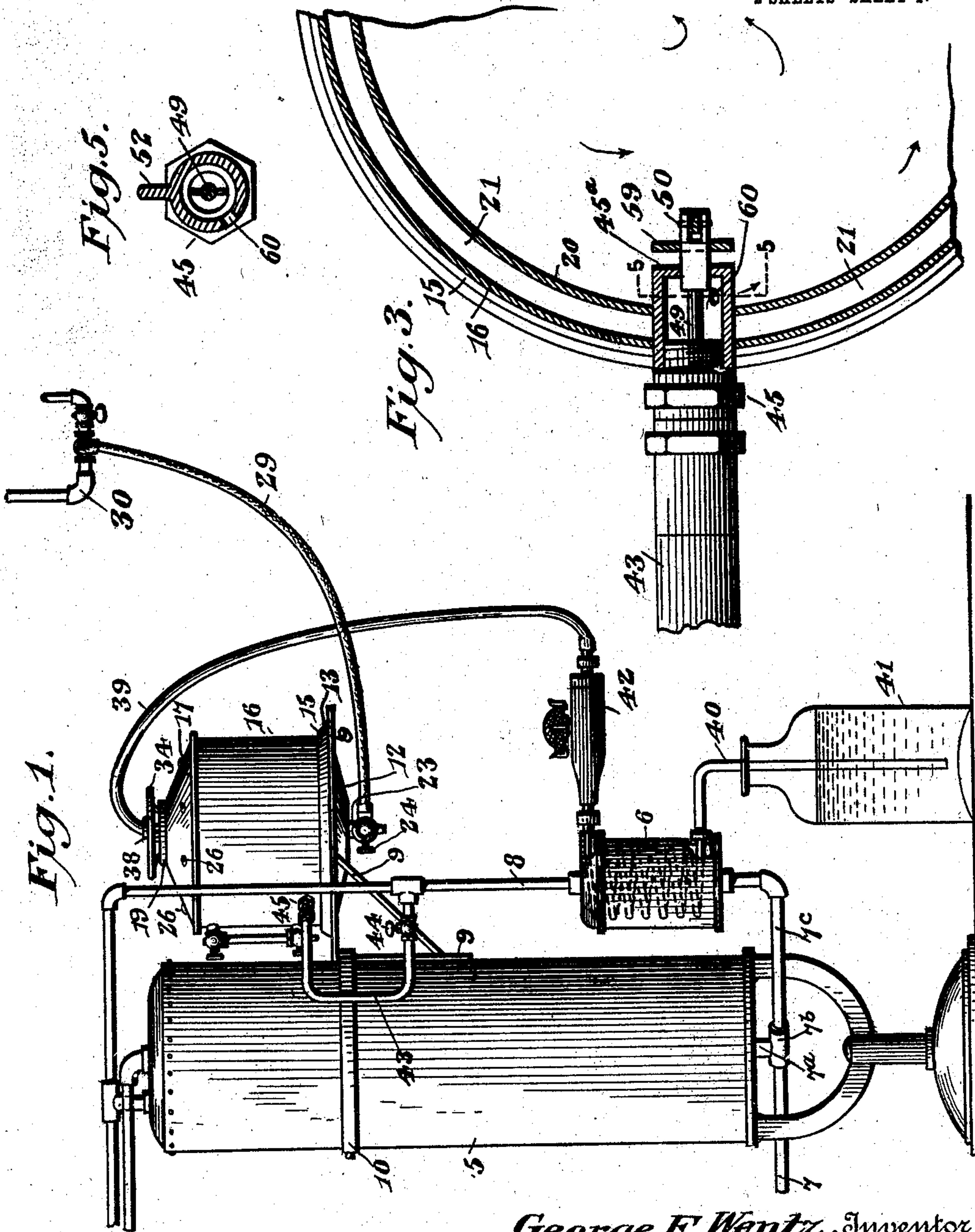


No. 815,392.

PATENTED MAR. 20, 1906.

G. F. WENTZ.
DISTILLING APPARATUS.
APPLICATION FILED JAN. 27, 1904.

2 SHEETS—SHEET 1.



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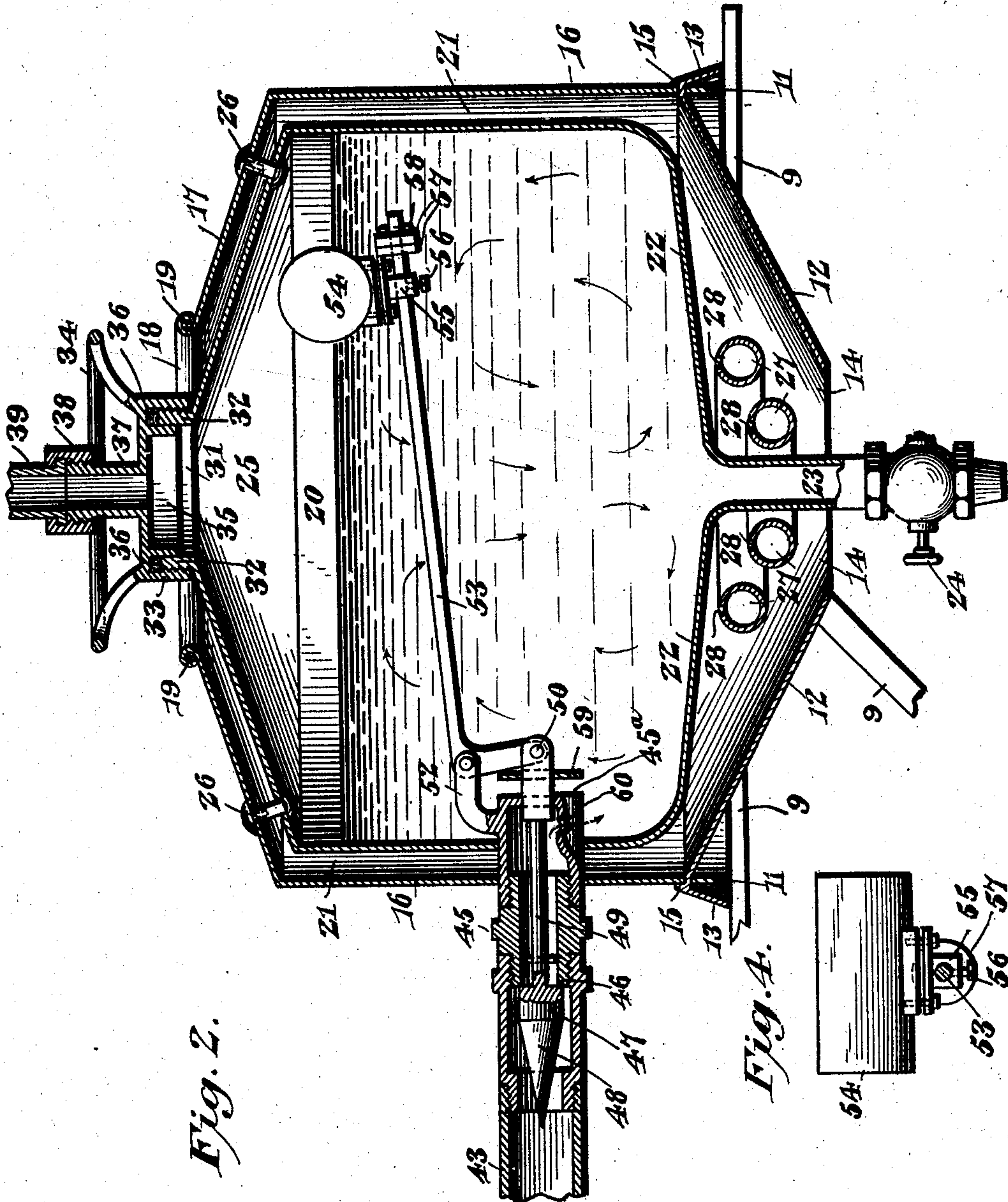


Fig. 2.

Fig. 4.

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GEORGE FRANKLIN WENTZ, OF ST. LOUIS, MISSOURI.

DISTILLING APPARATUS.

No. 815,392.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed January 27, 1904. Serial No. 190,832.

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.

This invention relates to improvements in distilling apparatus, especially of that type employed in the distillation of water, though perhaps useful for other analogous purposes.

The present invention relates more particularly to improvements in the steam-generator, its construction, means of support, and the means of supplying water thereto.

One of the features resides in mechanism which will permit the attachment of the generator to and its support upon a steam-boiler, where it may be properly associated with the other elements that go to make up the distilling apparatus as a whole.

Another feature relates to novel automatic means for supplying water to the generator so that the said water will effect the automatic cleansing of the same.

Still another feature is the construction, arrangement, and combination of the elements that constitute the generator as a whole, whereby a desirable and effectual manner of heating the water is obtained and all the parts are accessible for the purpose of repair, renewal, or adjustment.

In the drawings accompanying this specification, Figure 1 is a side elevation of the improved distilling apparatus. Fig. 2 is a vertical sectional view, on an enlarged scale, through the generator. Fig. 3 is a detail horizontal sectional view through a portion of the same. Fig. 4 is a side elevation of the float employed, and Fig. 5 is a detail sectional view taken on the line 5 5 of Fig. 3.

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

The distilling apparatus is associated with an ordinary stand-boiler, (designated 5,) alongside the lower portion of which is arranged a condenser-tank 6. A water-inlet pipe 7 has a branch connection 7^a through a coupling 7^b with the lower portion of the reservoir or boiler 5, and said pipe leads, as shown at 7^c, to the bottom of the tank 6, and a water-outlet pipe 8 extends from the top of the tank 6 and is in communication with the top of the reservoir or boiler 5. Brackets 9 are located against one side of the boiler and are secured thereto by a clamping-band 10, which sur-

rounds said boiler. The horizontal arms of these brackets support a ring 11, (shown in Fig. 2,) which ring constitutes the holder for the steam-generator. This generator has an outer casing partly formed by a bottom 12, that is in the form of an inverted truncated cone, having a depending annular flange 13, that surrounds the ring, said bottom resting upon the ring, as illustrated in Fig. 2, and having a central opening 14. The annular flange 13 extends above the upper surface of the casing a slight distance, constituting an annular rib or bead 15, that forms a seat for the annular cylindrical wall 16 of the casing. This casing-wall 16 carries at its upper end a conical top 17, having a central opening 18, surrounded by a bead 19. Within the casing is located the generator proper, which is in the form of a cylindrical receptacle 20, spaced from the walls of the casing to form an annular flue 21. The bottom 22 of this receptacle inclines downwardly to a centrally-disposed depending sediment-trap tube 23, which tube extends through the central opening 14 of the casing-bottom 12 and is provided with a suitable turning valve 24. The top of the casing is in the form of a truncated cone 25, disposed substantially parallel to the top 17 of the casing, but spaced therefrom, as shown. The receptacle is suspended within the casing by means of suitable bolts or rivets 26, connecting the tops 17 and 25. As will be seen by reference to Fig. 2, there is considerable space between the bottom of the receptacle and the bottom of the casing, this space affording sufficient room for a suitable burner, shown in the present instance in the form of a pair of concentric-ring tubes 27, surrounding the sediment-trap and having orifices 28 in their upper sides. This burner or heater is connected with any suitable source of gas-supply—as, for instance, by a tube 29, attached to an adjacent gas-bracket 30. (Shown in Fig. 1.)

The top 25 is provided with a comparatively large centrally-disposed hand-opening 31, surrounded by an upstanding exteriorly-threaded boss 32. Said hand-opening is normally closed, however, by means of a flange-cap 33, screwed upon the boss and having a hand-wheel 34, by means of which it may be readily operated. This cap is also provided with an annular internal flange 35, arranged to fit within the boss 32 and constituting means for holding suitable packing, as 36, which prevents the escape of steam through

this joint. The cap is furthermore provided with a centrally-disposed upstanding nipple 37, to which is coupled, by means of a sleeve 38, one end of a steam-pipe 39, said steam-pipe being of considerably less diameter than the diameter of the hand-opening. The steam-pipe 39 extends through the condenser-tank 6 and terminates in a water-discharge pipe 40, which may be introduced into a suitable receiving vessel 41. An air purifier and mixer 42 is located in the pipe 39.

Means are employed for automatically supplying water to the generator. As illustrated in Fig. 1, a water-supply pipe 43 leads from the outlet-pipe 8 between the condenser-tank and the reservoir or boiler 5 to the lower portion of the generator-receptacle 20. The passage-way through this pipe can be closed by means of a turning valve 44, Fig. 1, so that, if desired, the supply of water can be entirely cut off. An automatically-operated valve is also provided for this purpose and is fully illustrated in Fig. 2. The pipe 43 terminates in a horizontally-disposed nozzle, (designated as a whole by the reference-numeral 45,) the inner end of which is in the form of a cap or head 45^a, that projects into the receptacle 22. This nozzle contains a valve-seat 46, with which coacts a valve 47, arranged within the nozzle. The valve opens against the pressure of the water, and one end thereof coacts with the valve-seat, the opposite end, or, in other words, that opposed to the flow of the water, being made conical, as shown at 48, for the purpose of offering as little resistance as possible to such flow. The valve carries a stem 49, that projects beyond the inner end of the nozzle into the receptacle, where it is pivoted, as shown at 50, to the depending short arm of a bell-crank lever, that is pivoted to a bracket 52, forming a part of the inner end of said nozzle. Another arm 53 of this bell-crank lever extends transversely of the receptacle, and on its free end is mounted a cylindrical float 54. An ear 55 is attached to this float and is adjustably mounted on the arm 53, being normally held against movement, however, by a set-screw 56. On the outer end of the arm 53 are secured suitable counterweights 57, held in place by a cotter or split key 58. It is to be noted by reference to Figs. 2, 3, and 5 that the inner end of the nozzle is closed with the exception of the small opening in the cap or head, through which the valve-stem 49 extends and fits as snugly as is desirable to prevent the passage of water thereto, such passage, moreover, being prohibited by a washer 59, located upon the stem and movable into engagement with the end wall of the nozzle when the float is depressed. The outlet for the water is through a lateral discharge-orifice 60, that extends in a plane perpendicular to the stem and is inclined downwardly, so as to form an angle with the horizontal and with

the bottom 22, which orifice thus projects the water downwardly against the bottom 22 of the receptacle and at an inclination to said bottom for the purpose hereinafter pointed out.

The operation of the apparatus is as follows: Assuming that the boiler or reservoir 5 is supplied with water under pressure, it will be evident that the condenser-tank 6 will likewise be filled and that water flowing through the supply-pipe 43 will enter the generator-receptacle 20 until the float 34 rises sufficiently to close the valve 47. If heat is now applied to the receptacle from the burner, the water therein will be heated and brought to a boil. Particular attention is invited to Fig. 2, which shows the circulation of such water. Instead of an outward circulation, as is ordinarily the case with a receptacle, the heat being supplied not only to the bottom, but to the sides, will cause an upward and inward circulation at said sides and a downward circulation at the center. The effect is that the sediment will to a great extent be deposited at the center, and thus find its way into the sediment-trap 23. The steam generated will of course find its way through the pipe 39 and be condensed within the tank 6, the condensed water finding an outlet into the vessel 41. This condensation of the steam will of course heat the water in the tank 6, which will enter the top of the boiler or reservoir 5. As the level of the water within the generator-receptacle falls, due to the carrying off of the steam, the float will fall with it, and consequently a fresh supply of water will be introduced through the supply-pipe 43. Now, as this supply-pipe is connected with the outlet-pipe 8 for the heated water, it will be evident that heated water will be furnished to the steam-generator. Moreover, this water will be projected downwardly and at an inclination against the bottom 22 of the receptacle, causing a gyratory movement of the body of water within the receptacle, which movement thoroughly cleanses and scours the bottom and gradually works the sediment deposited thereon to the trap 23, whence it may be drawn. Thus to thoroughly cleanse the receptacle, it is only necessary to open the valve of the sediment-trap and permit the water to flow therefrom for some time. When said trap 24 is opened, the water contained in the receptacle of course passes out through said trap, and the float, sinking with the level of the water, opens the valve 47 to its fullest extent. The washer 59, secured to the outer end of the valve-stem 49, thereupon abuts against the end 45 of the nozzle, consequently closing the opening therethrough, and thus securing the full force of the escaping water through the orifice 60. This washer, furthermore, constitutes a stop that limits the downward movement of the float and arm in order to

prevent its striking the bottom of the receptacle.

It will be evident that this arrangement has many advantages, as it secures purified water practically without the necessity of the attention of an operator. The supply of water to the generator being automatic, there is no danger of burning out the elements, and this automatic supply practically constitutes the means for keeping the generator in a sanitary condition. The entire structure can be readily supported upon an ordinary stand-boiler and attached to any convenient source of gas-supply. Moreover, access can be readily gained to any or all of the parts. The casing is so constructed that the burner may be readily reached, and by removing the cap 33 the hand may be passed into the receptacle and by disassociating the parts therein the float and valve connections may be easily removed.

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-tank, a water-inlet pipe connecting the lower portion of the reservoir and the lower portion of the condenser-tank, a water-outlet pipe connecting the upper portion of the reservoir and the upper portion of the condenser-tank, a steam-generator, a steam-pipe extending from the generator to the condenser-pipe, and a water-supply pipe extending from the outlet-pipe between the condenser-tank and reservoir to the steam-generator.

2. In distilling apparatus, the combination with a reservoir, of a condenser-tank, a water-inlet pipe connecting the bottom of the reservoir and the bottom of the condenser-tank, a water-outlet pipe connecting the top of the reservoir and the top of the condenser-tank, a steam-generator, a steam-pipe extending from the generator to the condenser-tank, a water-supply pipe extending from the outlet-pipe between the condenser-tank and reservoir to the lower portion of the steam-generator, and means located within the generator for controlling the supply of water through the supply-pipe to the same.

3. In distilling apparatus, a steam-generator comprising a receptacle having a bottom and means for supplying water to the receptacle, said means including a discharge-orifice that extends downwardly at an inclina-

tion to the bottom, said orifice thus projecting the water downwardly upon and at an inclination to the bottom of the receptacle, and means for drawing off the water from the lower portion of the receptacle.

4. In distilling apparatus, a steam-generator comprising a cylindrical receptacle having a bottom, and means for supplying water to the receptacle, said means including a discharge-nozzle having an orifice that projects the water laterally and at a downward inclination into the same to effect the gyratory movement of the body of water contained in said receptacle, and means for drawing off the water from the receptacle.

5. In distilling apparatus, a steam-generator comprising a cylindrical receptacle having a bottom provided with a centrally-disposed sediment-trap, a draw-off valve in the trap, and means for supplying water to the receptacle, said means including a nozzle provided with a discharge-orifice that inclines downwardly toward the bottom and projects the water downwardly and at an inclination to said bottom to effect a gyratory movement of the water over the bottom about the sediment-trap.

6. In distilling apparatus, a steam-generator comprising a receptacle, means for heating the receptacle, a water-supply pipe communicating therewith and having a valve-seat, a valve opening against the pressure of the water, said valve having one end coacting with the valve-seat and its opposite end opposed to the flow of the water, said opposite end being tapered, a stem connected with the valve, and a float located within the receptacle and connected with the stem.

7. In distilling apparatus, a generator comprising a receptacle, means for heating the same, a water-supply pipe having a horizontally-disposed nozzle arranged therein and provided with an offset discharge-orifice, a valve arranged within the pipe and having a stem projecting from the end of the nozzle, a bell-crank lever pivoted at its elbow within the receptacle, one arm of the lever being connected to the valve-stem, and a float attached to the other arm.

8. In distilling apparatus, a cylindrical receptacle having a top provided with a hand-opening, a threaded boss surrounding the opening, a cap screwed upon the boss and having an annular flange fitting within the same, packing interposed between the outer wall of the cap and the flange, said cap being provided with an upstanding nipple, a steam-pipe detachably secured to the nipple, a water-supply pipe communicating with the interior of the receptacle, a valve controlling the same, and float mechanism arranged within the receptacle and connected with the valve, said mechanism being accessible and removable through the hand-opening of the receptacle.

9. In distilling apparatus, the combination
with a generator comprising a receptacle hav-
ing a downwardly-inclined bottom provided
with a valved sediment-discharge, of means
5 for delivering water to the receptacle, said
means including a nozzle that directs the wa-
ter downwardly toward and at an inclination
to the bottom.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature 10
in the presence of two witnesses.

GEORGE FRANKLIN WENTZ.

Witnesses:

FRANK EARNEST SELBY,
ELISHA HUBBARD DUTTON.