

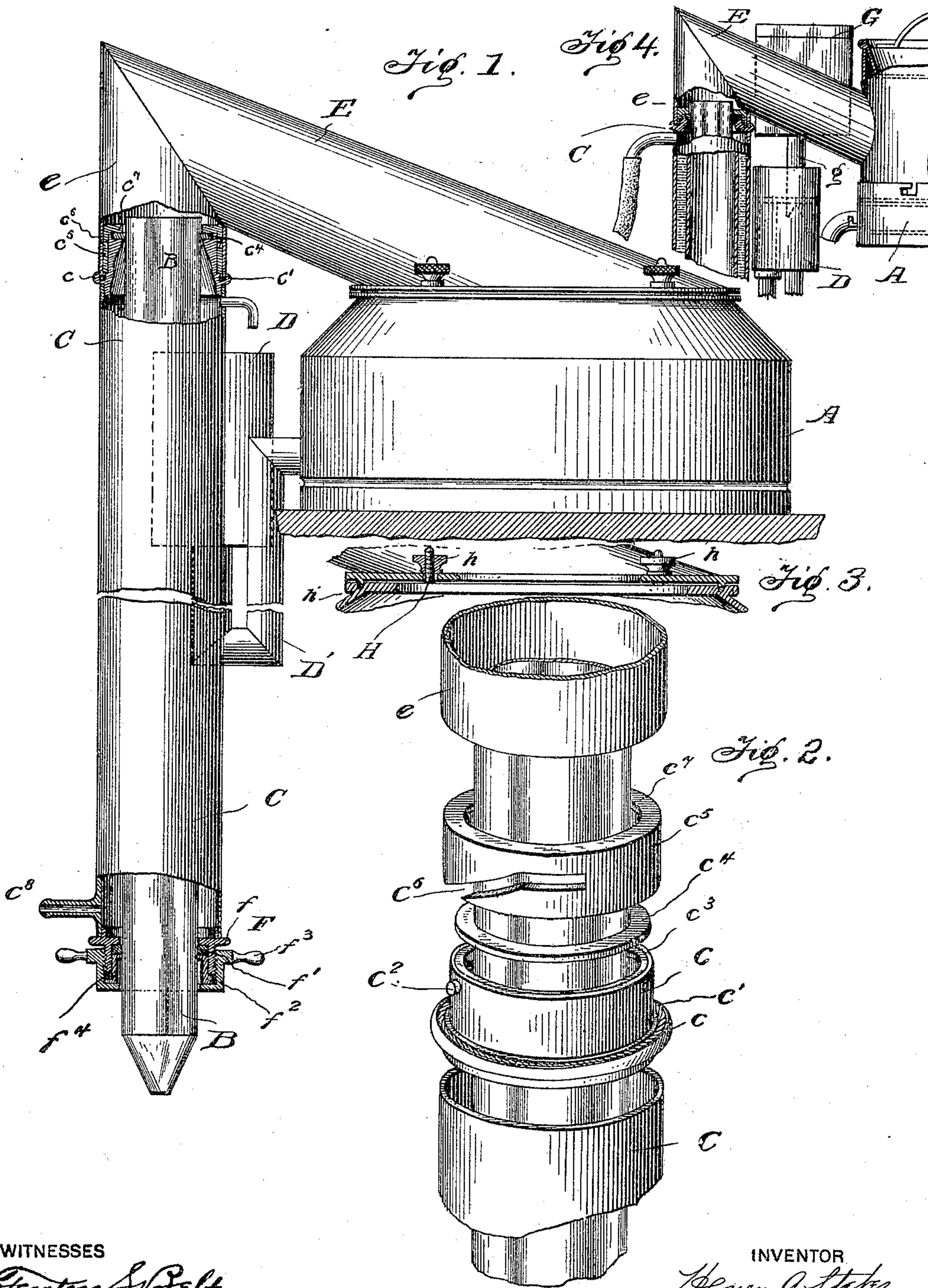
No. 640,970.

Patented Jan. 9, 1900.

H. A. STEBER.
DISTILLING APPARATUS.

(Application filed Apr. 22, 1899.)

(No Model.)



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

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DISTILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 640,970, dated January 9, 1900.

Application filed April 22, 1899. Serial No. 714,058. (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 distilling apparatus, and is designed as an improvement on my Letters Patent No. 576,910, dated February 9, 1897. I have had my apparatus successfully in operation for some time, and chemical and microscopic analysis of the water which has been distilled by said apparatus, as based upon the opinion of experts, has shown such water to be free from all and any organic germs and growth and free from all inorganic or mineral constituents; but in order to secure the most perfect results I have found it necessary to form a sealed joint at the connection between the hollow projection connecting the boiler with the water-jacket and also at the lower end of the water-jacket. By forming a sealed joint at the connection between the hollow projection connecting the boiler with the water-jacket I prevent any gases or vapors that may form in the space in the condensing-jacket from passing up into said projection. It also prevents any vapor or water from passing from said projection into the space in the water-jacket and there being condensed and wasted. It also prevents the escape of anything from the space in the water-jacket and the space in the hollow projection at the bayonet-joint connecting the pendent portion of said projection with the water-jacket, as the construction of the sealed joint I employ serves perfectly for a packing at that point. By reason of my peculiar construction of sealed joint I am enabled to accomplish all of these results.

The invention consists of certain novel constructions, combinations, and arrangements of parts, as will be hereinafter described and specifically claimed.

In the accompanying drawings, Figure 1 is a side elevation, partly broken away, of my improved apparatus. Fig. 2 is a perspective view of the sealed joint which I employ be-

tween the hollow projection connecting the boiler with the water-jacket, the parts being separated. Fig. 3 is a view, partly in section, showing the manner of connecting the cover to the boiler; and Fig. 4 is a side elevation of a modified form of the distilling apparatus.

A in the drawings represents the boiler; B, the condensing-tube; C, the water-jacket of the same; D, the open supply-receptacle for the boiler; D', the connection between the boiler and the receptacle D, and E the hollow connection between the water-jacket and the boiler. The construction and operation of these parts are practically the same as shown in my Letters Patent No. 576,910 and need no further description in this patent. The water-jacket C is connected to a pendent portion *e*, formed on the hollow projection E, which latter connects the boiler A with the water-jacket C. I have shown the hollow projection E extending from the boiler in an upwardly-inclined direction, and it is my preferred construction, by reason of which construction any condensation that occurs outside of the condensing-tube will be carried back into the boiler, and thus only the pure products of condensation are passed through said tube; but I do not wish to limit my invention to the said hollow projection being inclined.

I will now proceed to describe the watertight joint between the hollow projection and the water-jacket. The water-jacket is formed with a flange or projection *c*, which latter is provided with a circular groove *c'*. On the portion of the jacket which extends above the flange or projection are provided lugs *c''*, and the upper edge of the jacket is formed with a groove or depression *c'''*, in which rests the gasket or packing *c''''*, of paper, rubber, or other suitable material. The packing or gasket *c''''* is made of a width to slightly project beyond the inner peripheries of the water-jacket, so as to fit snugly against the condensing-tube B, (which latter is preferably constructed of glass,) so as to hold the same in proper central position and also prevent it from coming in contact with any metal surface. After the gasket *c''''* has been placed in position in the groove or depression *c'''* and the condensing-tube B has been passed through the same and it is desired to connect the wa-

ter-jacket to the pendent portion *e* on the hollow projection *E*, the upper end of the jacket, having projections or lugs *c*², is inserted into the bayonet-slots *c*⁶, formed on the ring *c*⁵, which latter is permanently secured to or forms a part of the said pendent portion *e*. The upper end of the ring or part *c*⁵ is provided with an inwardly-extending flange *c*⁷, which when the said ring is screwed down upon the upper end of the water-jacket *C* will come in contact with the packing or ring *c*⁴ and expand the same, so as to form an exceedingly-tight joint between the condensing-tube and said packing-ring, and thus produce an absolutely perfect sealed joint having the advantages set forth in a former part of this specification. Packing is also provided in the groove *c*¹ of the projection *c*, so that when the ring or part *c*⁵ is screwed down upon the upper end of the water-jacket its lower edge will come in contact with the said packing and form a tight joint at this point. The importance of providing a sealed joint at this point will be apparent from the following: As is well known, water is liable to and often does contain liquid and gaseous impurities, (formed by the fermentation of animal and vegetable matter in reservoirs and from other causes,) which class of impurities are more volatile than water itself. Water also generally contains animal, vegetable, and mineral impurities which are less volatile than water itself. It is important to remove impurities (and that includes both of the above-mentioned classes) and to do so by a continuous and automatic process. By regulating the supply or amount of cold water that I allow to enter the condensing-jacket *C* at *c*⁸ to a nicety I find that it gradually becomes warmer as it rises in said jacket, as it absorbs the heat from the vapor which is passing down through the condensing-tube *C*, and by the time it falls into the supply-receptacle *D*, which is open to the atmosphere, it can be heated to such a degree that trickling down in this heated state and being open to the outer air at this point it throws off those impurities which are more volatile than water at this point and continues to do so. If I did not provide a seal around the condensing-tube, some of these impurities would escape into the hollow projection *E* and get into the condensing-tube *B* and the product would contain some of them. If I did not provide a point in the water communication between the water-jacket and the boiler left open to the outer air, (such as is provided at *D*,) those more volatile impurities would be carried into the boiler and we would get them in the product. From this it will be seen that the sealed joint and the open receptacle are necessary to accomplish the desired results.

I also provide a water-tight joint *F* at the lower end of the water-jacket, which is formed in the following manner: The lower end of the jacket is provided with a fixed flange *f*, which extends inwardly and outwardly, as

shown, and forms a passage for the insertion and removal of the condensing-tube. On the under side of the flange *f* is provided a rubber or other suitable packing-ring or washer *f*¹. The lower end of the jacket, below the flange *f*, is externally screw-threaded.

*f*² represents a threaded nut, which is provided with lugs or nobs *f*³.

*f*⁴ represents a circular piece having upper and lower inwardly and outwardly extending flanges, which piece is seated in the nut *f*², as shown in the drawings, whereby when the nut is screwed up the piece *f*⁴ will be brought forcibly in contact with the packing *f*¹ and expand the same, so as to bring it in very close contact with the condensing-tube to form a perfectly-tight joint at this point.

In Fig. 4 I have shown a modified form of the construction of the distilling apparatus, which construction is similar to the modification described in my aforesaid Letters Patent, No. 576,910. This construction of the apparatus is designed particularly for distilling water and any other liquid other than that which is passed through the water-jacket to do the cooling. My improved sealed joint is particularly important in connection with this construction, as by its use no gas or vapor which may be formed or liberated in the water-jacket can possibly get into the product distilled from the liquid being distilled from the sealed reservoir *G* or from any other source. In this construction, as will be seen by reference to Fig. 4 of the drawings, and also to the specifications of my aforesaid Letters Patent, in which the construction and operation are fully described, the sealed vessel *G* is connected with the receptacle *D* by a pipe *g*, by means of which a supply of liquid to said open receptacle is automatically controlled.

In Fig. 3 I have shown the manner of securing the cover to the boiler. The same consists of screws or threaded projections *H*, provided on the upper edge of the boiler, which pass through apertures provided on the flange of the cover, held together by nuts *h*, applied on the screws *H*. The upper edge of the boiler may also be provided with a groove *h*, in which suitable packing may be placed. Said packing may extend slightly above the surface of the upper edge of the boiler, so that when the cover is applied to the boiler it will be held very tightly in contact with the packing by means of the screw clamping device, thus forming a practically air-tight joint.

In Fig. 2 I have shown the sealed joint which is formed at the connection between the hollow projection and the water-jacket with its parts in a separated condition and also show a part of the pendent portion of the hollow projection and a part of the water-jacket below the joint in order to more clearly illustrate the construction of the different parts.

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 of a boiler a condensing-tube for bringing a cooling agent in contact with the condensing-tube, a water-jacket, a hollow projection connected to the boiler at one end and to the water-jacket at its other end by a sealed joint, said joint comprising a packing seated in the upper end of the water-jacket, an inwardly-extending flange on the hollow projection, which is adapted to be brought in contact with the packing and press the same against the condensing-tube and thereby hold the same centrally and firmly in place and form a water-tight joint and also prevent the condensing-tube coming in contact with the water-jacket, and means for locking the water-jacket to the hollow projection, and means for supplying the boiler with water, substantially as described.

2. In a distilling apparatus, the combination of a boiler a condensing-tube, a water-jacket for bringing a cooling agent in contact

with the condensing-tube, a hollow projection 25
connected to the boiler at one end and to the
water-jacket at its other end by a sealed
joint, said joint comprising a packing seated
in the upper end of the water-jacket, lugs or
projections on the upper end of the water- 30
jacket, bayonet-slots and an inwardly-extending
flange provided on the hollow projection
which flange is adapted to be brought in contact
with the packing and press the same
against the condensing-tube when the bay- 35
onet-slots are engaged by the projections on
the water-jacket, and thereby holding the
same firmly and centrally in place and forming
a water-tight joint and preventing the
condensing-tube coming in contact with the 40
water-jacket, and means for supplying the
boiler with water, substantially as described.

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

HENRY A. STEBER.

Witnesses:

LEONARD VAN BAASTEN,
BERNARD T. STEBER.