No. 698,733. Patented Apr. 29, 1902.

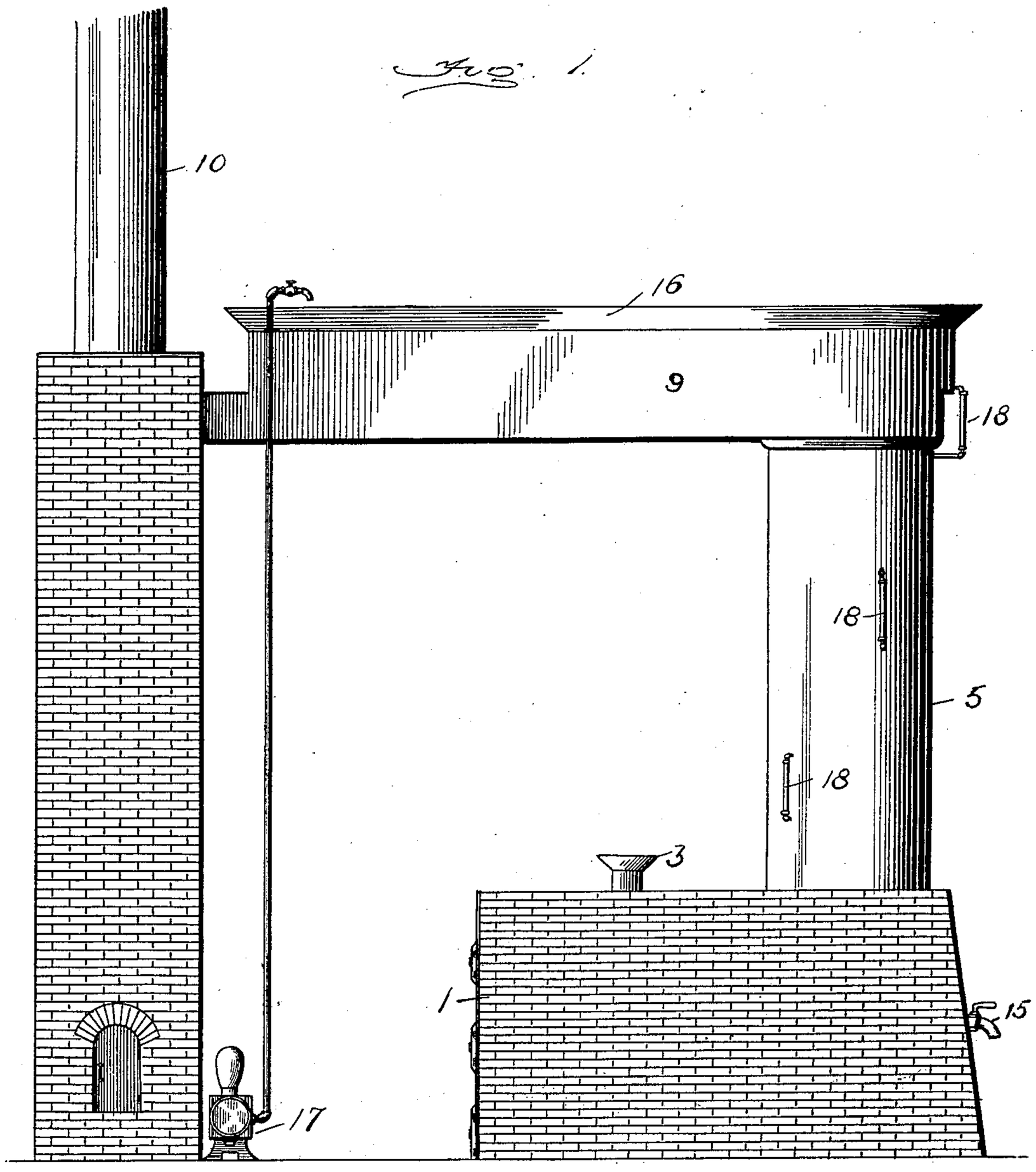
O. M. NILSON.

EVAPORATING APPARATUS.

(Application filed July 19, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses:
Chas. J. Booth.
Grace L. Dunn.

O. M. Nilson, Inventor
By J. Farrell Lawson
Attorneys

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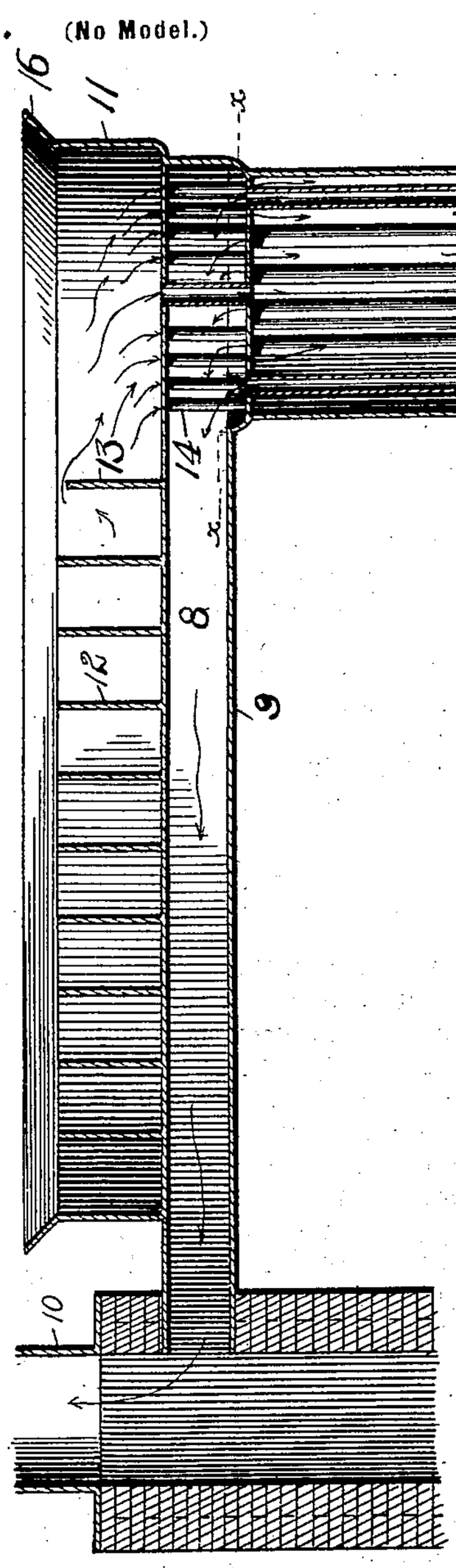

FIG. 2.

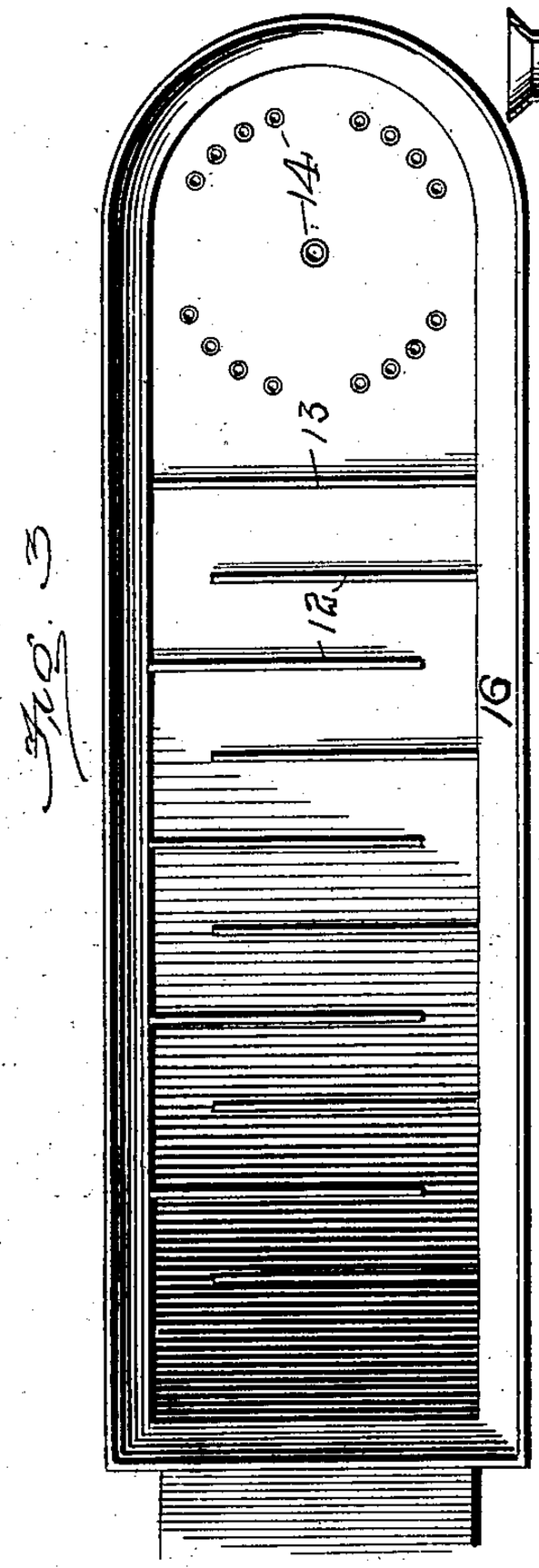

FIG. 3.

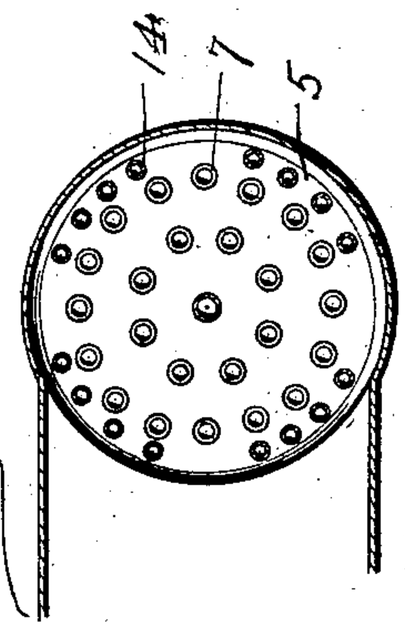

FIG. 4.

Witnesses:
Thos. Worth.
Grace L. Dunn

Inventor
O. M. Nilson,
By Farrell & Lawson
Attorneys

UNITED STATES PATENT OFFICE.

OSCAR M. NILSON, OF MANSFIELD, LOUISIANA.

EVAPORATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 698,733, dated April 29, 1902.

Application filed July 19, 1901. Serial No. 68,943. (No model.)

To all whom it may concern:

Be it known that I, OSCAR M. NILSON, a citizen of the United States, residing at Mansfield, in the parish of De Soto and State of Louisiana, have invented certain new and useful Improvements in Evaporating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in apparatus for boiling cane-juice and reducing it to sugar density.

The primary object of the invention is to provide a novel arrangement of hot-air flues, whereby the maximum heating-surface is presented to the light syrup made from previously-superheated juice and the same thereby quickly reduced to the desired density.

With this and other objects in view the invention consists in the novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is an elevation of the complete apparatus comprising my invention. Fig. 2 is a vertical longitudinal section therethrough. Fig. 3 is a plan view of the evaporating-pan; and Fig. 4 is a section on line $x\,x$, Fig. 2.

Referring to the figures by numerals of reference, 1 is an oven or furnace, preferably formed of masonry and having a suitable grate 2 and inlets 3. Fitted within the top of the furnace, at the rear thereof, is the enlarged lower end 4 of a cylindrical boiler 5. The bottom 6 of the boiler is inclined and forms the back wall of the combustion-chamber of the furnace.

Both ends of the boiler 5 are closed, and flues 7 extend longitudinally therein from the top to the enlarged portion 4. The flues are then bent at an angle and open through the bottom 6 and right angles thereto. These flues permit the products of combustion from the furnace to pass upward through the boiler into a flue or passage 8, which extends entirely under the bottom of the evaporator-pan 9 used in connection with this apparatus. This flue is formed of suitable material, as sheet metal, and opens into a smoke-stack 10, as shown in Fig. 2.

Formed or mounted upon the top of the flue 8 is the pan proper, 11, of the evaporator. This pan is arranged above the boiler 5 and preferably extends along the flue 8 to a point adjacent to the stack 10. Vertical strips 12 are arranged upon the bottom of the pan 11 and extend partly across the same from opposite sides alternately. Another strip 13, which is the one nearest the boiler 5, extends entirely across the pan and forms a dam, over which the juice is adapted to flow into tubes 14, which connect the bottom of the pan 11 with the interior of the boiler 5. These tubes are preferably arranged in circles in groups, and a single tube is provided at the center of the boiler-top.

An outlet-valve 15 is arranged at the lowest point of the boiler 5, preferably at the rear of the furnace 1.

Inclined flanges 16 prevent the juice from overflowing from the pan 11.

The juice of the cane is forced into the end of the pan 11 nearest the stack 10 by means of a suitable pump 17. As the juice moves back and forth between the strips 12 it will be thoroughly heated and evaporated by the hot gases passing from the furnace 1 through the flue 8. The juice will finally flow over the dam 13 and down into the boiler 5 through the tubes 14. The flues 7 in the boiler will be completely surrounded by the juice, the density of which will be quickly increased as it boils. The density may be readily determined by means of a desired number of glass tubes 18, having outlets (not shown) and suitably arranged upon and communicating with the boiler. When the density desired is secured, the product is withdrawn from the boiler in a continuous stream through the outlet 15.

Suitable means (not shown) may be provided whereby access may be readily obtained to the interior of the boiler 5 and flue 8 for cleaning purposes.

In the foregoing description I have shown the preferred form of my invention, but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

Having thus fully described my invention,

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

1. The combination with a furnace; of a boiler, an inclined bottom thereto forming a wall of the combustion-chamber of the furnace, an evaporating-pan, a flue extending thereunder, flues extending through the boiler and adapted to convey the products of combustion from the furnace to the flue of the pan, tubes connecting the pan with the interior of the boiler, and a valved outlet from the boiler.

2. The combination with a furnace, of a boiler, an inclined bottom thereto forming one of the walls of the combustion-chamber of the furnace, an evaporating-pan, a flue thereunder having an outlet, flues extending longitudinally through the boiler and adapted to conduct the products of combustion from the furnace to the flue of the pan, alternately arranged cross-strips in the pan, a dam, tubes connecting the pan with the interior of the boiler, whereby juice is permitted to flow into said boiler and surround the flues therein, and a valved outlet from the boiler at the lowest point thereof.

3. The combination with a furnace; of a boiler forming one wall of the combustion-chamber of the furnace, an evaporating-pan, a flue thereunder, means for conducting the products of combustion from the furnace to the flue under the pan, tubes connecting the interior of the boiler with the evaporating-pan whereby juice is permitted to flow into said boiler from the pan, said tubes and boiler being heated by the products of combustion, and an outlet from the boiler.

In testimony whereof I affix my signature in presence of two witnesses.

OSCAR M. NILSON.

Witnesses:
JOHN M. HUSON,
S. H. BELL, Jr.