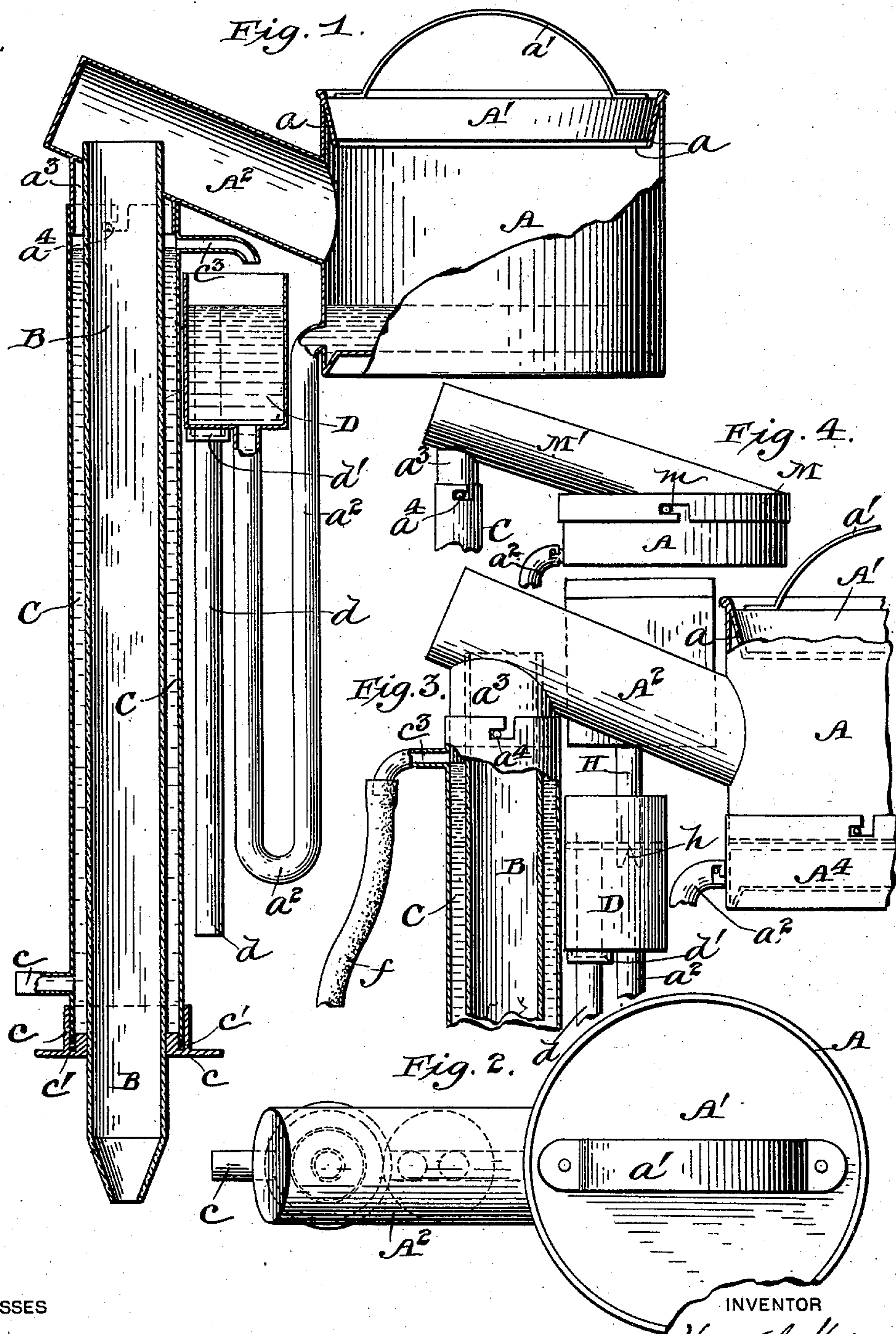


(No Model.)

H. A. STEBER.
DISTILLING APPARATUS.

No. 576,910.

Patented Feb. 9, 1897.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY A. STEBER, OF UTICA, NEW YORK.

DISTILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 576,910, dated February 9, 1897.

Application filed June 27, 1896. Serial No. 597,252. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. STEBER, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Distilling Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in apparatus for distilling liquids, and has more particular relation to such apparatus as is employed for distilling water.

The invention consists of the combination, with a suitable boiler, of a condensing-tube communicating therewith, a water-jacket about said tube, a water-supply to said jacket, a supply-receptacle communicating with the boiler, and a pipe for causing the overflow from the water-jacket to drop into the said supply-receptacle.

The invention also consists of certain other novel constructions, combinations, and arrangements of parts, all of which will be hereinafter more particularly set forth and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 represents a central vertical section, partly in side elevation, of the devices embodying my invention. Fig. 2 represents a top plan view of the same. Fig. 3 represents a broken side elevation, partly in section, of a modified construction of my invention. Fig. 4 represents a detail broken side elevation of another modified form of my invention.

A in the drawings represents the boiler; B, the condensing-tube; C, the water-jacket about the same, and D the supply-receptacle for the boiler.

The vessel A is of any desired material and construction and is provided at its top with a downwardly and inwardly projecting flange a , that forms an approximately conical seat for a cover A' , that tightly covers the said boiler or water vessel, so that the steam generated therein cannot escape therefrom. This cover is provided with a suitable han-

dle a' , by which it may be removed, when so desired, for cleaning or other purposes.

The boiler is fed from near the bottom by a pipe a^2 , that has the form of an extended pendent loop and communicates with the bottom of the boiler-supply receptacle D. The boiler is also provided with a lateral upwardly-inclined hollow projection A^2 , communicating with the interior of the same, so that the vapors of the heated liquids in the boiler will pass into the same and thence into the glass condensing-tube B, which projects up into the same from below. This tube B projects sufficiently into the part A^2 to prevent any water of condensation that may accumulate in said part from passing into the condensing-tube. All such condensation flows back into the boiler because of the inclination of said part A^2 . Pendent from said part A^2 is a tubular support a^3 , to which the water-jacket C is attached by means of bayonet-joints a^4 , the pins being formed on the tubular support, while the slots are provided in the jacket. It will thus be noticed that the water-jacket is detachably secured to the tubular support and may be removed at any time desired for cleaning or repairs.

The lower end of the water-jacket is closed by a rubber or other packing-ring c , that fits snugly about the condensing-tube and is provided with an annular groove c' for receiving the lower end of said jacket. Water is admitted to the lower part of the jacket through a pipe c^2 and discharges from the top of said jacket through an overflow-pipe c^3 in the form of a spout. This spout is normally directly above the open top of the supply-receptacle for the boiler, so that any discharge from it will fall directly into the said receptacle and thus always keep the same filled. The supply of water through the water-jacket sometimes exceeds the amount required in the boiler, and to carry off this excess an overflow-pipe d is mounted in the receptacle D by passing up through its bottom and into the same. This pipe is held adjustably in position by means of a screw-threaded cap d' , that engages a suitable screw-threaded flange formed about the opening in the bottom of

the said receptacle through which said pipe passes. As the depth of the water in the boiler is always equal to the depth of the water in the supply-receptacle, it will be seen that the regulation of the overflow in said supply-receptacle by means of said adjustable pipe will also control the amount of water in the boiler at one time. It will also be observed that although the boiler is in direct water communication with the supply-receptacle the temperature of the water in the boiler will not be affected by the temperature of the water in the receptacle because of the pendent loop of the pipe a^2 . As hot water always rises, none of the same will pass from the boiler to the supply-receptacle because it would first have to pass down through the colder water of the tube, and thus no heat is lost from the boiler and a perfect feed of water is maintained.

In Fig. 3 is represented a modified form of the device in which is shown the manner of adjusting the water-jacket when it is desired to feed to the boiler other liquid for distillation than that passed through the said water-jacket. When this is to be done, the water-jacket is detached from the tubular support a^3 and turned so as to be in the opposite position to that shown in Fig. 1 and is again locked to the support a^3 , as shown in Fig. 3, and a discharge-pipe f is connected to the spout c^3 . The liquid to be fed to the boiler is then supplied to the receptacle D by any suitable pipe or means of communication. When the liquid to be distilled is valuable and the overflow from the supply-receptacle D is not to be used because of the loss sustained, I prefer to use a construction such as shown in Fig. 3. This comprises a pipe H, having a V-shaped notch h formed in its lower end. This pipe H is connected to a sealed supply-receptacle. When the liquid in the receptacle D falls too low, the upper portions of the notches h are uncovered, allowing air to pass into the sealed supply-receptacle and the liquid to feed therefrom into the receptacle D until the said notches h are again covered, when the supply will be stopped. In this case the overflow-pipe of the receptacle is closed in any suitable manner, so that none of the liquid can escape at this point.

In the construction shown in Fig. 3 the bottom of the boiler and the looped pipe are made detachable and are secured together by bayonet-joints and suitable packing for preventing leaks of either liquid or vapor. In this construction the detachable bottom A^4 of the boiler is made in the form of an inverted cap and is of sufficient depth so that when applied to the boiler its upper edge will be above the surface of the water within the boiler, and will thus prevent the escape of either the liquid or the vapor.

It will be observed from the foregoing that any condensation that occurs outside of the glass condensing-tube is carried back into the

boiler, and thus only the pure products of condensation are passed through said tube. Any condensation that has struck any of the metallic walls of the apparatus is liable to be impregnated with impurities that are bound to collect upon the walls.

It will also be observed that while I have a direct feed of water from the water-jacket to the supply of the boiler still I have no direct water communication that would tend to subtract from the heat of the boiler.

I do not care to limit myself to a glass condensing-tube, as a porcelain-lined metallic tube or the like may be employed with equal facility.

In Fig. 4 I have shown a modification of my invention in which the top M of the boiler is secured upon the same by means of bayonet-joints $m m$, such as before have been described. This top is provided with an inclined hollow projection M' , similar to that shown in Fig. 1 and adapted to take its place in this modified construction. The condensing-tube and water-jacket are applied to the hollow projection in the same manner as before described.

I do not wish to limit myself to a V-notch cut in the lower end of the feeding-tube for the supply-receptacle, as I contemplate employing rectangular and other shaped slots or notches, as well as different-shaped apertures formed near the lower end of said tube.

I have shown and described the discharge-pipe c^3 capable of being turned around so as to direct the condensing liquid away from the independent receptacle, but it is obvious that the condensing water may be prevented from entering said receptacle, when it is so desired, in any other suitable manner.

All the parts of my apparatus are readily taken to pieces for cleaning and other purposes and may as readily be put together again.

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

1. In a distilling apparatus, the combination with a suitable boiler having a laterally and upwardly extending inclined hollow projection, communicating therewith, of a non-corrodible condensing-tube projecting through the wall of and into said hollow projection, whereby any condensation in said hollow projection is prevented from entering the condensing-tube and must flow back into the boiler, substantially as described.

2. In a distilling apparatus, the combination with a suitable boiler, of a condensing-tube communicating therewith, a water-jacket about said tube, and an independent supply-chamber for the boiler, means whereby the independent chamber may be fed from the condensing water, means whereby such supply may be cut off from said chamber and whereby such chamber may be supplied independently of the condensing water, a con-

tinuous looped pendent pipe connected to the supply-receptacle at one end and to the boiler at the other for supplying the latter whereby the height of the liquid in said boiler can be known and regulated externally of the same, said loop forming a cold-water trap, and occupying a position considerably below the bottom of the boiler, substantially as described.

3. In a distilling apparatus the combination with a suitable boiler, of a condensing-tube communicating therewith, a water-jacket about said tube, a water-supply to said jacket, a supply-receptacle communicating with the boiler, a pipe for causing the overflow from the water-jacket to feed into the said supply-receptacle and a vertically-adjustable overflow-pipe for said supply-receptacle whereby the height of the water in both the supply-receptacle and the boiler may be gaged at will, substantially as described.

4. In a distilling apparatus the combination with a suitable boiler, of a condensing-tube communicating therewith, a water-jacket about said tube and an independent supply-chamber for the boiler, means whereby the independent chamber may be fed from

the condensing water, means whereby said supply may be prevented from entering said chamber and whereby said chamber may be supplied independently of the condensing water, a pipe connected to the supply-receptacle at one end and to the boiler at the other for supplying the latter, said pipe forming a cold-water leg, substantially as described.

5. In a distilling apparatus, the combination with a boiler, having a hollow laterally-inclined projection, and a supply-receptacle, of a condensing-tube, extending into said projection, a tubular support on said projection, about the condensing-tube, a water-jacket detachably connected to said support, in such a manner that it may be adjusted to deliver its contents into said supply-receptacle for the boiler or elsewhere, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

HENRY A. STEBER. [L. S.]

Witnesses:

B. T. STEBER,
GEO. L. FULLER.