(No Model.)

G. M. PIERCE.

EVAPORATING PAN.

No. 307,328. Patented Oct. 28, 1884.

Fig. 1

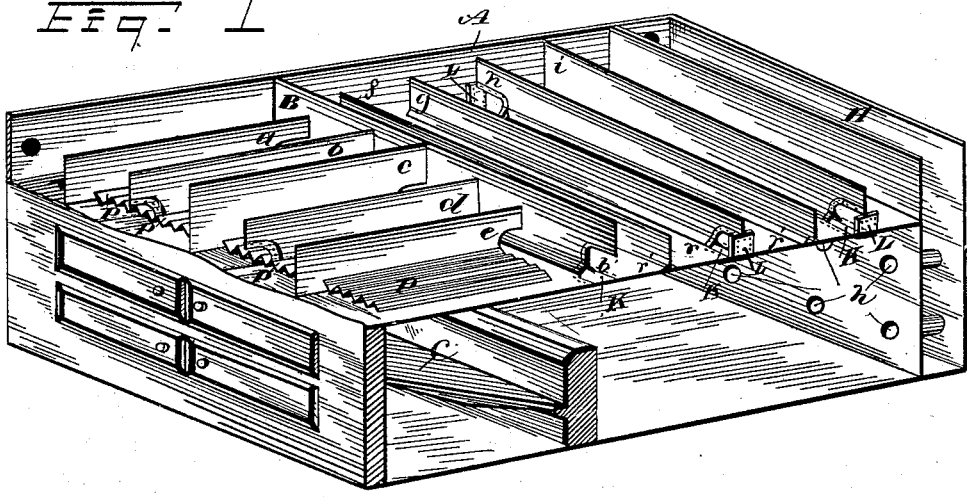


Fig. 2.

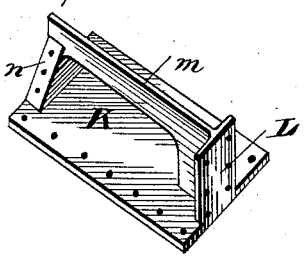


Fig. 3.

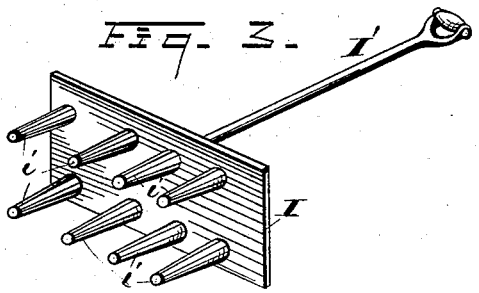
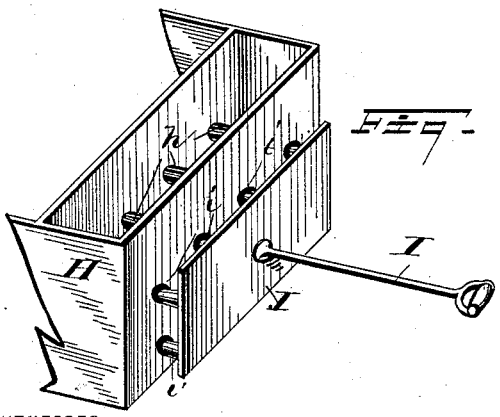


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE M. PIERCE, OF EAGLEVILLE, OHIO.

EVAPORATING-PAN.

SPECIFICATION forming part of Letters Patent No. 307,328, dated October 28, 1884.

Application filed June 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. PIERCE, of Eagleville, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Evaporating-Pans; 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 pertains to make and use the same.

My invention relates to improvements in evaporating-pans; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective of my improved evaporating-pan, with portions broken away to show the internal construction. Fig. 2 is an enlarged view in perspective of a cast-metal plate used in constructing the pan. Fig. 3 is a view in perspective of a damper attachment. Fig. 4 is a view in perspective of the back end of the heater with the damper in position.

A represents an evaporating-pan divided in the central part by the transverse partition B into two general compartments. The front compartment is located over the arch C, and has a corrugated bottom, the corrugations P running lengthwise of the pan, but crosswise of the compartment, and do not extend to the sides on either side of the compartment. This compartment is subdivided by the partitions *a*, *b*, *c*, *d*, and *e*, that are joined in front to the end of the pan and at the rear to the partition B. These partitions are also joined to the bottom of the pan, but are so located that they each pass over and are joined to the apex of a corrugation. The partition *a* has an opening at the lower rear corner and the partition *b* at the lower front corner, and so on through these partitions. The sap is received into the pan at the front left-hand corner, and by means of these partitions and openings is made to pass backward and forward through the compartment until it is discharged through the opening *b'* in the partition B into the rear compartment. The partitions in the front compartment are graduated in height, the lowest being the outer partitions, *a* and *e*, and the highest is the middle partition, *c*, the central part of this compartment being directly over the central part of the furnace, where the heat is most intense and the agitation of the liquid at this point in boiling is most violent, and is sufficient to dash the foam and scum over the partitions *b* and *d*, but not over the higher central partition, *c*. In the same manner the scum is dashed over the lower partitions, *a* and *e;* but the decreased ebullition toward the outside is not sufficient to carry the scum over the partitions toward the center. The scum therefore accumulates at the sides of the pan, from whence it may be easily removed. The rear compartment is subdivided by the partitions *f*, *g*, *h*, and *i*, running crosswise of the pan, and each of these partitions is secured on the apex of the corrugations *r*, as shown; otherwise the bottom of the rear compartment is flat. These partitions are graduated in height. The rear partition, *i*, should be of considerable height, to prevent the sirup from boiling over, which it is more inclined to do as it becomes thicker. The partitions *h* and *g* may therefore be less in height, and the partitions *f* still less, and considerable material saved thereby. The openings in these partitions are arranged as shown, and the liquid in each sub-compartment or space is in a body extending across the pan and subjected throughout to about the same degree of heat. As the liquid from the first space passes through the opening in the partition *f* to the next space it is subjected to less heat, and so on to the end of the pan. It is well known that in the latter steps of the process, where the liquid is being converted into sirup, the heat should gradually decrease to prevent scorching the product.

I have found that with this construction of evaporating-pans the liquid in all of its stages is under the most favorable conditions for accomplishing a speedy reduction and producing a superior product. At the back end of the pan is the heater H, that may be joined to the pan and made a part thereof, or may be made separate, as preferred. This heater extends some distance below the pans, and rests on the ground or foundation, so that the products of combustion must pass through the horizontal tubes *h* in the lower portion thereof. A plate, I, is provided with a handle, I',

extending through the brick wall back of the heater. The front side of the plate is provided with conical plugs *i*, arranged to fit the tubes, and is used in combination with the dampers in front to control the heat. This device is found to be of great advantage in somewhat confining the heat under the pans, resulting in a great saving of fuel. When the tubes are unobstructed, nearly all of the heat passes through the upper row. By partially closing the tubes by thrusting these plugs more or less into them, the heat is compelled to pass alike through all of the tubes, and they are all kept full of heated air, thereby greatly increasing the effective heating-surface. The cold sap is introduced into this heater, and by means of heat that would otherwise be wasted is raised usually to the boiling-point, so that when it is introduced to the pan in front it does not materially retard the boiling of the liquid at this part. The sap is usually conveyed from the heater to the pan in a pipe on the back side. (Not shown.) With the ordinary construction there are usually weak places at the ends of the corrugations that support the partitions where the openings in the partitions are. As a means of strengthening and securing these parts I have invented the device shown in Fig. 2. It consists of a single piece of cast metal, usually brass, and has a broad bottom, K, that is riveted and soldered to the bottom of the pan, and an upright flange, L, secured in a like manner to the side of the pan, and a rib, *m*, that is secured to the partition, and a triangular part, *n*, that fits into and forms an end to the corrugation, and is soldered and riveted to secure the parts.

The opening under the rib *m* may be provided with a slide or gate, to regulate the flow of the liquid, if so desired. Two of these plates are shown in position on partitions *g* and *i*, and are preferably used on all of the partitions where openings occur.

What I claim is—

1. An evaporating-pan, preferably rectangular in form, and divided in the central part by a transverse partition into two general compartments, and the front compartment subdivided by partitions running lengthwise of the pan, and the rear compartment subdivided by partitions running crosswise of the pan, and the partitions each secured to the apex of a triangular corrugation forming a part of the bottom of the partitions, provided with openings for the circulation of the liquid, and arranged alternately on opposite sides of the compartments, substantially as set forth.

2. An evaporating-pan divided in the central part by a partition into two compartments that are subdivided by partitions arranged as described, and the partitions graduated in height in the front compartment, the highest partition being in the center and the partitions on either side decreasing in height toward the sides of the pan, and in the rear compartment the partitions increasing in height toward the rear of the compartment, substantially as set forth.

3. In an evaporating-pan, the heater H, provided with the tubes *h*, in combination with the plate I, provided with the conical plugs *i*, set so as to register with the tubes in the heater, and provided with the handle I′, or equivalent device, by means of which the tubes may be more or less closed by introducing the plugs therein, substantially as set forth.

4. In an evaporating-pan, the metal plate K, provided with the flanges L and *m*, and the triangular piece *n*, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 5th day of May, 1884.

GEORGE M. PIERCE.

Witnesses:

ALBERT E. LYNCH,

CHAS. H. DORER.