

(No Model.)

C. C. HAYNES.

APPARATUS USED IN EVAPORATING SACCHARINE JUICES.

No. 264,694.

Patented Sept. 19, 1882.

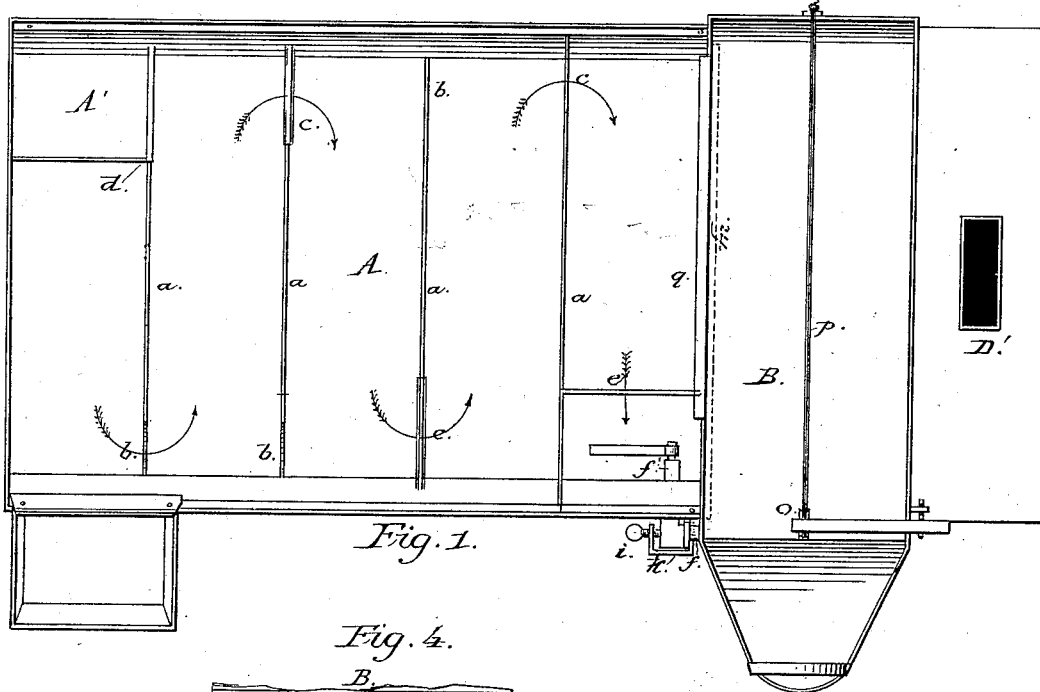


Fig. 4.

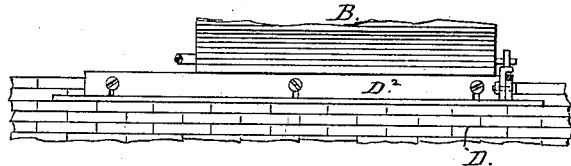


Fig. 5.

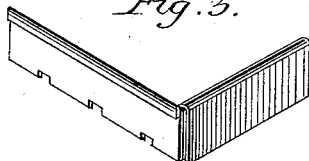


Fig. 3.

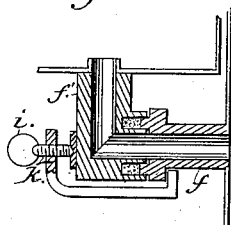
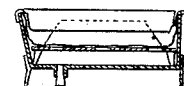


Fig. 2.

Fig. 6.



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CLINTON C. HAYNES, OF WILMINGTON, VERMONT.

APPARATUS USED IN EVAPORATING SACCHARINE JUICES.

SPECIFICATION forming part of Letters Patent No. 264,694, dated September 19, 1882.

Application filed June 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, CLINTON C. HAYNES, of Wilmington, in the county of Windham and State of Vermont, have invented certain new and useful Improvements in Apparatus used in Evaporating Saccharine Juices; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention consists more particularly in the improved construction and arrangement of the evaporating-pans for boiling and evaporating saccharine juices, cider, jellies, and especially maple-sap, to convert the same into sugar.

It consists also in the improved construction and arrangement of the finishing-pan and certain connections by which the sap may pass into the same, when desired, from the evaporating-pan.

It consists also in the improved construction of the wall-plate under the finishing-pan, all of which will be fully set forth hereinafter.

In my drawings, Figure 1 is a plan or top view, showing the evaporating-pan, finishing-pan, &c. Fig. 2 is a front elevation of the same. Fig. 3 is a horizontal section, showing the tube which forms the communication between the evaporating and finishing pans. Fig. 4 is a vertical section through the wall-plate and the adjustable plate connecting therewith. Fig. 5 is a perspective view, showing the L-shaped partitions *d* or *e*. Fig. 6 is a sectional view of the skimmer.

Similar reference-letters indicate like parts in all the figures.

Referring to drawings, A is the evaporating-pan, preferably oblong in form, having its end walls vertical and its longitudinal side walls splaying and turned over horizontally. Narrow strips of metal are secured to the splaying walls of the said pan, which, together with the horizontally-turned edges described, form grooves to receive strips of wood, which serve to strengthen and stiffen the said metal sides. Within the said evaporating-pan are fixed

transversely low partitions or ledges *a*, which are cut away or splayed at their ends to form, together with the longitudinal walls, angles of about ninety degrees.

B is the finishing-pan, located at the end of the evaporating-pan, also oblong in form, and provided with a spout, from which may be poured the finished sirup.

A hollow tube, *f*, opening into the finishing-pan, is coupled with a corresponding tube, *f'*, to form a communicating conduit between the evaporating and finishing pans. These tubes are provided with an annular projection and a corresponding groove, and an elastic packing substance to insure a tight joint, and are yoked together with a yoke, K, and a clamping-nut, *i*. The tube *f'* is fixed to the pan A, and that of *f* is secured permanently to the said finishing-pan. The latter, with the yoke K and screw *i*, forms the axis of motion to said finishing-pan.

D is the foundation or supporting wall of the structure for the evaporating and finishing pans. On that portion of said structure which receives the evaporating-pan are ridges *l*, which form bearings for the horizontal metallic strips of said pan. Within the supporting-walls of the structure, and beneath the evaporating-pan, is formed the fire-chamber, which has the necessary grate-bars, supported in the usual way.

At the front end of the evaporating-pan hinges are provided, to which is hung a door, F. This door, when closed and secured by means of a catch pivoted in the bar G, will force a draft in its natural course through the fire and on toward the chimney in the rear.

At a point beneath the axis of the finishing-pan is a wall-plate, *D*², provided with slots, through which pass screws which hold said plate adjustably to a stone or iron sill based upon the wall D. This adjustable plate is provided to insure a close joint between the finishing-pan and its bearing, in case there should be a settlement in the wall at this point, which is frequently the case, especially where the greater portion of the weight of the said finishing-pan, with its contents, is thrown directly on so narrow a portion.

D' is the chimney connected with the furnace, provided with a suitable foundation.

c c are partitions of lengths sufficient to embrace the spaces *b*, so formed as to be readily applied over said spaces, or removed therefrom at will when it becomes necessary to vary, retard, or accelerate the circulation of the boiling sap. These partitions are formed preferably of sheet metal doubled over on itself, so that when in place they will embrace the low partitions *a* and form complete barriers to the flow of sap at points wherever placed. The inclined portions of the said low partitions form holds to the short partitions or dams up to the point of intersection of said low partitions with the splaying longitudinal walls of the pan.

L-shaped partitions *d e* are also provided, and so constructed as to be adaptable to the ledges *a* to form separate apartments at different points in the evaporating-pan.

On the bottom of the evaporating-pan, at the rear end, is formed a ledge, *m*, as shown in dotted line, Fig. 1, to receive and form a rest for the bottom of the finishing-pan. A rope, *p*, fixed to the free end of the finishing-pan, passes over pulley *O*, pivoted in suitable bearings fixed to the arm of a crane, *n*, serves, in the hands of the operator, to lift the said pan upon its axis and dump its contents into a suitable receptacle. One wall of the finishing-pan is reduced in height to form the overflow-lip *q* next to the evaporating-pan.

A is an apartment formed at one corner of the evaporating-pan by one of the *L*-shaped partitions, and into this is poured or fed the sap to be boiled and evaporated.

In the operation the sap passes from the front to the rear of the pan, moving from one side to the other in a serpentine course, being barred from one side or another by the adjustable partitions *c*, which are set from time to time by the operator, as his judgment dictates, while observing the said boiling sap. When sufficient evaporation has taken place and the sap is in proper condition it is drawn off through the tube *f f'* (the plug used to close the orifice having been removed) into the finishing-pan *B*, which at the proper time is lifted upon its axis and discharged.

The apartment surrounding the orifice of the discharge-tube *f f'* serves to prevent the scum from clogging the said orifice.

In skimming the boiling sap I use a small pan provided with a movable perforated diaphragm and a muslin strainer. This pan is of a size suitable to the spaces between the partitions of the evaporating-pan. Said skimmer is provided with an overhanging strip on one side, by which it may be hung onto the sides of the evaporating-pan when not needed in the front end of said pan. In the use of the skimmer the importance of having the longitudinal walls of the evaporating-pan splaying is appa-

rent, as in the act of skimming the said skimmer may be used the entire length of the evaporating-pan. In said use the skimmer, when inclined, may be drawn along between the splaying sides of the evaporating-pan and the splaying edges of the partitions *a* without obstruction.

The partitions *a* being splayed, as described, only a narrow space is left for the circulation of the sap, and this construction serves to keep the weak and sweet sap separated when the pan is left without fire—as, for instance, over night. In evaporating-pans of ordinary construction there is a tendency in the sap to mix up under such circumstances and sugar up in the center, unless it is dipped up from one end of the pan to the other.

The *L*-shaped partitions described have openings cut from their bottoms through which the sap may flow slowly beneath the scum.

The adjustable partitions need not be confined to the uses specially mentioned, as they would be useful for forming ice-apartments, when it might be necessary, or apartments for other purposes.

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

1. The finishing-pan *B*, arranged to tilt upon suitable bearings fixed in connection with furnace-wall and the adjoining evaporating-pan, in combination with the lifting device composed of the post *n*, provided with an overhanging arm, the pulley *O*, and a suitable cord passing over the latter and connected with the heavy end of the said evaporating-pan, as and for the purpose set forth.

2. The combination, with an evaporating-pan provided with partitions, as described, of the *L*-shaped partitions adapted for use in forming separate apartments at suitable points in said pan, as and for the purpose specified.

3. The finishing-pan *B*, in combination with the evaporating-pan *A* and the jointed connecting-pipes *f f'*, all constructed and arranged as and for the purpose set forth.

4. The combination, with a furnace for sugar-evaporation, of the adjustable plate *D*², as and for the purpose set forth.

5. The combination, with the tilting finishing-pan *B*, of the crane *n*, and a suitable cord and pulley arranged in connection with said crane, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CLINTON C. HAYNES.

Witnesses:

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