

J. H. BOWER.

Lime Kiln.

No. 5,270.

Patented Aug. 4, 1847.

Fig. 1

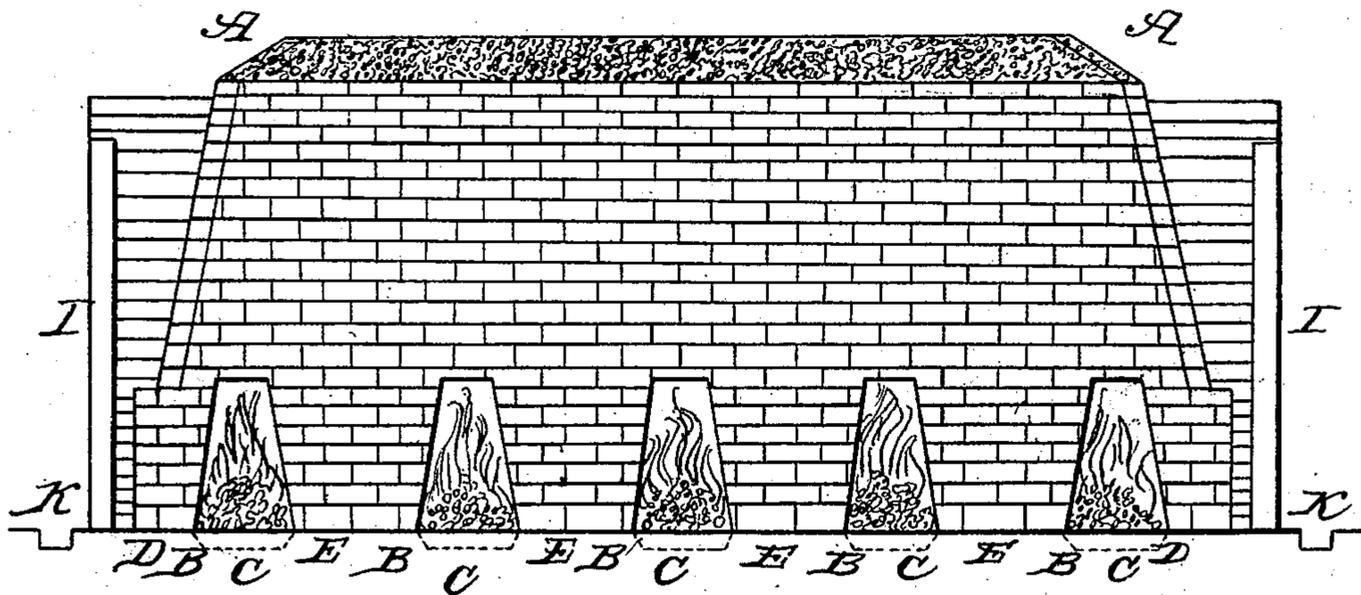
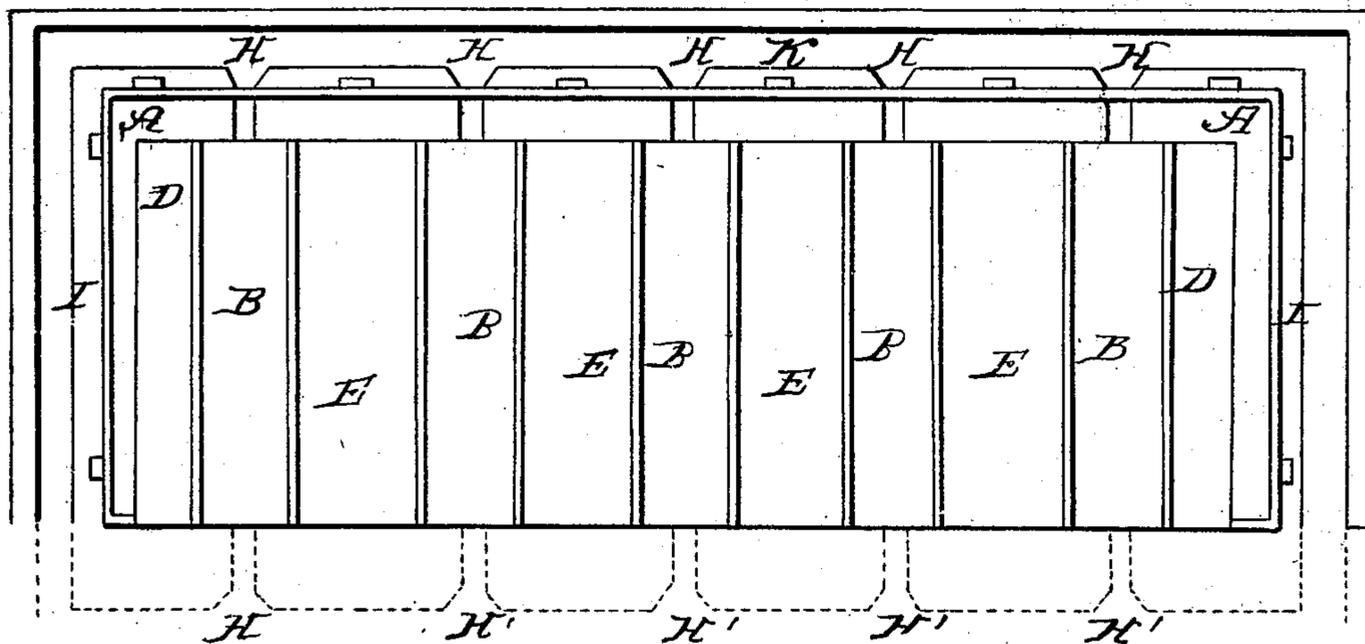


Fig. 2



# UNITED STATES PATENT OFFICE.

JACOB H. BOWER, OF WALNUT, PENNSYLVANIA.

## CONSTRUCTION OF LIMEKILNS.

Specification of Letters Patent No. 5,270, dated September 4, 1847.

*To all whom it may concern:*

Be it known that I, JACOB H. BOWER, of Walnut, in the county of Juniata and State of Pennsylvania, have invented a new and  
5 useful Improvement in the Mode of Burning Lime; and I do hereby declare that the following is a full, clear, and perfect description of the same, reference being had to the accompanying drawings, making a  
10 part of this specification, in which—

Figure 1 is an elevation; Fig. 2 a plan.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

15 (A A) represents a structure of lime stone raised in a peculiar manner. I do not confine it to any particular shape or dimensions, though I have considered it better for purposes of convenience, to build it with  
20 reference to its external configuration, similar to a truncated pyramid, in the following manner. The site of the structure I make out on a level piece of land in the form of a rectangle. Beginning at either of the  
25 angles of the figure, I measure off lengthwise of the site, suitable widths (B B B B B) Fig. 2 for the fire places or arches, and excavate them to the depth of about ten inches, inclining the sides inward during the operation in order that the full force of the fire, may act upon the mass of stone immediately above. At the extreme ends of the structure, I build abutments (D D),  
30 and on the spaces between the excavations I build piers (E E E E) extending the same height as the abutments (about three feet;) the sides of the abutments next to the excavations as also the sides of the piers, forming corresponding angles with the sides of the excavations, thus forming the arches (C C C C C Fig. 1,) as will be perceived, wider at the bottom than the top. The piers and abutments, are built of large blocks of lime stone, and sufficiently strong to sustain the superincumbent weight of the mass. The arches are then covered by laying across them a series of longitudinal courses of large blocks of lime stone; the inside courses to be laid a little apart, in order that the spaces between them may form conducting passages or ramifying channels through which the heat ascending from the arches may circulate throughout the mass; while the outside course must be laid as close as  
55 possible to prevent the escape of the heat. Similar courses are successively laid on, a

little care being taken to continue the conducting channels during the raising of the mass, until it is carried up as high as desirable, when the smaller stones or fragments accumulated in the quarrying or building are thrown or piled on the top. This mass of lime stone can be converted into lime without the intervention of a kiln generally employed to effect that object, thereby saving a large proportion of the expense and trouble encountered in its erection, as follows: At the termination of the excavations and in the center thereof, on either side of the mass, I cut drills or air flues (H H H H H) extending a distance of four or five feet from the structure, for the purpose of creating a draft through the arches, to prevent them from choking, and also to regulate the force of the fire as their openings can be closed or opened, thereby increasing or diminishing the draft as circumstances may require.

In order to confine the heat to the structure, three sides of it must be encompassed by a casing (I I) made of plank or fence rails, or any timber deemed appropriate for that purpose, the same being situated about three feet from it and equally as high as the structure. The opening of the arches and also the air flues (H H H H) are covered by flat stones; the extremities of the air flues being left open. When the space included between the lime stone structure and the casing, is filled in with earth taken from around the casing, and compressed by walking upon it or otherwise. The excavation made in procuring this filling, forms a ditch K preventing the water in case of rain from flowing into the arches through the air flues. The mass being now ready for the process designated sweating, the air flues are closed temporarily by placing small stones against them, and a small quantity of fuel is thrown into the arches, and a moderate fire kept up for twenty-four hours, or until the niter is exhausted which is readily ascertained by any one skilled in the art of lime burning. After this process the stoppages are removed from the air flues, and a hotter fire is applied and kept up twenty four hours, care being taken not to heat the mass too much, as the stone in that case would be liable to fuse and block up the channels, thereby preventing the diffusion of the heat. This operation does not burn the whole of the mass and there-

fore to insure a thorough burning other air flues or drills (H' H' H' H' H' Fig. 2) similar to those already described, are cut in the same manner on the opposite side thereof at the end of the excavations (B B) and immediately opposite the air flues (H H H H H.) The casing (I, I) is then removed and set up on the same side of the structure as that on which the last mentioned air flues have been cut, and the opening of the arches on this side being covered, as also the air flues in the manner hereinbefore referred to, the space comprehended between the casing (I, I) is then filled in with earth and managed as above described. The fuel is then applied to the arches on the same side of the structure from which the casing has been removed; the stones hereinbefore referred to as covering the arches being taken away for that purpose. The fire is continued for about twenty four hours which operation completes the process of converting the structure into lime.

The casing is then taken down, and the whole structure is a solid mass of lime, as will be readily perceived, accessible on all sides.

Having thus fully described my invention, I do not claim the peculiar manner of laying the stones in order to form conducting passages or channels for the diffusion of the heat, as I am well aware such disposition or arrangement have been made in the setting of brick kilns, but

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

Combining such arrangement or disposition of the lime stone with a temporary casing or kiln in the manner above specified, by means of which I obviate the difficulty and expense incurred in the erection of a permanent kiln.

JACOB H. BOWER.

Witnesses:

RICHARD D. LODER,  
ANDREW SHOVER.