

UNITED STATES PATENT OFFICE.

DANIEL J. FARRELL AND ANDREW T. LIEN, OF MASON CITY, IOWA,
ASSIGNORS TO FARRELL, WHITE & LIEN, OF SAME PLACE.

IMPROVEMENT IN LIMEKILNS.

Specification forming part of Letters Patent No. **180,214**, dated July 25, 1876; application filed May 27, 1876.

To all whom it may concern:

Be it known that we, DANIEL J. FARRELL and ANDREW T. LIEN, of Mason City, in the county of Cerro Gordo and State of Iowa, have invented a new and useful Improvement in Limekiln, of which the following is a specification:

Figure 1 is a vertical section of our improved limekiln, taken through the line *w w*, Fig. 2. Fig. 2 is a cross-section of the same, taken through the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to improve the construction of limekilns; to give a much better application of the fire to the limestone than in kilns constructed in the usual way; to make the kiln air-tight, even should it crack; to avoid the use of heavy timber and rods for tying the kiln; to cause the lime to drop evenly to the center of the draw; to avoid the necessity of drawing the lime while at a white or red heat, and to enable the lime to be dropped readily and surely.

The invention consists in providing the kiln with a case and filling the space between them with clay, to render the kiln air-tight, even in case it should crack in consequence of the effect of excessive heat. The invention further relates to a device for dislodging the lime and causing it to drop into the hopper, as hereinafter described.

The outer wall A of the kiln is formed of stone and is made six-sided. The inner wall B of the kiln is formed of fire-brick, and is made round. The arches C are also lined with fire-brick, and should be one in each side in large kilns, and one in every other side in small kilns.

Upon each corner of the outer kiln is placed a hard-wood timber, D, the inner sides of which are grooved to fit upon said corners. To the upright timbers D are attached hard-wood planks E, forming a casing, which may be strengthened by one or more bands or hoops, F. The space between the casing E and the outer wall A is tamped with clay.

This construction makes the kiln air-tight, even should it crack.

G is the draw-hopper, which is made of cast-iron, and nearly one-half of which is exposed to the air, so that the lime, before it is drawn, may become partially cooled, and may thus be conveniently drawn and handled. The hopper G is provided with an inclined bottom, *g*¹, and a door, *g*². H is a rod placed just above the top of the door *g*², and the inner end of which is pivoted and swiveled to the back wall of the said hopper G.

The outer end of the rod H passes out through a hole in the plate I, and through a horizontal slot in the front wall of the hopper G, and has a crank, J, attached to it, to serve as a handle to rotate and vibrate the said rod H. The plate I slides in keepers attached to the wall of the hopper G, as the rod H is vibrated. To the middle part of the rod H is attached one or more cross-rods, *h*', which, as the rod H is rotated or vibrated, catch upon and dislodge the lime, so that it can be drawn. The two movements of the rod H enable the lime to be dislodged and drawn most effectually. The rod H also enables the drawing to be stopped whenever desired.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In combination with the wall or stack A B of the kiln, the casing D E and the filling of clay, as and for the purpose specified.

2. The combination of the rotating and vibrating rod H, provided with one or more cross-bars, *h*', and the sliding plate I, with the cast-iron draw-hopper G of the kiln A B C, substantially as herein shown and described.

DANIEL J. FARRELL.
ANDREW T. LIEN.

Witnesses:

F. G. EMSLEY,
M. A. EMSLEY,
GEORGE WHITE,
ANNERS T. LIEN.