No. 660,257. Patented Oct. 23, 1900.

J. D. LANCE.

PORTABLE CONDENSING APPARATUS.

(Application filed Nov. 2, 1899.)

(No Model.)

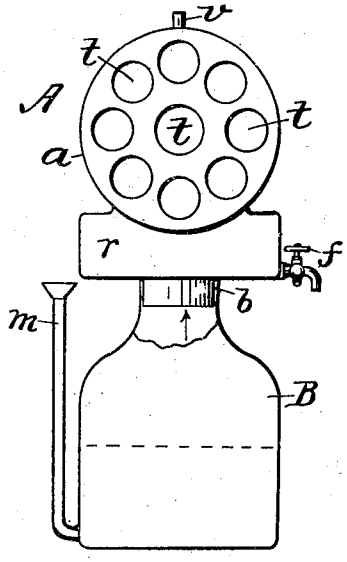


FIG. 1.

FIG. 2.

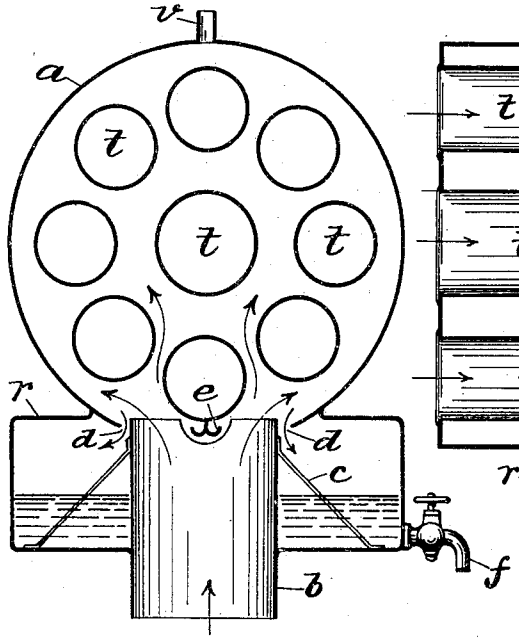
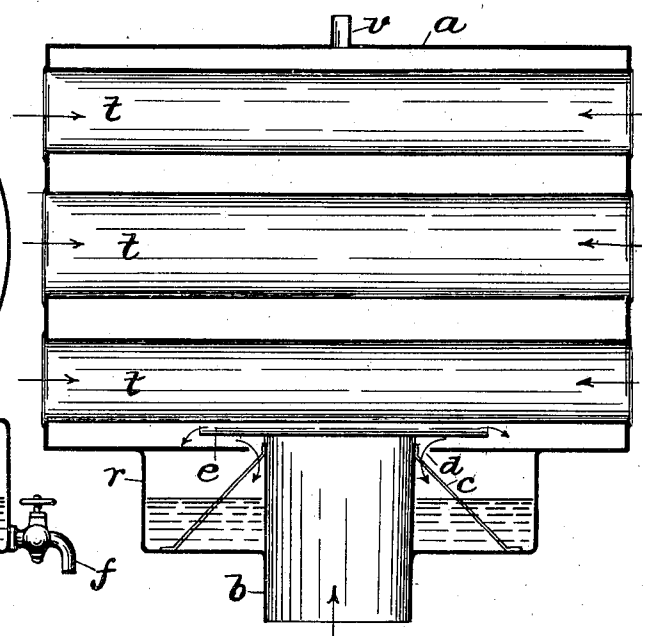


FIG. 3.



WITNESSES.

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PORTABLE CONDENSING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 660,257, dated October 23, 1900.

Application filed November 2, 1899. Serial No. 735,576. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. LANCE, a citizen of the United States of America, and a resident of the city and county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Portable Condensing Apparatus, of which the following is a specification.

My invention relates to improvements in portable surface condensers or distilling apparatus; and it consists, essentially, of a cylindrical or other suitably-shaped closed condenser provided with a series of tubes having open ends through which air freely circulates, a downwardly-extending inlet tube or nozzle communicating with the interior of the condenser-chamber and through which nozzle the generated steam or vapor to be condensed passes, and a reservoir closed to the outer air into which the product of condensation falls by gravity from the condensing vessel, all as will be more fully hereinafter set forth and claimed.

The object I have in view is to produce a simple portable condensing apparatus especially adapted for use in hotels, hospitals, kitchens, &c. The apparatus is arranged to be placed on top of a water boiler or kettle, or, in fact, any suitable vessel adapted to be heated, so as to convert the water therein into vapor or steam, which in turn passes into the condenser, where the cooling-surfaces thereof serve to liquefy the vapor. The distilled water thus produced is caught in the reservoir forming a part of the apparatus and may be drawn off for use as desired through the cock or faucet provided for the purpose.

In the accompanying sheet of drawings, Figure 1 is an end elevation of my improved portable condenser mounted on a water-boiler as in use. Fig. 2 is a transverse sectional view, in enlarged scale, taken through the center of the apparatus; and Fig. 3 is a corresponding longitudinal sectional view.

A, again referring to the drawings, indicates my improved condensing apparatus as a whole adapted to be placed upon and snugly fit the top of any suitable water-holding vessel or boiler, as B, capable of having the water therein converted into vapor or steam. In practice the boiler rests, say, upon the back part of a heated range or stove, whereby the condensing process is carried on continuously without any attendance whatever, except it be to occasionally supply the boiler with water through the filling-tube *m*.

The shell portion *a* of the condenser proper I prefer to make cylindrical, into which are secured longitudinally a series of open-end tubes *t*, as clearly shown. These tubes may be comparatively large in diameter and are adapted to have the air of the room circulate freely through them. (See arrows, Fig. 3.) The inner surface of the shell *a* and the outer surfaces of the tubes combined constitute practically the condensing area.

To the under side of the condenser *a* is centrally located the reservoir *r*, the same being water-tight and soldered to the condenser. An open pipe or nozzle *b* extends up through the center of the reservoir, its upper end rising above the lower side of the shell *a*, the latter being cut away so as to form a passage or annular space *d* around said nozzle. In order to strengthen the reservoir, as well as to support the pipe *b*, a series of internal braces *c* are secured thereto, as shown. The lower portion of pipe *b* extends through the reservoir, so as to fit snugly into the mouth of the boiler B.

As obviously the vapor condensed on the tubes *t* drops from the under side thereof, it is desirable to prevent any of the water from the vertical central row of tubes from falling back into the boiler down through the large open nozzle *b*. This objection is overcome by means of the open-end trough or drip-catcher *e*, secured to the bottom of the lower tube *t* (see Fig. 2) and extending longitudinally well past the nozzle, as shown in Fig. 3.

The operation of my improved vapor condensing or distilling apparatus A may be described as follows: The vapor rising from the warm or hot water contained in the boiler B passes freely into the condenser *a* (see long arrows, Fig. 2) and is condensed therein by contact with the cooler surfaces of the shell and tubes. The vapor thus condensed being now practically distilled water drops from the tubes, &c., to the bottom of the shell *a* and from the latter via the annular passage *d* (see arrows) into the collecting-reservoir *r*.

The water is readily drawn from the reservoir as desired by means of the faucet or stop-cock *f*.

I prefer to provide the condenser with a small open vent *v* at the top. This not only assists the circulation of the vapor in the condenser, but at the same time affords an escape for steam in case the latter should be generated under pressure.

My improved condensing device may be made of suitable sheet metal, as tin, although I prefer to use sheet-copper, having the interior surfaces suitably tinned or otherwise protected. The apparatus forms a simple, efficient, and comparatively inexpensive means for producing distilled water for culinary, domestic, or other uses, and since the apparatus may be combined with a boiler kept continually on the range or stove or even adapted to be connected with the usual hot-water tank of such ranges it is obvious that the cost of producing distilled water by means of my invention becomes practically *nil*. The uses to which distilled water may be employed are manifold and well known.

While I do not claim, broadly, a surface condenser as my invention, I desire to secure by United States Letters Patent—

1. The portable surface condensing apparatus, substantially as hereinbefore described, the same consisting of the condenser *a* having air-circulating tubes *t* mounted therein, the reservoir *r* secured to the under side of the condenser, the stayed open-ended nozzle *b* extending upwardly through the reservoir having its lower end adapted to communicate with a hot-water boiler or holder, and a space or opening *d* formed in the lower portion of the condenser, through which opening communication is maintained with the reservoir, for the purpose set forth.

2. The portable surface condensing apparatus hereinbefore described, consisting of the condenser-shell *a*, the air-circulating tubes *t* mounted in the shell, the reservoir *r* secured to the lower side of and in continuous communication with the interior of the shell, an open inlet-nozzle *b* extending through the reservoir, and a trough or conductor adapted to prevent water from dripping back into the nozzle, substantially as set forth.

Signed by me at Providence, Rhode Island, this 25th day of October, A. D. 1899.

JOHN D. LANCE.

Witnesses:
GEO. H. REMINGTON,
LEVI E. SALISBURY.