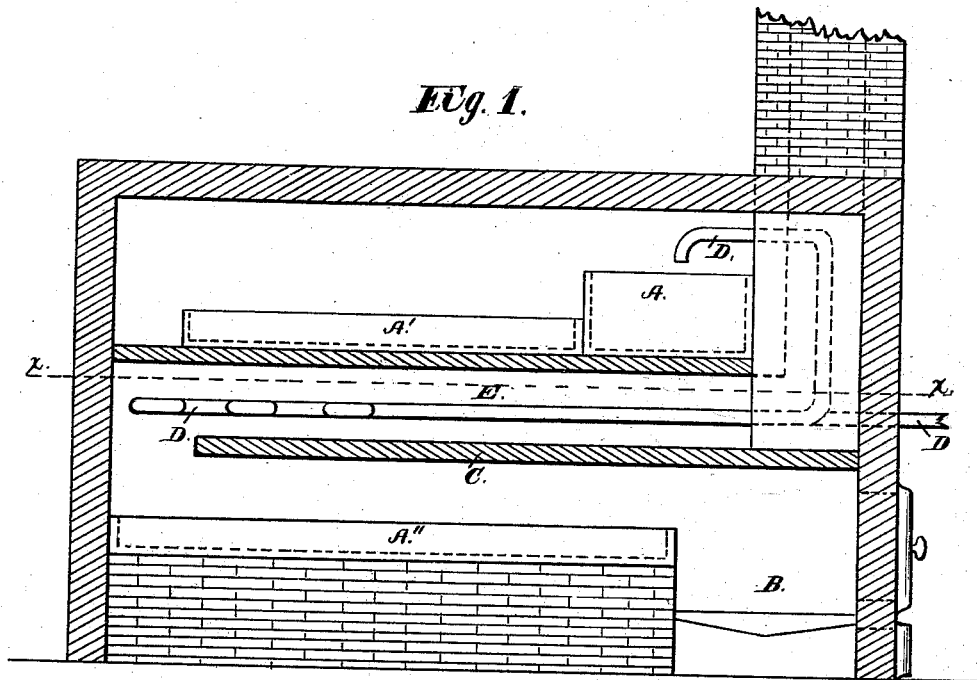


W. R. NIXON.  
Furnace for Recovering Soda Ash.

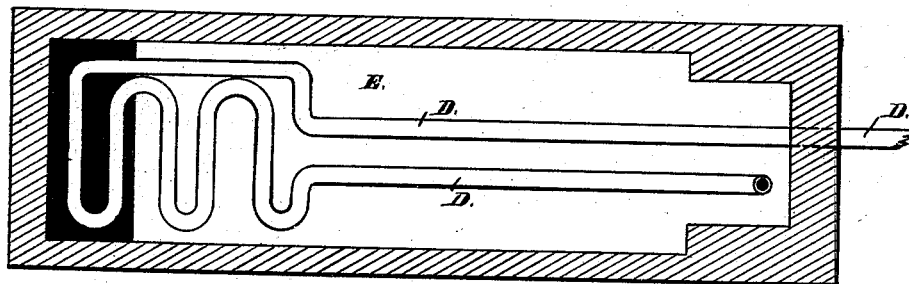
No. 215,285.

Patented May 13, 1879.

*Fig. 1.*



*Fig. 2.*



*Witnesses;*  
*Chas. M. Peck*  
*Patrick H. Guisekel*

*Inventor;*  
*William R. Nixon*  
*by his Attys;*  
*Peck & Ritchie*

# UNITED STATES PATENT OFFICE.

WILLIAM R. NIXON, OF DAYTON, OHIO.

## IMPROVEMENT IN FURNACES FOR RECOVERING SODA-ASH.

Specification forming part of Letters Patent No. **215,285**, dated May 13, 1879; application filed December 10, 1878.

*To all whom it may concern:*

Be it known that I, WILLIAM R. NIXON, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Furnaces for Recovering Soda-Ash; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention has for its object an improvement in soda-ash-recovery furnaces used in paper-making.

As the process is ordinarily conducted, the evaporation of the spent lye is effected in what is known as a "recovery-furnace." In this furnace are arranged a series of shallow evaporating-pans, into which the spent lye is conducted, to be subjected to the heat of the furnace.

An important object aimed at in the construction of these furnaces and the arrangement of the pans is the economizing of the fuel required to evaporate the liquid and recover the residuum, which is soda-ash. The ash so recovered is used again in forming the lye for reducing the rags or vegetable products to fiber and cleansing them from impurities. After such use the lye, impregnated with impurities from the material acted on, is called "spent," and is again evaporated to save the soda with as little waste as possible.

My invention consists in the combination, with a recovery-furnace, of an induction-coil of pipes located in the fire-chamber above, and free from contact with the fuel, whereby said pipes are kept free from accumulations of soot and clinker, and whereby the entering fluid is highly preheated before entering the evaporating-pans, thus rendering the evaporation of the spent lye rapid and economical, as will be herewith set forth and specifically claimed.

In the accompanying drawings, Figure 1 represents a side elevation of a recovery-furnace with the side wall removed. Fig. 2 is a plan view through the line *xx* of Fig. 1.

The furnace may be constructed in the ordinary way or in any suitable manner.

A A' A'' are the evaporating-pans. B is the fire-box, and C the division-wall. As ordinarily used, the spent lye is conducted into the pans in a cold state; but I employ an induction-pipe, D, which enters the furnace and is led through the fire-chamber E, with a series of elbows and returns, and finally discharges into the upper pan, A, whence the

liquid is conducted into the other pans successively.

By thus passing the spent lye through the coils of pipe directly exposed to the heat of the fire it becomes heated almost, if not quite, to the boiling-point before it reaches the pans, and consequently much less time is needed to evaporate it, and a great saving of fuel is effected.

I am aware that it is not new in sugar-evaporators to place a coil of pipes, connecting the reservoir with the evaporating-pans, in the chimney of the furnace for the purpose of preheating the sap or juice; but such arrangement of the pipe requires special contrivances whereby it can be removed to free it from accumulations of soot, which not only prevent the pipes, in a great measure, from becoming heated, but also serve to choke up the chimney and seriously interfere with the draft of the furnace. My arrangement, on the contrary, does not in any way interfere with the draft of the furnace, and does not require any provision for the removal of the pipes, for, being situated directly in the flames of the fire, there is no accumulation of soot upon them; and, in addition, the entering liquid is heated to a high degree before reaching the pans, thus rendering the process of evaporation much more rapid and economical.

I am aware, also, that it is not new, in sugar-evaporating furnaces, to locate the induction-pipe directly upon the grate, to be covered by the fuel; but this arrangement is objectionable, because the pipe, being under the fuel, does not become sufficiently heated, and, in addition, is liable to become covered with clinker, to remove which requires much labor and trouble. This is an objection from which my arrangement of the induction-pipe is free.

What I claim is as follows:

In a furnace for the recovery of soda-ash by evaporation, the combination of the evaporating-pan and the induction coil of pipes D, located in the fire-chamber above, and free from contact with the fuel, whereby said pipes are kept free from accumulations of soot and clinker, and whereby the entering fluid is highly preheated before entering the evaporating-pan, substantially as described.

Witness my hand this 21st day of November, A. D. 1878.

Witnesses: WILLIAM R. NIXON,  
QUINCY CORWIN,  
WM. RITCHIE.