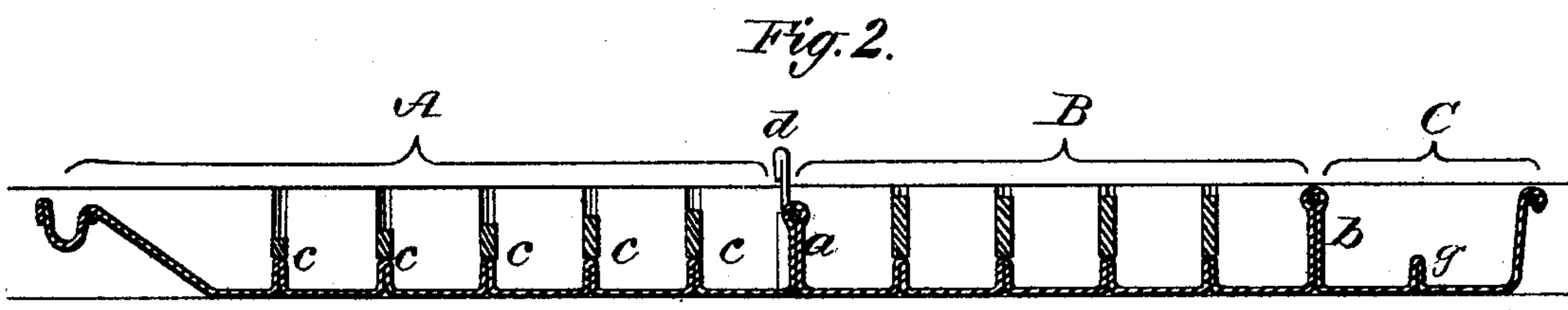
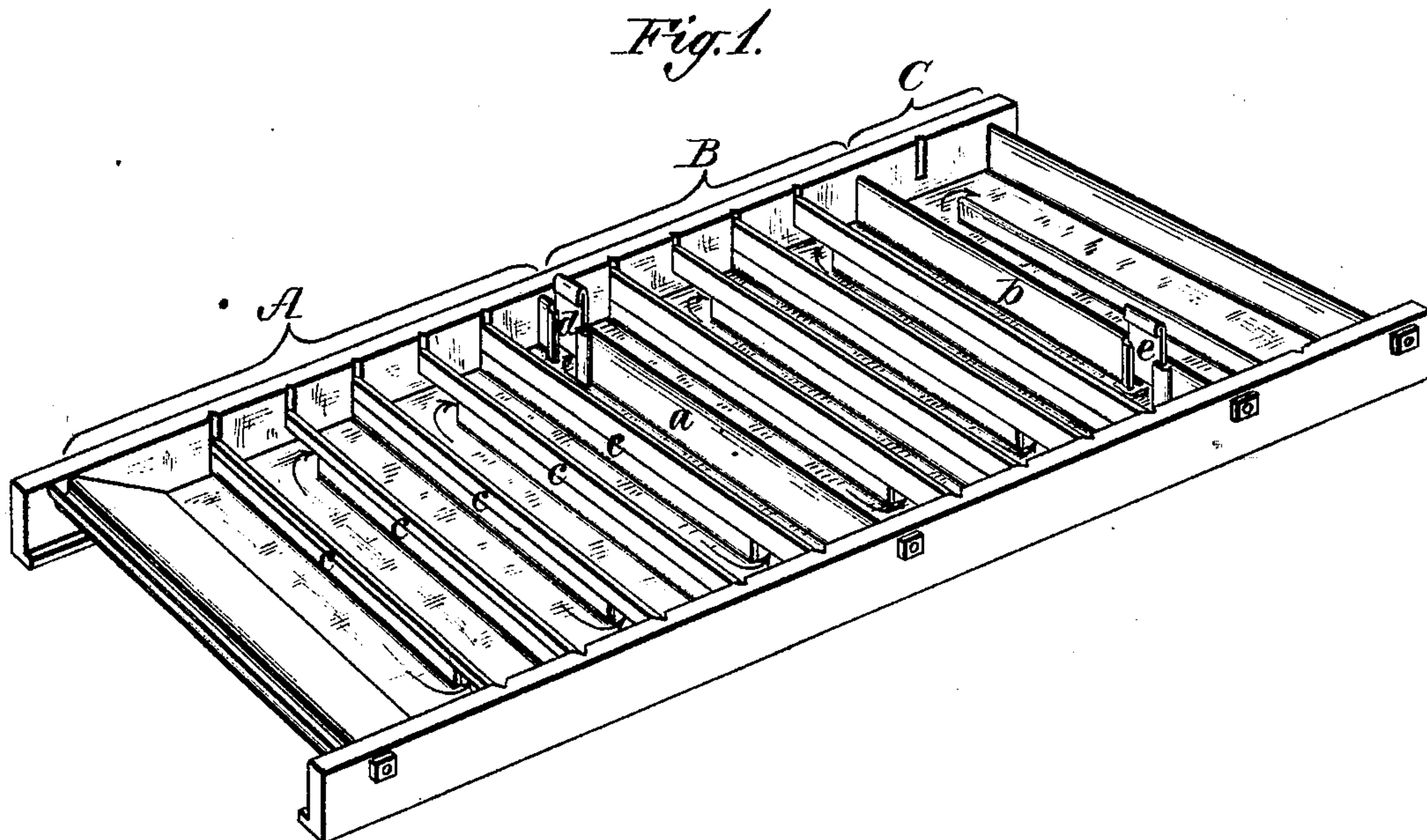


S. H. KENNEY.
Evaporating-Pan.

No. 219,818.

Patented Sept. 23, 1879.



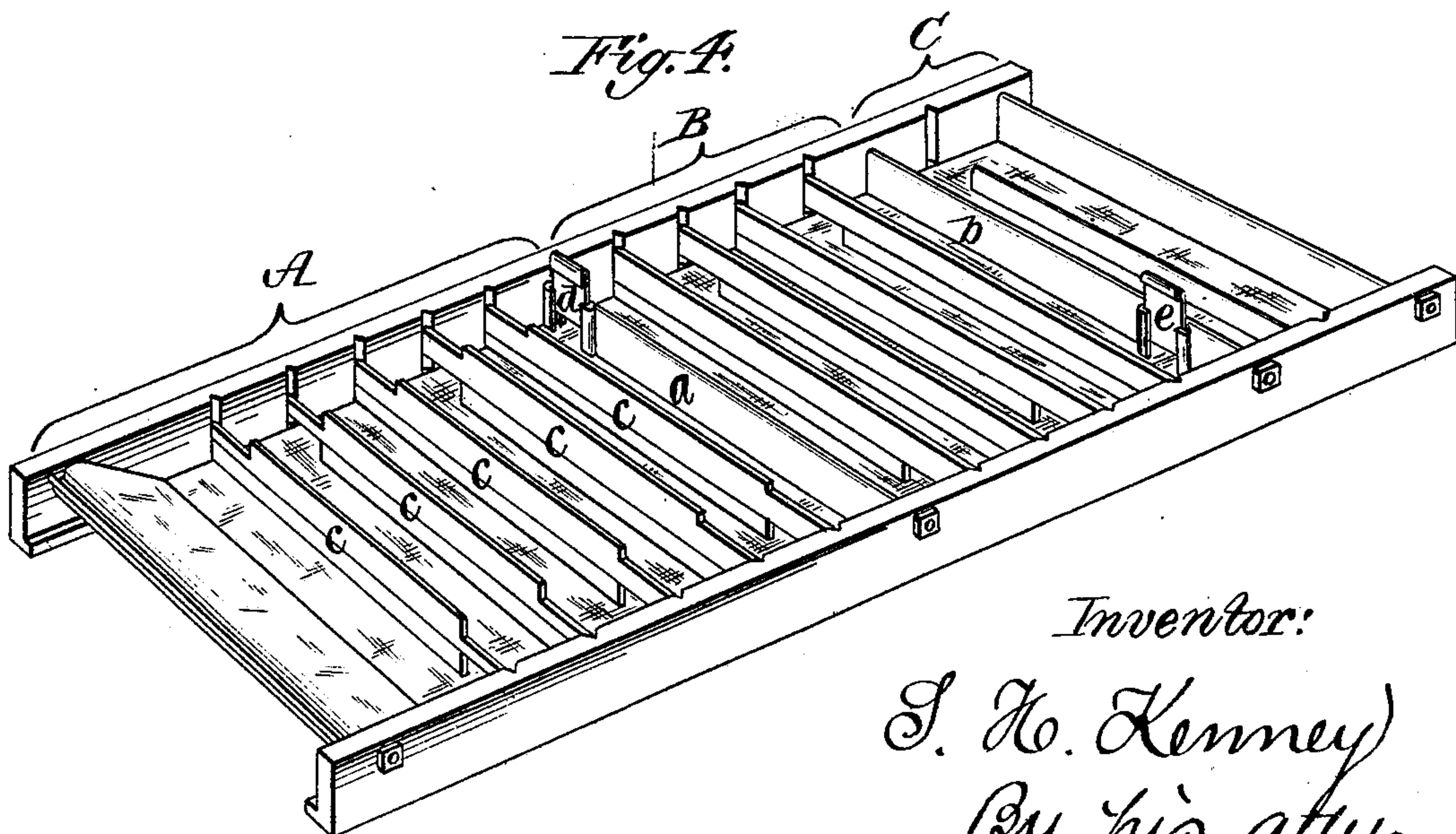
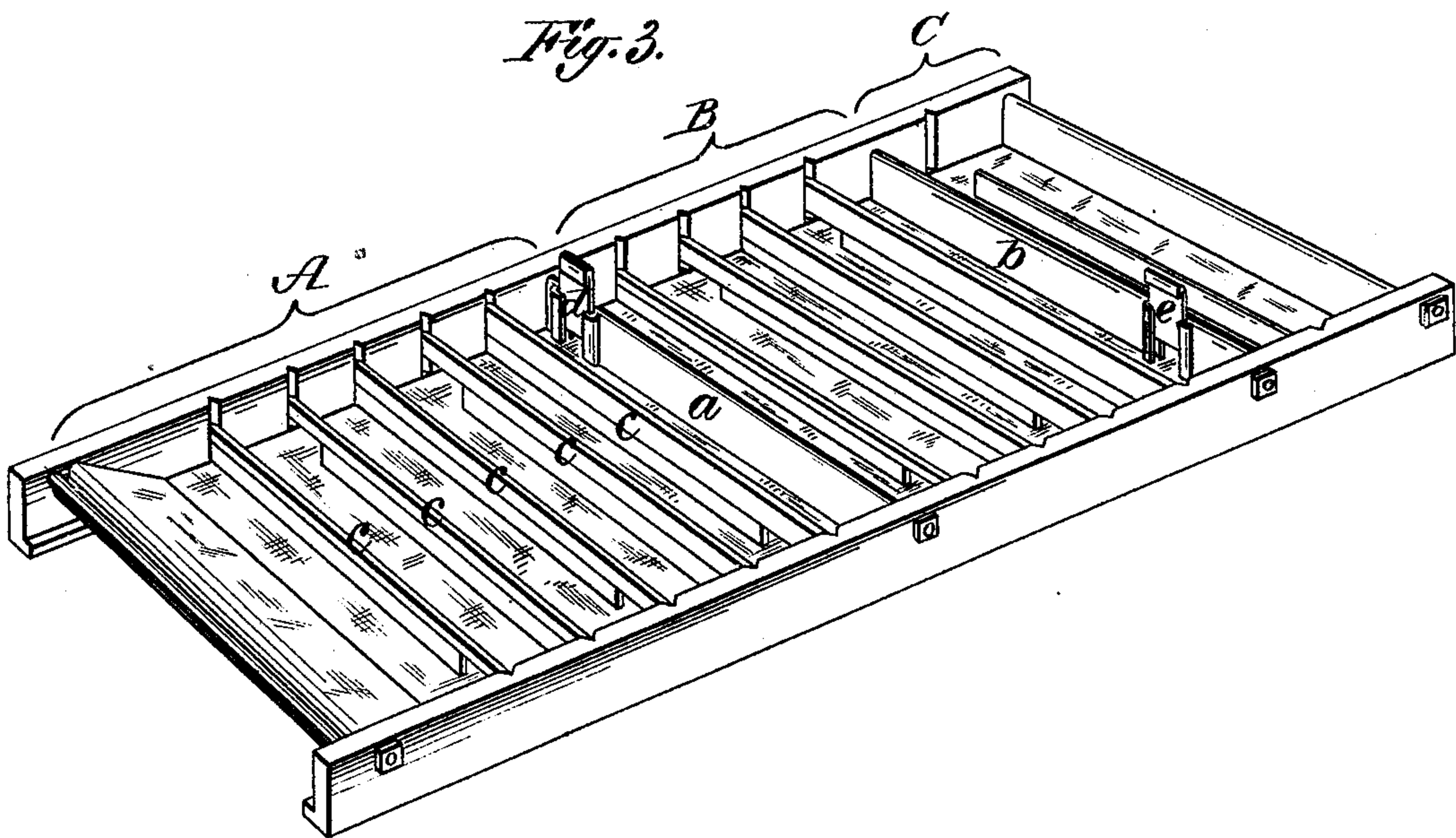
Witnesses:
William W. Dodge.
Doun J. Twitchell.

Inventor:
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UNITED STATES PATENT OFFICE.

SETH H. KENNEY, OF MORRISTOWN, MINNESOTA, ASSIGNOR TO J. S. BLYMYER, OF CINCINNATI, OHIO.

IMPROVEMENT IN EVAPORATING-PANS.

Specification forming part of Letters Patent No. 219,818, dated September 23, 1879; application filed January 2, 1879.

To all whom it may concern:

Be it known that I, SETH H. KENNEY, of Morristown, in the county of Rice and State of Minnesota, have invented certain Improvements in Evaporating-Pans, of which the following is a specification.

My invention relates to that class of pans by which continuous process of evaporation and reduction of a shallow stream of flowing sirup is carried on, the operation being commonly known in the art as the "Cook process," and being distinguishable from other processes in that the sirup is not rehandled or changed from one apparatus to another, and that it is kept in constant movement.

The object of my invention is to produce a pan in which the coarse and impure matters will be thoroughly and automatically separated from the juice previous to its evaporation, and prevented from remixing therewith; and to this end it consists in constructing the pan with two or more communicating apartments or divisions, through which the juice flows successively, the first division or divisions being graded and specially arranged to cause the scum, glucose matters, and other impurities to separate from the juice, while the last division is designed to receive and reduce the previously-purified juice.

In the treatment of saccharine juices it is important that the coarse and impure matters shall be separated at the earliest possible point in the process, and previous to the commencement of the reduction, in order that they may not discolor the juice or become inseparably incorporated therewith.

Hitherto the best results have been attained only by treating the sirup in its different stages in different pans or kettles at different temperatures.

My invention is designed to effect the purification and reduction in one pan in a continuous operation.

Referring to the accompanying drawings, Figure 1 represents a perspective view of my pan in what I consider the best form; Fig. 2, a longitudinal central section of the same; Figs. 3 and 4, views showing modifications.

Referring to Figs. 1 and 2, it will be seen that my pan consists of wooden sides, a sheet-

metal bottom, and a series of transverse partitions, similar in the general construction and arrangement to the well-known Cook evaporator, and others of its class. The pan shown in the figures referred to is divided by two high transverse partitions, *a* and *b*, into three sections or apartments, A, B, and C, the first designed to effect the separation of the coarse impurities while the juice is still at the low temperature resulting from the constant addition of raw juice, the second designed to cause the separation of the glucose and other impurities, which separate only at high temperatures, and the third and last designed to effect the final evaporation and reduction of the purified juice.

The division or apartment A contains a number of transverse partitions, *c*, extending from side to side, and increasing successively in height as the finishing end is approached. The partition at the receiving end of the pan is quite low; but the next is higher, the third higher than the second, and so on in succession to the end of the apartment or division, which, in the present instance, contains five partitions, but which may have a greater or less number. The partitions of this apartment are cut away on the bottom at the side of the pan, the first one on the right hand, and the second at the left, and so on alternately, in order to cause the juice in its forward movement to follow a zigzag path across the pan and underneath the partitions. The pan will be mounted, like others of its class, on a furnace, having a flue extended lengthwise under the center of the pan from the receiving toward the finishing end. As the juice passes forward between and beneath the partitions *c*, the heat causes the coarse impurities to rise and separate from the juice, and work backward and downward over the graded partitions *c* to the head of the pan, where it is readily removed by a skimmer or drawn into a scum-trough. The passage of the juice beneath the partitions prevents it from carrying the scum forward, as the scum encounters and is held back by the partitions. The juice, freed from its coarse impurities and still at a comparatively low temperature, passes from apartment A, through a gate, *d*, in partition *a*, into the second apart-

ment, B, where its temperature is elevated nearly or quite to the point at which reduction or evaporation commences. This second apartment contains a series of transverse partitions, of equal height, having their ends cut away on the under side, on the right and left of the pan alternately, as shown, so that the juice is again compelled to flow back and forth across the pan during its advance, and to pass under the partitions, which serve to hold back the scum, which, owing to the action of the heat, is caused to flow to the sides of the pan, whence it is readily removed. During its passage through this second apartment, B, the juice escapes through a gate, *e*, in partition *b* into the last apartment, C, where its temperature is augmented and its evaporation effected. The apartment C is provided with one or more transverse partitions, *g*, cut away at one end to permit the free passage of the sirup around it.

By combining the differently-arranged apartments as described I effect a ready and thorough separation of the impurities automatically, prevent the separated impurities from again encountering the juice at a more advanced point, secure the delivery of the juice to the finishing-apartment in a pure, unstained condition, and as a result produce a sirup of great purity, and a fine color and clearness.

By means of the gates and high partitions *a b* the flow of the juice from one apartment to the next is brought perfectly under the control of the operator, and thus he is enabled to regulate the height of the fluid in the cleansing apartments, and the length of time which it occupies in passing through them, so as to secure the exact results required.

The partitions may be constructed in any suitable manner; but it is preferred to make low partitions, as usual, by folding up the metal bottom, and filling them out to the required heights by the application of wooden bars seated at their ends in the sides of the pan, as shown.

Instead of arranging the partitions of the second apartment, as in Figs. 1 and 2, to throw the scum to the sides, they may be graded in

the same manner as those in the first apartment, as shown in Fig. 3, so as to throw the scum back to one point next to the partition *a*.

Instead of grading the partitions downward across the entire top, as shown in Fig. 1, they may be simply cut down at the ends, as shown in Fig. 4, these ends being graded in height.

I am aware that it is old to provide a pan having a single compartment only with transverse graded partitions open at alternate ends, the series extending from one end of the pan to the other; and I am also aware that it is old to provide a pan having two compartments with a series of transverse graded partitions each provided with openings and deflectors at its two ends, so that the sirup can pass through them without crossing the pan from side to side, and such constructions I do not claim.

Having thus described my invention, what I claim is—

1. The combination, in a single evaporating-pan, of two compartments—the first a cleansing-apartment, in which transverse channels for the flow of the juice from side to side are formed by transverse partitions graded downward in height toward the receiving end and provided with openings at alternate ends, and the second a reducing-apartment, separated from the first by means of a high transverse partition provided with a narrow gate or means of communication between the two compartments, as shown and described.

2. The combination, in one pan, of the two communicating compartments A B, each provided with graded transverse partitions, and the finishing-apartment C.

3. In one pan, the combination of the three apartments, communicating by adjustable gates, the first having graded partitions, and the second partitions having bottom openings arranged at alternate sides of the pan, as shown, to cause a transverse underflow.

SETH H. KENNEY.

Witnesses:

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