

(No Model.)

J. W. CURRIER.

DEVICE FOR COOLING AND GRAINING MAPLE SUGAR.

No. 469,058.

Patented Feb. 16, 1892.

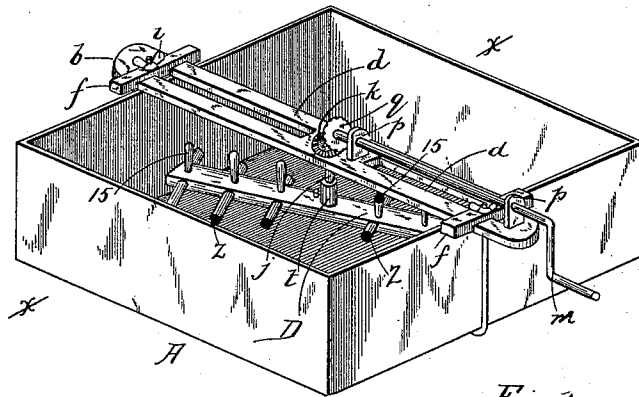


Fig. 1.

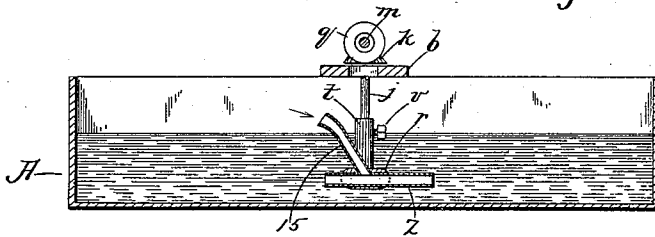


Fig. 2.

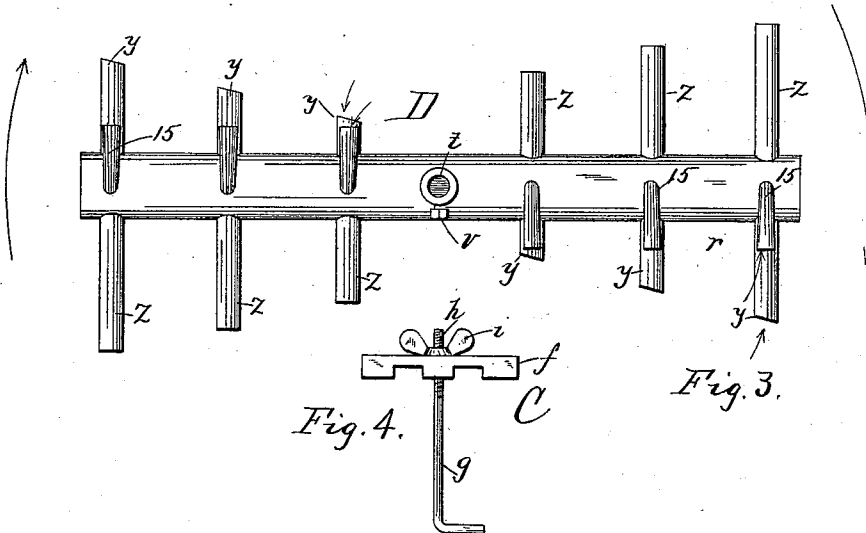


Fig. 4.

Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

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DEVICE FOR COOLING AND GRAINING MAPLE-SUGAR.

SPECIFICATION forming part of Letters Patent No. 469,058, dated February 16, 1892.

Application filed June 1, 1891. Serial No. 394,631. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. CURRIER, of North Troy, in the county of Orleans, State of Vermont, have invented certain new and useful Improvements in Devices for Aerating, Cooling, Graining, &c., Maple-Sugar, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, referring had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of a sugaring-off pan, showing my improved apparatus in position; Fig. 2, a vertical transverse section of the same; Fig. 3, a plan view, enlarged, showing the agitator removed; and Fig. 4, an elevation of one of the clamps.

Like letters and figures of reference indicate corresponding parts in the different figures of the drawings.

My invention relates especially to a device for stirring or mixing sugar in the sugaring-off pan for purposes of whitening and graining the same; and it consists in certain novel features hereinafter fully set forth and claimed, the object being to produce a simpler, cheaper, and more effective device of this character than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation:

In the drawings, A represents the pan, which is ordinarily rectangular in form. A bar *b* of sufficient length to rest upon and overlap the edges of the top of the pan is slotted longitudinally at *d d*. In each of said slots a sliding clamp C, (shown in Fig. 4,) is mounted. Said clamps comprise a block *f*, grooved to receive the bar *b* and slide laterally in the slot thereof, and a right-angle iron or hook *g*, threaded at *h* and turned centrally through said block, a thumb-nut *i* being turned onto said hook to adjust the same vertically in the blocks. Centrally in the bar *b* a vertical stub-shaft *j* is mounted bearing on its upper end a beveled gear *k*. A crank-shaft *m* is arranged longitudinally on the bar *b* and journaled in lugs *p* thereon, said shaft bearing a beveled

gear *q*, which meshes with the stub-shaft gear *k*.

The agitator D comprises a flat bar *r* of suitable length to rotate freely in the pan A, and provided centrally with a socket *t*, adapted to receive the lower end of the stub-shaft *j*, whereby said agitator may be adjusted vertically on said shaft, a set-screw *v* passing through said socket jamming against said shaft and supporting the agitator. A suitable step may be provided for the agitator-bar in the bottom of the pan, if desired. A series of horizontally-arranged tubes or pipes *z* pass through and are secured in the agitator-bar *r*. Any number of these tubes can be employed; but, as shown, three are employed on each side of the socket *t*. The tubes are arranged so that their mouths *y* of each set open in opposite direction in relation to the bar *r*. A vertically-inclined air-tube *l* passes through the bar *r* and opens, respectively, into each agitator-tube *z*.

In the use of my improvement the mixer is adjusted on the pan A by means of the clamps C, which can be moved on the mixer-bar *b*, so that their hooks will take onto the bottom of said pan, the mixer being thus applicable for use on any size pan into which the agitator D may be inserted. The agitator is adjusted on the shaft *j* to suit the depth of pan employed. By means of the crank *m* said agitator may be readily rotated from left to right, as viewed in the figures. The tubes filled with the liquid sugar violently agitate it as the bar is rotated. By means of air-pipes *l*, which project above the surface of the liquid, air is forced into said tubes and into the sugar, rapidly effecting the process of aeration. When sugar is aerated, grained, and whitened in the pans by stirring it by hand the process is exceedingly laborious, and the sugar cooling so rapidly results in imperfectly whitening the same.

By the use of my improved mixer the liquid is agitated so rapidly and the air introduced so forcibly that the whitening is effected much more completely than by the ordinary processes. Moreover, the tubes being arranged in lines parallel to the tangent of the agitator circle, the contents of the pan in

the corners is as thoroughly mixed as that through which the agitator directly passes. Said tubes may be curved on the arcs of a circle, if desired; but I prefer to mount them in the form shown. Instead of employing tubes the width of the agitator-bar *r* may be increased and tubular openings formed therein, into which air-tubes 15 may lead, if desired.

10 The air-tubes 15 may be omitted, as when the sugar in the pan is violently agitated a portion of the air will pass into the tube *z* without the aid of said air-tube. The mouths of the tubes are preferably beveled toward
15 the pivot of the agitator, as shown, as it tends to cause a greater quantity of the sugar to pass through when in motion. The discharge ends of the tubes are longer than the receiving or mouth ends, and the length of said
20 tubes is graduated from the pivot to the bar end, imparting a violent centrifugal movement to the liquor, which could not be attained were simply tubular openings in the bar used. Moreover, employing elongated tubes serves
25 to aerate the liquid sugar much more thoroughly than were such openings employed.

It is not absolutely essential that the air-

tubes be inclined vertically, as a vertical tube may be employed provided with a bell-mouth for directing the air therein.

Having thus explained my invention, what I claim is—

1. In a device for graining maple-sugar, a horizontally-arranged agitator-bar and mechanism for supporting and rotating said bar, in combination with a series of horizontal tubes opening through and projecting from said bar, the discharge ends of said tubes being elongated, substantially as and for the purpose set forth.

2. The agitator-bar *r*, provided with the horizontally-arranged tube *z* and air-tubes 15, substantially as and for the purpose set forth.

3. The supporting-bar and adjustable clamps, in combination with the rotary shaft and actuating mechanism, an agitator adjustable vertically on said shaft, horizontally-arranged tubes in said agitator, and vertically-inclined air-tubes opening into said horizontal tubes, substantially as set forth.

JOHN W. CURRIER.

Witnesses:

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