

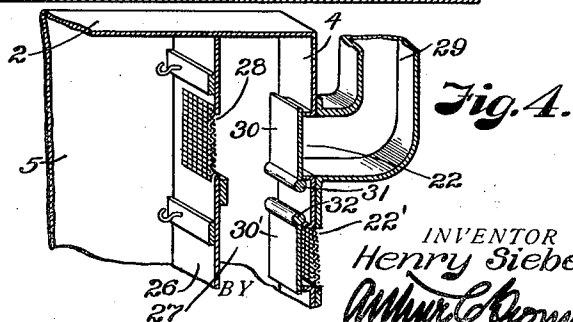
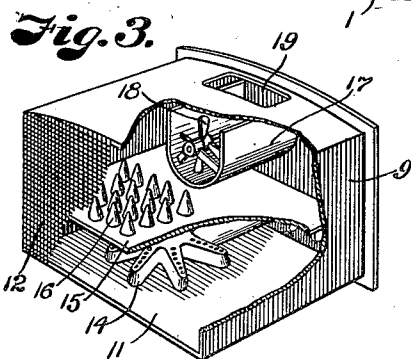
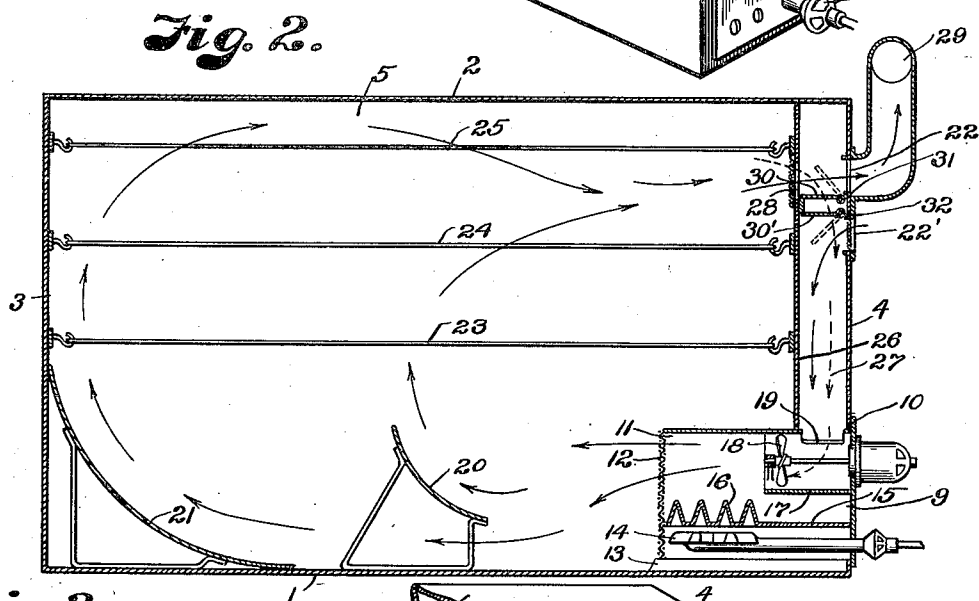
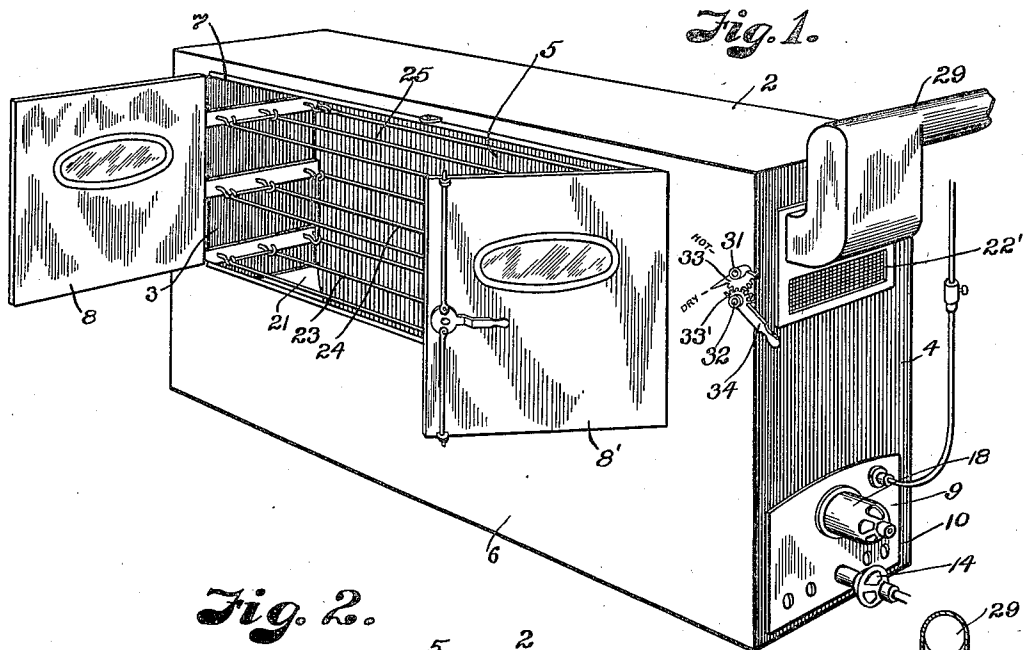
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H. SIEBEN

EVAPORATOR

Original Filed June 13, 1921



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UNITED STATES PATENT OFFICE.

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EVAPORATOR.

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To all whom it may concern:

Be it known that I, HENRY SIEBEN, citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Evaporators; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to a moisture evaporator, and particularly to clothes driers. One of the objects of the invention is to provide an efficient, durable and inexpensive means for inducing a current of heated air to circulate in the casing of the evaporator so as to dissipate the moisture, the moisture laden air being exhausted from the casing, preferably in such manner as to cause a counterflow so that the period of time that the moisture-absorbing air will remain in the casing will be sufficient to take up a maximum amount of moisture, and thereby economically evaporate the moisture from the clothes or other articles within the casing. This is an important feature because if the time period, due to the fact that the stream passing from the impeller to the exhaust is too short, the heated air will be exhausted before it has attained its maximum efficiency, but by providing for a counterflow, the air may remain in the casing, in some cases reaching substantially the point of saturation, before it exhausts, thus reducing the time required to dry the articles within the evaporator or casing.

I have also provided means whereby the effective arrangement of the casing may be varied, the means being shown as consisting of an adjustable baffle which will bend the stream lines of impelled air to any point between two extremes so that if a fractional part of the casing is provided with clothes, or other articles from which the moisture is to be evaporated, the baffle may be adjusted nearer the impeller, but if the maximum capacity of the device is to be employed then the baffle will be adjusted at the maximum distance from the impeller. This is also an important feature of my invention.

In the drawings,

Fig. 1 is a perspective view of an evaporator constructed in accordance with my invention.

Fig. 2 is a vertical, longitudinal, sectional view through the same.

Fig. 3 is a fragmentary, perspective view of a unit for heating and impelling the air to be circulated within the casing, and

Fig. 4 is a fragmentary perspective view of one end of the drier.

The casing is shown as consisting of a substantially rectangular hollow body having a bottom 1, top 2, ends 3 and 4, back wall 5 and front wall 6. The front wall is provided with an opening 7 which may be closed by hinged doors 8 and 8'. The particular form of the casing, however, may be varied to suit requirements. In the end wall 4 of the casing and near the bottom thereof is located means for heating the air to be circulated within the casing, and there is also means for inducing the circulation or impelling the air. The air impelling means and the heating means may be constructed in unitary form by providing a removable stove or casing 9, which is substantially rectangular and which may be introduced through an opening 10 in the wall 4. The casing 9 is open at its inner end as indicated at 11, the opening being preferably provided with a screen 12, as clearly seen in Figs. 2 and 3. On the bottom 1 is also shown a rail or support 13, upon which the casing 11 may rest when it is in its functional position.

The casing 11 is provided with a heat source 14 which may be a gas burner as shown or which may consist of other suitable means for generating heat. Immediately above the burner, however, I prefer to arrange a radiator, which is shown as consisting of a sheet 15 with a plurality of upstanding conical projections 16 immediately below the tubular portion 17 for the air impeller. The air impeller is shown as a motor driven fan 18, the diameter of which is slightly less than the diameter of the tubular portion 17, there being an air inlet 19 so that air may be introduced through the casing above the radiator and be directed into the casing of the evaporator. The stream lines of heated air will initially be directed longitudinally of the casing until they strike the arcuate baffle 20 or 21, resting upon the bottom of the casing, when they will bend and be directed

upwardly, and finally exhaust through the exhaust opening 22 at the top of the end wall 4.

The baffle 20 may be dispensed with but if it is used, it will be supported above the floor of the casing so that some of the air will pass beneath it and contact with the baffle 21. When the baffle 20 is used, the streams of air will be divided so that some of them will be diverting, while the others will pass the maximum distance before being bent upwardly to exhaust through the opening 22. This is clearly indicated by the arrows in Fig. 2.

While the evaporator may be utilized for a multitude of purposes, I have shown it as particularly designed for drying clothes and to this end I have shown a plurality of clothes lines, indicated at 23, 24 and 25. Therefore, it will be apparent that the air will be circulated over and between the garments supported by the lines 23, 24 and 25 before it passes out through the exhaust 22, and it will also be apparent by reference to Fig. 2 that some of the air issuing from the casing 11 will immediately rise to absorb some of the moisture in the garments, but that the maximum amount will pass longitudinally of the casing and then counter-flow to the exhaust at the top of the casing, so that the air will remain in the casing the maximum length of time to absorb the maximum amount of moisture before it exhausts.

The lines 23, 24 and 25 are connected to hooks fastened to the end 3 and to the partition wall 26 (see Fig. 2). The partition walls are spaced from the walls 4 so as to provide an air conduit 27 communicating with the interior of the casing through the opening 28 and with the flue 29 through the opening 22. The opening 10 through which the case 11 is projected into the main casing is covered by a flap 9 which carries the fan motor 18 and is adapted for completely closing the opening so that air is taken into the casing only through the air intake port 19, whereby a closed system of circulation may be provided, or other air may be taken into the heater and the saturated air delivered from the closed chamber according to position of the valves or gates 30 and 30'.

In order to accomplish this I have provided two hinged valves or gates 30 and 30', the former of which is adapted to close off the opening 22 and the latter of which is adapted to close the opening 22'. The valves or gates 30 and 30' are hinged to the pintles or shafts 31 and 32, which extend through the wall 6 of the casing and carry segmental gears 33 and 33'; the segment 33' carrying an operating handle or lever 34 (see Fig. 1).

If it is desired to cause the air to pass

through the drier casing in a continuous stream, the valves or gates 30 and 30' will be caused to assume the position shown in Fig. 2 and the handle 34 will be in the position shown in Fig. 1. If it is desired to return the air in a closed circulating system through the casing, the handle 34 will be raised, causing the valve or gate 30 to close the opening 22 and the valve or gate 30' to close the opening 22'. Then the air circulated by the impeller will pass into the casing, through the opening 28, down the conduit or flue 27, through 19 and back through the impeller in a continuous closed circulating stream so that its temperature will be raised by passing it repeatedly over the heating element and thereby the air within the drier casing can be raised to a relatively high temperature so as to more quickly dry the clothes than would be possible where the flow of the air is continuous from the inlet end through the flue 29.

It will be apparent that the clothes or other articles from which the moisture is to be evaporated may be conveniently placed within the casing and that the casing can be closed so as to protect the contents from dust, dirt and other extraneous matter during the drying process, and that an efficient, simple and inexpensive evaporator may be provided.

What I claim and desire to secure by Letters-Patent is:

1. An evaporator comprising a casing having an air inlet and an air outlet, means within the casing for heating the air, an impeller for directing the air in a stream line, and a baffle adjustable toward and away from the impeller to bend the stream line to cause a counterflow of the air within the casing.

2. An evaporator comprising a casing having an air inlet at one end and an air outlet at the same end and above the air inlet, means adjacent to the inlet for heating the air, an air impeller for directing the heated air longitudinally of the casing in a stream line, and means for bending the stream line of air upwardly to cause it to counterflow through the exhaust opening.

3. An evaporator comprising a casing having an air inlet and an air outlet, means adjacent to the inlet for heating the incoming air, said means comprising a heater and a radiator above it, an impeller above the radiator for directing the incoming air longitudinally of the casing, in a stream line, and means for directing the air toward the outlet.

4. An evaporator comprising a casing having an inlet opening at its lower portion and an outlet opening at its upper portion, a casing removably secured in the first named casing, an air heater supported by the second mentioned casing, and an air

impeller carried by the second mentioned casing for directing the air longitudinally of the first mentioned casing.

5 5. An evaporator comprising a casing having an air inlet and an air outlet, means for heating the air entering the casing, and means for simultaneously closing the air inlet and the air outlet, said means also being effective to simultaneously open the air inlet
10 and air outlet.

6. An evaporator comprising a casing, a

conduit in one end of the casing, the casing having an air inlet opening into the conduit, an exhaust flue having its inlet end connected to the conduit, the conduit having 15 an air inlet from the casing and an air discharge into the casing, and valves for closing the first named inlet and the inlet to the flue.

In testimony whereof I affix my signature. 20

HENRY SIEBEN.