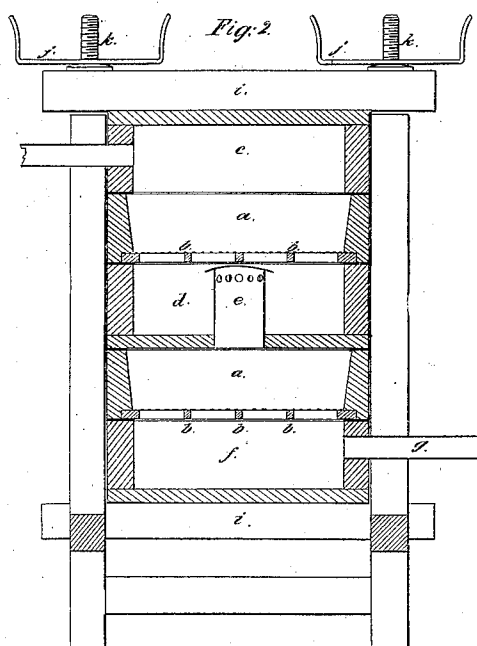
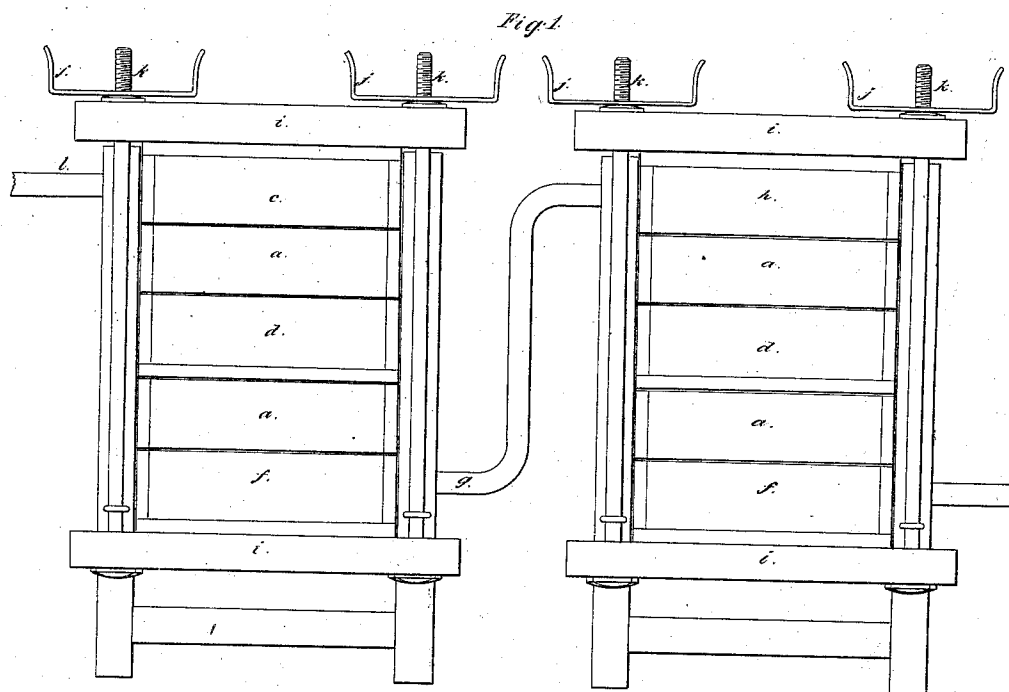


No. 8,362.

PATENTED SEPT. 16, 1851.

S. GARDNER.
APPARATUS FOR DRAINING SUGAR.



The drawing is not in pencil

UNITED STATES PATENT OFFICE.

SMITH GARDNER, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR DRAINING SUGAR.

Specification forming part of Letters Patent No. 8,362, dated September 16, 1851.

To all whom it may concern:

Be it known that I, SMITH GARDNER, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for the Depuration of Sugar, but which is applicable to the separation of other liquids from solids; and I do hereby declare that the following is a full, clear, and exact description of the principle or character of my invention which distinguishes it from all other things before known, and of the method of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation, and Fig. 2 a vertical section of my said improved apparatus.

The same letters indicate like parts in all the figures.

It has often been essayed to depurate sugar by forcing currents of air under pressure through the mass placed in a vessel with the bottom perforated and covered with wire-gauze having meshes so fine as to prevent the passage of the crystallized sugar, and yet admit the passage of the liquid matter and air, but the power necessary to induce the current of air of the requisite pressure to accomplish the desired result was so expensive as to render this method practically useless, for if the charge be increased in depth, say beyond six inches, the sugar will pack and prevent the passage of the liquid matter and air, and if the charge be increased by either enlarging the pan or multiplying the number of pans the expenditure of power will be increased in the same proportion, for the power applied to make a given pressure must be the same or nearly the same for every square inch of surface, whether that pressure be direct or induced by exhaustion. I have, however, so improved the apparatus for this process that the current of air required for producing the required effect in one vessel on a limited quantity can, without additional power, be made to pass in succession through several vessels, and produce the same or nearly the same effect in all of them, and thus reduce the expense so as to render this method of depurating sugar of great practical utility.

The nature of my invention consists in arranging one or more series of pans with their bottoms perforated or made of wire-gauze, and each provided with a pan or receiver below to catch the molasses, and provided with an aper-

ture for the passage of the current of air, the whole being otherwise made air-tight, so that the current of air forced into the first shall, in producing the required effect, pass to the second to produce a like effect there, thence to the third, and so on throughout the series, and thence in like manner through other series, if desired.

In the accompanying drawings, *a a* represent two straining-pans with the bottom of each composed of grate-bars *b* covered over with fine wire-gauze having meshes sufficiently fine to prevent the crystals of sugar from passing through. Over the upper one of these straining-pans is put a cover, *c*, of the form of the pan inverted, and made perfectly air-tight, and below it a molasses-pan, *d*, made perfectly air-tight, except that it is provided with a central tube, *e*, perforated around the periphery and near the top or cover, which extends so far over the edges as to prevent the liquid matter that passes through from the top pan *a* from entering the tube while the air can escape freely. Below the molasses-pan *d* is placed the second straining-pan *a*, and below that another molasses-pan *f*, similar to the one *e*, except that it is not provided with a central tube, but instead of this there is an air-pipe, *g*, leading out from near the upper edge thereof to the cover *h* of the top pan of the second series arranged and constructed like the first in every particular. These pans are charged with the matter to be acted upon to the depth of about four inches. The edges of all the pans are lined with india-rubber or other elastic substance. When they are all put into a frame, *i*, and drawn together tight by means of the nuts *j* of screw-bolts *k*, the joints shall be all packed air-tight. In this way, it will be perceived, any desired number of straining and molasses pans can be placed one over the other extending to any height which convenience will permit. Each molasses-pan in the series must be provided with a central tube, *e*, like the pan *d*, except the last of the series, which only requires to be provided with an air-pipe above the height to which the molasses will rise. The cover of the first series is provided with a wind-pipe, *l*, leading to any kind of blowing apparatus which will force in air under a considerable pressure, say, twenty pounds to the square inch, (more or less,) although I have found twenty pounds to produce a good effect.

The air thus forced in acts on the saccharine matter, and carries the liquid matter through the meshes of the wire-gauze into the molasses-pan below, where it is collected, leaving the crystals of sugar in a dry state above the wire-gauze. The air that has acted on the matter in the first pan passes into the molasses-pan, and through the apertures in the central tube to the next straining-pan, where it performs the same office as in the first, thence to the third, and so on through the series to the last molasses-pan, and then it passes through the pipe *g* to the cover of the top pan of the next series, and passes through that series as in the first, and so on through any number of series until discharged into the atmosphere. In this way the current of air required for one pan can be carried through any desired number of pans performing in succession the office in each, instead of being all expended in one, thus greatly reducing the expense of working.

The pans can be made of any desired form and material, and the joints packed in any desired manner to resist the pressure and prevent the escape of air. Any mode of mounting the series of pans in frames and clamping them together may be substituted for the one herein described which I have essayed with success.

In charging the apparatus care must be taken not to put too much saccharine matter in each

straining-pan, as in that event the pressure of air introduced will have the tendency to pack the crystals and prevent the discharge of the liquid parts, and, as the same current of air can be carried in succession through any number of pans, there will be no necessity for over-charging any one pan.

It will be obvious from the foregoing that this apparatus can be applied to other purposes analogous to the depuration of sugar—that is, of driving or separating liquids from solids, so as to leave the solid matter in a dry state.

What I claim as my invention, and desire to secure by Letters Patent, is—

Combining two or more straining-pans with molasses or receiving vessels below each, substantially as described, the said pans being provided with a discharge pipe or tube, substantially as described, so that the current of air shall pass from the lower part of the first to the upper part of the next through the series, and so arranged as to retain the molasses or other liquid parts, and this combination whether the said succession of pans be used in one or more series, as described.

SMITH GARDNER.

Witnesses:

ALEX. PORTER BROWNE,
CAUTN. BROWNE.