(No Model.)

M. SAYRE.

LIMEKILN.

No. 375,896. Patented Jan. 3, 1888.

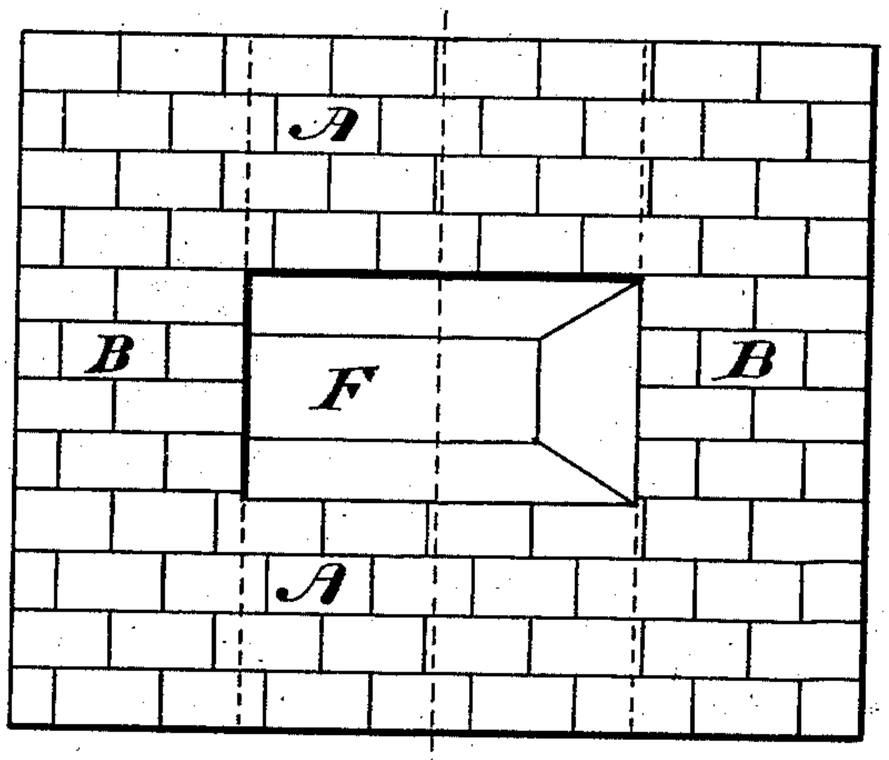

Fig. 1

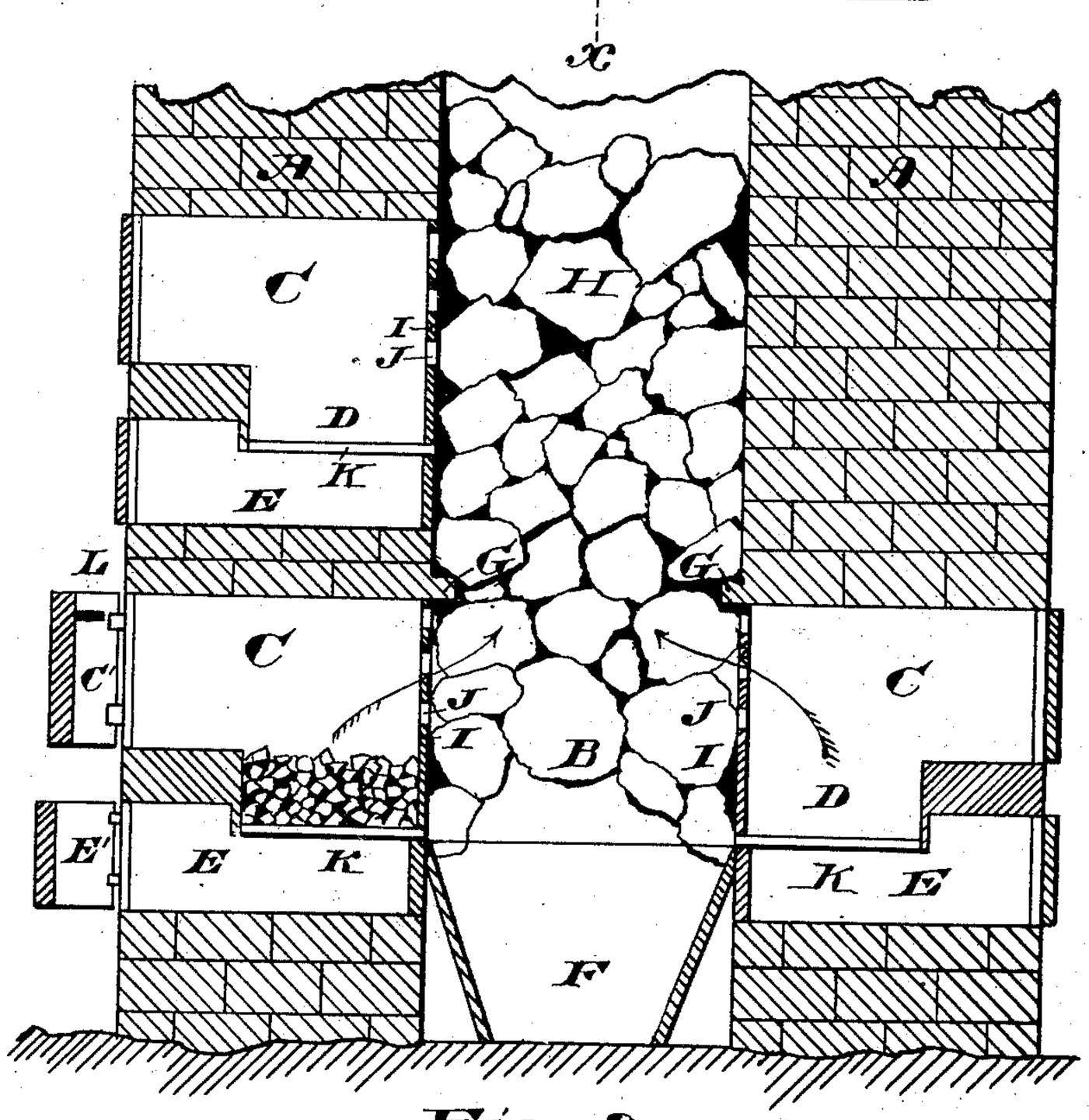

Fig. 2.

WITNESSES:

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UNITED STATES PATENT OFFICE.

MARCUS SAYRE, OF MONTROSE, NEW JERSEY.

LIMEKILN.

SPECIFICATION forming part of Letters Patent No. 375,896, dated January 3, 1888.

Application filed February 21, 1887. Serial No. 228,304. (No model.)

To all whom it may concern:

Be it known that I, MARCUS SAYRE, a citizen of the United States, residing at Montrose, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Limekilns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Among the methods heretofore in use in burning lime it has been the custom to lay first a stratum of stone, then one of coal, then another of stone, and so on, to the top of the kiln. The difficulty in this is that the residue of the products of combustion mixes with the lime, and great labor is involved in separating them after the lime has been burned, and even then impurities are left in the lime which greatly impair its value.

Another method is to burn the lime with wood. This necessitates the use of an oven to burn the wood in, and outlets or "pigeon-holes" to allow the heat to ascend and mix with the limestone. The difficulty attending this method is that when the lime is drawn, after having been burned, a pressure of air is occasioned by the settling of the limestone, the only escape for which is through the oven where the wood is burned. Therefore, before the lime is settled the fire has to be drawn, otherwise it would be scattered by the strong pressure of air in all directions, endangering the workmen and the building; hence the putting out and rebuilding of the fire is necessitated. Thus great delay, expense, and loss of time and heat are occasioned.

My invention completely overcomes these difficulties and objections. The heat is steady and uninterrupted, more economical and safe, and produces perfectly pure lime.

It consists, first, in constructing and locating a fire-chamber below the bottom of the oven, which allows the escape of air over the fire when the lime is settled or drawn without disturbing or affecting the fire or contents of the fire-chamber.

It also consists in a new method of burning limestone, whereby I am enabled to burn with coke or coal without mixing them with the limestone, and in the arrangements and combinations of parts of the kiln, substantially as will be hereinafter set forth, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, in which like letters indicate corresponding parts in each of the several figures, Figure 1 is a plan view of my improved kiln, and Fig. 2 is a transverse vertical enlarged sectional view, taken through line X, Fig. 1, illustrating the new arrangements of ovens, fire-chambers, ash-pits, &c.

In said drawings, A A represent the side walls, and B B the end walls, of said kiln. Said side walls are greater in length than the end walls, and contain the ovens C, fire-chambers D, and ash-pits E. Thus the heat-generators being disposed on the longer sides, and being so arranged as to distribute the heat to the best advantage, a more efficient kiln is provided than those heretofore in use.

At the base of the kiln is a hopper-shaped opening, F, through which the lime is withdrawn, and on the inside of the kiln, just above the top of the ovens C, are projections G, as ordinarily constructed, which form abutments for the limestone H, which of itself forms an arch, and is thereby held in place, as will be understood.

In front of the ovens C and fire-chambers D are partitions I, through which are openings or pigeon-holes J, to allow the heat to escape and be conducted through the stone to be burned. These openings extend to a point just above or on a level with the top of the fire, so that when the back draft or puff of air occurs it will pass over the top of the fire and not in any way disturb the same.

The fire is built on a grate, as K, of any ordinary construction, for which I preferably use coke, although coal may also be used to advantage in some cases. Just below the fire and grate K is an ash-pit, E, provided with a door, E', which may be provided with a damper, and permits of the removal of ashes, cinders, &c. The oven C is also provided with a door having a damper, L, near the top, so that the draft may be regulated, and, being near the top of the door, allows the cold air to strike

the crown of the oven, thus keeping it comparatively cool.

If desired, a series of fire-chambers and ovens may be arranged one above the other, as illustrated in Fig. 2, so that the whole of the limestone within a certain limited distance will be kept up to the required temperature for forming lime.

I do not wish to be understood as limiting myself to the exact proportion and form of parts as herein shown, as it is evident that changes may be made in those particulars without in any way departing from the spirit or scope of my invention. It is also manifest that other outlets may be provided for the escape of air when the lime is drawn other than through the oven, as herein shown, and still not interfere with the fire; hence I do not wish to limit myself in this respect.

Having thus fully described my invention, what I claim as new is--

1. In a limekiln, a series of ovens and fire-chambers arranged one above the other, substantially as and for the purposes set forth.

2. In a limekiln, a series of fire-chambers arranged one above the other and below the bottoms of the ovens, as set forth, for the purposes described.

3. In a limekiln, a series of fire-chambers arranged one above the other, and openings, as described, for admitting of the outward escape of air as the limestone settles and causes the backward pressure of said air, without disturbing the fires, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of February, 1887.

MARCUS SAYRE.

Witnesses:
OLIVER DRAKE,
OSCAR A. MICHEL.