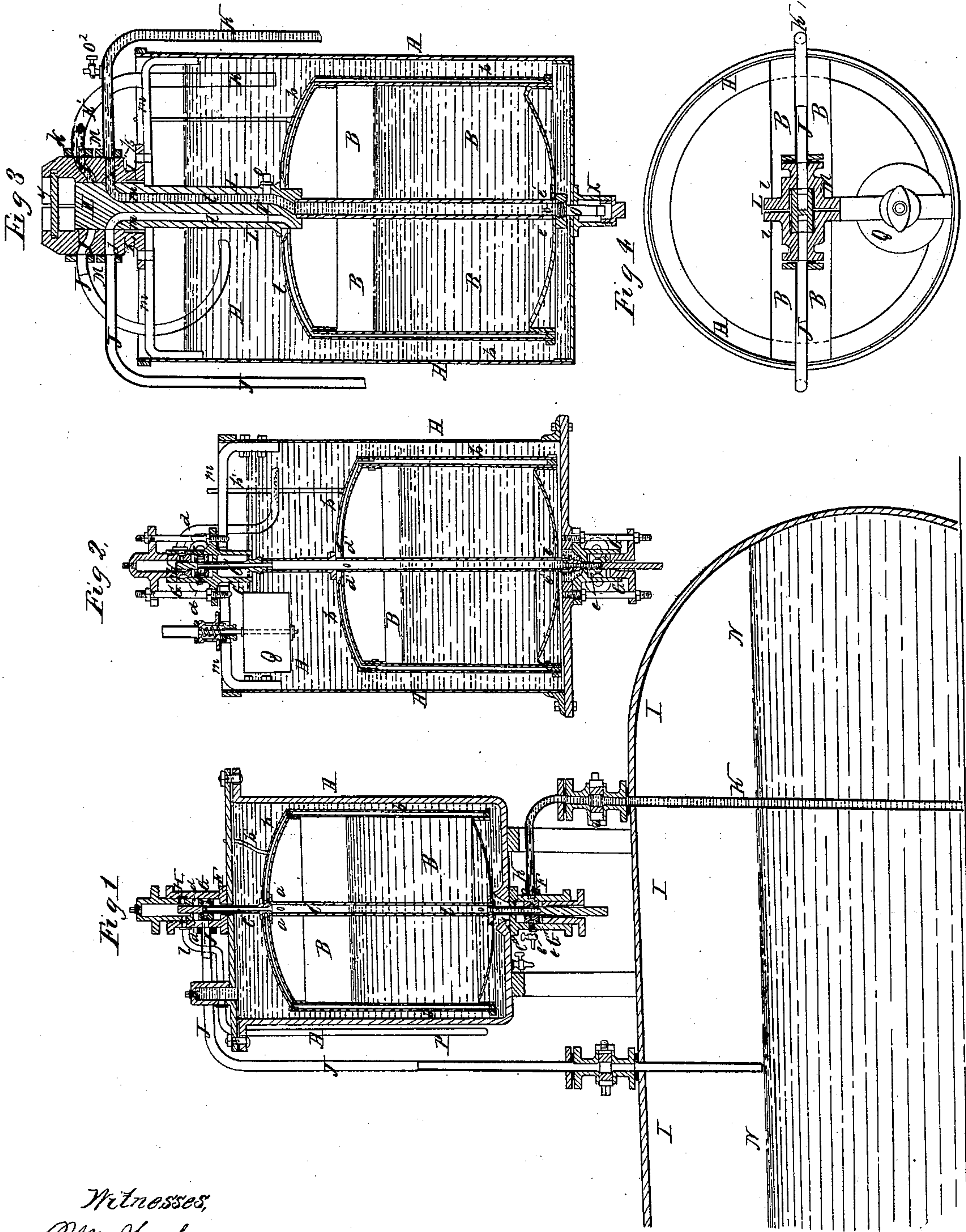


V. F. Clevet,
Steam-Boiler Water-Feeder,

N^o 39,379

Patented Aug. 4, 1863.



Witnesses,
Wm H Harrison
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UNITED STATES PATENT OFFICE.

VICTORIN FLORENTIN CLEUET, OF PARIS, FRANCE.

IMPROVEMENT IN SELF-ACTING APPARATUS FOR SUPPLYING BOILERS WITH WATER.

Specification forming part of Letters Patent No. 39,379, dated August 4, 1863.

To all whom it may concern:

Be it known that I, VICTORIN FLORENTIN CLEUET, of Paris, in the Empire of France, have invented certain new and useful Improvements in self-acting apparatus for supplying boilers with water, applicable also to the raising and to the measuring of liquids; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, to be hereinafter referred to.

My apparatus consists of a hollow vessel or float immersed in liquid contained in another vessel or case, which float in alternately filling and emptying becomes in turn heavier or lighter than the liquid which surrounds it, and partakes of itself of alternative vertical motion, whereby it is placed in successive communication with the boiler and the feed-supply, to transfer from one to the other the water necessary for the generation of steam.

Figure 1 of the accompanying drawings shows in sectional elevation my apparatus in its most simple form applied to a steam-boiler.

A is a vessel constantly filled with water from a reservoir or other source of supply.

B is a cylindrical float with a jacket, *b*, intended to prevent the too great heating and vaporization of the water in the vessel A. The space between the jacket and the float communicates with the atmosphere through a flexible pipe, *b'*, through which any steam which might be generated in the jacket may pass off. A tube, C, traverses the float, and has two series of openings made in it at *d' d'* and *e' e'*. Two tubes, C' C'', also provided with openings *d d* and *e e*, form prolongations of the tube C, and slide in the stuffing boxes G G'.

F F' are rings pierced with holes, fixed in the stuffing-boxes G G'.

h is a space formed in the upper stuffing-box, intended to allow of the escape of steam, which may be returned through a tube, *l*, into the vessel A.

I is the steam-boiler; J, steam-pipe, carried down into the boiler to the proper water-level, N; K, water feed-pipe to boiler.

The working is as follows: Suppose the boiler empty and the float and vessel A full of water. The weight of the float is equal to

one-half of the weight of water that its volume displaces, and its dimensions are so calculated that the ascending or descending power it possesses, according to its being empty or full, shall be sufficient to overcome the friction of the tubes C' C'' in their packing. These conditions fulfilled, the float rests upon the bottom of the vessel A, and is in communication with the steam-pipe J through the openings *d d* of the tube C', and with the water feed-pipe K through the openings *e e* of the tube C''.

In consequence of the difference of the level between the float and the boiler, the water it contains will run into the boiler, and will be replaced by air entering through the pipe J. As the water runs out from the float, the air which takes its place makes the density of the float lighter, and lighter than that of the water which surrounds it. Consequently its ascending power increases until sufficient to overcome the friction of the packings, when the float will rise to the top of the vessel A. In this new position the openings *d d* in the tube C' become placed in the space *h* opposite the escape-tube communicating with the atmosphere or the supply. The openings *e e* of the tube C'' communicate with the vessel A, the water in which, replaced by that entering from the supply-reservoir, enters the float by the openings *e' e'* and drives out the air therefrom. As the water enters the float, the power which kept it raised decreases, becomes neutral, and the float resumes its first position. The running out into the boiler again takes place and continues until the level of the water in the boiler reaches and stops the mouth of the tube J, when, the air being prevented from entering the float, the flow of water from the float ceases. If, now, steam is generated in the boiler, the same actions as those described follow, and water from the float will only run into the boiler as long as the water-level in the boiler does not close the mouth of the tube J. The density of steam, differing little from that of air, will soon impart sufficient lightness to the float to cause it to rise. The steam then goes off through the escape-pipe and enters the reservoir, where it becomes condensed. Through a pipe, P, water might be drawn up from a reservoir on a lower level, as the vacuum pro-

duced by the condensation of the steam is sufficient to raise the water a few feet; but it is preferable that the main source of supply should be placed on a level rather above that of the float.

The raising of liquids is effected by the vacuum produced in the apparatus as just described, and liquids may be measured by the ascent and descent of the float.

In the arrangement represented at Fig. 2, the water from the reservoir is admitted to or shut off from the vessel A by a spring-float, Q. It is therefore unnecessary for the vessel A to be closed at top; there need only be a cross-bar, *m*, as shown. The action is the same as in the arrangement represented at Fig. 1, and the same letters refer to corresponding parts. In both arrangements there is a packing both above and below, but the lower packing may be replaced by a valve-seat, care being taken to place a valve on the return-pipe to prevent the return of water from the boiler when the float rises and the valve leaves its seat.

In Figs. 3 and 4 I show another arrangement of my apparatus.

L is a plug fixed to the float by lugs L' and connected to the tube C.

l l' are passages in the plug L. One, *l*, communicates with the interior of the float, the other, *l'*, with the tube C. The plug L has two enlargements, *m m'*, at its upper part, which act as flat slides. The parts M M' form by their union the slide-box. They are brought together by the closing of the flanges *n n*, or by any other means of closing proportioned to the pressure in the boiler.

j j' are openings or ports over the box M. *j* communicates with the steam-pipe J, and *j'* with the escape steam-pipe J'.

k k' are openings or ports over the box M'. *k* communicates with the feed-pipe K, and *k'* with the pipe K'.

o is a plug screwing into the plug L and communicating with the passage *l'*, for the purpose of filling the float when it is required to set the apparatus to work.

o' is a screw-plug closing the lower end of

the tube C, and serving at the same time as a guide in the socket X.

o² is a cock on the pipe K. The action is as follows: In the position represented in the drawings the float is in communication, on the one hand, with the feed-pipe K, and on the other with the steam-pipe J. The tube C, the passage *l'*, and the pipe K, thus form a siphon, the longer leg of which is that which dips into the boiler. The water in the float, under pressure of the steam, will therefore pass into the pipe K, and thence to the boiler. When the float becomes light, it rises, together with the plug L, the top of which will then abut against the stop *y*. At the same time the upper ends of the passages *l l'* come opposite the openings *j' k'* the float is in communication with the steam-escape pipe J', which leads the steam from the float into the vessel A, where it is condensed, while water again enters the float by the pipe K', which, together with the passage *l'* and tube C, acts as a siphon.

In the three arrangements hereinbefore described, with the exception of the loss of heat by radiation, (a loss which can be materially reduced by inclosing the vessel A in a bad conductor of heat,) the feeding of the boiler is accomplished without any expenditure of feed, because the heat of the steam employed in my apparatus is transmitted to the feed-water, and consequently restored to the boiler.

Having now described the nature of my said invention, and in what manner the same is to be performed, I declare that I claim—

The self-acting apparatus for supplying boilers with water, constructed and acting substantially in manner hereinbefore described, and illustrated in the accompanying drawings.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

V. F. CLEUET.

Witnesses:

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