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A. P. GEER.

EVAPORATOR.

APPLICATION FILED SEPT. 28, 1904.

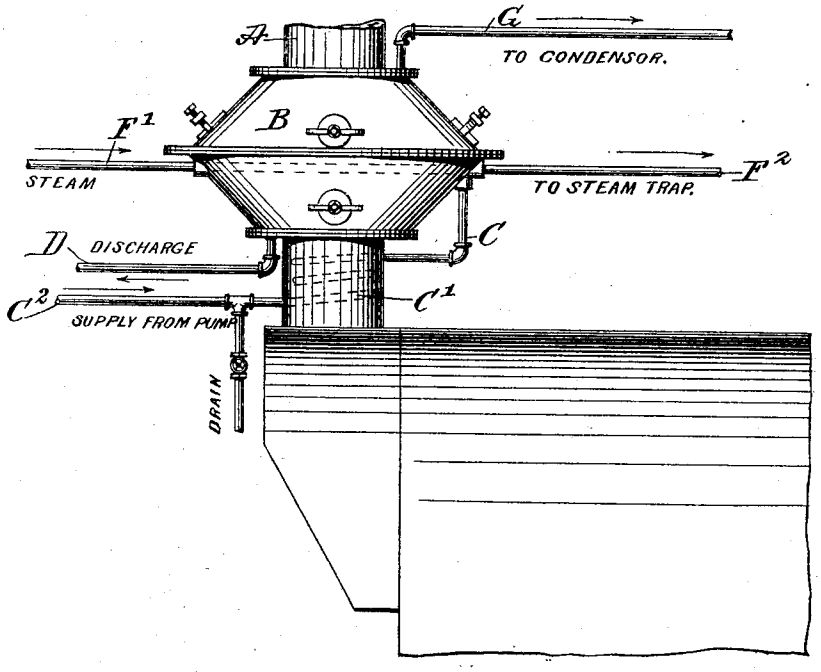

Fig. 1

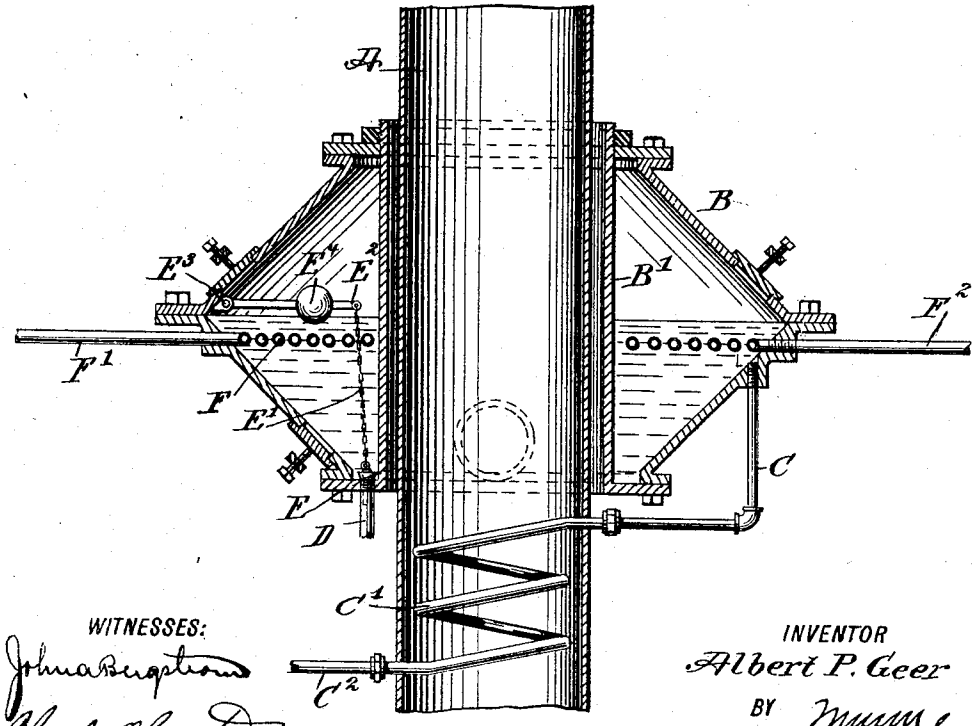

Fig. 2

WITNESSES:

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EVAPORATOR.

No. 796,839. Specification of Letters Patent. Patented Aug. 8, 1905.

Application filed September 28, 1904. Serial No. 226,326.

To all whom it may concern:

Be it known that I, ALBERT P. GEER, a citizen of the United States, and a resident of New London, in the county of New London and State of Connecticut, have invented a new and Improved Evaporator, of which the following is a full, clear, and exact description.

The invention relates to apparatus used on board marine vessels for evaporating salt water and condensing the vapors for the production of water fit for use in the boilers and for other purposes.

The object of the invention is to provide a new and improved evaporator which is simple and durable in construction, very effective in operation, and arranged to insure a proper evaporation of the salt water without danger of clogging the apparatus or rendering the same ineffective.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a side elevation of the improvement as applied to the stack of a boiler, and Fig. 2 is an enlarged transverse section of the same.

The stack A of the boiler passes through a tube B′, extending centrally through and forming part of a closed vessel B, into which discharges a pipe C, having a portion formed into a coil C′, located within the stack A, the said pipe being connected at the entrance end to the coil by a pipe C^2 with a pump or like device for forcing the salt water into the vessel B, the water during its passage through the coil C′ receiving a preliminary heating. From the bottom of the vessel B leads a water-discharge pipe D, having an outlet-valve E controlled by a float, so as to maintain the water in the vessel B at a uniform level, it being understood that the inflow of the water to the vessel B by way of the pipe C corresponds to the aggregate amount of the water evaporated and the water saturated and discharged from the vessel to keep the saturation down to as low a point as possible. For the purpose mentioned the valve E is connected by a chain E′ with a float-lever E^2, fulcrumed at E^3, within the vessel B, and on the said float-lever E^2 is held a float E^4, rising and falling with the water in the vessel B. At or immediately below the level of the water in the vessel B is arranged a steam-coil F for heating the water in the said vessel to such a degree as to insure a rapid surface evaporation, and the entrance end F′ of the said coil is connected with a steam-supply and the exit end F^2 of the coil connects with a suitable steam-trap or other device.

From the top of the vessel B leads a pipe G to a condenser for condensing the vapors, or the pipe may be connected with the boiler-pump.

It is understood that the heat passing up the stack A assists in heating the water in the coil C′ and in the vessel B; but in order to insure a quick and proper evaporation of the water it is necesssary to highly heat the same immediately below the level of the water, which is kept constant by the float-controlled discharge-valve E, so that the saturated water and the impurities falling to the bottom of the receptacle can readily flow out by way of the pipe D, thus allowing the coil F to evaporate the water unhampered by the water which is saturated and charged with precipitating sediment. Thus from the foregoing it will be seen that in order to insure proper working of the evaporator it is necessary to insure a proper discharge of the saturated water and to heat the water immediately below its level kept constant by the float-controlled outlet. The vapors pass from the top of the vessel B by way of the pipe G to the condenser to be condensed, and the resultant water of condensation is then pumped to the boiler or to a storage vessel; but, if desired, the pipe G may be directly connected with the water-feeding device of the boiler.

It is expressly understood that the constant supply of the salt water to the vessel B corresponds to the aggregate amount of the water evaporated and the saturated water running out of the discharge-pipe D, and in practice the valve E will remain open most of the time and close only temporarily on the water falling below the normal level.

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

1. A salt-water evaporator comprising a closed vessel having a vapor-outlet and a constant water-discharge, means for constantly supplying the said vessel with salt water to

an amount corresponding to the aggregate amount of evaporated and discharged water, to maintain a uniform level of the water in the said vessel, and means for heating the water immediately below the said water-level.

2. A salt-water evaporator comprising a closed vessel having a vapor-outlet and a constant water-discharge, means for constantly supplying the said vessel with salt water to an amount corresponding to the aggregate amount of evaporated and discharged water, to maintain a uniform level of the water in the said vessel, means for heating the water immediately below the said water-level, and a float-controlled valve for the said water-discharge.

3. A salt-water evaporator comprising a closed vessel, means for heating the same, a water-supply for the said vessel, a float-controlled water-outlet for the said vessel, to maintain a uniform level of the water in the vessel, a vapor-outlet for the vessel, and means for heating the water in the vessel at or immediately below the level of the water.

4. A salt-water evaporator comprising a closed vessel arranged for attachment to a stack, to surround the same, a water-inlet for the vessel, a valved water-discharge leading from the bottom of the vessel, a float for controlling the said valved outlet, to maintain a uniform level of the water in the said vessel, a heating-coil in the vessel, immediately below the level of the water, and means for carrying off the vapors.

5. An evaporator comprising a vessel for containing the liquid to be evaporated, and a heating means in the said vessel, bodily disposed immediately under the level of the liquid, to evaporate a portion of the liquid and to allow the saturated liquid to pass to the bottom of the vessel.

6. An evaporator comprising a vessel connected with a liquid-supply and having an outlet in its lower portion for the saturated liquid and a vapor-escape in the upper portion, a heating means in the said vessel, bodily disposed immediately below the level of the liquid, and regulating means for maintaining an approximately uniform level of the liquid in the said vessel.

7. An evaporator comprising a vessel connected with a liquid-supply and having an outlet in its lower portion for the saturated liquid and a vapor-escape in the upper portion, a heating means in the said vessel, bodily disposed immediately below the level of the liquid, and regulating means for maintaining an approximately uniform level of the liquid in the said vessel, the said regulating means being controlled by the inflow of the liquid and the said regulating means controlling the outflow of the liquid.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT P. GEER.

Witnesses:

THEO. G. HOSTER,

EVERARD BOLTON MARSHALL.