

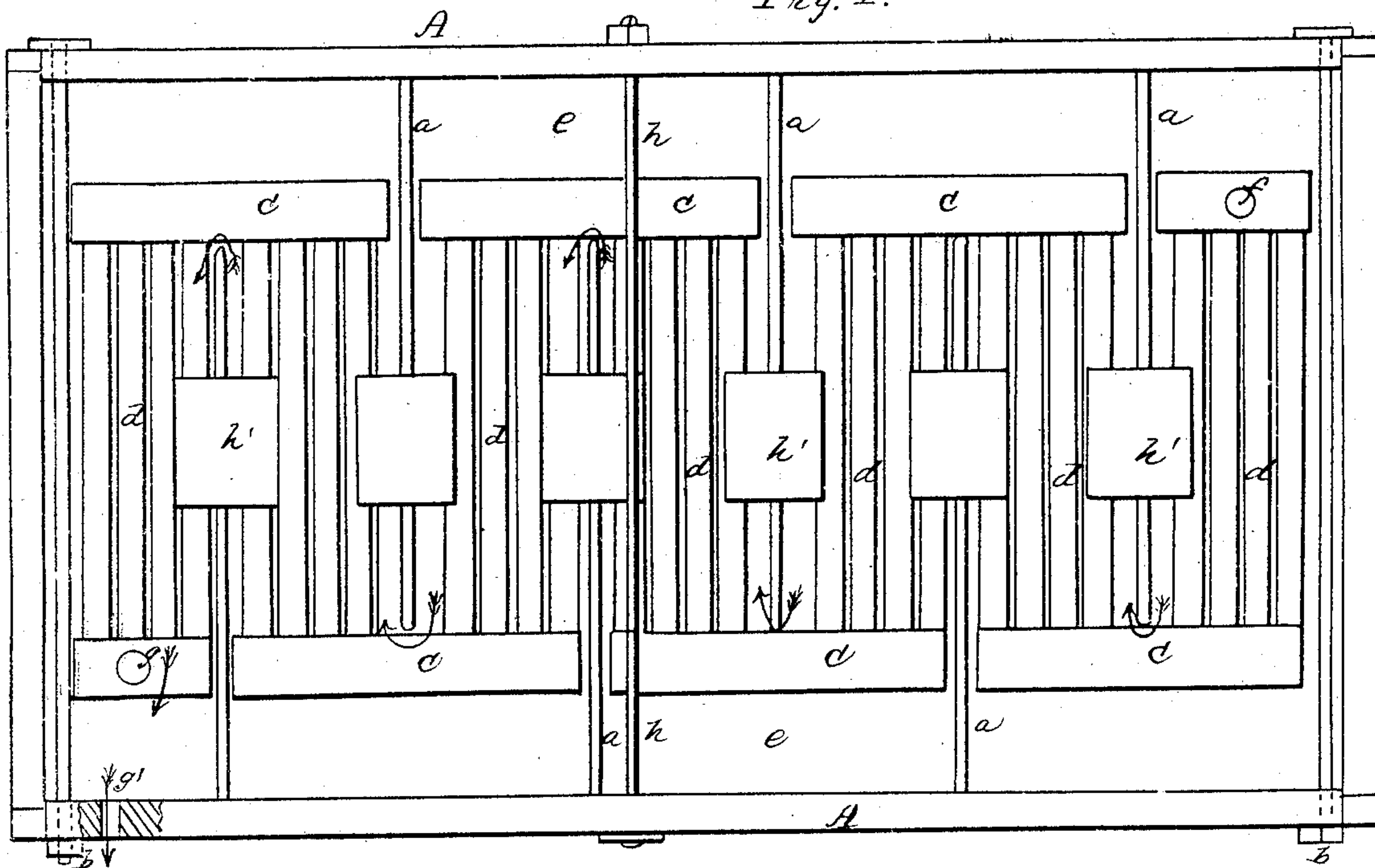
*D. M. Cook.*

*Evaporating Pan.*

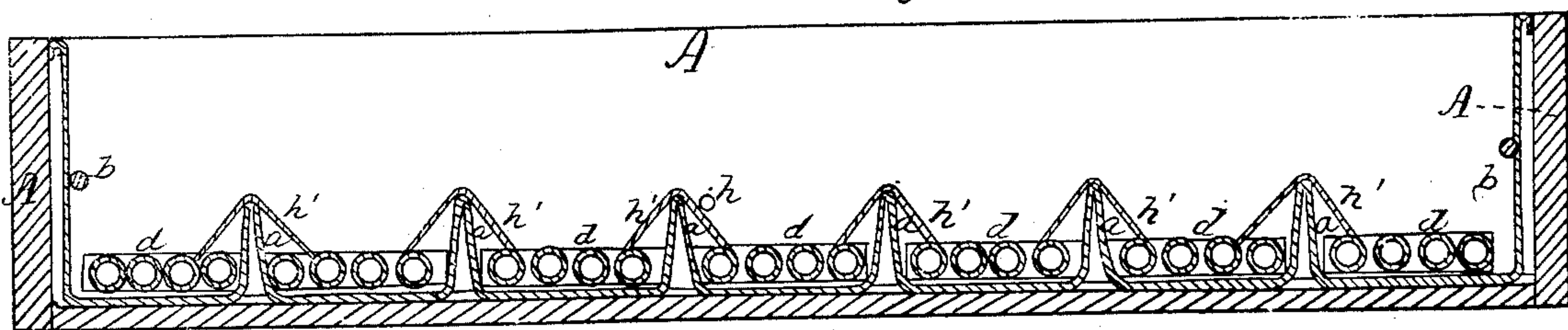
*N<sup>o</sup> 38/52.*

*Patented Apr. 14. 1863.*

*Fig. 1.*



*Fig. 2.*



*Gustav Dietrich  
R. T. Campbell.*

*D. M. Cook  
by his attys  
Mason Gerwick  
Lawrence*



# UNITED STATES PATENT OFFICE.

D. M. COOK, OF MANSFIELD, OHIO.

## IMPROVEMENT IN EVAPORATING-PANS FOR SUGAR-JUICES.

Specification forming part of Letters Patent No. 38,152, dated April 14, 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 Evaporating-Pans for 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 or top view, and Fig. 2 a vertical longitudinal section, of the improved evaporator-pan.

The same letters of reference in the different figures indicate corresponding parts.

This invention relates especially to the evaporator-pan patented to me on the 22d of June, 1858, reissued December 20, 1859. In that pan I obtained a continuously-flowing stream in an indirect course from one end of the pan to the other. I also effected the evaporation of the juices by fire-heat alone.

The object I now have in view is to effect the evaporation of sugar-juices on the principle of operation described in my said patent by means of steam heat, or a combination of both fire and steam heat, employing for this purpose a zigzag system of steam-coils, arranged mainly on the middle portion of the pan-bottom, and traversing the zigzag channel formed by scum-arresting partitions, which are arranged so as to form a zigzag circulation-channel.

The advantages due to the cooking of sugar-juices by steam or a combination of steam and fire are well understood; but it may be proper to state that when steam is employed with fire-flame the heat on the surface of the pan does not require to be so "scorching hot," and if steam alone is used there is no danger under proper care of the juice being burned.

The advantages of the ledges and the cooling sides of my patented pan are now so universally known and admitted it may be unnecessary for me to give a description of the same, except by referring to that patent which is dated as above stated.

To enable others to understand my present improvement, I will proceed to describe the same with reference to the drawings.

A is a rectangular pan. Its sides are made, preferably, of wood. Transversely to the pan, at proper distances apart, are arranged scum-

arresting ledges or partitions *a a*, said ledges being formed by corrugating or crimping the metal portion of the pan-bottom. They strike out alternately from opposite sides of the pan, so that a zigzag or indirect channel or passage from front to tail end for the current to circulate through is formed, as represented in the drawings. The arrows indicate the circulating sugar-juice current. The pan-bottom, with its ribs, is clamped between the wooden sides by means of screw-bolts *b b* or otherwise. The ends of the bottom may be turned up as high as the wooden ends of the pan. Now, I take steam-pipes *d* or tubes and unite them in several series by means of head and end tubes, *c c*, so as to form a zigzag "coil," which is just adapted to fill the spaces between the partitions *a a*, so far as longitudinal capacity of said spaces is concerned. The length of the tubes separated is much less than the width of the pan-bottom, and therefore when the coil is laid upon the pan-bottom there remains an uncovered portion of bottom, as indicated at *e e*, on each side of the coil or pan. These uncovered portions constitute cooling sides or surfaces. The steam-coil has an inlet at *f* and an outlet at *g*. The pan has a discharge at *g'* for the escape of the flowing juice as fast as cooked or evaporated. The steam-coil is held down by means of a screw-rod, *h*, or in any suitable manner that will allow it to be removed for cleansing.

If the pan is to be used for steam-evaporation only, the metal bottom is closed in with a wooden bottom, so as to prevent the rapid radiation of the heat. The steam-coil may be held in suspension by means of small arches or other connecting devices, *h' h'*, so that the juice may flow under the tubes, as well as about and over them.

If the pan is placed on a fire-arch only, such portion of its metal bottom as is covered by the steam-coil is exposed to the fire, so that the pan is heated at its middle portion and kept cool on its sides outside of the range of the fire or flame. I may sometimes use both fire and steam, but never fire alone, with this pan. The pan may also be set on rockers or on a device which will enable it to be set more or less inclined to facilitate the flow of the juice or retard the flow of the same. As the heat varies, so must the pan be regulated or the thickness of stream varied, as described



in my aforesaid patent. The steam flows into the coil and follows the line of the flowing juice, and thus acts upon it equably about the middle portion of the pan. The thus heated juice is caused to boil, and as the surface of pan outside of the coil is comparatively cool, the scum flows from the middle of the pan in both directions, right and left, and deposits, ready to be skimmed off with a skimmer.

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

1. The arrangement of a zigzag steam-coil, constructed substantially as described, within the ledges of an evaporator-pan, which allows the juice to flow continuously in an indirect

course; arrests the impurities and also keeps the juice comparatively cool outside of the steam-coil, substantially as and for the purposes described.

2. The combination of the steam-coil, metal bottom, partitions, wooden ends, and wooden bottom, in the manner and for the purpose described.

3. The manner of suspending the coil.

Witness my hand and seal in the matter of my application for patent on improved evaporating-pan.

D. M. COOK.

Witnesses:

A. T. BATES,

W. H. BLYMYER.