H. C. STEVENS & T. W. STEVENS.

Sugar Evaporators.

No. 137,576. Patented April 8, 1873.

Fig. 1.

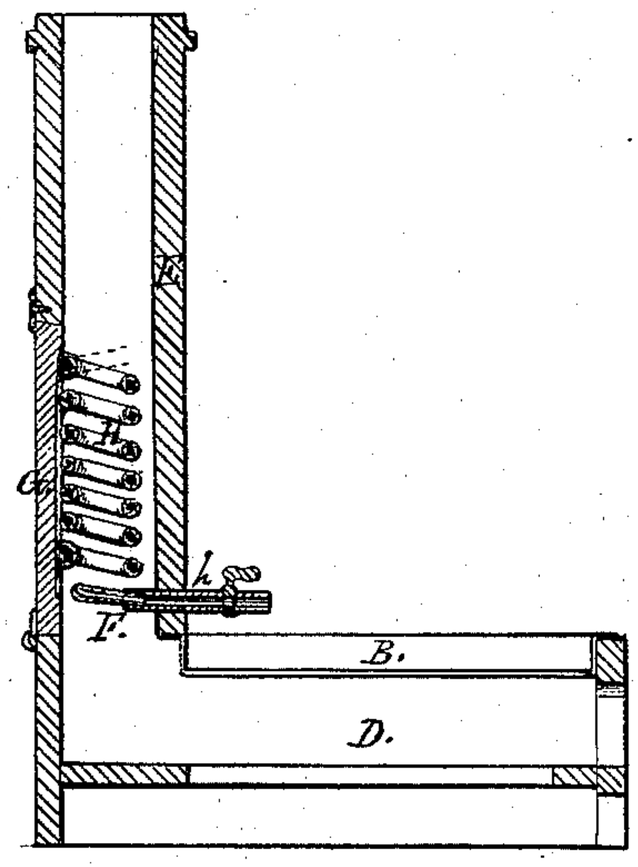
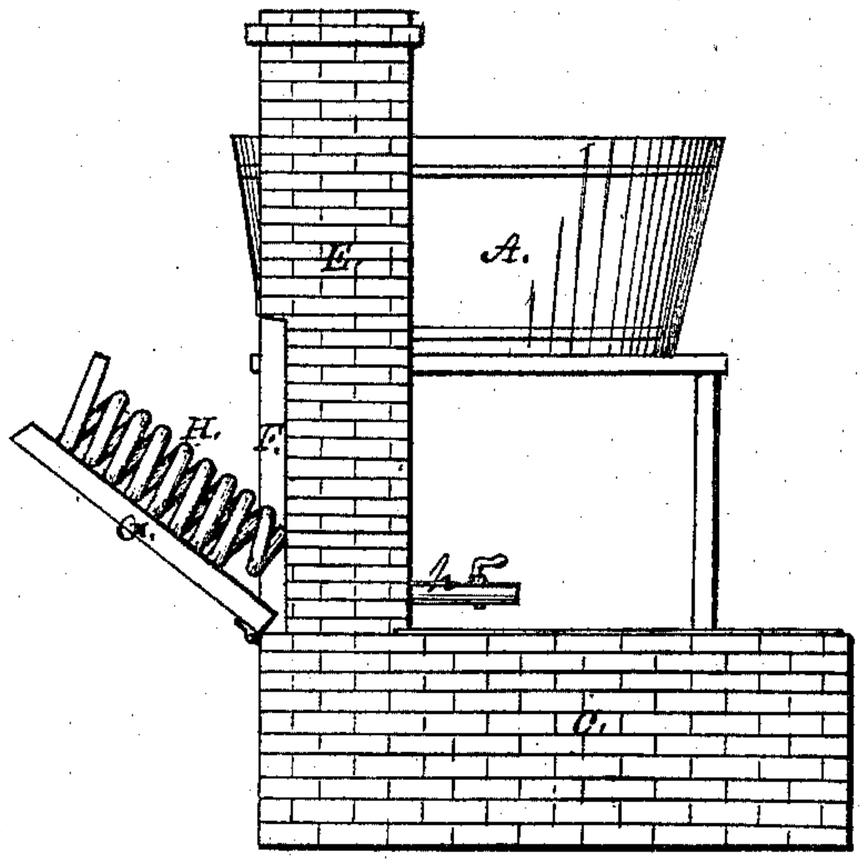


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

HOMER C. STEVENS AND THEODORE W. STEVENS, OF ENOSBURG, VT.

IMPROVEMENT IN SUGAR-EVAPORATORS.

Specification forming part of Letters Patent No. **137,576**, dated April 8, 1873; application filed October 28, 1872.

To all whom it may concern:

Be it known that we, HOMER C. STEVENS and THEODORE W. STEVENS, of Enosburg, in the county of Franklin and State of Vermont, have invented a certain new and useful improvement in apparatus for boiling and evaporating maple sap, the juice of sorghum, sugar-cane, beet, or other substances; and the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 represents a side sectional view through the evaporating-pan, fire flue or place, and chimney, showing the coil of pipe in the flue of the chimney as attached to a hinged door, through which coil the sap or juice flows from the tub or reservoir, and is discharged into the evaporating-pan. Fig. 2 is a side-view elevation of the evaporating apparatus, showing the door open, on which the heating coil of pipe is attached, so that it can be easily cleaned from an accumulation of soot to make the heating of the sap or juice effectual while it is passing through it to the pan.

The nature and object of our invention is to economize fuel and time in reducing maple sap and other juices to sirup by heat or artificial evaporation; and it consists in the coil of pipe being placed in the flue or chimney of the furnace above the evaporating-pan, the coil of pipe being so attached to a door or shutter that it can be opened outward from the chimney and removed from the flue, so as to be easily cleaned of the smoke and soot that rapidly accumulate on everything within the draft-flue, where the smoke and gases are partially consumed.

To enable others to make and use our improvements, we will describe them more fully, referring to the drawing and letters thereon.

In the manufacture of maple sirup and sugar the process generally heretofore has been by boiling the sap in furnace-kettles set rudely out of door, or in a small cabin, in the midst of the sap-orchard, where the flow of sap could be more conveniently gathered in tubs, and as it is reduced the kettles have been replenished by pouring in the cold sap, which, for a time, causes the ebullition to cease, which greatly retards the evaporation and consumes the time and fuel without any beneficial result; but more recently shallow evaporating-pans have been arranged over furnaces for evaporating sorghum-juice, &c., and a constant flow of juice, running in cold at one point, and passing over the surface of the pan in channels of sufficient length to reduce it to sirup when discharged at another point. The juice or sap thus let into the pan does not become sufficiently heated for a considerable length of time to commence ebullition, and consequently there is no evaporation or reduction, but on the contrary is expanded until it gets to a boiling heat; here is also a very perceptible loss of time and waste of fuel.

Our improvement provides a means, at a very little expense, by which the sap or juice may be brought to nearly or quite a boiling temperature as it flows from the reservoir A into the evaporating-pan B set in the masonry C, which forms the furnace or fire-place D. In the rear or one side of the draft-chimney E there is left an opening to the flue, F, in which is fitted a slab or door, G, of some incombustible material, the same being hinged so as to open down or outwardly. On the door G we secure a spirally-coiled tube, H, which is inclosed within the flue F at the base of the chimney E, as seen in Fig. 1, the upper end connecting with the reservoir A, and the lower end fitting into the tube or stem of the spigot *h*, which is made to slide in and out of the front of the chimney, so that when the stem or tube is drawn forward the door G may be opened, and the coiled tube H so exposed that it can be easily cleaned of soot or other foul matter as often as desirable, to have the heat take effect on the brass or copper coil, and thus utilize the heat that would be otherwise lost, to bring the juice or sap to a boiling temperature before it drips into the evaporating-pan.

With our improvements, constructed and arranged in the manner as above described, fully one-third more sap or juice can be reduced to sirup in a given time with the same amount of fuel, thus effecting a net saving of at least thirty-three per cent. in the cost of making maple sirup and sugar, and it is presumed to be equally economical in the manu-

facture of sugar from the beet, sorghum, or other sugar-cane.

What we claim is—

1. The spirally-coiled pipe H, attached to the hinged door G or shutter, which can be easily opened and detached, and closed to connect with the sap-reservoir A, and discharging-spigot *h* to operate within the chimney or flue of the evaporating-furnace, as herein set forth.

2. In combination with the chimney E having an opening F, the hinged door or shutter G and coil H, arranged to be easily opened to expose the coil for cleaning, as herein shown and described.

HOMER C. STEVENS.
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Witnesses:
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