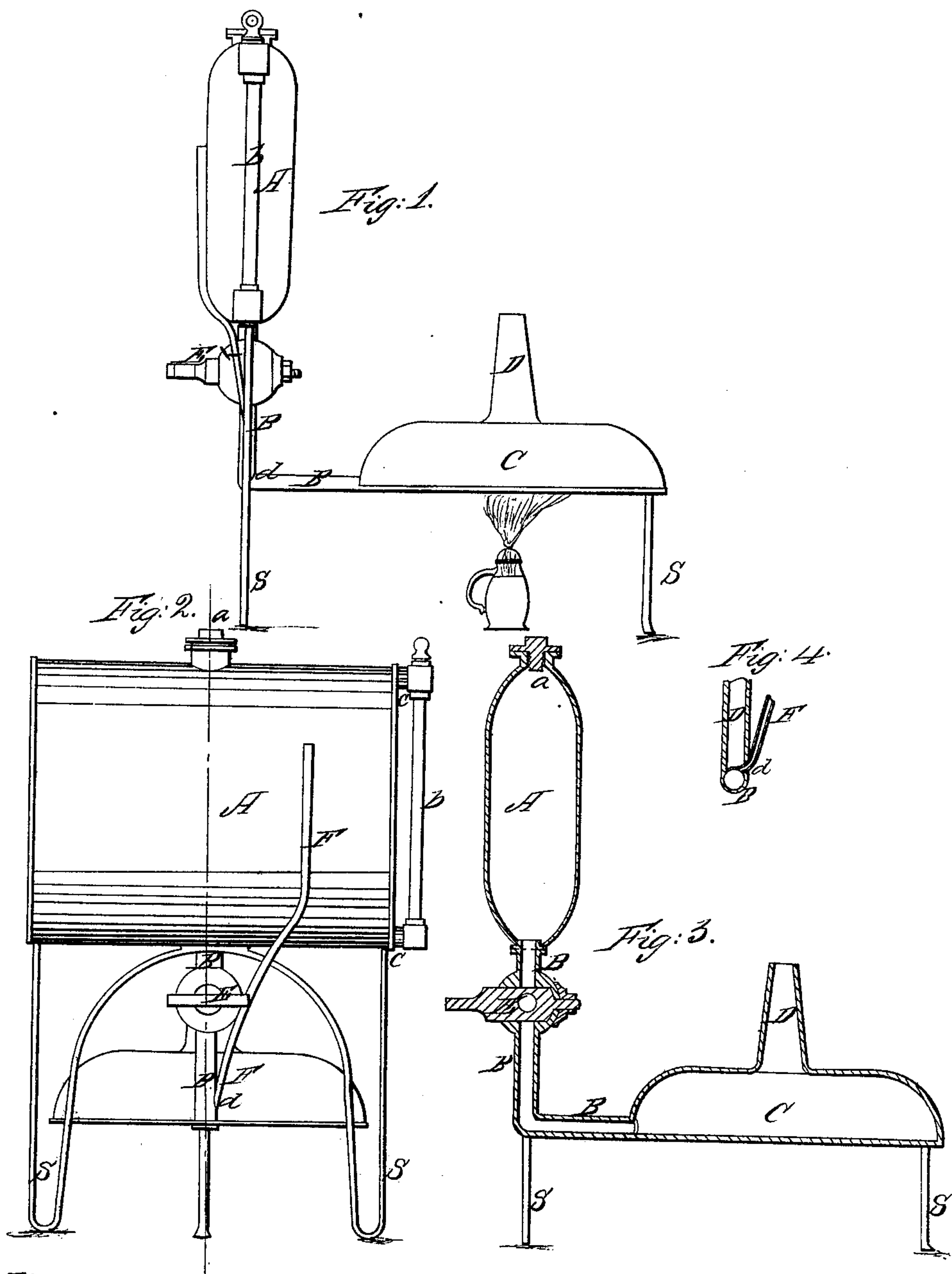


R.B. Mitchell.

Steam Generator.

Nº 91,254.

Patented Jun. 15, 1869.



Witnesses:

*W. E. Marrs -
H. Bruns*

Inventor:

Robert B. Mitchell

United States Patent Office.

ROBERT B. MITCHELL, OF CHICAGO, ILLINOIS.

Letters Patent No. 91,254, dated June 15, 1869.

IMPROVEMENT IN STEAM-GENERATOR.

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, ROBERT B. MITCHELL, of Chicago, in the county of Cook, and State of Illinois, have invented a new and useful improved Steam-Generator; and I do hereby declare and make known that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and the letters and figures marked thereon, which form part of this specification.

My said invention consists in a novel arrangement of a water-reservoir with a steam-generator, whereby the water is supplied to the generator automatically, and, by means of a self-regulating device, is kept at a certain required depth in the generator, so that a small quantity only of water is admitted, or remains therein, thus enabling the steam to be generated very rapidly, and heated to a very high temperature with but very little fuel, while, as the water becomes converted into steam, and passes out to be utilized as desired, whenever it falls below a certain level, the water from the supply-reservoir immediately passes in and keeps the requisite quantity in the generator at all times, as hereinafter more fully set forth.

To enable those skilled in the art to make and use my said invention, I will proceed to describe the same with particularity, making reference, in so doing, to the aforesaid drawings, in which—

Figure 1 represents a side elevation of my invention;

Figure 2 is a rear view of the same;

Figure 3 is a vertical central section at the line *x* in fig. 2; and

Figure 4 is a section, showing the junction of the air-vent pipe with the supply-pipe.

Similar letters of reference, in the several figures, represent the same parts of my improvement.

A represents a reservoir, which is connected with the steam-generator C by means of a pipe, B, the reservoir being arranged above, or at a higher elevation than the generator, so that the water will descend from the reservoir, through the pipe B, into the said generator, by its own weight, as hereinafter described.

The generator is a flat or shallow circular vessel, as shown, but it may be of any other suitable configuration or proportion; but as only a small quantity of water is used in it at once, it may be made shallow, if desired, and of a sufficient superficial area to answer the purposes for which it is used.

The steam passes out from the generator through a pipe, D, and it may be used for cooking or heating-purposes, or for any of the uses to which steam may be applied where pressure is not required.

When the stop-cock E, in the tube or pipe B, is turned to shut off the communication between the reservoir and the generator, and the screw-plug *a* is inserted properly in the top of the reservoir, as shown, it then becomes air-tight, so that when the stop-cock E is opened, after filling the reservoir, the water would not flow down readily into the generator, except for an air-tube or vent, F, which extends down from the back of the reservoir, exterior thereto, as seen in figs. 1 and 2, and joins with the connecting-pipe B, just at

its elbow, opening into the same in such a manner and position, that when the water wholly fills the horizontal part of the pipe B, that is, when the water in the generator is deep enough to cause it to fill the said horizontal pipe, the end of said tube F, at its junction with the pipe B, is closed, so as to prevent the entrance of air through the same into the reservoir, as is clearly shown in fig. 4.

At one end of the reservoir is a glass tube or gauge, *b*, connected with the reservoir at each end by tubes *c c*, to admit the water into the tube, and show when said reservoir requires filling.

Having described the construction of my invention, I will proceed to describe the operation.

To fill the reservoir, the stop-cock E is closed, and the screw-plug *a* in the top removed, and the water is poured in through the aperture, which is then closed air-tight.

When the apparatus is to be put in use, the stop-cock E is opened, and the water flows down into the reservoir, the air entering the tube F, and passing up into the reservoir, to displace the water, until the water rises in the generator high enough to close or fill the horizontal part of the feeding-pipe B, and when this happens from the position where the air-tubes join the pipe, the lower end of said air-tube is closed by the water, so as to prevent any more air from passing through said pipe F, up into the reservoir, thus making an automatic check to the admission of water into the generator, as the water will not descend from the reservoir unless air rises or enters the same to displace it.

From this arrangement, it results that the water in the generator is always kept at a depth equal to the diameter of the pipe B, entering the generator, for as soon as the water is converted into steam, and falls below the upper side of the horizontal tube B, air enters through F, until the deficiency is supplied.

It may be observed, that when the air-vent or pipe F is employed to admit air into the reservoir, so as to cause the water therein to descend into the generator, the pipe B, or rather that part thereof which enters the generator, should be inclined slightly downward, in entering said generator, so that the end of the pipe will always be submerged in the water, although the vent-pipe F may be unclosed.

Or the same end would be attained by having said tube horizontal, and having the vent-pipe open into the pipe B, a slight distance above the top of the horizontal part of the pipe B.

Having thus fully described the construction and operation of my invention,

What I claim, and desire to secure by Letters Patent, is—

The steam-generator C, air-tight water-reservoir A, connecting-pipe B, and air-vent tube F, when constructed and arranged substantially as specified.

ROBERT B. MITCHELL.

Witnesses:

H. BRUNS,

W. E. MARRS.