

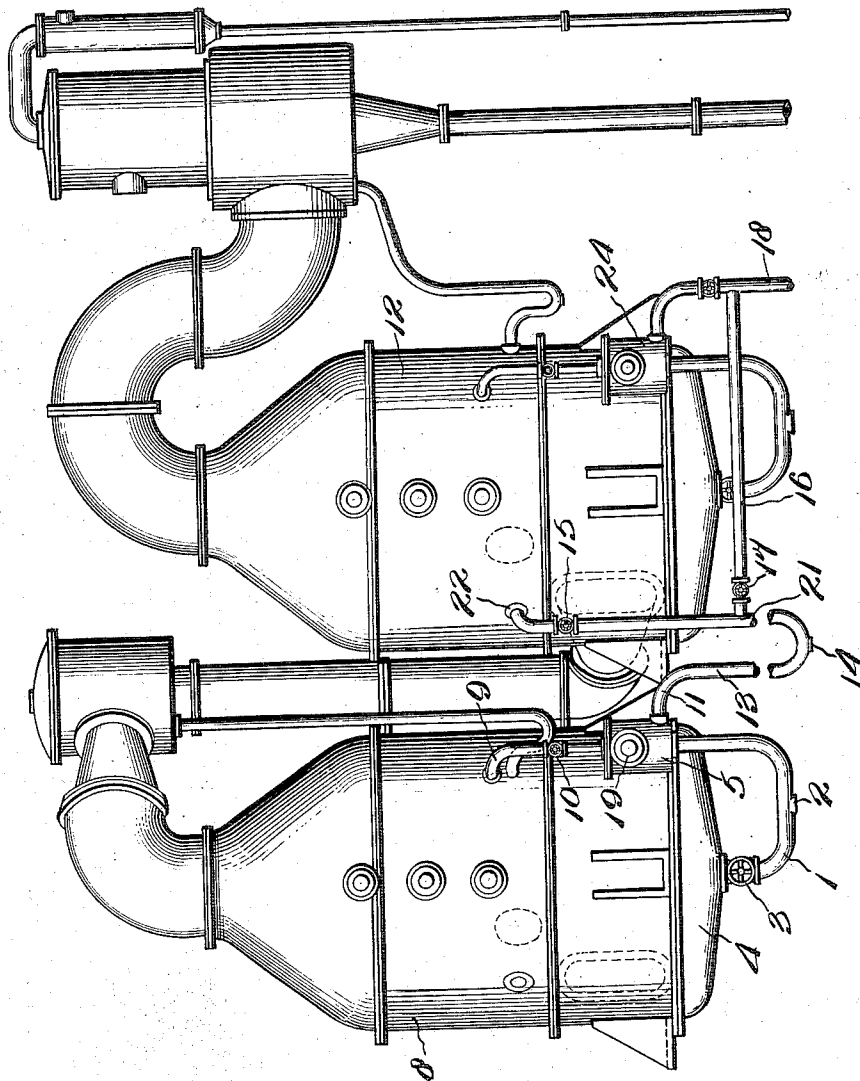
A. L. WEBRE.
 MULTIPLE EFFECT.
 APPLICATION FILED FEB. 2, 1912.

Patented Jan. 7, 1913.

2 SHEETS—SHEET 1.

1,049,424.

Fig. 1.



Witnesses
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 H. W. Primm.

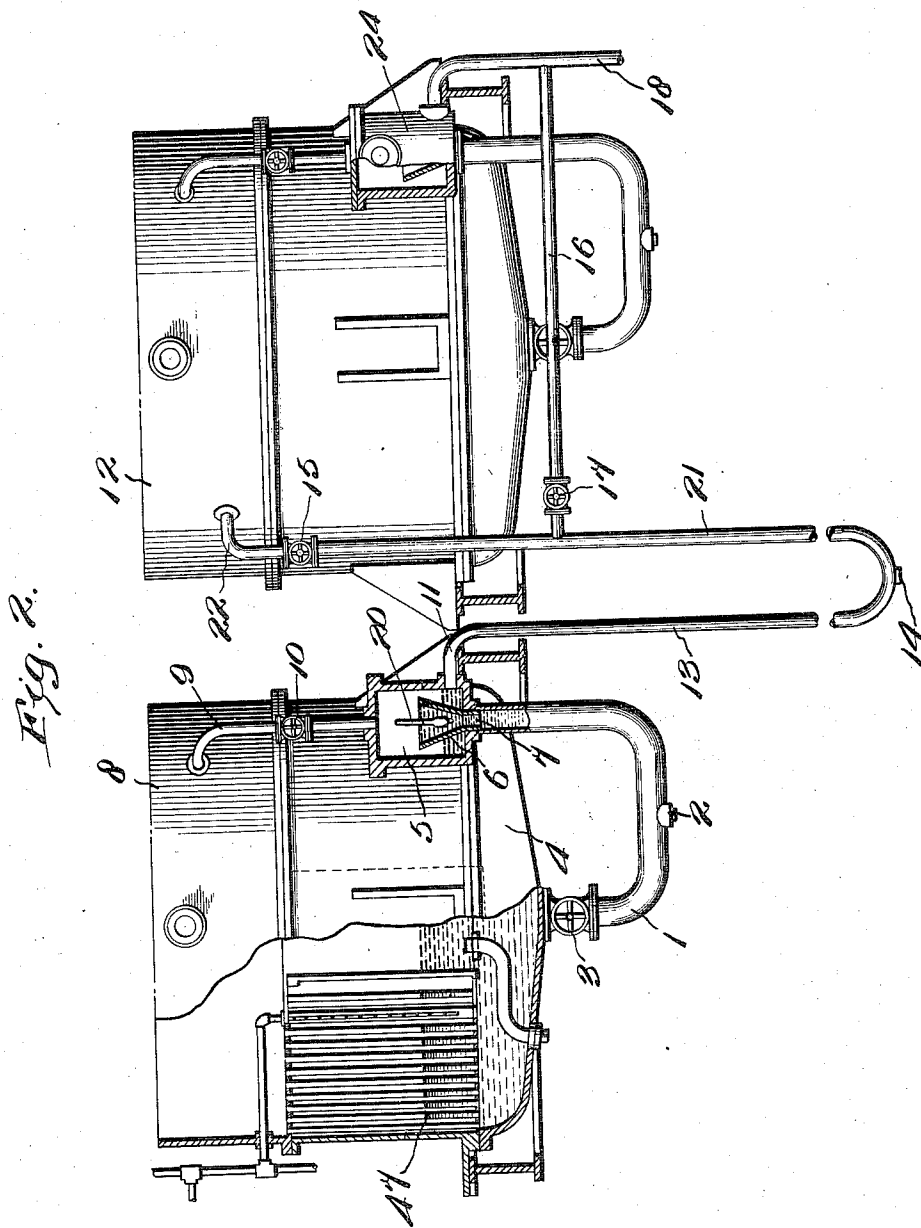
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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MULTIPLE EFFECT.

1,049,424.

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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 Multiple Effects; 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 multiple effects, or other evaporating apparatus, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of my invention is to provide an improved effect provided with automatic means for positively controlling the level of the boiling liquids, thereby permitting the boiling liquids to be safely maintained at a less head or level than has been heretofore possible; whereby the relatively rapid movement of such liquids will tend to scour the boiling side of the heating surfaces and prevent fouling of the latter.

A further object of my invention is to provide an improved gravity-actuated means for automatically controlling the level of the boiling liquids in a multiple effect, which is free from all moving parts and durable and certain in action.

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 side elevation of a double effect, illustrating one embodiment of my invention; Fig. 2 is an enlarged fragmentary view of the lower portion of Fig. 1, with parts broken away, to show means for automatically controlling the level of the boiling liquids.

Referring to the drawings, 1 indicates an outlet pipe from the bottom 4 of an effect 8, which is provided with a drain 2 and a manually-operated valve 3, and terminates in an over-flow discharge, or funnel 6 within a closed controlling chamber 5; said chamber being connected to the vapor belt of said effect by a small pipe 9 provided with a valve 10. An eye glass 19 is provided in the wall of the chamber 5 in position for conveniently reading a hydrometer 20, which latter is supported for limited movement in the funnel 6, said hydrometer float-

ing in the boiling liquids flowing slowly through the funnel 6, and indicating at all times the extent of evaporation.

A U-pipe, provided with a drain 14, and a manually-operated valve 15, has its short leg 13 connected at 11 to the controlling chamber 5, and its long leg 21 connected at a higher level 22 to the next, or succeeding, effect 12; said unequal legs 13 and 21 being so proportioned that the U-pipe will provide a sufficient head of the boiling liquid passing therethrough to overcome the difference of vacuum in said effects 8 and 12. The effect 12 is provided with a similar controlling chamber 24, which incloses an over-flow discharge and is connected at its top and bottom, respectively, with the vapor belt of said effect and with an outlet pipe 18. A by-pass 16, provided with a valve 17, connects the pipes 21 and 18, to provide a convenient means for cutting out the effect 12 and conducting the boiling liquids from the chamber 5 directly to the discharge pipe 18.

In the operation of this device, the liquid supplied to the effect 8 will be automatically maintained at a level 47 in line with the top of the over-flow discharge 6; said discharge 6 being positioned at the desired height. After the level 47 has been reached, the boiling liquids over-flow from said funnel 6 into the chamber 5 and fill the short leg 13 and a portion of the long leg 21, and are drawn into the next effect 12 by the greater vacuum therein. When normal running conditions have been established, the level of the liquid assumes such a position in the short leg 13 that the dynamic head of the flowing liquid plus the static head due to the height between such level and the top of the long leg 21 just balances the difference of vacuum between the two effects 8 and 12.

If desired, the automatic device for controlling the liquid level can be readily cut out by closing the valve 10, upon which, the controlling chamber 5 and the entire pipe system will become filled with the boiling liquids; under these conditions, the liquid levels in the effects can be regulated by the valve 15.

From the above description, it will be clear that my invention provides efficient means by which the level 47 of the boiling liquids can be maintained with certainty at

the lowest permissible point, thereby noticeably increasing the evaporation and causing the relatively rapidly moving liquids to exert a scouring effect which tends to prevent fouling of the heating surface.

I have illustrated and described my invention applied to a double effect, but it will be obvious that it may be similarly applied to all multiple effects, such as triple effects, quadruple effects, etc.

I claim:—

1. In a multiple effect, the combination of an over-flow discharge for the boiling liquids, a controlling chamber inclosing said over-flow discharge, means for maintaining said chamber at a pressure equal to that of the vapor belt of the effect, and a pipe connecting said controlling chamber to the succeeding effect at a level above that of the liquid discharge in said chamber.

2. In an effect, the combination of an over-flow discharge for the boiling liquids, means for maintaining said over-flow discharge in free communication with the vapor belt of the effect, means for closing said communication, and a pipe connecting said controlling chamber to the succeeding effect at a level above said over-flow discharge.

3. In a multiple effect, the combination of

an over-flow discharge for the boiling liquids, a controlling chamber inclosing said over-flow discharge, means for maintaining said chamber at a pressure equal to that of the vapor belt of the effect, and a U-pipe having its short leg connected to said controlling chamber and its long leg connected at a higher level with the succeeding effect.

4. In an effect, the combination of an over-flow discharge for the boiling liquids, a controlling chamber inclosing said over-flow discharge, and a density indicator within said chamber for indicating the rate of evaporation in the effect.

5. In a multiple effect, the combination of over-flow discharges for the boiling liquids of the several effects, independent controlling chambers inclosing said over-flow discharges and communicating with the vapor belts of the corresponding effects, and inverted siphons for conducting the liquid discharge from said several controlling chambers to the succeeding effects.

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

ALFRED L. WEBRE.

Witnesses:

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CAMILLE MASSON.