

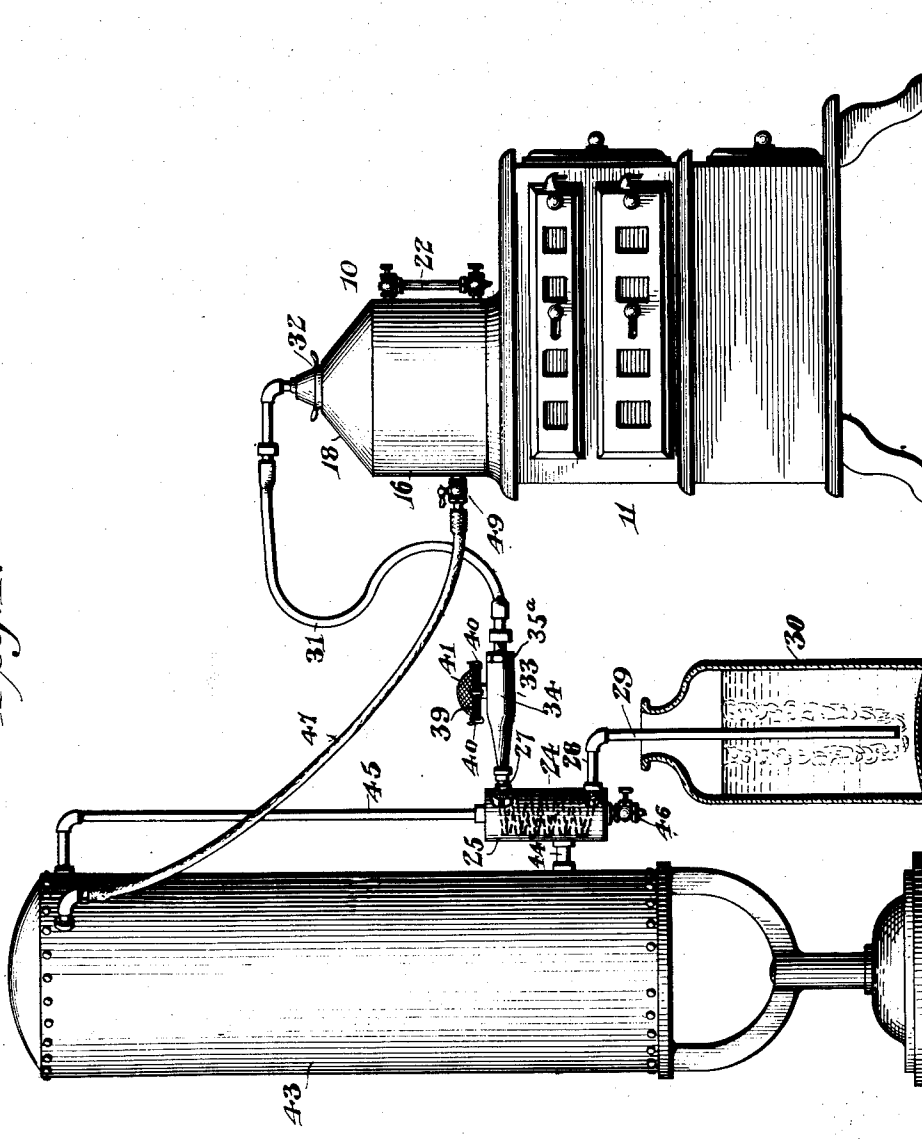
No. 833,271.

PATENTED OCT. 16, 1906.

G. F. WENTZ.
DISTILLING APPARATUS.
APPLICATION FILED DEC. 1, 1902.

2 SHEETS—SHEET 1.

Fig. 1.



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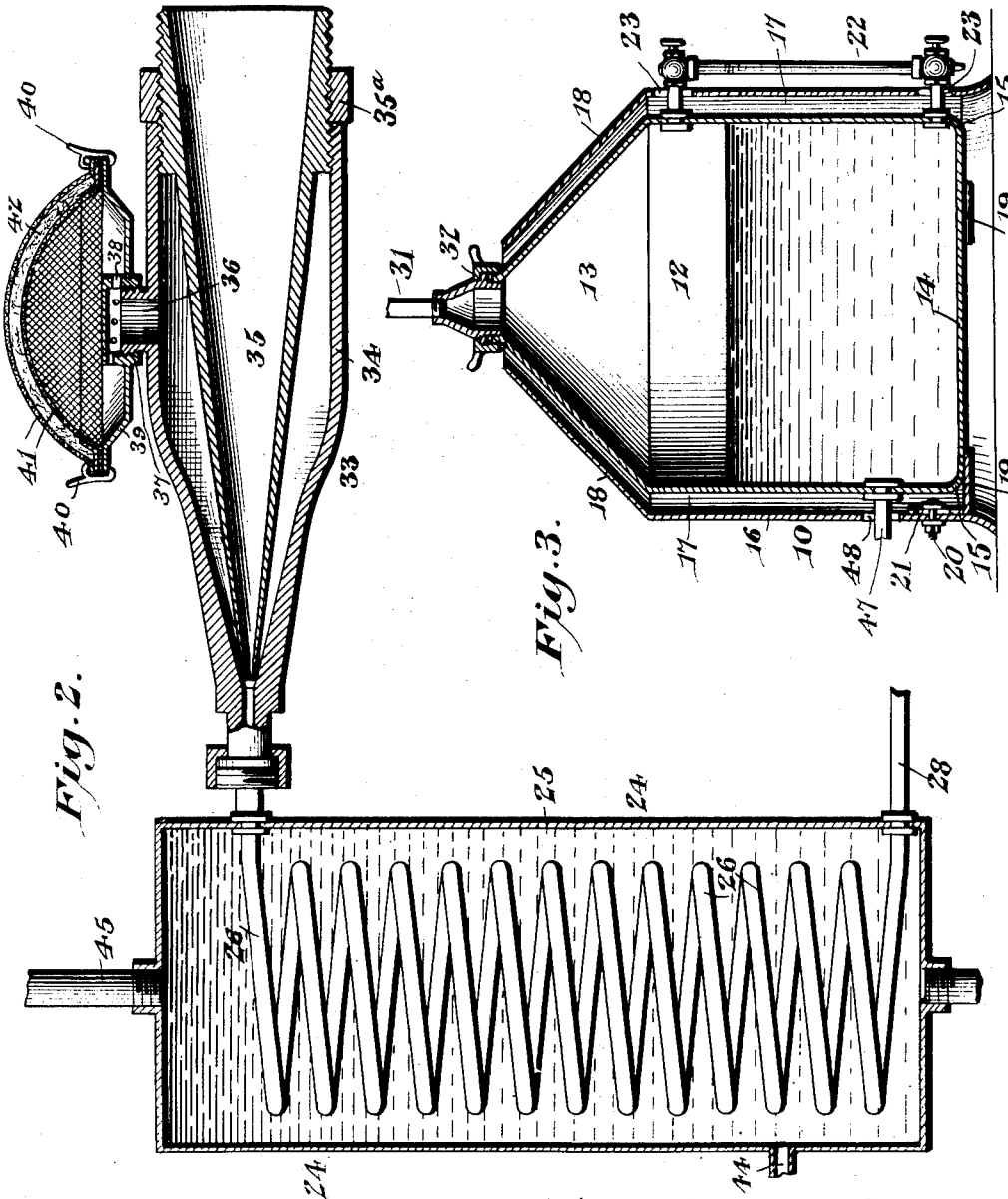


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORGE FRANKLIN WENTZ, OF ST. LOUIS, MISSOURI.

DISTILLING APPARATUS.

No. 833,271.

Specification of Letters Patent.

Patented Oct. 16, 1906.

Application filed December 1, 1902. Serial No. 133,397.

To all whom it may concern:

Be it known that I, GEORGE FRANKLIN WENTZ, a citizen of the United States, residing at St. Louis, State of Missouri, have invented a new and useful Distilling Apparatus, of which the following is a specification.

The present invention relates to means for obtaining pure water; and the object is to provide a structure wherein the heat eliminated from the steam in the condensing operation is conserved.

It is also the object to provide a novel and simple means for aerating the distilled water, the air being first purified and the amount thereof being regulable as desired. Further than this, it is the aim to provide apparatus that can be employed for domestic or household use, the usual stand-boiler forming a part thereof.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of the improved apparatus, portions thereof being shown in section. Fig. 2 is a vertical sectional view, on an enlarged scale, through the condenser and the air-mixer. Fig. 3 is a vertical sectional view through the steam-generator.

Similar numerals of reference denote corresponding parts in all the figures of the drawings.

The steam-generator is designated as a whole by the reference-numeral 10 and is shown in Fig. 1 placed upon an ordinary range 11, though a gas or other heater can be employed, if desired. The construction of the generator will be more clearly seen in Fig. 3. It comprises a receptacle 12 having a conical top 13 and a bottom 14, the lower corners being preferably rounded, as shown at 15. This receptacle can be placed, if desired, within a jacket (shown at 16) which is larger than the same in order to provide an annular heating space or flue 17 between the two walls, the upper end of this jacket being tapered, as shown at 18, and terminating at the upper end of the receptacle to permit a free draft through said flue. The receptacle is preferably vertically adjustable within the jacket, being supported upon brackets 19, secured to the inner walls of said jacket by means of bolts 20, that pass through slots 21, formed in the brackets. The receptacle may carry an exposed gage-glass 22, the connections of which pass through slots 23, formed

in the wall of the jacket. It will be understood, however, that the jacket may be dispensed with, if desired.

A condenser 24 constitutes a part of the apparatus and consists of a cylindrical water-tight casing 25, within which is located a worm 26, the upper end of which projects from the upper end of the casing in the form of a nipple 27, the lower end extending through the lower portion of the casing, as shown at 28, and having a depending discharge-pipe 29 attached thereto, said pipe projecting into the receiver 30 for the distilled water. Block-tin has been found to be excellent material for use in the construction of the coil, though the invention is not limited in this respect. The generator and condenser are connected by a steam-pipe 31, attached to the apex of the receptacle 12 by means of a coupling 32. This pipe is preferably constructed of block-tin or other metal that can be readily bent so as to permit the generator being moved about as may be found necessary. Arranged in this pipe is an air-injector, (designated as a whole by the reference-numeral 33.) The construction of the mixer is illustrated in Fig. 2. It comprises an outer shell 34, having a tapering bore, within which is arranged a nozzle 35, connected with the steam-pipe. This nozzle is adjustable toward and from the tapered end of the bore, and for this purpose it is threaded in the larger end, a jam-nut 35^a being employed for normally holding the parts against relative movement. The shell 34 carries an upstanding nipple 36, upon the upper end of which is screwed an air-regulating head 37, having an annular series of inlet-orifices 38, which are located at different distances from the end of the cap. Forming a part of this cap is a strainer comprising a base-plate 39, which is secured to the cap and to which are fastened, by means of suitable clips 40, spaced perforate walls 41, formed of wire fabric and holding between them a lining or filling 42, preferably composed of cotton.

The condenser 24 is located alongside a reservoir, (shown in the form of an ordinary stand-boiler 43,) and water is supplied to said condenser from the boiler by means of a coupling-pipe 44, connected to the lower portion of the boiler and the casing 25. An outlet-conduit 45 extends from the top of the casing 25 to the top of the boiler, being designed to

carry off the heated water, and thus permit the inflow of cold water from the bottom of the boiler, as will be readily understood. A sediment-discharge nipple 46 may also be connected to the bottom of the casing 25. Water is supplied to the steam-generator through a pipe 47, which is preferably constructed of flexible material and is connected with the upper portion of the boiler 43 and the lower portion of the receptacle 12, passing through a slot 48 in the jacket and having an exposed valve 49 to control the passage of water.

Assuming the boiler and condenser filled with water and the generator partially filled, it will be evident that fire in the stove will produce steam in the generator, which will flow through the pipe 31 and discharging through the nozzle 35 will cause an inflow of air into the mixer, said air being purified, however, by passing through the cleaning device above described. The mixed steam and air will thus enter the worm, and coming into contact with the cold walls thereof the steam will be condensed, and the water will flow into the receiver 30, carrying the air with it, which air will bubble up through the water therein, thus insuring thorough aeration of the latter. The amount of air admitted to the mixer is of course regulable by screwing the cap 37 up or down upon the nipple, thereby successively uncovering or covering the openings. The force with which the air is entrained is due to the particular arrangement of the discharge end of the nozzle in the contracted end of the shell. Experiments have shown that when the discharge end of the shell is made large as compared to that of the nozzle the air will not be carried as deeply into the water in the receiver. With small orifices, as shown, and with the end of the nozzle fitted closely in the shell the air will be carried through the discharge-pipe when there is a large body of water in the receiver. As the water in the condenser becomes heated from contact with the coil it will rise through the pipe 43 and enter the top of the boiler, its place being taken by cold water passing through the pipe 44. Thus the water in said boiler will gradually be made hot by the heat abstracted from the steam that is condensed. When a new supply of water is required in the condenser, it is drawn from the top of the boiler through the pipe 47, and thus this heated water is employed. As a result the heat is conserved and used over again. The boiler may of course be used in the ordinary manner by being connected with the distributing system in the house, and it may also be connected to the water-back of the stove, these various connections not being shown, however, as they do not enter into the present invention. Because of its adjustable connection with the jacket the receptacle 12 can be raised or low-

ered, as desired, and thus placed at different distances from the fire.

By means of this apparatus it will be apparent that pure water may be obtained and that it is thoroughly aerated by air which has been deprived of dust and unclean matter. The adjustment of the nozzle and the regulating means for admission of the air are important factors in the performance of these functions. The heat withdrawn from the steam during the condensing operation is not wasted, as the water absorbing the same can be employed not only for domestic purposes, but for supplying the generator. The apparatus is especially designed for household use and can be readily understood and operated by persons other than experts in this art.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In distilling apparatus, the combination with a reservoir, of a condenser, an inlet and an outlet water-pipe connecting the reservoir and condenser, a steam-generator, a steam-pipe extending from the generator to the condenser, and a supply-pipe connecting the upper portion of the reservoir to the generator.

2. In distilling apparatus, the combination with an upright stand-boiler, of a condenser comprising a casing and a worm arranged therein, an inlet and an outlet pipe connecting the lower and upper portions of the boiler and condenser casing, a steam-generator, a steam-pipe leading from the generator to the worm, and a supply-pipe extending from the upper end of the boiler to the generator.

3. In distilling apparatus, the combination with a steam-generator, of a condenser, a steam-pipe connecting the generator and condenser and including an air-injector, a reservoir for the water of distillation, and a combined water and air discharge pipe extending from the condenser to the lower portion of the reservoir and adapted to have its discharge end submerged in the water of distillation in the said reservoir.

4. In distilling apparatus, the combination with a steam-generator, of a condenser, a steam-conduit connecting the generator and condenser and including an air-injector provided with an air-inlet and means for varying the supply of air through said inlet, a receiving vessel, and a discharge-conduit leading from the condenser into the lower portion

of the receiving vessel and adapted to have its discharge end submerged in the liquid in the said receiving vessel.

5 In distilling apparatus, the combination with a steam-generator, of a condenser, a steam-conduit connecting the generator and condenser and including an air-injector having an air-inlet and a cap adjustably fitted over the inlet and controlling the air-supply
10 to the inlet, and a combined air and liquid discharge conduit from the condenser communicating with the lower portion of the receiving vessel and adapted to have its discharge end submerged in the liquid of distillation in the receiving vessel.

15 6. In distilling apparatus, the combination with a steam-generator, of a condenser, a steam-pipe connecting the condenser and generator and including an air-injector having an upstanding air-inlet nipple and a cap threaded on the nipple and having openings arranged to be covered by the nipple to vary the supply of air through the nipple, a receiving vessel, and a combined air and liquid discharge conduit leading from the condenser
20 into the lower portion of the receiving vessel and adapted to have its discharge end submerged in the liquid in said receiving vessel.

25 7. In distilling apparatus, the combination with a steam-generator, of a condenser, a steam-conduit connecting the generator and condenser and including an air-injector provided with a threaded nipple having an open

air-inlet end and a regulating-cap screwed upon the nipple and having an annular series
35 of openings arranged at different distances from the end of the cap and arranged to be successively covered by the nipple upon the movement of the cap thereon, a receiving vessel, and a combined water and air discharge conduit from the condenser communicating with the lower portion of the receiving vessel and adapted to have its outlet submerged in the liquid in said receiving vessel.

40 8. In distilling apparatus, the combination with a steam-generator, of a condenser, a steam-conduit connecting the generator and condenser and including an air-injector having an air-inlet, a strainer comprising a cap located over the inlet, a base carried by the
45 cap, spaced perforate walls secured to the base and extending over the cap, and a porous filling located between the walls, a receiving vessel for the water of distillation, and a combined air and water discharge conduit leading
50 from the condenser into the lower portion of the receiving vessel and adapted to have its discharge end submerged in the water of distillation in the receiving vessel.

55 In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE FRANKLIN WENTZ.

Witnesses:

FRANK M. MUELLER,
AUGUST H. RADKE.