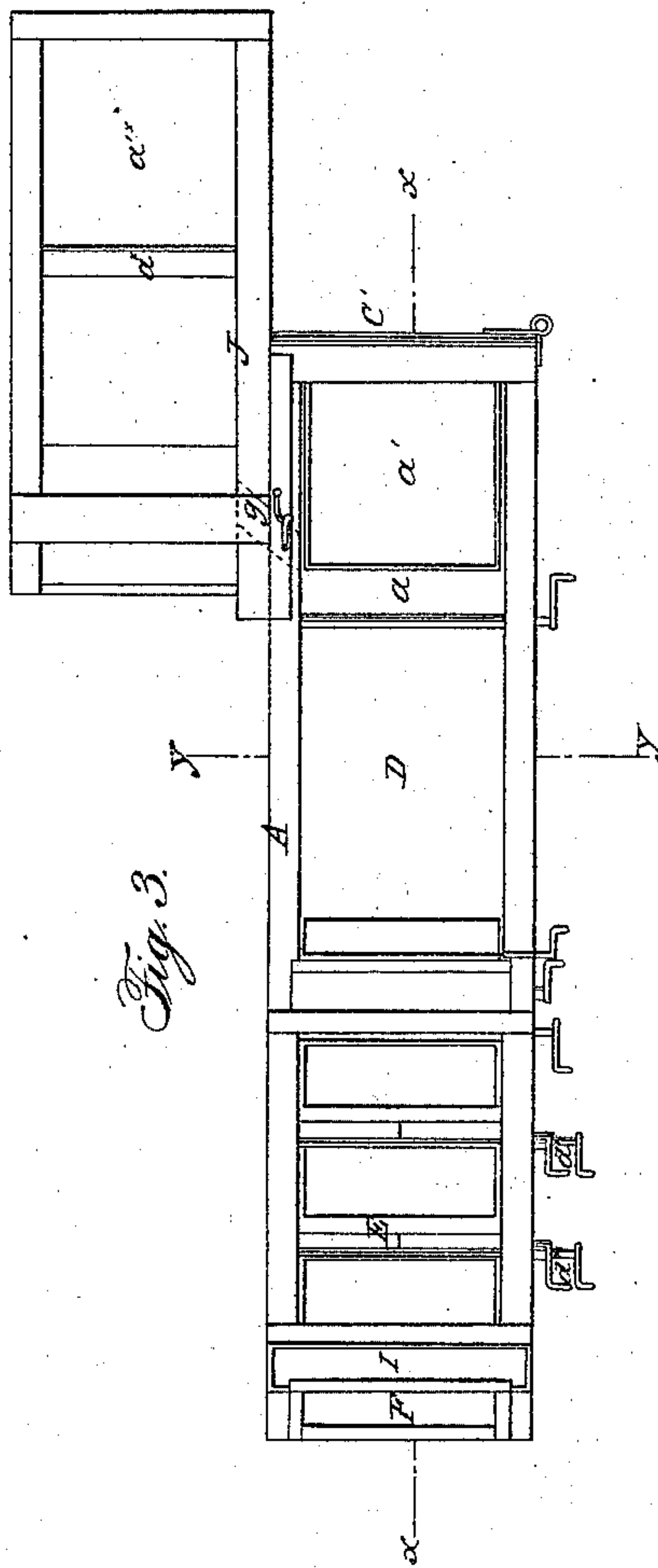
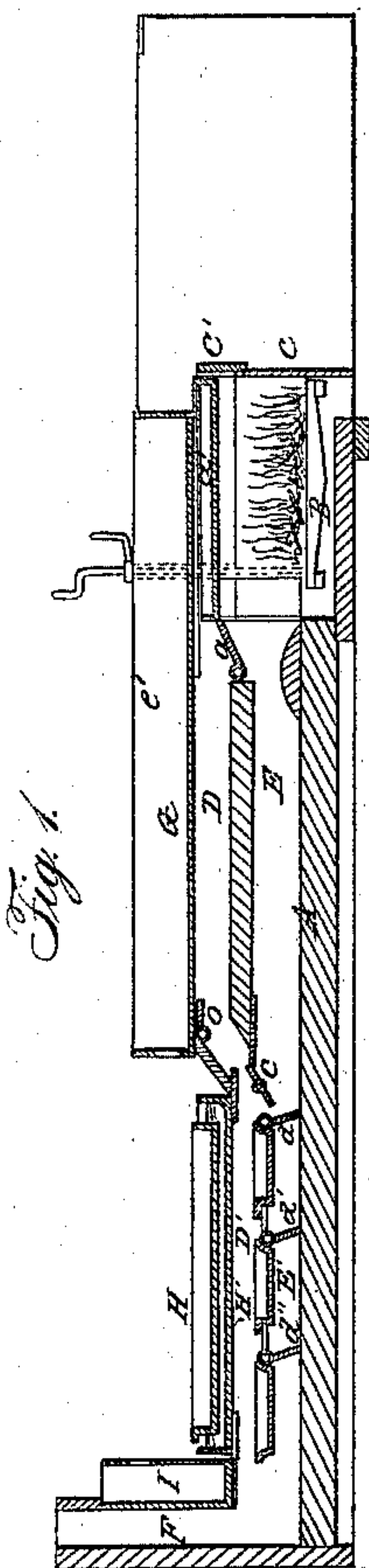
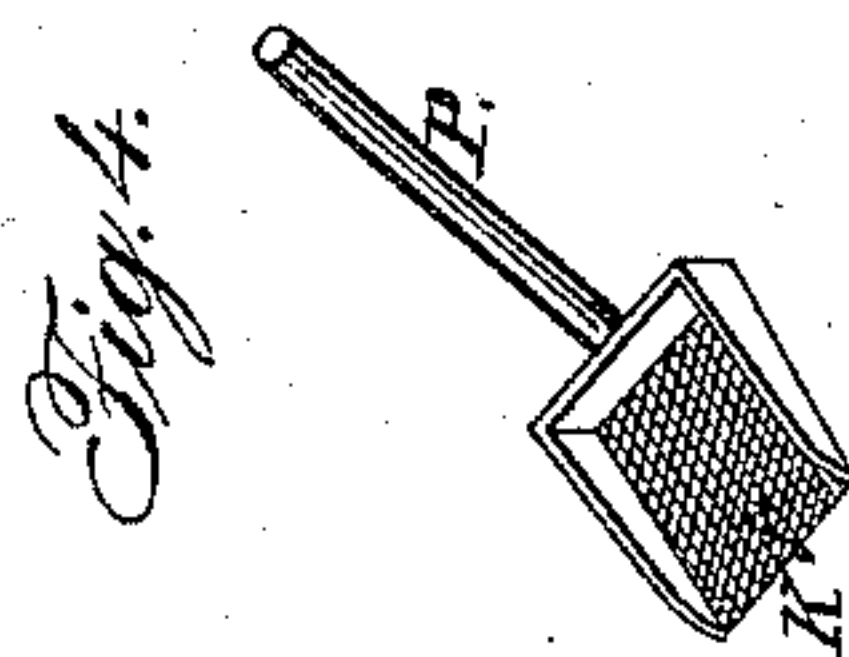
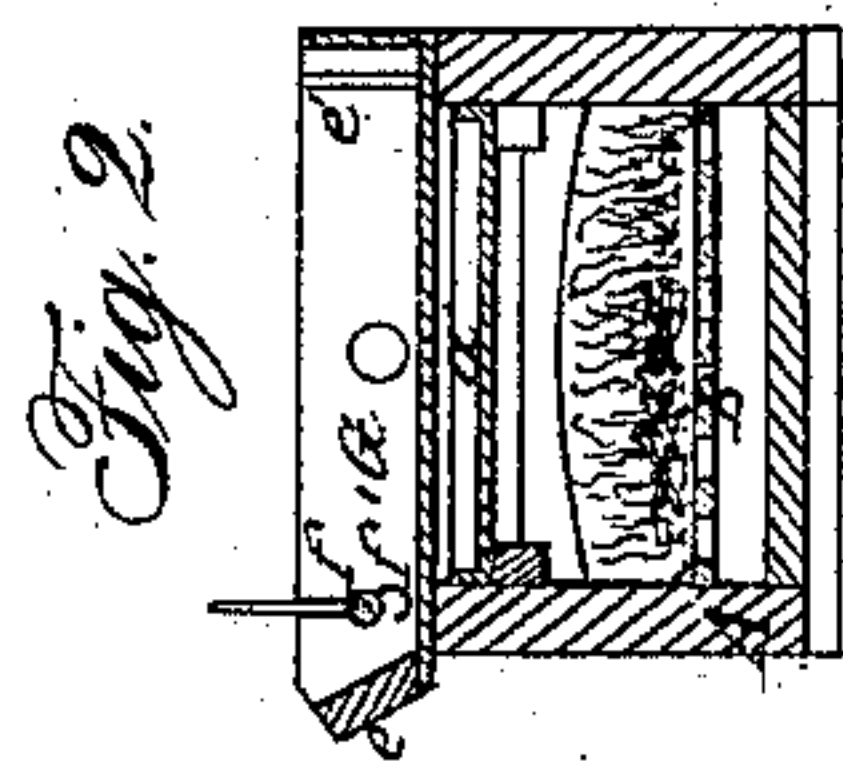


C. BOND.  
Evaporating Pan.

No. 43,472.

Patented July 12, 1864.



Witnesses:

*Wm. P. Hall.*  
*Geo. W. Reed.*

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# UNITED STATES PATENT OFFICE.

CALEB BOND, OF RICHMOND, INDIANA.

## IMPROVED SORGHUM-EVAPORATOR.

Specification forming part of Letters Patent No. 43,472, dated July 12, 1864.

*To all whom it may concern:*

Be it known that I, CALEB BOND, of Richmond, in the county of Wayne and State of Indiana, have invented a new and Improved Evaporator for Saccharine Juices; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal vertical section of my invention, taken in the plane indicated by the line *x x*, Fig. 3. Fig. 2 is a transverse vertical section of the same, the line *y y*, Fig. 3, indicating the plane of section. Fig. 3 is a plan or top view of the furnace, the pans having been removed to expose the several flues and dampers. Fig. 4 is a detached perspective view of the skimmer.

Similar letters of reference in the four views indicate corresponding parts.

This invention relates to certain improvements in the means for regulating the draft and directing the heat in an apparatus for evaporating saccharine juices in such a manner that either of the pans, or both, can be heated to any desired degree or cooled off, at the pleasure of the operator, simply by changing the position of a few dampers, and without increasing or diminishing the fire; also, to certain improved means for removing the scum and clarifying the juice.

The nature of my invention and its principal advantages will be readily understood from the following description.

A represents the furnace of my evaporator, which may be made of brick or any other suitable material.

B is the fire-place, which is closed by the door C, and from which two flues, D E, extend, one above the other, toward the chimney F. A damper, *a*, serves to direct the heat from the fire either into the flue D or into the flue E, and through those flues and their continuations D' E' to the chimney. The flue D is situated close under the bottom of the pan G, and this pan extends beyond that flue and over the fire-place B, as clearly shown in Fig. 1 of the drawings. A small door, C', over the fire-door C gives access to the space under the front end of the pan G, and through this door a slide or plate, *a'*, may be intro-

duced, which prevents the fire from coming in contact with the bottom of said pan. By opening the door C when the slide *a'* is in its place, a current of cold air is passed through under the bottom of the pan G, whereby the contents of said pan can be cooled in a short time.

H is the finishing-pan, which is situated over the flues D' E', and the communication between the flues D D' E E' is regulated by the dampers *b c d d' d''*, as will be presently explained. The damper *b* is situated at the end of the flue D, and this damper will be turned down, if it is desired to cool off the first pan, while the heat passes through the flues E and D' under the bottom of the second pan to the chimney. In that case the double-winged damper *c* will be revolved so as to open the communication between the flues E and D'. If both pans are to be exposed to the full heat of the fire, the damper *a* is turned down so as to close the flue E, the damper *b* is opened, and the double-winged damper *c* and the damper *d* are brought in such a position that the communication between the flues D D' is opened. If it is desired to cool off the second pan while the contents of the first are to be heated, the damper *a* is turned down, the damper *b* is opened, and the double-winged damper *c* and dampers *d d' d''* are turned so as to cut off the communication between the flues D D' and open that between the flues D E' and the chimney. The dampers *d d' d''* are situated at different distances from the chimney, and by these means any portion of the pan H can be exposed to the heat or cooled off, at pleasure. Each of these dampers is made in one or more sections, which are operated by handles *d\** on the same side of the furnace, one section of each damper being secured to a tube which slides over the rod to which the other section is fastened. Instead of using solid rods, however, for the purpose of operating the dampers, they may be secured to tubes through which the air passes for the purpose of cooling them off. The pan G is constructed with a metal bottom and three metal and one wooden side, *e*, and it is placed on the flue D, so that its iron side *e'* is close to the edge of the flue, and the wooden side projects a little over, so that all the scum will accumulate on the same.

In order to facilitate the separation of the



scum and other impurities from the juice and their removal from the pan, the wooden side is made flaring, and a vertically-adjustable wooden rail, *f*, is arranged near to that side, as clearly shown in Fig. 2 of the drawings, and this rail is provided with a series of hooks, *f'*, from which a bag is to be suspended filled with bone-black, cord or other clarifying material. By these means the juice can be readily freed from its scum and impurities, and after this has been accomplished the clean juice is let down from the first pan into the finishing-pan H. This pan is placed in a water bath, H', so that its contents will be preserved from being overheated or scorched; and in order to have a supply of hot water always on hand, a boiler, I, is placed between the end of the pan H and the chimney F on the flue D'. This boiler projects through the side of the chimney, and is partially heated by the gases of combustion escaping through the chimney.

A preliminary heating may be given to the juice in a pan placed on the side furnace, J, which is provided with a separate fire-place and communicates with the main furnace through an oblique flue, *g*, passing through the side walls of both furnaces, as clearly shown in Fig. 3. This side furnace may be arranged with a damper, *a\**, and slide *a'\**, similar to the damper *a* and slide *a'* in the main furnace; or it may be arranged in any other convenient manner, and it ought to be somewhat higher than the main furnace, so that the juice from the pan on said side furnace can be conveniently let down into the first pan on the main furnace.

For the purpose of removing the scum, I use with advantage the skimmer R, a perspective view of which is shown in Fig. 4. This skimmer consists of a wooden scoop with a perforated sheet-metal or wire-gauze bottom, and provided with a handle, *h*, which is applied in such a manner that the same will stick up in a convenient position to be grasped when the skimmer floats on the juice in the pan. This skimmer can be used with advantage in pans of any desired construction.

It remains to remark that my evaporator can be converted with very little trouble into a cooking-stove simply by replacing the boiler and finishing-pan by an oven and the first pan by a suitable contrivance to take boilers, kettles, &c.

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

1. The combination of the furnace A and the flues D D' E E', one above the other, with the dampers *a b c* and *d d' d''*, by which the heat is thrown at will against both, either, or neither of the pans, or against a smaller or larger portion of the rear pan, and at the same time avoid or impinge upon the forward pan.

2. The vertically-adjustable wooden rail *f*, provided with hooks *f'*, in combination with the pan G, as described, for the purpose of attaching and operating a bag containing some clarifying materials.

CALEB BOND.

Witnesses:

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J. M. LANCASTER.