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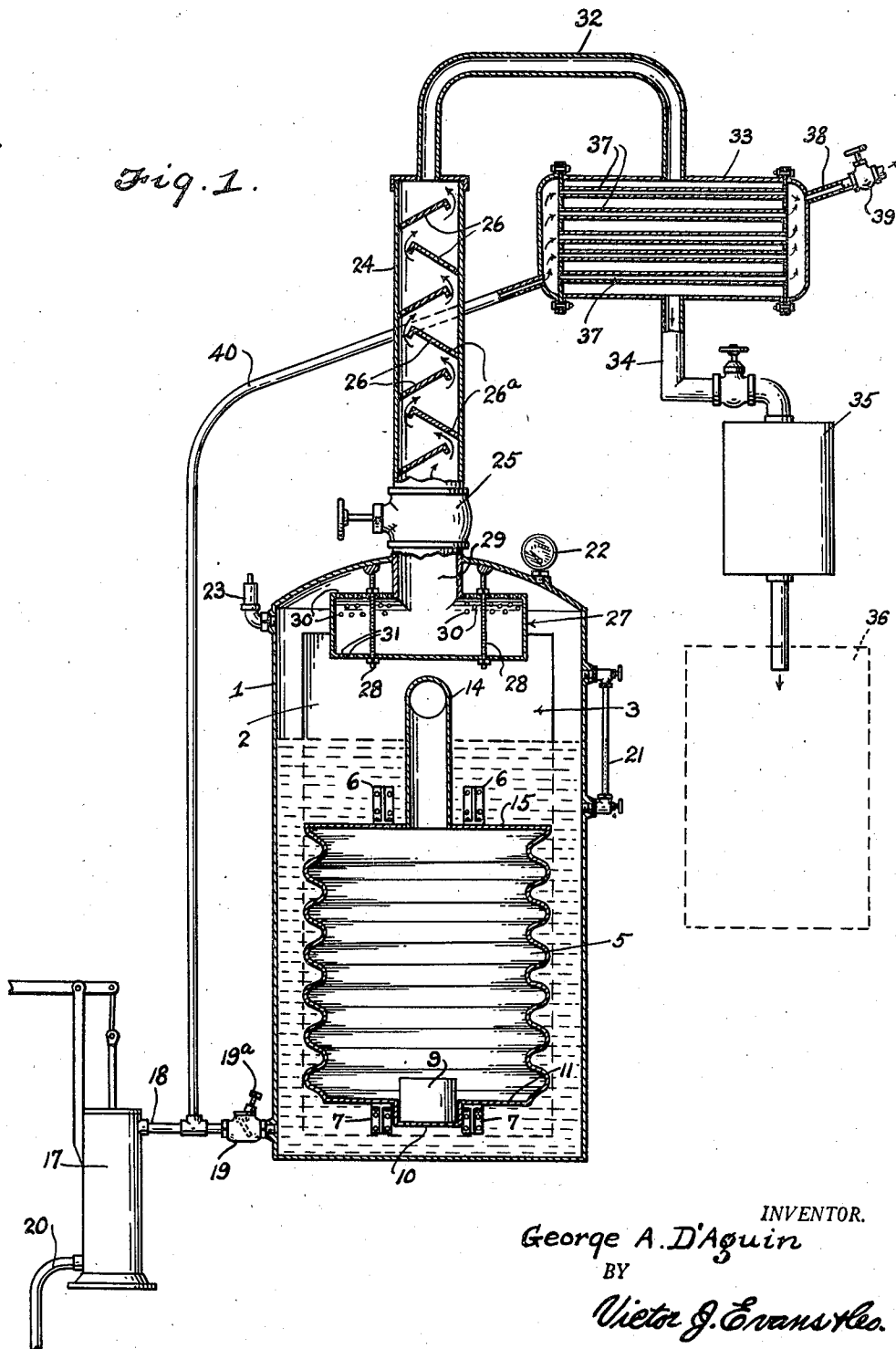
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2,420,935

EVAPORATING SET

Filed Jan. 29, 1944

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

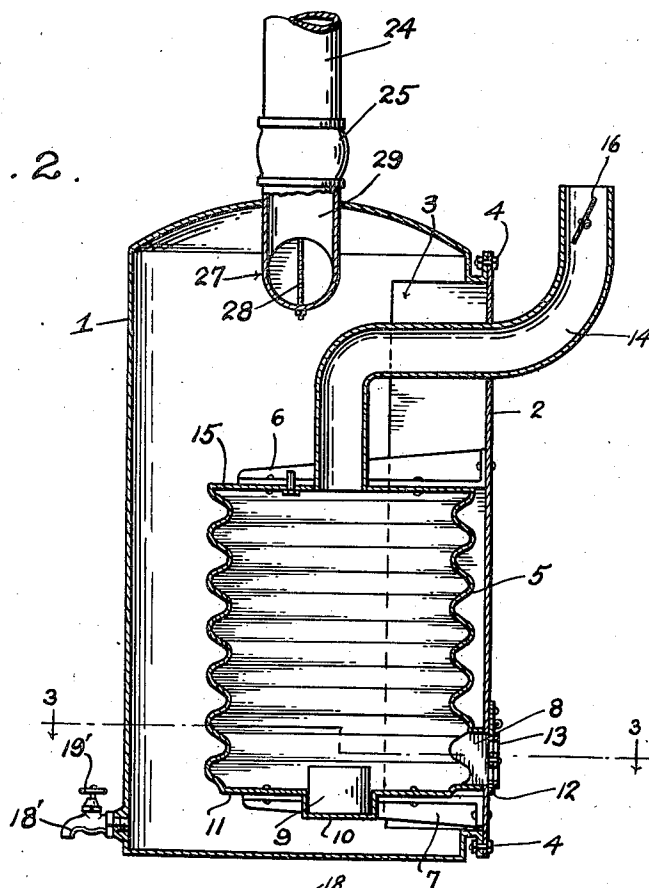
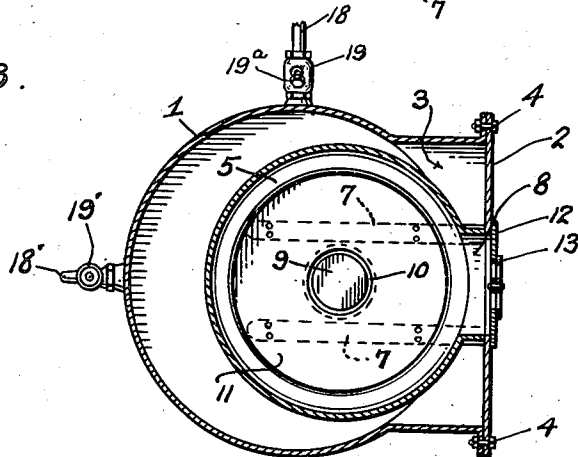


Fig. 3.



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UNITED STATES PATENT OFFICE

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EVAPORATING SET

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2 Claims. (Cl. 122-16)

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This invention relates to a water purifier and it is one object of the invention to provide an apparatus of this character by means of which sea water may be purified and rendered fit for drinking.

Another object of the invention is to provide the apparatus with a boiler having a heater of improved construction mounted therein and carried by a door which is movable outwardly to an opened position and carries the heater with it so that cleaning and repairs may be readily performed.

Another object of the invention is to so form and mount the heater that a supply of fuel may be set in place therein without opening the door carrying the heater.

Another object of the invention is to provide the heater with an outlet for vapor having a guard of special construction which serves very effectively to prevent water from passing out with the steam or vapor during operation of the apparatus.

Another object of the invention is to provide an apparatus of this character wherein water may be pumped into the boiler and also to a condenser as means for converting the steam into water.

Another object of the invention is to provide a water purifier which is of light weight and quite small and compact, thus permitting it to be used in a life boat or raft and easily carried ashore after a landing has been made.

The invention is illustrated in the accompanying drawings wherein:

Figure 1 is a view showing the improved water purifier partially in vertical section and partially in elevation.

Figure 2 is a sectional view upon an enlarged scale taken vertically through the boiler.

Figure 3 is a sectional view taken transversely through the boiler.

This improved water purifier has a boiler 1 which may be of any dimension desired but is preferably of such size that it can be conveniently placed in a life boat and carried ashore for use by occupants of the boat after reaching land if necessary. The boiler has an opening at one side which is normally closed by a door or closure 2 having water tight engagement with walls of the side opening 3. While a suitable number of bolts 4 have been shown as means for holding the door closed and forming a tight seal about margins of the door it will be understood that other means may be used.

Within the boiler is a fire box 5 which is

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formed of metal and is disposed vertically in the boiler. Walls of the fire box are corrugated circumferentially to permit expansion and contraction and in order to support the fire box there have been provided brackets 6 and 7 which project from the inner surface of the door and are secured against the top and the bottom of the fire box in transverse spaced relation to each other. By so mounting the fire box it will be carried by the door and when the door is opened the fire box will be shifted out of the boiler to a position in which it can be easily cleaned or repaired. The neck 8 extends laterally from the fire box so that a package of fuel 9 may be thrust into the fire box and set in the pocket or seat 10 of the bottom 11 thereof and in order to normally close the neck there has been provided a door 12 having a damper 13 for controlling flow of air into the fire box. A flue 14 extends upwardly from the center of the top 15 of the fire box and outwardly through the door 2 with its outer portion directed upwardly and carrying a damper 16 for controlling flow of products of combustion through the flue.

The boiler is filled with water which is forced into the same from a pump 17 through a pipe 18 and a check valve 19 which opens in the direction of the boiler and the extent of the opening of which is regulated and controlled by a screw 19a. The pump may be of any desired construction and has an inlet hose or flexible pipe 20 of sufficient length to be dropped over the side of a boat and into the ocean or other body of water on which the life boat is floating. A water gauge 21 is provided for determining the depth of water in the boiler. As the water is converted into steam or vapor it rises in the boiler to the top thereof and in order that danger or damage by an explosion be prevented there have been provided a pressure gauge 22 and a safety valve 23. The steam or vapor passes out of the boiler through a flue 24 controlled by a valve 25 and in order to prevent too rapid movement of steam through this flue there have been provided baffle plates 26 disposed at an incline and extending in opposite directions in overlapping relation to each other. Each baffle plate 26 is provided near its lower end with a drain opening 26a. A cylindrical guard 27 controls flow of steam into the flue and is disposed horizontally in the upper portion of the boiler where it is secured by hanger bolts or rods 28 with its upstanding neck 29 registering with the inlet of valve 25. Perforations 30 are formed in the upper portion of the guard and from an inspection of

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Figure 1 it will be seen that the steam must rise over the guard before it can enter the same through the perforations. By providing drain openings 31 at the bottom of the guard, any condensation within the guard will return to the boiler.

The steam or vapor which reaches to the top of flue flows through a pipe 32 and through the depending end portion thereof into a condenser 33. This condenser is of cylindrical formation and extends horizontally with its discharge pipe extending downwardly from its bottom and connected with a chemical water sweetener 35 through which the water passes before it is delivered into a water receptacle 36. Cooling water flows through tubes 37 of the condenser and out through a discharge pipe 38 having a globe valve 39. In order to supply cooling water to the condenser there has been provided a pipe 40 leading from the pipe 18 at a point between the pump 17 and the check valve 19. When the valve 39 is choked down or closed and the pump 17 is in operation, there will be built up in the salt water side of the condenser a pressure greater than that in the boiler, whereby to permit water to be fed to the boiler. When the valve 39 is opened the water will flow freely through the condenser, with the result that the vapor entering the condenser will be condensed and flow from the condenser into the sweetener and from the sweetener into the fresh water receptacle.

Having thus described the invention, what is claimed is:

1. A boiler for a water purifying apparatus having a side opening, a closure for the side opening movable into and out of closed relation thereto, a fire box carried by said closure and disposed within said boiler when the closure is in closing relation to the side opening, said fire box having a neck registering with an opening in the closure for insertion of a heating medium into the fire box, the bottom of the fire box being formed with a pocket to receive the heating medium, a flue extending upwardly from the

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fire box and out through the closure, a flue on said boiler, a valve in said flue controlling the emission of steam from said boiler through said flue, a conduit leading from the top of the flue for delivering vapor exteriorly of said boiler, and a pump for supplying water directly to the boiler.

2. A boiler for a water purifying apparatus disposed vertically and having a side opening, a closure for the side opening removably held in closing relation thereto, a fire box disposed vertically in said boiler when the closure is in its normally closed position, brackets carried by said closure and projecting from the inner face thereof and secured to the top and the bottom of the fire box for supporting the fire box and withdrawing the fire box from the boiler when the closure is opened, a flue on said boiler, a valve in said flue for controlling the emission of steam from said boiler, baffle plates in said flue, a conduit for delivering vapor from the flue exteriorly thereof, and a pump for supplying water directly to the boiler.

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