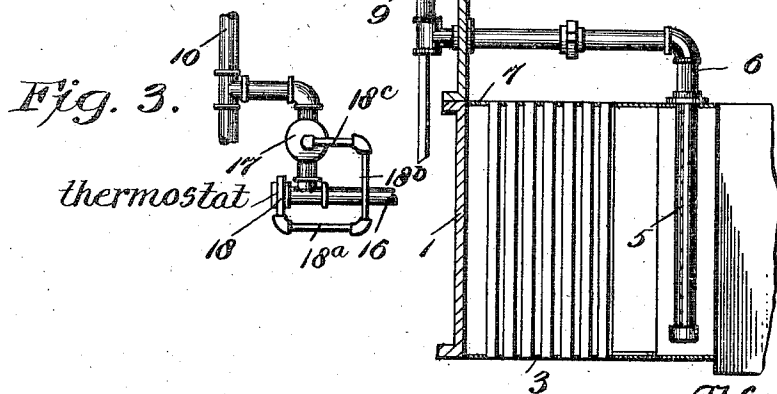
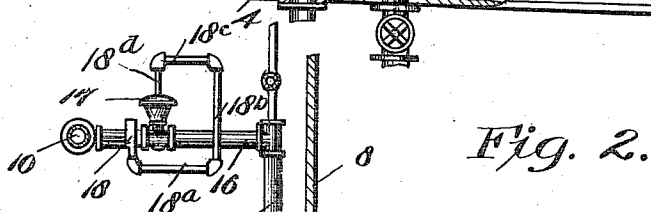
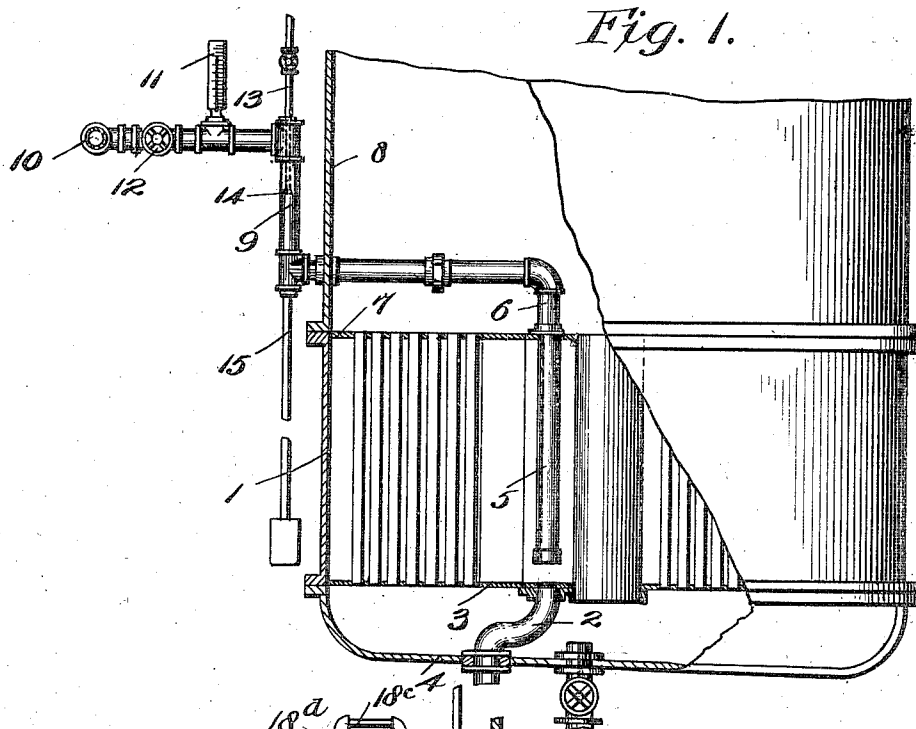


A. L. WEBRE.
 EVAPORATING APPARATUS.
 APPLICATION FILED MAR. 26, 1912.

1,049,426.

Patented Jan. 7, 1913.



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UNITED STATES PATENT OFFICE.

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EVAPORATING APPARATUS.

1,049,426.

Specification of Letters Patent.

Patented Jan. 7, 1913.

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To all whom it may concern:

Be it known that I, ALFRED L. WEBRE, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Evaporating Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in evaporating apparatus, such as vacuum pans and multiple effects, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of my invention is to provide an improved means for preventing the wasteful withdrawal of uncondensed steam from the steam belt of an evaporating apparatus, while insuring a continuous thorough withdrawal of the uncondensed heating gases therefrom.

A further object of my invention is to provide an improved means for insuring an economy of steam consumption in the steam belt of an evaporating apparatus, and for preventing the extent of effective heating surface from being reduced by the retention and accumulation of the heating gases in the steam belt.

In the accompanying drawings forming a part of this application, and in which similar reference symbols indicate corresponding parts in the several views:—Figure 1 is a fragmentary side elevation, partly broken away, showing one embodiment of my invention applied to the steam belt of an evaporating apparatus; Fig. 2 is a fragmentary section of the steam belt of an evaporating apparatus, with a modified form of my invention applied thereto; and Fig. 3 is a detail plan view of my improved regulating means shown in Fig. 2.

Referring to the drawings, 1 indicates the steam belt of an evaporating apparatus, which is provided with a drain pipe 2, extending from the lower tube sheet 3 through the bottom 4 of the apparatus, for discharging the water of condensation condensed from the steam circulating through said steam belt.

The air and other uncondensed gases of the heating medium are withdrawn by a

perforated pipe 5 extending within the steam belt, and communicating with a pipe 6 leading from the upper tube sheet 7 through the side 8 of the evaporating apparatus.

In order to insure an efficient operation and to avoid steam waste, it is necessary that the heating gases be withdrawn through the pipe 6 at a rate which will prevent an accumulation of gases in the steam belt and also prevent the wasteful withdrawal of steam therefrom. I have shown means for determining and controlling such rate of withdrawal, which comprise a vertical pipe, or cooler, 9 for conducting the gases from said pipe 6 to a header 10 leading to a condenser or vacuum pump; a thermometer 11 and valve 12 being inserted in the connection between said cooler and header. A small, fixed amount of water is continuously injected into the cooler 9 in a direction opposite to the flow of gases therethrough by a valved pipe 13 provided with a nozzle 14; said injected water escaping through a water sealed drain pipe 15. By this improved construction, if there be a wasteful amount of steam in the withdrawn gases, the small injection of water into the cooler 9 will not be sufficient to condense all of such steam, hence the latent heat liberated by the condensation of a portion of the steam will maintain the temperature of the mixture, and the thermometer 11 will indicate a temperature of the withdrawn gases substantially equal to that within the steam belt 1. When this condition occurs, the valve 12 is partially closed to decrease the rate of withdrawal of the gases, in order that the steam may be more completely condensed in the steam belt. On the other hand, if the withdrawn gases be entirely free from steam, said gases will be materially cooled by the continuous injection of water into the cooler 9, and the thermometer 11 will indicate a substantial drop in temperature; whereupon, the valve 12 will be opened to increase the rate of withdrawal for preventing accumulation of gases in the steam belt.

Figs. 2 and 3 illustrate a modification in which a connection 16 between the cooler 9 and header 10 is provided with a diaphragm valve 17 automatically actuated by a thermostat 18; thereby providing means

for automatically controlling the rate of withdrawal of the heating gases from the steam belt 1. A pipe 18^a, 18^b, 18^c and 18^d is shown connecting the thermostat 18 to the valve 17, to provide a protective casing for any suitable connection between said thermostat and valve.

From the above description, it will be clear that my invention provides means for causing an efficiently rapid circulation and withdrawal of the heating vapors in such manner as to insure an economical steam consumption and to prevent the accumulation of gases in the steam belt; thereby maintaining a maximum heating capacity of the entire heating surface and insuring a uniformity of operation.

I claim:—

In an evaporating apparatus provided with a steam belt, the combination of a conduit for withdrawing a heating medium containing steam from the steam belt, a thermal device in said conduit, a valve for controlling said conduit, connections to said thermal device for actuating said valve, and means for injecting a cooling fluid in said conduit at a point intermediate of said steam belt and thermal device.

In testimony whereof, I affix my signature, in presence of two witnesses.

ALFRED L. WEBRE.

Witnesses:

EDWARD HARE,
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