

(No Model.)

2 Sheets—Sheet 1.

M. SAYRE.

LIMEKILN.

No. 375,897.

Patented Jan. 3, 1888.

Fig. 1

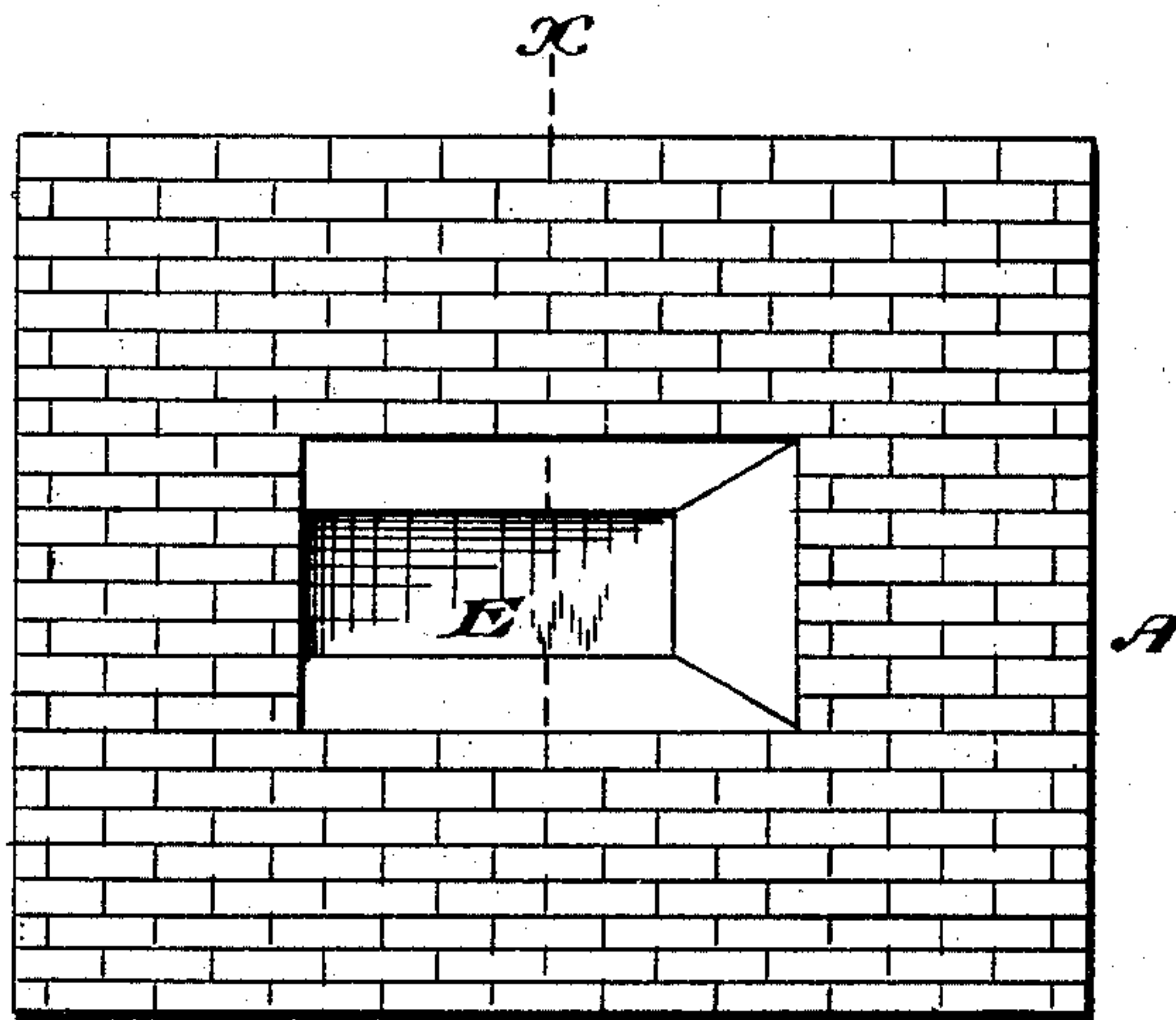
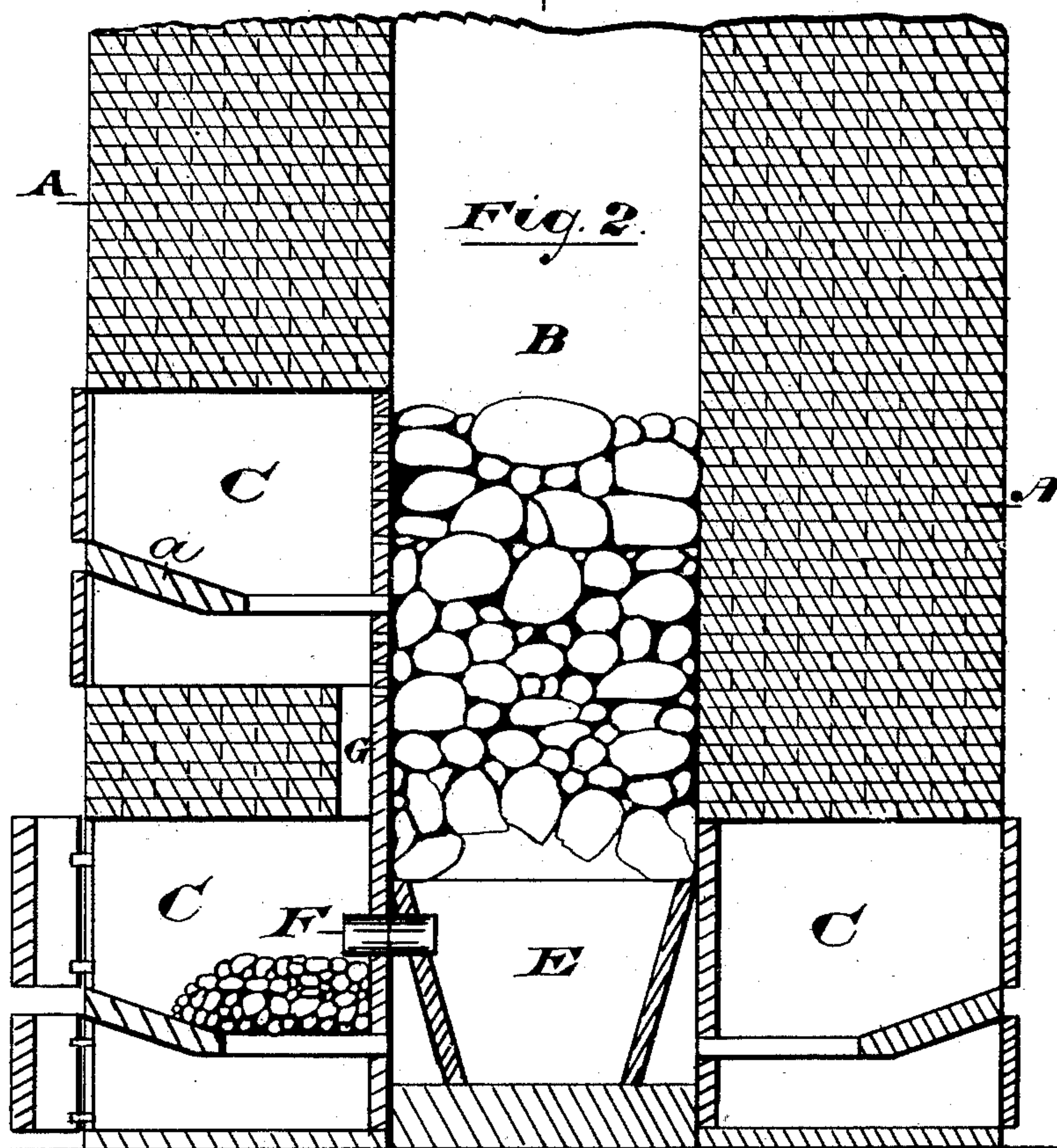


Fig. 2



WITNESSES:

INVENTOR:

Oscar A. Michel.
Horace E. Rewe

Marcus Sayre,

BY *Drake & Co.* ATT'YS.

(No Model.)

2 Sheets—Sheet 2.

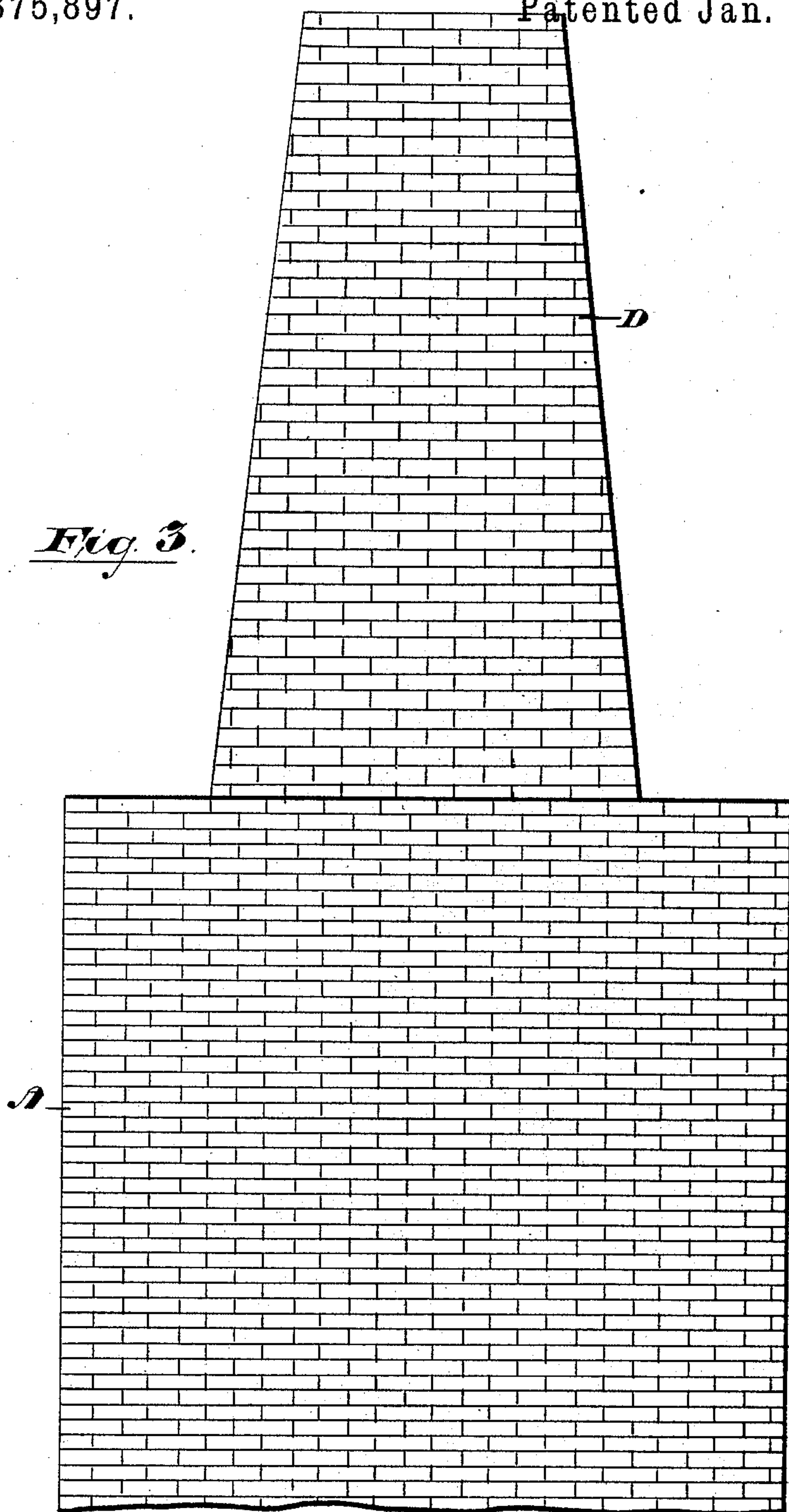
M. SAYRE.

LIMEKILN.

No. 375,897.

Patented Jan. 3, 1888.

Fig. 3.



— WITNESSES: —

— INVENTOR: —

Oscar A. Michel.
Horace E. Bunn

Marcus Sayre,

BY S. J. Drake & Co., ATT'YS.

UNITED STATES PATENT OFFICE.

MARCUS SAYRE, OF NEWARK, NEW JERSEY.

LIMEKILN.

SPECIFICATION forming part of Letters Patent No. 375,897, dated January 3, 1888.

Application filed March 21, 1887. Serial No. 231,667. (No model.)

To all whom it may concern:

Be it known that I, MARCUS SAYRE, a citizen of the United States, residing at Newark, 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.

The object of this invention is to secure increased efficiency in the operation of a limekiln, to improve the quality of the lime and increase the production of the same.

The invention consists in certain novel features in the construction of the kiln, whereby the advantages above enumerated are obtained, as will be hereinafter set forth, and finally pointed out in the claims.

Referring to the accompanying drawings, in which like letters of reference indicate like parts in each of the several figures, Figure 1, Sheet 1, represents a top or plan view of my improved kiln. Fig. 2, same sheet, represents a vertical transverse section through line X of Fig. 1, showing certain structural arrangements of the kiln. Fig. 3, Sheet 2, represents an elevation of my improved kiln.

In said drawings, A represents the walls of the kiln; B, the receptacle for the limestone; C, fire-places or ovens; D, a smoke stack or flue.

My design in the present application is to cover certain improvements upon an invention described and claimed in my application filed February 21, 1887.

Among the methods which have been heretofore prevalent in burning lime it has been the custom to lay first a stratum of stone, then one of coal, then one of stone, and so on, to the top of the kiln. The difficulty in this is that the residue of the productions 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

with an approximately level bottom to burn the wood in, and outlets or "pigeon-holes" to allow the heat to escape and mix with the limestone. The difficulty attending this method is that when the lime is drawn, 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 buildings and the workmen's lives; hence the putting out and rebuilding of the fires is necessitated. Thus a great delay, expense, 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 a perfectly pure lime.

In my former application, to which reference has been made, and in which similar objects were had in view, the fire-boxes were so constructed as to render it somewhat difficult to stir up the coke, which I use for the fuel, over the mouth of the oven. The only convenient way was by a poker inserted through the ash-box and through the grate beneath the fire; but I have found it advisable to stir the fire or the coke in some cases from the top as well as from the bottom, and hence have changed the construction of the fire-boxes by slanting the hearth or bottom of the oven from the mouth thereof downward to intersect with the grate, as is plainly indicated at *a* in Fig. 2. This construction enables me to accomplish my object without any difficulty, as will be manifest upon referring to the drawings. I have also found it advisable to utilize the receptacles for the limestone to a greater depth than formerly, and hence have constructed the walls of the pit E so that they project inwardly at the top and form a ledge upon which the limestone settles and rests, as will be seen in Fig. 2, thus considerably increasing the capacity as well as the product of the kiln, as will be evident. I also construct fire-boxes below the limestone, from which the heat passes through the flue or flues F into the pit beneath the limestone and upward through the

same, as clearly indicated in said Fig. 2. I also construct a flue or flues, G, leading from the lower fire-boxes to those above, so that, when desirable, I can open the same and let
5 the hot air pass up through side flues and through openings to the receptacle for the limestone, as is plainly indicated in said Fig. 2, whereby I am enabled to secure the very best and most effective distribution of heat in order
10 to secure the most complete reduction of the contents of the receptacle B into lime.

A further improvement is the construction and arrangement of a smoke-stack, D, which I have found desirable in order to secure a
15 greater draft than I have been enabled to obtain heretofore. This smoke-stack may be built of brick or metal, as may be desired, and carried to any required height.

The flues G, above referred to, may be provided with suitable dampers, (which I have not
20 deemed it necessary to show,) by which to open and close the same at pleasure.

Having thus described my invention, what I claim as new, and wish to have secured by
25 Letters Patent of the United States, is—

1. The combination, in a limekiln, with the pit thereof, of fire-boxes or ovens, as C, lo-

cated below the ledges formed at the top of said pit, and a flue or flues, as F, connecting said fire-boxes with said pit, as and for the
30 purpose set forth.

2. The combination, in a limekiln, of fire-boxes or chambers located one above another, and a flue or flues, as G, communicating with said boxes or chambers and with the recepta-
35 cle for the limestone, as and for the purposes set forth.

3. In a limekiln, a fire-box or fire-boxes provided with a hearth arranged upon an in-
40 cline slanting from the mouth of the oven downward to the grate, as shown and described, for the purpose set forth.

4. In a limekiln, a pit, as E, the walls of which project inwardly at the top and form
45 ledges for the support of the limestone, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of March, 1887.

MARCUS SAYRE.

Witnesses:

CHARLES H. PELL,
OSCAR A. MICHEL.