O. A. NENNINGER.

CONDENSER AND DISTILLING DEVICE.

APPLICATION FILED NOV. 4, 1916.

**1,252,154.**

Patented Jan. 1, 1918.

3 SHEETS—SHEET 1.

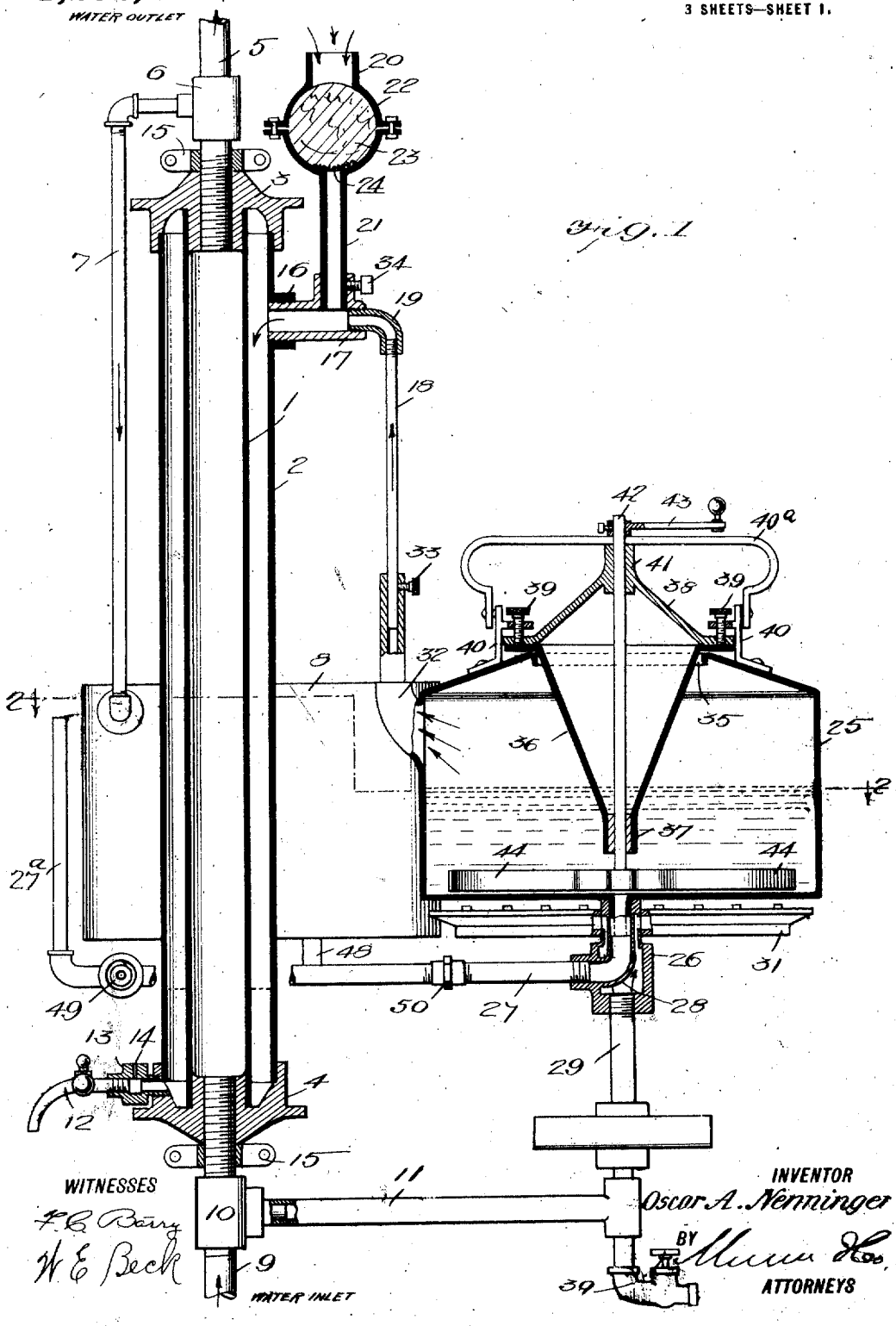


Fig. 1.

WITNESSES

F. C. Barry

W. E. Beck

INVENTOR

Oscar A. Nenninger

BY Munn & Co.

ATTORNEYS

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3 SHEETS—SHEET 2.

Fig. 2.

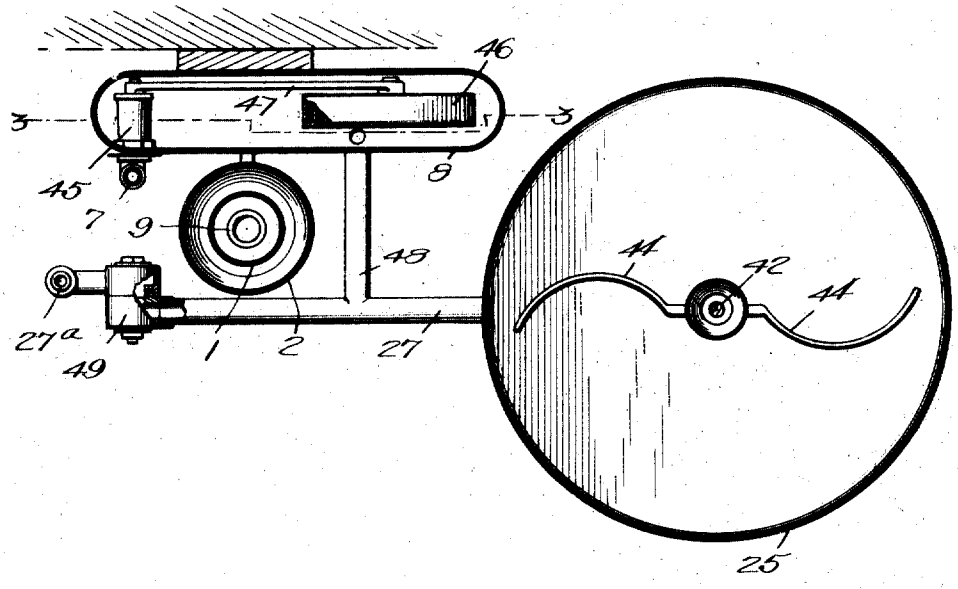
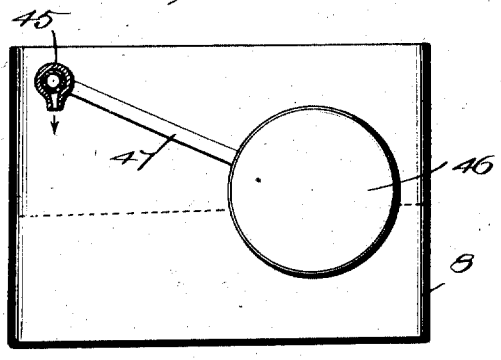



Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4.

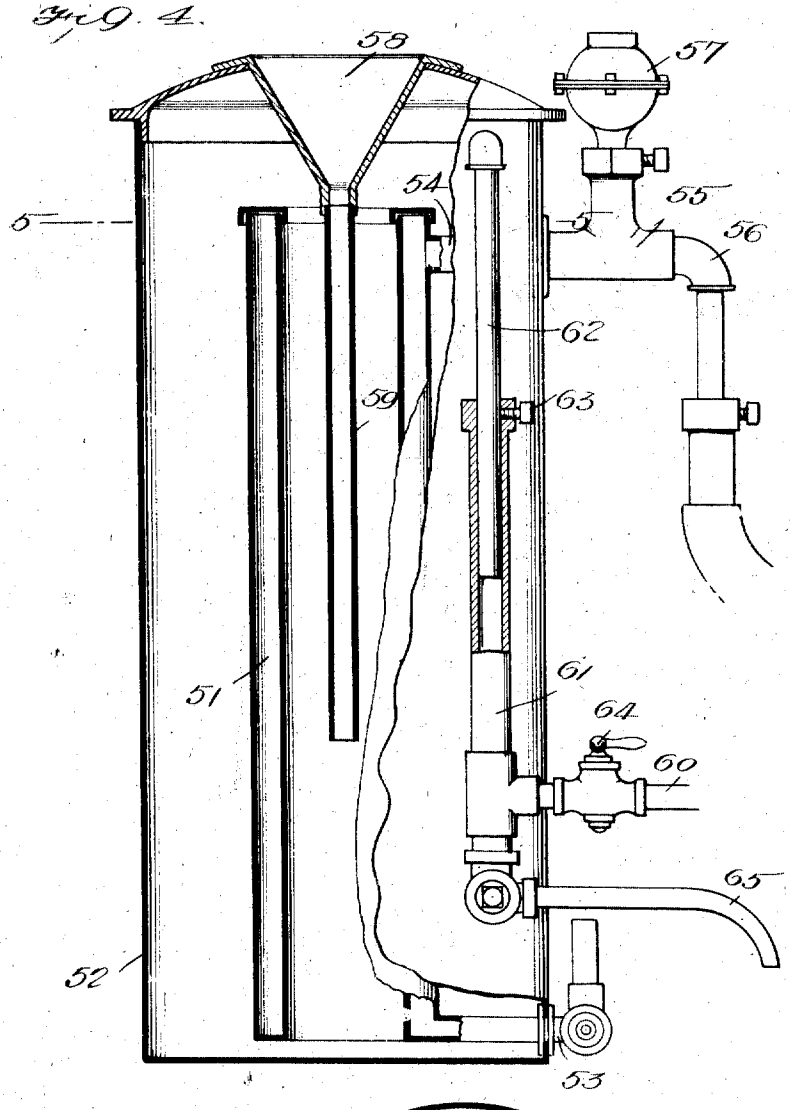
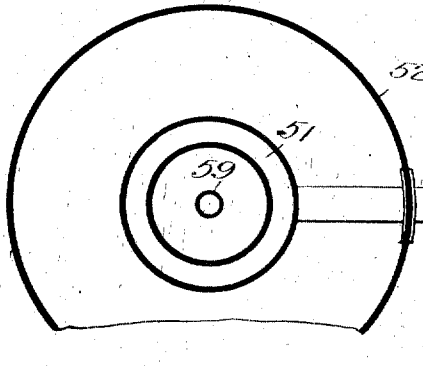



Fig. 5.

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ATTORNEYS

# UNITED STATES PATENT OFFICE.

OSCAR ALFRED NENNINGER, OF NEWARK, NEW JERSEY.

## CONDENSER AND DISTILLING DEVICE.

1,252,154. Specification of Letters Patent. Patented Jan. 1, 1918.

Application filed November 4, 1916. Serial No. 129,513.

*To all whom it may concern:*

Be it known that I, OSCAR A. NENNINGER, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Condensers and Distilling Devices, of which the following is a specification.

My invention is an improvement in condensers, and has for its object to provide a condenser wherein means are provided for heating and vaporizing the water and for injecting at the same time a current of air to aerate the water as it is condensed.

In the drawings:

Figure 1 is a vertical section through the improved condenser;

Fig. 2 is a section on the line 2—2 of Fig. 1, looking in the direction of the arrows adjacent the line, and

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a view of a modified construction partly in section.

Fig. 5 is a section on the line 5—5 of Fig. 4.

In the present embodiment of the invention, a condenser is provided consisting of inner and outer tubular casings 1 and 2 which are connected at their upper and lower ends by fittings 3 and 4, the said fittings holding the casings concentric and in spaced relation. A water outlet pipe 5 is threaded through the upper fitting 3 and this pipe has a T 6 from whose lateral branch extends a pipe 7, the said pipe communicating with a tank 8 arranged behind the condenser near the lower end thereof.

A water inlet pipe 9 is threaded through the lower fitting 4, and a T 10 is interposed in the pipe, the lateral branch of the T carrying a bracket 11 which supports the heating and vaporizing apparatus to be described later.

A discharge faucet 12 is connected with the fitting 4 and communicates with the space between the casings 1 and 2. A three-way casing 13 is arranged between the faucet 12 and the fitting, one branch of the said casing communicating with the annular chamber between the casings 1 and 2, another branch with the faucet 12, and the third branch which extends upward has an outlet opening 14. Supporting brackets 15 are connected with the outlet and inlet pipes at the fittings 3 and 4, and by means of these brackets the condenser may be connected with a suitable support, as for instance a wall.

The casing 2 has a lateral nipple 16 near its upper end, and to this nipple is connected a T 17. A pipe 18 is connected to the outer end of the T by an elbow 19, and the sectional casing is connected with the lateral branch of the T, the said branch extending upwardly. This casing consists of upper and lower sections 20 and 21, the said sections being enlarged at their meeting ends to form a chamber 22 for receiving a filling, indicated at 23, of absorbent cotton or the like, and a screen 24 is arranged below the cotton. These sections 20 and 21 have outwardly extending flanges at their adjacent edges, and the flanges are secured together as shown.

A boiler or kettle 25 is arranged at the level of the tank 8, the said boiler or kettle having at its lower end a casing 26 from which extends laterally a pipe 27, the said pipe communicating, by an elbow 28 which extends through the casing 26, with the boiler or kettle at the center thereof. A pipe 29 is tapped into the lower end of the casing 26, and the said pipe and the kettle are supported by the bracket 11 before mentioned, the pipe 29 passing through a vertical bearing at the outer end of the arm and having a valve 30 interposed in its length below the arm. This pipe 29 supplies fuel to the heater indicated at 31, and arranged directly below the bottom of the boiler or kettle. The boiler or kettle has a spout 32 extending outwardly and upwardly from the inner side thereof, and the lower end of the pipe 18 is received within this spout and is held in adjusted position by a set screw 33. A similar set screw 34 is passed through the lateral branch of the T 17 to engage the section 21 of the aerating device to prevent disengagement thereof.

Within the opening 35 at the top of the boiler or kettle a funnel-shaped member 36 is interposed, said funnel-shaped member having a bearing 37 at its lower smaller end,

while the upper end is flanged and engages the top of the kettle around the opening 35. A suitable cover 38 of conical shape is provided for closing the kettle, the cover being seated on the flange of the funnel-shaped member 36, and set screws 39 are passed through inwardly extending lugs or ears 40, secured to the top of the kettle and to which a bail 40ª connects. By means of the set screws the cover 38 may be clamped tightly upon the kettle to close the same. This cover has a bearing 41 at its center or apex, and a shaft 42 is journaled in the bearing 41 and in the bearing 37 before mentioned. The shaft has a suitable crank 43, and an agitator, shown more particularly in Fig. 2, is connected with the lower end of the shaft, the agitator consisting of oppositely extending curved arms 44. The lower edges of these arms move close to the bottom of the kettle, and it will be evident that when the agitator is turned by means of the crank 43, the arms will move over the bottom and will clean it from any sediment that may have collected thereon.

The pipe 7 before mentioned communicates with the tank 8 by means of a valve 45, shown more particularly in Figs. 2 and 3. This valve is controlled by a float 46 arranged within the tank and connected to the valve by an arm 47. The float is arranged to hold the water level at about the dotted line in Fig. 3, closing the valve when the water rises slightly above this point. The pipe 27 before mentioned communicates by a lateral branch 48 with the tank 8. A universal joint 49 is interposed in this pipe 27 and also a union 50, the union being between the universal joint and the kettle. By releasing the union 50 and the set screw 33 the kettle may be disengaged from the condenser.

By means of the pipe 27 the boiler or kettle may be drained. It will be noticed that this pipe has at its outer end a vertical portion 27ª which, by means of the universal joint, may be turned downwardly to drain the kettle or boiler and when the said pipe is turned upwardly into the position of Fig. 1, the upper end thereof is above the water level of the boiler.

In operation, water being introduced into the boiler and the burner lighted, the water will be distilled. The steam will pass upwardly through the pipe 18 to the elbow 19 and the T 17, into the annular space between the casings 1 and 2. The interior of the casing 1 is filled with water from the inlet pipe 9, the said water passing out at the pipe 5 and condensing the steam in the annular space between the casings 1 and 2. As the steam issues from the elbow 19, the T 17 acts as an injector, drawing in air through the antiseptic cotton 23 and thoroughly mixing the air with the steam as it is condensed. The water in the kettle is retained at a predetermined level by the float valve in the tank 8, and it is the water that has been heated by its passage through the casings that is admitted to the tank and to the kettle, that is, water already warmed. The distilled water may be drawn off at the faucet 12 and since it is thoroughly aerated it will be free from the insipid taste usually borne by distilled water. Should the kettle or boiler become foul, it may be removed by loosening the screw 33 and the union 50 and by means of the agitator, the bottom may be thoroughly scraped.

In the embodiment of the invention shown in Figs. 4 and 5, the condenser 51 which is a double walled receptacle of annular form, is arranged within the tank 52, and coaxial with the tank. A discharge pipe 53 leads from the bottom of the condenser and extends through the tank, and an inlet pipe 54 leads through the tank from the top of the condenser. A T 55 is connected with this pipe outside the tank, and the heater, not shown, but of the same construction as that shown in Fig. 1, discharges into the T by means of the elbow 56. The casing 57 corresponding to the casing 22 is connected with the T. The tank has a funnel-shaped top 58, and a pipe 59 leads from the said top downwardly at the axis of the condenser a little more than midway of the length of the condenser. The heater is supplied with water by a pipe 60 which extends laterally from a pipe 61 arranged on the outer face of the tank, and connected to the tank at its top by means of a pipe 62. This pipe 62 extends into the upper end of the pipe 61, and a set screw 63 is provided for connecting the said pipes 61 and 62. A valve 64 is interposed in the pipe 60 between the heater and the pipe 61. A pipe 65 corresponding in function to that of the pipe 27ª is rotatably connected with the lower end of the pipe 61, and this drain pipe 65 is shown in lowered position, that is in position to drain the heater.

In practice, the pipe will be elevated, so that the upper end thereof will be above the level of the water in the heater. A suitable source of supply for cold water discharges into the funnel 58, and the cold water in the tank will cool and condense the steam which enters from the heater, and becoming warm will pass upwardly and out through the pipes 62, 61 and 60 to the heater. A suitable float valve may be provided for controlling the flow, operating in the same manner as that shown in Fig. 1. The last described embodiment of condenser offers a larger surface to the contact of the cold water, since it may engage both the inner and the outer surface thereof.

I claim:—

In a device of the character specified, a

condenser consisting of concentric casings, fittings connecting the casings at the ends thereof and holding them in spaced relation, said fittings having water conducting pipes passing through the same for supplying cold water to the inner casing, and a discharge faucet connected with the lowermost fitting and in communication with the space between the casings, a boiler delivering to the space between the casings, and means for controlling the level of the water in the boiler.

OSCAR ALFRED NENNINGER.