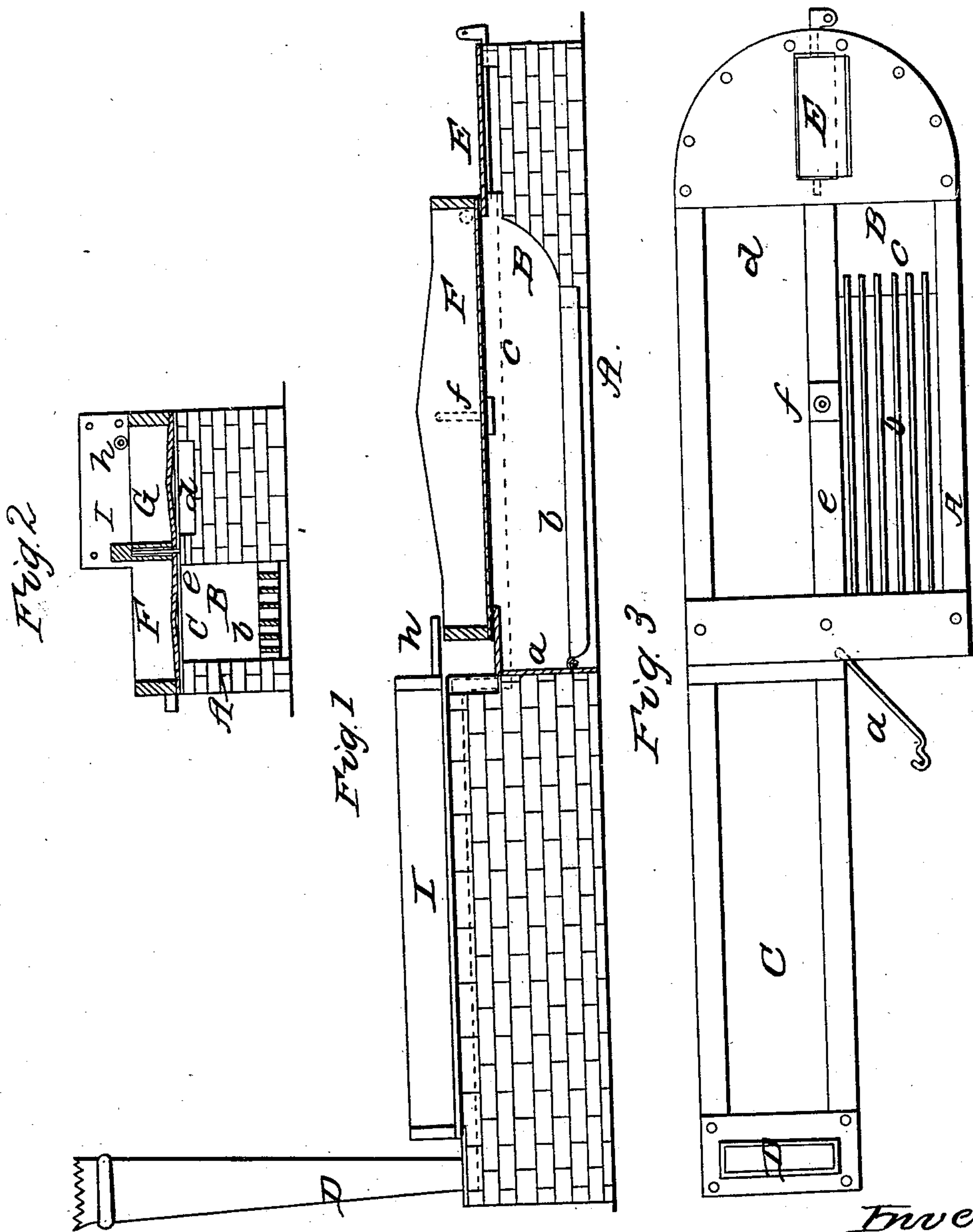


## Evaporator for Saccharine Juices.

Patented Sept. 13, 1864.

No. 44,248.



Witnesses  
J. W. Coombs.  
W. Reed

Inventor  
S F Woodworth  
per Murm &  
attys.



# UNITED STATES PATENT OFFICE.

S. F. WOODWORTH, OF IOWA FALLS, IOWA.

## IMPROVED EVAPORATOR FOR SACCHARINE JUICES.

Specification forming part of Letters Patent No. 44,248, dated September 13, 1864.

*To all whom it may concern:*

Be it known that I, S. F. WOODWORTH, of Iowa Falls, in the county of Hardin and State of Iowa, 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, making a part of this specification, in which—

Figure 1 represents a longitudinal vertical section of my invention. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a plan or top view of the furnace, the pans having been removed to expose the flues.

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

This invention consists in the application of two revolving pans to a furnace with a return-flue, in combination with a damper in such a manner that by revolving said pans either of the two can be brought over the hottest part of the furnace, and by opening the damper a current of cold air can be passed under that pan not directly over the furnace whenever it may be desirable, either for the purpose of drawing off its contents or for the purpose of cooling the pan.

The invention consists, further, in the combination, with two revolving pans placed over a return-flue, of a third pan set over an arch, which forms the continuation of the return part of the first flue, in such a manner that the surplus heat escaping from the return-flue can be advantageously used for the purpose of heating the juice previous to its introduction in the revolving pans.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a furnace built up of brick or any other suitable material, and provided with a door, *a*, and grate *b*, as clearly shown in Fig. 3 of the drawings. The products of combustion from this furnace are carried off through the return-flue B and through the secondary flue C to the chimney D. The return-flue B is composed of two arches, *c* *d*, which are separated one from the other by the partition-wall *e*, and a damper, E, placed at the junction of said two arches, serves to open or close the communication between them. The return-flue B supports two fans, F G,

which are rigidly connected with each other, and which revolve on a pivot, *f*, inserted in the partition-wall *e* between the two arches of said return-flue. By revolving the two pans on this pivot either one of them can be brought directly over the furnace or over the coolest portion *d* of the return-flue, and if by turning the damper E the communication between the two arches is closed the pan situated over the arch *d* does not come in contact with the products of combustion, and at the same time a current of cold air introduced at the opening left by the damper passes through under it. By this arrangement the sirup in the second pan, G, can be easily cooled down and removed and at the same time the juice in the first pan, F, is boiling, so that by the time the sirup is removed from the second pan and it is again filled with a second batch the first pan will have evaporated about one-sixth of the juice in it, and just so soon as the bottom of the second pan is covered with fresh juice the damper may be closed and the products of combustion carried through under the bottom of the second pan until the juice in the first pan is ready to finish up over the moderate fire of the second arch of the return-flue. At this stage the two pans are revolved on the pivots *f*, bringing the pan G over the arch *c* and the pan F over the arch *d*, and the contents of the pan F can be readily thickened without danger of scorching until the sirup is finished, when the boiling can be stopped in an instant by opening the damper E.

In order to utilize the heat escaping from the arch *d* of the return-flue, I have continued this arch, as clearly shown in Fig. 3 of the drawings. This continuation forms the secondary flue C, which is in direct communication with the chimney D and supports the pan I. In this pan the raw juice receives a preliminary heating previous to introducing it in the pan over the arch *d* of the return-flue, and a spout or tube, *h*, serves to admit the contents of said pan I to the pan over the return-flue. The bottoms of the pans F G I are made convex to prevent them from sagging down under the weight of the juice. By this arrangement all the heat is utilized, and the evaporation of the juice can be effected with a saving in fuel and with comparatively little labor.

I do not claim the use of a return-flue in an

evaporator for cane-juices, neither do I claim separately the use of the revolving pans, as both have been previously employed; but

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

1. The application of revolving pans F G to the return-flue B, in combination with the damper E, constructed and operating in the manner and for the purpose substantially as herein shown and described.

2. The combination of the secondary flue C and pan I with the return-flue B and revolving pans F G, substantially as and for the purpose set forth.

S. F. WOODWORTH.

Witnesses:

H. GRAVES,  
J. K. SENTER.