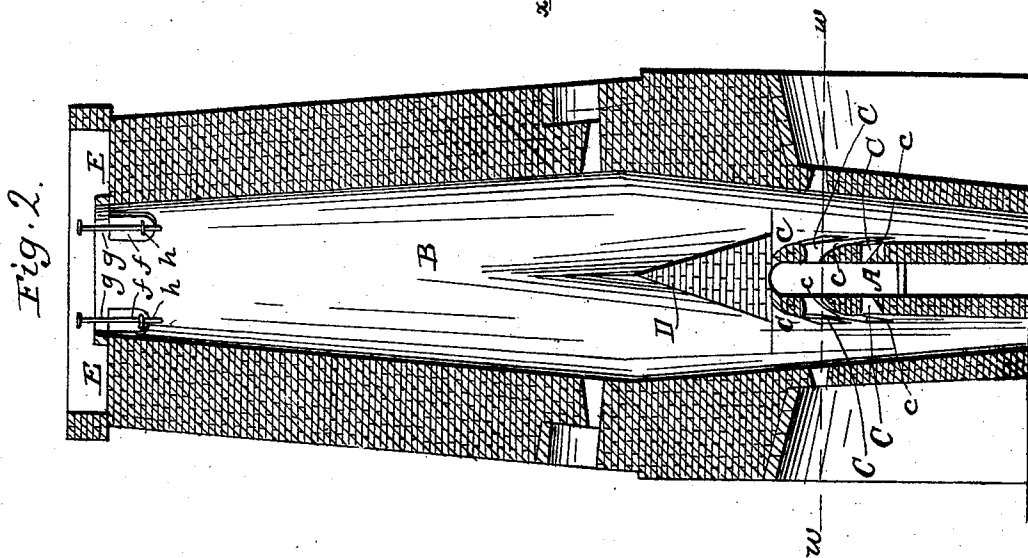
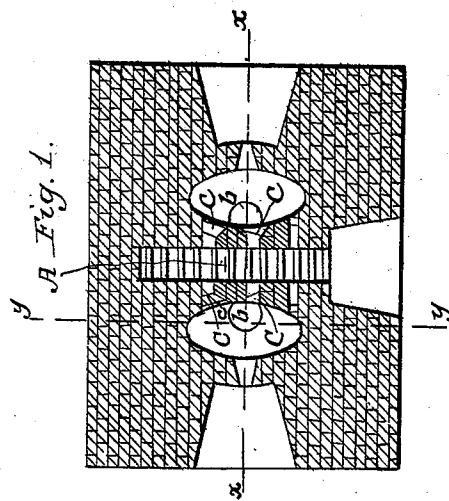
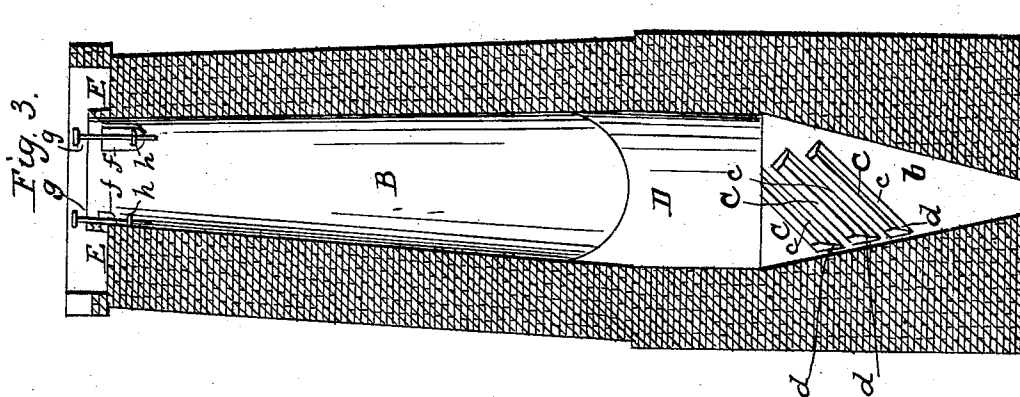


D. STEPHENS.

Lime Kiln.

No. 17,986.

Patented Aug. 11, 1857.



UNITED STATES PATENT OFFICE.

DANIEL STEPHENS, OF ELMIRA, NEW YORK.

LIMEKILN.

Specification of Letters Patent No. 17,986, dated August 11, 1857.

To all whom it may concern:

Be it known that I, DANIEL STEPHENS, of Elmira, in the county of Chemung and State of New York, have invented a new and useful Improvement in Limekilns; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.
Figure 1, being a horizontal section of the kiln, in the plane indicated by the line *ww*, Fig. 2; Fig. 2, a vertical section thereof, in the plane indicated by the line *xx*, Fig. 1; Fig. 3, a vertical section, in the plane indicated by the line *yy*, Fig. 1.

Like letters designate corresponding parts in all the figures.

The kiln is composed of a main shaft B, which terminates at the bottom in conical or taper branches *b, b*, substantially as represented. For the purpose of conveniently feeding the lime stone into the shaft, the stack has a suitable hopper E, surrounded by other and inner walls, and communicating with the shaft through openings in the inner wall; said openings being covered by suspended doors *f, f*, which are kept closed, when the lime stone is not to be fed into the shaft, by rods *g, g*, passing through staples *h, h*, substantially as represented.

Beneath the wedge-shaped arch D, which separates the branches *b, b*, of the shaft, is situated the furnace, or fire chamber, A. The flues C, C, which lead from this fire chamber to the branches of the shaft, I construct and arrange in the following manner:

They are situated diagonally, or inclined, in the dividing wall substantially as represented, and extend nearly from one side to the other of each branch *b*. The under sides *c, c*, of these flues slope downward from the fire chamber toward the shaft branches, either in a single plane, or more. The in-

clination of the position of the flues, and of their sloping under sides, should be sufficient to enable whatever may fall into the flues, to slide outward thereon, by its own gravity, into the shaft branches. At the lower edges of the flues the inclination downward into the shaft branches, is the result of both the inclination of the flues and of their under sides; by which channels or spouts are formed for readily discharging into the branches whatever may collect in the flues. There may be any convenient number of said flues; and to protect them sufficiently against the weight of lime stone above, the brickwork over them may be arched.

The flues thus constructed and arranged, have nearly or quite all the advantages of wide horizontal and vertical flues, without the disadvantages of either. Thus, they present sheets of flame to the lime stone, the whole diameter of the shafts or branches, as well as horizontal flues; and also present the flame to nearly or quite as great an extent, up and down, as vertical flues. They likewise present but a narrow space across, vertically, for allowing any entrance to the descending lime stone or lime, nearly as well as horizontal flues; and at the same time, allow the bottoms thereof to slope downward, for the purpose of keeping them free from obstructions; while they offer a free ascent of flame through them, as well as the vertical flues.

What I claim as my invention is—

The diagonal or oblique flues, with sloping bottoms, arranged substantially as described, in combination with the shaft B, and its branches *b, b*, for the purposes specified.

DANIEL STEPHENS.

Witnesses:

W. A. BUCHANAN,
J. FRASER.