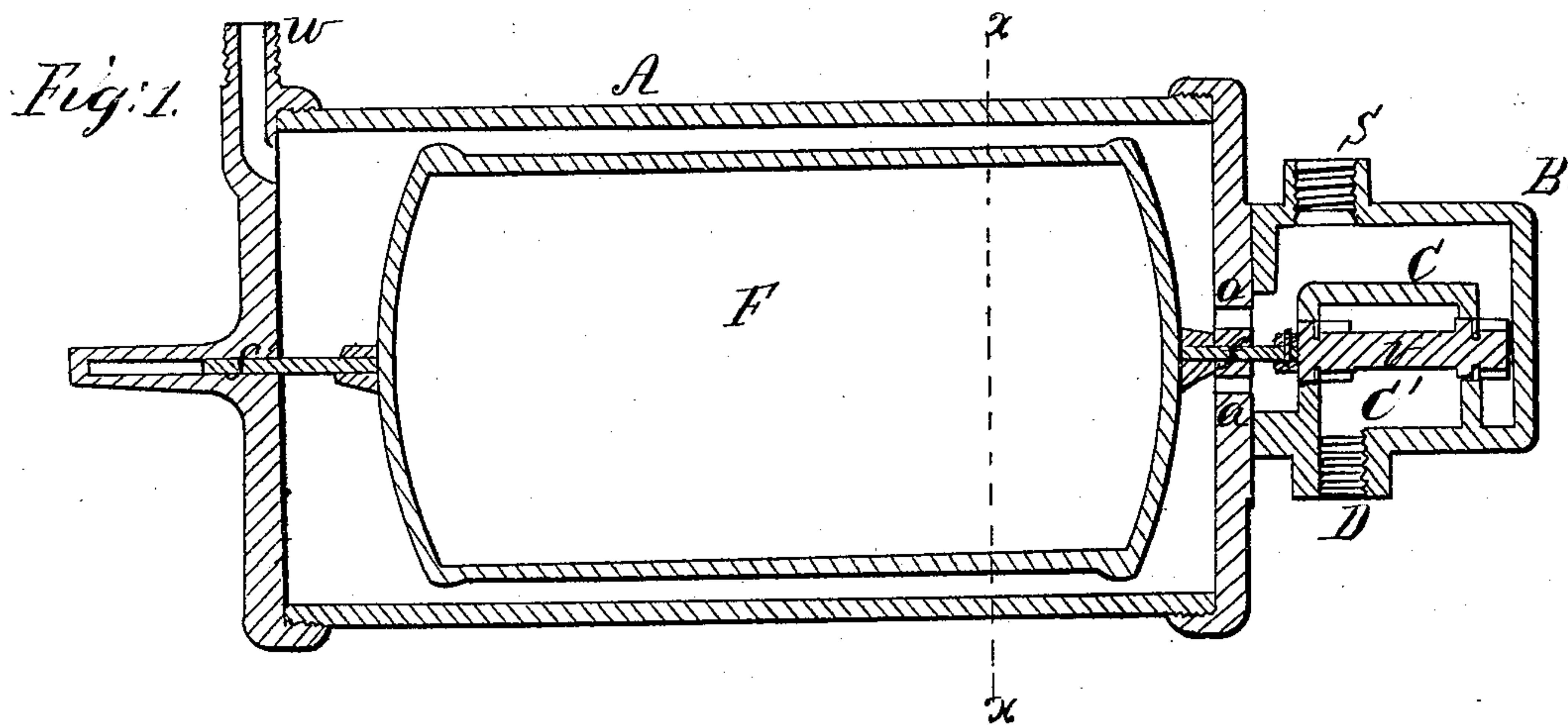


R. Gornall,
Valves for Boiler Feeder.
N^o 72,287. Patented Dec. 17. 1867.



Witnesses;

S. C. Kemor
J. R. Ellmuth

Inventor;

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Attorneys

United States Patent Office.

RICHARD GORNALL, OF BALTIMORE, MARYLAND

Letters Patent No. 72,287, dated December 17, 1867.

IMPROVEMENT IN VALVES FOR BOILER-FEEDERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, RICHARD GORNALL, of Baltimore, in the county of Baltimore, and State of Maryland, have invented a new and improved Automatic Steam-Valve for Injectors or Feeders 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 forming part of this specification, and in which—

Figure 1 is an axial section of my invention, the apparatus being represented as resting on its side, the upper end to the right hand; and

Figure 2 is a cross-section of the same through the line *xx* of fig. 1.

This invention consists in a new device designed to be applied to a steam-boiler, whether connected with an engine or not, and automatically to regulate the flow of steam from the boiler to a pump or injector, the steam thus escaping being used to work the pump or injector and feed the boiler, entirely independent of the action of an engine.

Similar letters of reference indicate corresponding parts in the several figures.

In the drawings, A represents a hollow brass cylinder, seven or eight inches in length by from three to four in diameter, surmounted by a hollow brass cap, B, containing two chambers, one, C', enclosed within the other, C, and attached to the side wall of the cap B, having a discharge-steam pipe D. The chamber C communicates with the interior of the cylinder A, by means of several apertures, *a a*, in the top of the cylinder. Inside of the cylinder A is a hollow copper float, F, held in position so as not to move laterally, but to be capable of a vertical motion, by means of the rods *ff'* working in sockets at the centre of the top and bottom of the cylinder. Directly over the upper socket and axial rod or journal *f* of the float, the top and bottom of the chamber C' are pierced, opening up a communication from the chamber C to the discharge-steam pipe D through the chamber C'. The rod *f* is here prolonged upward and shaped into a slide-plug valve, *v*, seating upward against the top and bottom of chamber C', so as to close at the same time both passages into that chamber from the adjoining chamber C. The whole combined instrument thus formed is to be attached to a steam-boiler at the water-line, and communication is to be established between its interior and the interior of the boiler by means of a pipe, S, running to the steam-space, and another pipe, W, running into the boiler below the water-line. These pipes are always open, and always in communication with each other by means of the holes *a a*, as well as through the boiler, in consequence of which the water and steam will enter the cylinder A, and there maintain the same height and pressure as in the boiler. The cylinder is to be attached to the boiler at such a height that the float F will be lifted by the water when the boiler is properly filled, and will seat the valve *v*, and prevent the escape of steam into the discharge-pipe D, but when the water falls below the proper level, will open the valve and allow the steam to escape in a steady, continuous jet through the pipe D, to a pump or injector to which the pipe leads.

If the whole apparatus is constructed as above described and shown, and the water-pipe W is connected with the cylinder A, at a point opposite to the lower end of the float F, the operation of the instrument under the most powerful pressure of steam will be as easy and certain as if the parts were operated in the open air, the float F sustaining an equal pressure on every side, and the valve *v* being balanced by the steam above and below the chamber C'. An apparatus thus constructed is the most simple, compact, durable, cheap, and effective that can be used for the purpose, every part operating by direct positive action, without the intervention of levers or gear of any description.

I am aware that an instrument somewhat similar, patented by E. A. Woods, of Utica, New York, March 7, 1860, has been used for the same purpose. In this invention, however, the valve is operated by a lever, which is apt to work inaccurately, and to get out of order so as not to work at all. The upper chamber in his apparatus must be made large enough to accommodate the working of the lever, which increases the cost of the instrument. The construction, attaching, and connecting of the lever, besides the material used in making the enlarged chamber around it, are all saved in my improved apparatus, a saving which diminishes materially the cost, besides increasing the simplicity and effectiveness of the instrument.

My instrument is not designed automatically to blow off the steam, nor to sound a whistle, but its object is to open and regulate automatically a direct steam-passage from the boiler to the steam-pump or injector, by

means of an apparatus working by the direct positive action of the rise and fall of the water in the boiler, and without the use of levers, gear-wheels, pulleys, belts, or any other parts except the float and valve. It is obvious that, as the instrument depends for its action solely upon the movement of the water, its working is altogether independent of an engine; and it is also obvious that the steam passing through the pipe D may be made to work the pump or injector without the use of the main engine, which is a leading purpose of my invention. My apparatus, therefore, will be very valuable, regulating and feeding the water to the boiler with perfect accuracy in cases where a steam-boiler but no engine is used, as, for example, in establishments for canning fruit, in laundries, &c., &c.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination of the float F and valve *v*, seating upwards, with the chambers C and C', the pipes D S W, and the cylinder A, the valve being attached directly to the float F by the valve-stem *f*, and the parts operating without levers or gear of any description, but substantially in the manner and for the purposes specified.

RICHARD GORNALL.

Witnesses:

JOHN W. ATKINSON,
JAMES LOGAN.