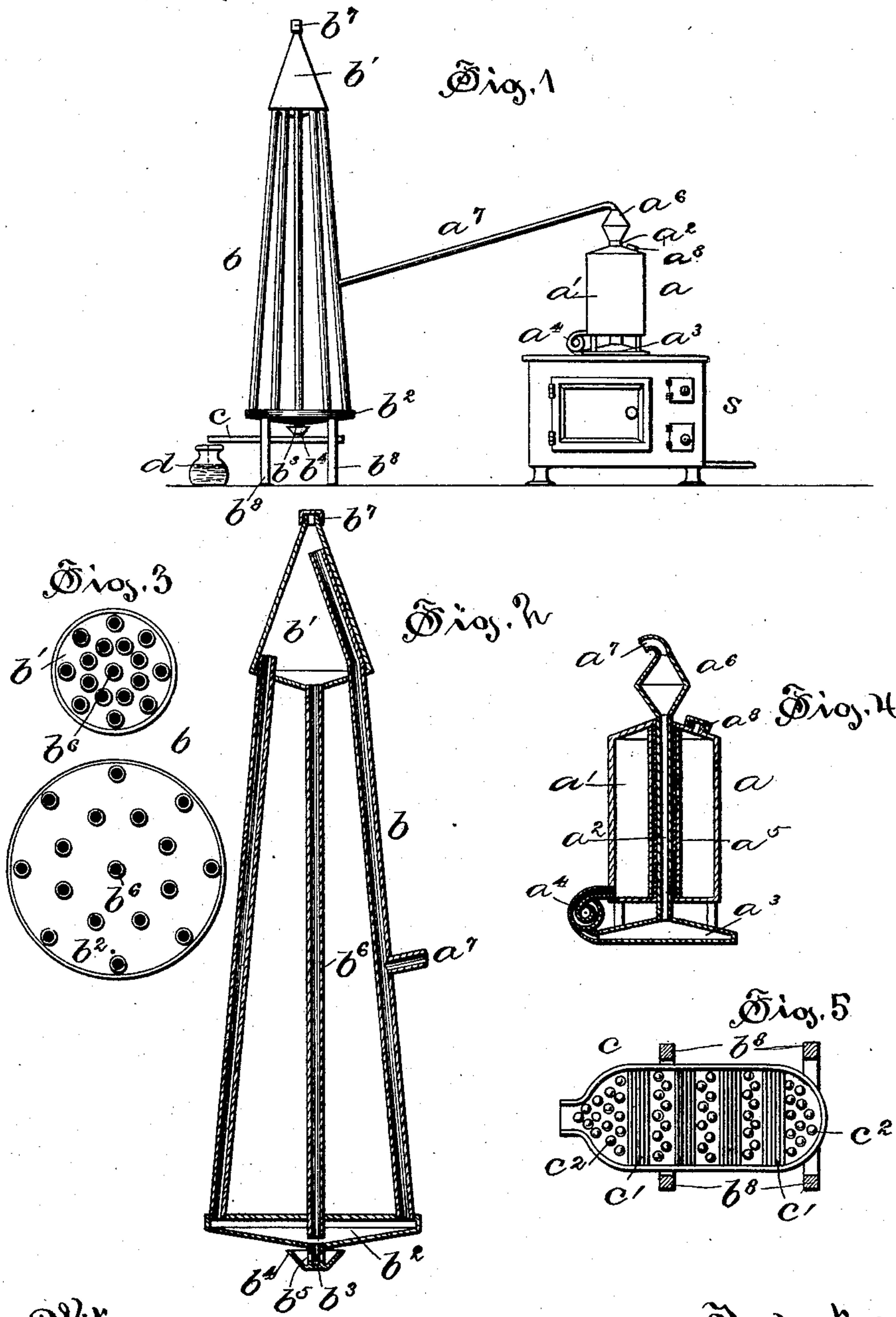


(No Model.)

L. S. LEWIS.
APPARATUS FOR PURIFYING WATER.

No. 472,641.

Patented Apr. 12, 1892.



Witnesses:

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PURIFYING WATER.

SPECIFICATION forming part of Letters Patent No. 472,641, dated April 12, 1892.

Application filed March 24, 1891. Serial No. 386,198. (No model.)

To all whom it may concern:

Be it known that I, LEROY S. LEWIS, a citizen of the United States, residing at East Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Purifying Water, of which the following is a full, clear, and exact specification.

The invention relates to the class of apparatus for freeing water from chemically-dissolved and mechanically-suspended impurities; and the object is to provide a simple, cheap, and easily-operated apparatus of this class requiring but little attention, whereby all animal and vegetable bacteria and organisms will be destroyed and water supplied chemically pure and fully aerated, so as to be palatable.

The invention resides in details of the construction of the apparatus whereby this result can be obtained simply and continuously without constant attendance, as more particularly hereinafter described, and pointed out in the claim.

Referring to the accompanying drawings, Figure 1 is a side view of the apparatus. Fig. 2 is a vertical section, on enlarged scale, of the portable tubular condenser. Fig. 3 are sections at the top and bottom of the tubes of the condenser. Fig. 4 is a vertical section of the vaporizer. Fig. 5 is a plan view of the aerating-tray.

In the views, the letter *a* indicates a vaporizer, adapted to be placed over any source of heat, as a common cook-stove or an oil or gas burner, as convenient. This vaporizer, which is made of thin metal, preferably consists of a large upper chamber *a'*, having an inlet *a⁸*, for receiving and holding the supply of water to be purified, through the center of which passes a tube *a²* to a smaller heating-chamber that is adapted to rest directly over the source of heat. A small pipe *a⁴*, usually bent in several coils, connects the lower part of the chamber *a'* with the lowest part of the chamber *a³*, so that as the water in this latter chamber is vaporized and the vapor rises through the tube *a²* water from the supply-chamber enters through the pipe *a⁴* to keep the heating-chamber full. The tube *a²* passes from the center and highest part of the heat-

ing-chamber to permit the free escape of the vapor generated from the water, and where this tube passes through the chamber *a'* it is surrounded by a jacket of non-heat-conducting material, as asbestos, which is held in place by a larger tube *a⁵* to prevent the colder water in the supply-chamber from condensing the vapor before it passes out of the tube. The tube *a²* above the vaporizer is preferably enlarged, forming a chamber *a⁶* to allow a free expansion of the vapor or steam, so it may free itself from any globules of unvaporized or boiling liquid and not carry it along the tube *a⁷*, which connects the vaporizer with the portable tubular air-condenser *b*. This condenser consists of a number of tubes arranged in circles vertically, or nearly so, opening at their upper end into a conical chamber *b'* and at their lower end into a chamber *b²*. The tube which is connected with the tube from the vaporizer preferably projects into the conical chamber nearly to the apex, which is preferably provided with a threaded cap *b⁷*, that can be removed when desired, while all of the remaining tubes, except the central one *b⁶*, project into this chamber but a slight distance above the bottom, which is convexed, so that the water of condensation which collects in this chamber will run to the central tube and through that to the chamber *b²*. The central tube opens directly over an outlet-tube *b³*, that depends from the convexed bottom of the chamber *b²* and supports a cup *b⁴*, having side walls, which rise to a higher level than the lateral openings *b⁵* through the outlet-tube, so that the water which passes through the openings fills the cup before running over, and seals the outlet to prevent the escape of vapor or steam. Below this cup *b⁴*, to receive the water which overflows its walls, is placed an aerating-tray *c*. This tray is supported at a slight incline by brackets connecting the legs *b⁸*, depending from the bottom of the condenser, and its bottom surface is roughened by ridges *c'* and bosses *c²*, in order that the water of condensation which escapes from the condenser will spread out in a sheet, and in running slowly to the receiving jar, barrel, or other receptacle *d* will be obliged to travel an uneven and broken course, so that all portions will be brought

into contact with and subjected to the influence of the atmosphere, whereby the purified water, which has lost its air during the boiling, will again absorb oxygen and become palatable.

Any kettle or common vaporizer may be used in which to generate steam; but with that form shown the vapor can be generated quicker than with an ordinary vessel. Water from the supply-chamber a' passes through the pipe a^1 to the heating-chamber a^3 , and the vapor generated collects at the convexed top of this chamber and passes upward through the tube to the chamber a^6 , where it parts with its moisture and passes to the chambers of the condenser and is condensed by contact with the sides of the tubes through which it circulates. The vapor which collects in the conical upper chamber is drawn into the tubes by the condensation of the vapor which comes in contact with their sides, as their extent of surface exposed to the atmosphere permits a rapid radiation of heat. The water of condensation in the upper chamber passes through the tube b^6 to the chamber b^3 , while the condensed vapor in the tubes passes directly to this chamber and escapes through the trapped outlet at the bottom and over the walls of the cup into the aerating-tray. From this tray, where it is aerated, the purified water is allowed to run into any suitable receptacle to remain until used.

The vaporizer can be placed on any stove or over any gas or oil burner, while the condenser, which occupies but little ground-space, can be moved to any closet or cellar at a distance from the source of heat and be connected by

fixed pipes, so that a quantity of pure water fully aerated may continually be making and a supply always kept on hand without any particular attention or attendance. When the vaporizer-tube is disconnected from the condenser and the cap at the apex of the upper chamber of the latter is removed, the tubes, being heated, cause a current of air to pass through them, which dries out all moisture. Of course the boiling of the water destroys all bacteria and disease-germs, and the vapors leave all mineral and other foreign substances in solution or mechanically suspended in the vaporizer and the water reaches the aerating-tray in a pure state. The tubes of the condenser are quite thin and, having considerable surface, readily part with their heat, so they do not become hot enough to render them useless.

I claim as my invention—

A water-purifier consisting of a vaporizer, a condenser connected therewith, having a series of vertical steam-tubes connecting two chambers and surrounded by the atmospheric air, a trap-outlet from the lower chamber, an inclined aerating-tray located below the trap-outlet and provided with an embossed and ridged upper surface on the upper face of its bottom, whereby an unevenness is provided, over and around which the purified water must pass to the receiving vessel or receptacle, substantially as specified.

LEROY S. LEWIS.

Witnesses:

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