D. G. ORMSBY.

Lime-Kiln.

No. 211,637. Patented Jan. 28, 1879.

Fig. 1.

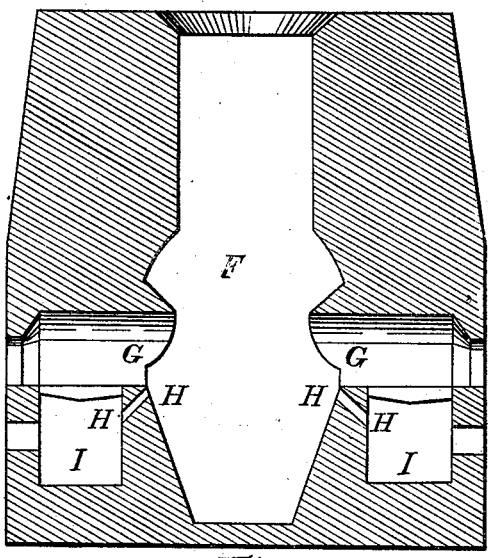
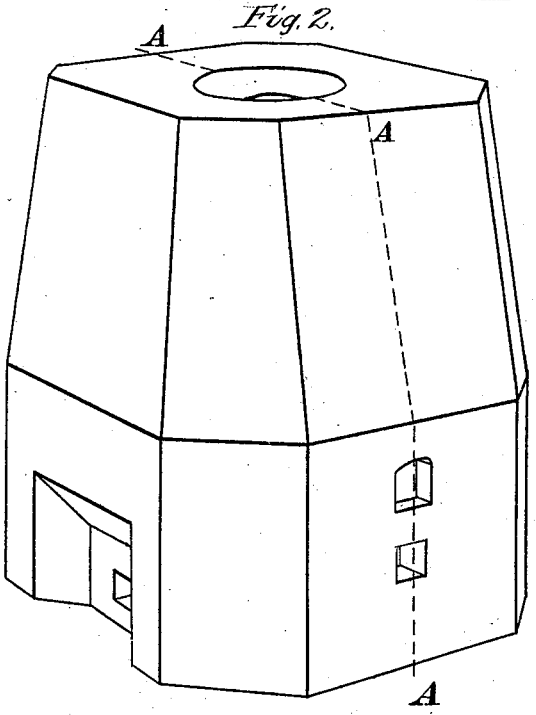



Fig. 2.




Witnesses:
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN LIMEKILNS.

Specification forming part of Letters Patent No. **211,637**, dated January 28, 1879; application filed April 30, 1878.

*To all whom it may concern:*

Be it known that I, DAVID G. ORMSBY, of the city and county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Limekilns, of which the following is a specification:

The invention relates to economy in the use of fuel, and also to the prevention of overburning, so common in other lime-kilns.

Heretofore such kilns have been so constructed as to introduce the air to the interior of the kiln directly through and over the burning fuel, thereby burning all the gases generated by the combustion of the fuel and air, and depriving the air of all moisture before the gases and moisture come into contact with the lime or stone, the effect of which is to overburn the lime and spend the strength of the fuel upon that portion of the lime which lies contiguous to the inner end of the arch, causing thereby much waste of fuel and lime.

The object of my invention is to effect a more equal distribution of the gases of the fuel and air throughout the interior of the kiln in a highly heated and inflammable state, where, by their expansive power, consequent upon their ignition, the heat is still more thoroughly diffused through the mass of stone, every part of which is thereby evenly reduced to lime.

The invention consists of air-flues through the back wall of the ash-box. These flues, opening into the ash-box below the back end of the grates, open at the other end of the flues into the hopper of the kiln just below the plane of the upper surface of the grates.

It also consists of an elongation of the furnace-arches at the back or inner end, beyond the surface of the walls of the expanded chamber, and extending to the perpendicular line of the walls forming the upper portion of the charge-cylinder.

In the drawings, Figure 1 is a vertical longitudinal section of the kiln upon the line A A A, Fig. 2.

The expanded chamber F, Fig. 1, forms an oven, holding a large quantity, which lies more loosely than would be the case in a perpendicularly-walled cylinder, the effect of which is to facilitate the circulation and retention of the heat.

The air-flues H H, Fig. 1, are for the purpose of introducing air moistened by evaporation of water in the pit of the ash-box I. The effect of this steam and air, heated by passing through the hot walls of the ash-box and furnace to such a degree as to prevent any slaking of the lime, is to prevent the overburning of the lime contiguous to the back end of the furnace by a reduction of the draft through the furnace; and its further effect is to cause a greater penetration of the gases, air, and steam before they are united, and then, by their union, instantaneous combustion ensues, causing the heat to be forced through every part of the chamber, where, being temporarily confined by the contracting walls thereof, the intense heat produced having served its purpose in reducing the stone therein contained to lime, it is liberated by passing through the charge-cylinder, to whose contents it imparts a large proportion of the remaining heat before its escape into the open air.

The elongated arches G G, Fig. 1, also serve the purpose of conveying the heat farther toward the center of the kiln, and thus preventing the formation of draft-channels through the stone next to the sides of the kiln, insuring the even distribution of heat, and consequent even burning of the lime.

I do not claim the enlarged oven or chamber, nor the hopper, nor the construction of a kiln with two furnaces, nor a central fire-chamber of any particular form or arrangement; neither do I claim any flues or chambers opening into a central fire-chamber or into a furnace, because I know that such devices are in use in other kilns.

What I do claim is—

1. The flues H H, for the purpose of reducing the draft through the burning fuel, which is effected by the passage through the flues of a part of the hot air and steam from the ash-pit at a point below the grates of the furnace into the hopper of the kiln, constructed and arranged substantially as and for the purposes herein set forth.

2. The elongated arches G G, which prevent the formation of draft-channels along the inside walls of the kiln by diffusing the flame more generally through the limestone before it ascends to the point where the perpendicular wall of the charge-cylinder commences, said arches being constructed and arranged substantially as and for the purposes herein described and specified.

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