

A. SHOESMITH.
Evaporating-Furnaces.

No. 218,785.

Patented Aug. 19, 1879.

Fig. 1.

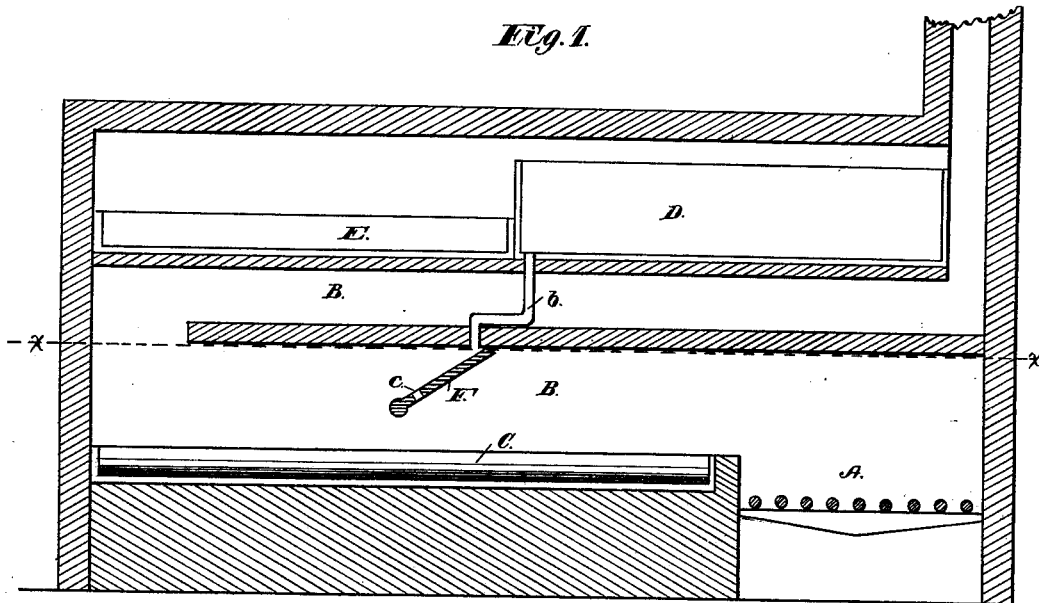
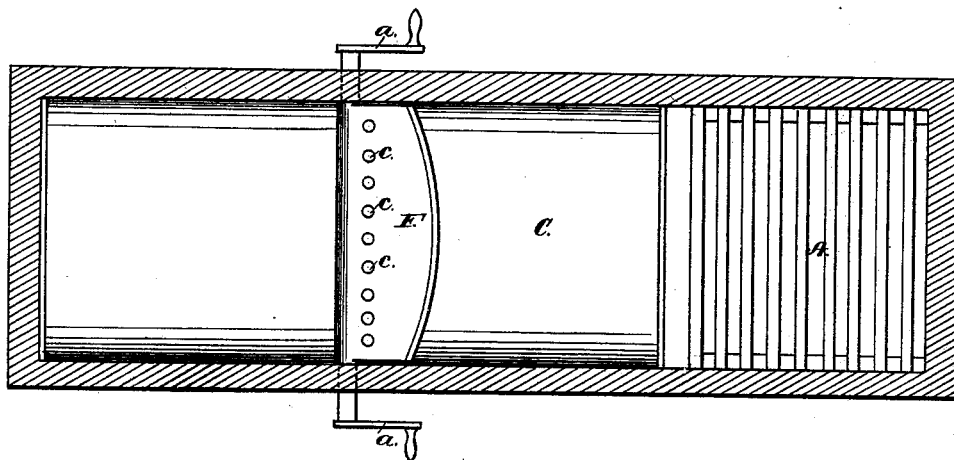


Fig. 2.



Witnesses:
Chas. M. Peck
P. H. Gunkel.

Inventor:
Alfred Shoemith
by Peck & Ritchie
his Attys.

UNITED STATES PATENT OFFICE.

ALFRED SHOESMITH, OF DAYTON, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT
TO WILLIAM R. NIXON, OF SAME PLACE.

IMPROVEMENT IN EVAPORATING-FURNACES.

Specification forming part of Letters Patent No. **218,785**, dated August 19, 1879; application filed
April 23, 1879.

To all whom it may concern:

Be it known that I, ALFRED SHOESMITH, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Evaporating-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to an improvement in evaporating-furnaces, particularly to that class known as "recovery-furnaces," in which the spent lye, in paper-making, is evaporated to recover the soda-ash for reuse.

In this class of furnaces the evaporating-pan is just in the rear of the fire-box and forms a part of the fire-chamber, so that the flames pass over the top of the liquor to be evaporated.

The object of my invention is to hasten the evaporation and thus economize both time and fuel. To this end I place in the fire-chamber, just over and across the evaporating-pan, an adjustable hinged deflector, which serves a two-fold purpose—viz., it deflects the flames and heat and throws them down upon the surface of the liquor, which is thus made to boil rapidly; and it, being located under the inflow aperture of the lye, which is made to pass over its surface before entering the pan below, also highly pre-heats the lye in its passage to the evaporating-pan.

The novelty consists in the combination, with an evaporating-furnace, of an adjustable hinged deflector, located over the evaporating-pan, whereby the heat and flames are directed upon the liquor; and also in details of construction, as will be herewith set forth and specifically claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of a furnace provided with my improved deflector. Fig. 2 is a plan view through the line *x x* of Fig. 1.

A represents the fire-box; B, the fire-chamber; and C D E, the evaporating-pans, of which C is the finishing-pan, and D E the induction or warming pans. About the middle of the fire-chamber, just over the pan C, I apply the deflector F, which is, preferably, a flat metal plate, having trunnions upon the corners of one end, which trunnions are journaled in and pass through the walls of the furnace, as seen in

Fig. 2. One or both of their outer ends are provided with cranks *a* or suitable gearing, by operating which the deflector may be swung to any desired inclination. The position of the deflector shown in Fig. 1 is its working position, and in this position it inclines toward the fire-box. Its upper edge comes in close contact with the roof or arch of the fire-chamber, and its ends abut against the sides of said chamber. The height of its lower edge above the liquor in the pan should be sufficient not to interfere with the proper draft of the furnace. When the deflector is in the position shown in Fig. 1 the heat and flames from the fire strike upon its under side, and are directed down upon the surface of the liquor, which is thus made to boil and evaporate rapidly. By means of the cranks or their equivalents *a* the deflector may be turned from the position shown in Fig. 1 to a more horizontal position, which would thus open a space above it for the passage of a part of the flames and heat whenever the evaporation proceeded more rapidly than desired. When the spent liquor has been entirely reduced the deflector may be turned completely down, so as to direct the flames and heat entirely over it.

To aid the speedy evaporation of the liquor I lead the inflow-pipe *b* from either of the pans D or E through the furnace in any convenient manner to a point just over the upper surface of the deflector, so that the liquor entering the pan C has to pass over the heated surface of the deflector, and thus become highly pre-heated before entering the pans C. If desired, one or more rows of small perforations, *c*, may be made in the deflector near its lower edge, to allow the liquor to pass through them in its passage to the pan C.

In furnaces where the evaporating-pan is long, more than one of these deflectors may be used, if desired.

I am aware that it is not new in evaporating-furnaces to employ deflectors or dampers in the fire-chamber beneath the bottoms of the evaporating-pans to vary the intensity of the heat and regulate its direction, and consequently I do not broadly claim a deflector when used in an evaporating-furnace.

I am aware that combined evaporating and

deflecting plates have been immovably fixed in the fire-chambers of evaporating-furnaces, and consequently make no claim to such.

Having thus fully described my invention, I claim—

1. In an evaporating-furnace, a deflecting-plate arranged in the fire-chamber over the evaporating-pan, and so applied that the heat and flames are directed down upon the exposed surface of the liquor, as and for the purpose specified.

2. In an evaporating-furnace, a hinged adjustable deflecting-plate arranged in the fire-chamber over the evaporating-pan, whereby

the heat and flames may be either directed down upon the liquor or up and over the deflector, as and for the purpose specified.

3. In an evaporating-furnace, the deflector F, consisting of a flat plate of metal having trunnions by which it is pivoted in the fire-chamber, and provided with apertures for the passage of the entering liquor, as set forth.

Witness my hand this 22d day of March, A. D. 1879.

ALFRED SHOESMITH.

Witnesses:

CHAS. M. PECK,
PATRICK H. GUNCKEL.