

Evaporating Pan.

No. 37,736.

Patented Feb. 24, 1863.

Fig. 1.

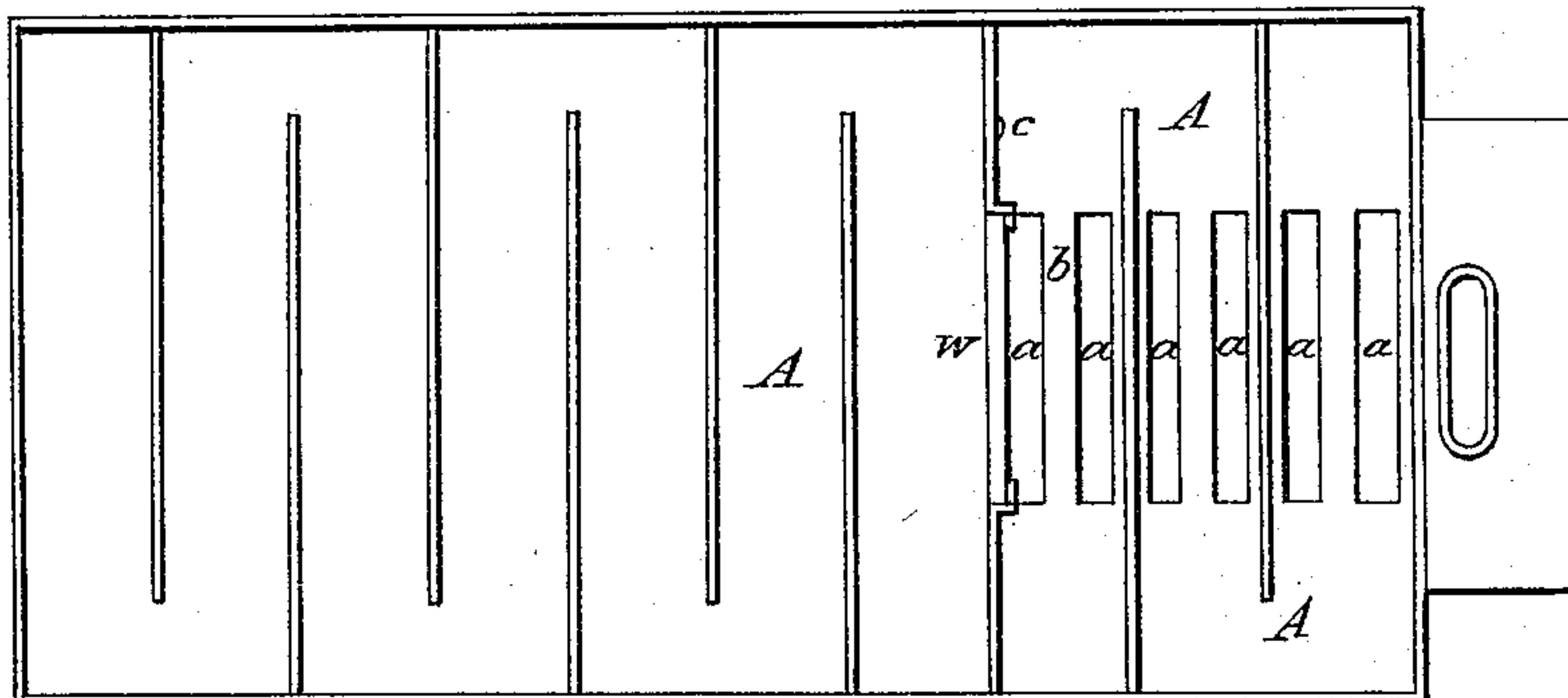


Fig. 3.

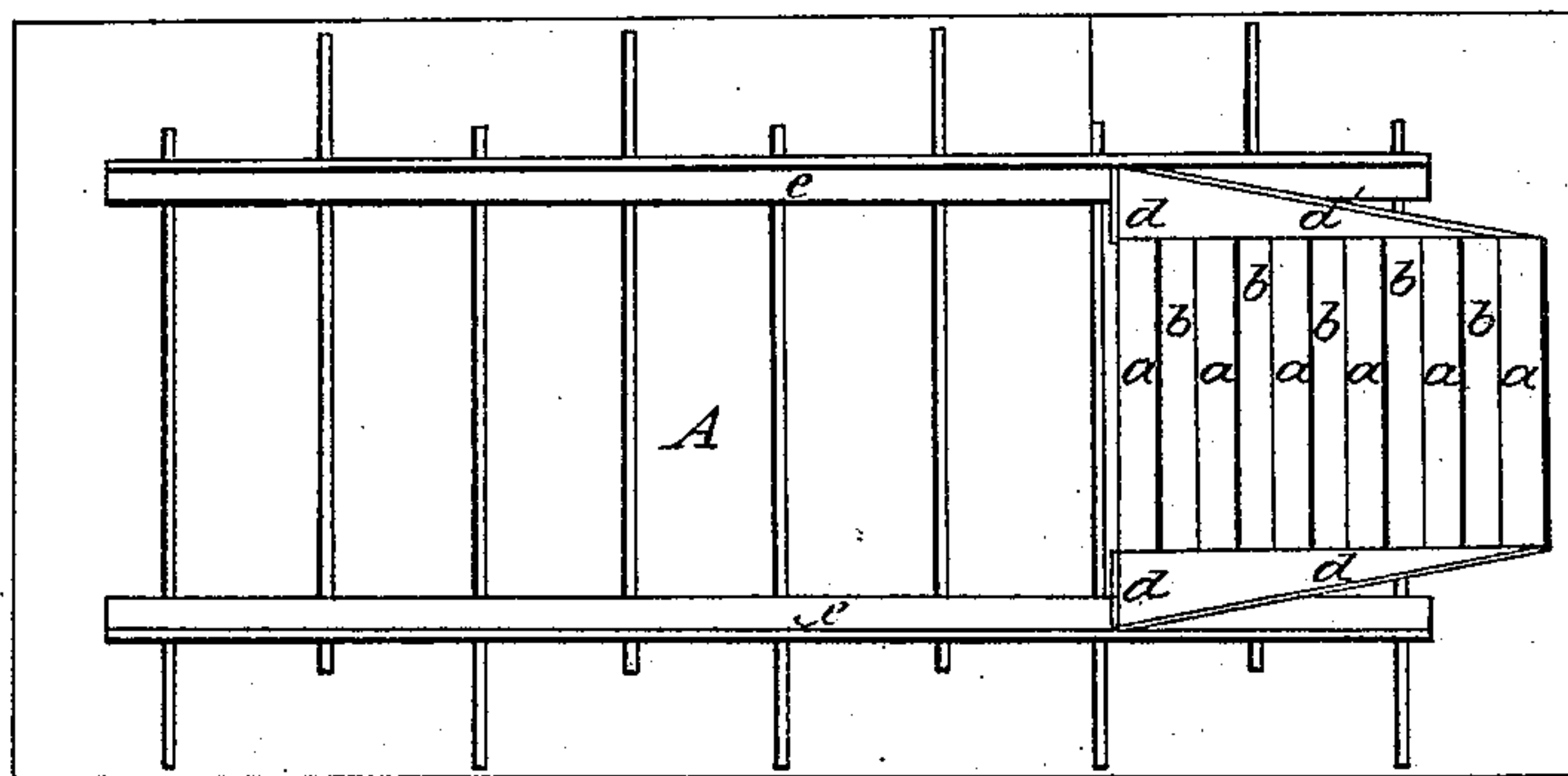
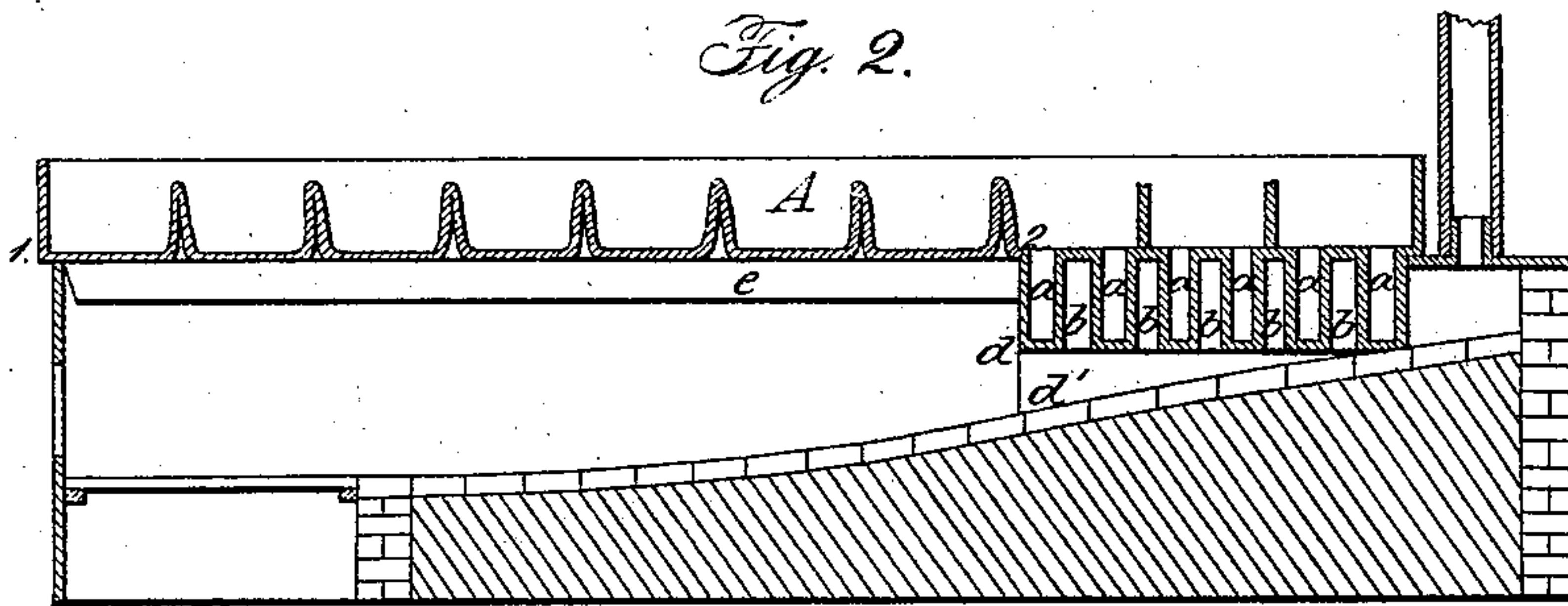


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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IMPROVED EVAPORATING-PAN WITH CELLULAR BOILER.

Specification forming part of Letters Patent No. 37,736, dated February 24, 1863.

To all whom it may concern:

Be it known that I, D. M. COOK, of Mansfield, in the county of Richland and State of Ohio, have invented a new and useful Improvement in Cellular Boiler and Shallow Evaporating-Pan United for Evaporating Sugar-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 is a plan of a shallow evaporator and cellular boiler united. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is an inverted plan of the pan and boiler.

Similar letters of reference in the several figures indicate corresponding parts.

The nature of my invention consists in a shallow evaporator constructed with a cellular boiler, which constitutes a portion of its bottom.

My invention also consists in a new arrangement of flame-directors, in combination with the cellular boiler and shallow pan.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

In order to construct a shallow evaporating-pan with great heating-surface in a small compass, I make the pan-bottom A with a sufficient length and width to evaporate a given quantity of juice in a given time, on an elevated level, as indicated between 1 and 2 in Fig. 2, and the remainder of the pan I construct with deep cells *a a*, which extend down from the level of the pan-bottom, as represented. These cells are formed by crimping or casting metal with folds, and then closing every alternating fold at both ends, thus obtaining cells *a a* and flame-flues *b b*, as illustrated.

The evaporating-surface of the pan may be extended from end to end of the pan and the cellular boiler be within a front and two lateral portions of evaporating-surface, as represented in Figs. 1 and 3.

The crimps might be diagonal or longitudinal to the passage of the flame, instead of at right angles thereto, as represented. When the crimps or folds are as shown, I arrange flame-directors *d d* between the ordinary guards, *e e*, and the front fold, and from these directors extend other diminishing directors, *d' d'*, as represented. By this arrangement,

in connection with the locating of the cellular part of the pan in the throat of the furnace, the waste flame and heat are compelled to pass under the folds or crimps, and thus a lateral circulation through the flues formed between the cells is produced, and the juice in the cellular boiler is heated from the bottom, sides, and ends of the cells, the effect of which is rapid boiling. The flame thus directed is caused to act on the lateral portions of the shallow evaporating-surface between the cells and walls of the furnace. The arrest of the flame and waste heat by the cellular portion of the pan also causes a greater heat in the pan itself, as the reflected waste heat is thrown in contact with the bottom of the pan. Thus, with the same amount of fuel as is used with a pan of the same amount of heating-surface, but occupying a larger compass, a greater amount of evaporation and a more perfect discharge of feculent matter are effected.

I have shown one of my patented evaporator-pans with the addition of a high ledge and gate, *w x*, also a brick fire-furnace; but I do not confine myself to any particular construction of pan or furnace, as it is obvious that the two planes, one shallow and the other deep and with cells, may be embodied in the various evaporators known, and be used with the different furnaces adopted for heating such pans.

The boiler or cellular portion of the pan may be constructed by suspending cylindrical or other geometrical forms of cells from the bottom of the pan. The flame in this case would circulate between and around the cells.

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

1. A cellular boiler and a shallow evaporating-pan united, substantially in the manner and for the purpose described.

2. The arrangement of the directors *d d d' d'*, in combination with the cellular boiler and shallow evaporating-pan, substantially as and for the purpose described.

Witness my hand in the matter of my application for patent on shallow evaporating-pan with cellular boiler this 22d day of January, 1863.

D. M. COOK.

Witnesses:

A. T. BATES,
W. H. BLYMYER.