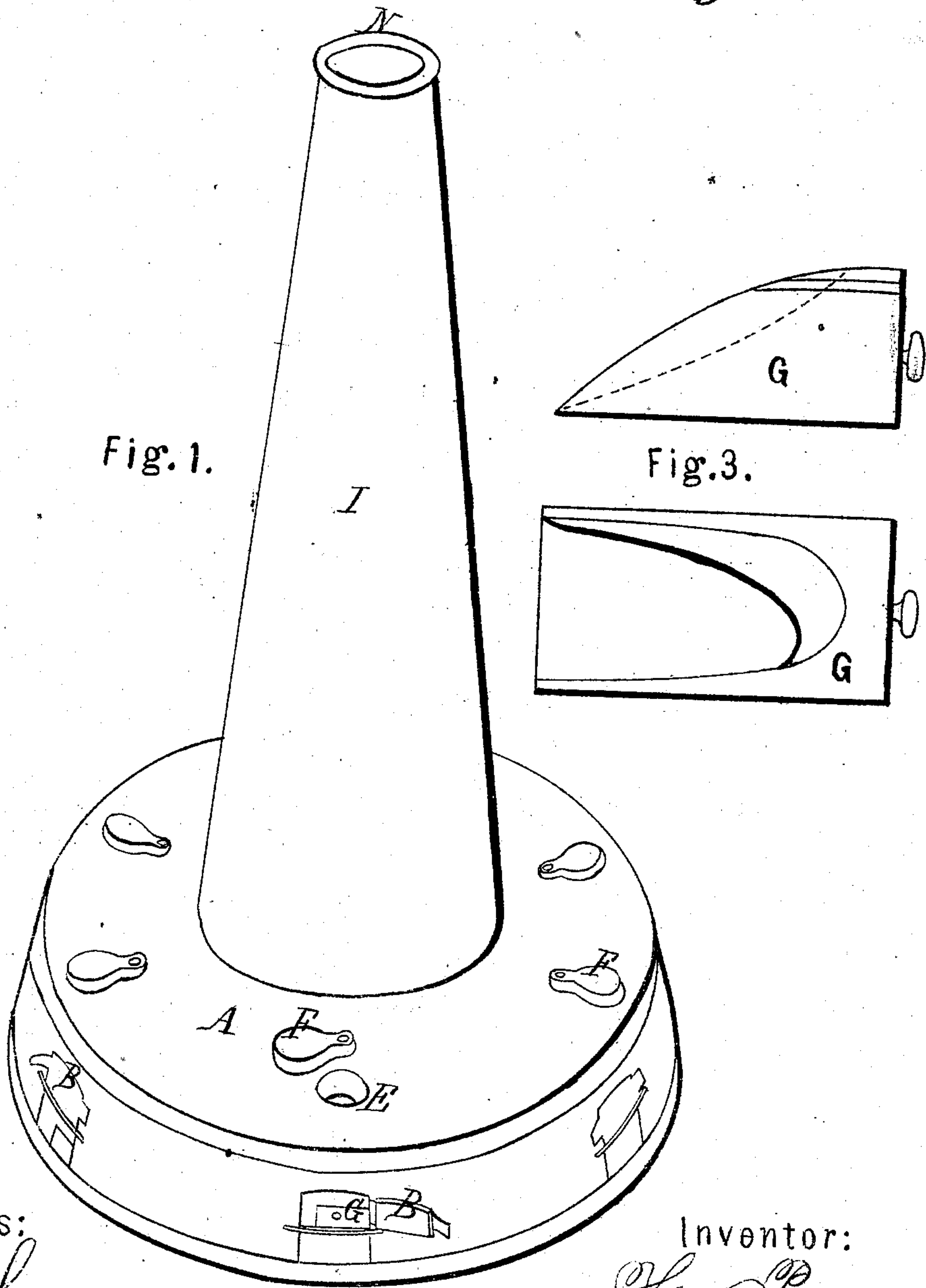


*H. Pelton.*  
*Lime Kiln.*

*2 Sheets.*  
*Sheet 1.*

*No 54,943.*

*Patented May 22. 1866.*



Witnesses:

*Wm. E. Lyon*  
*Wm. Frewin*

Inventor:

*H. Pelton*  
*per Murray & Co*  
*Attorneys*

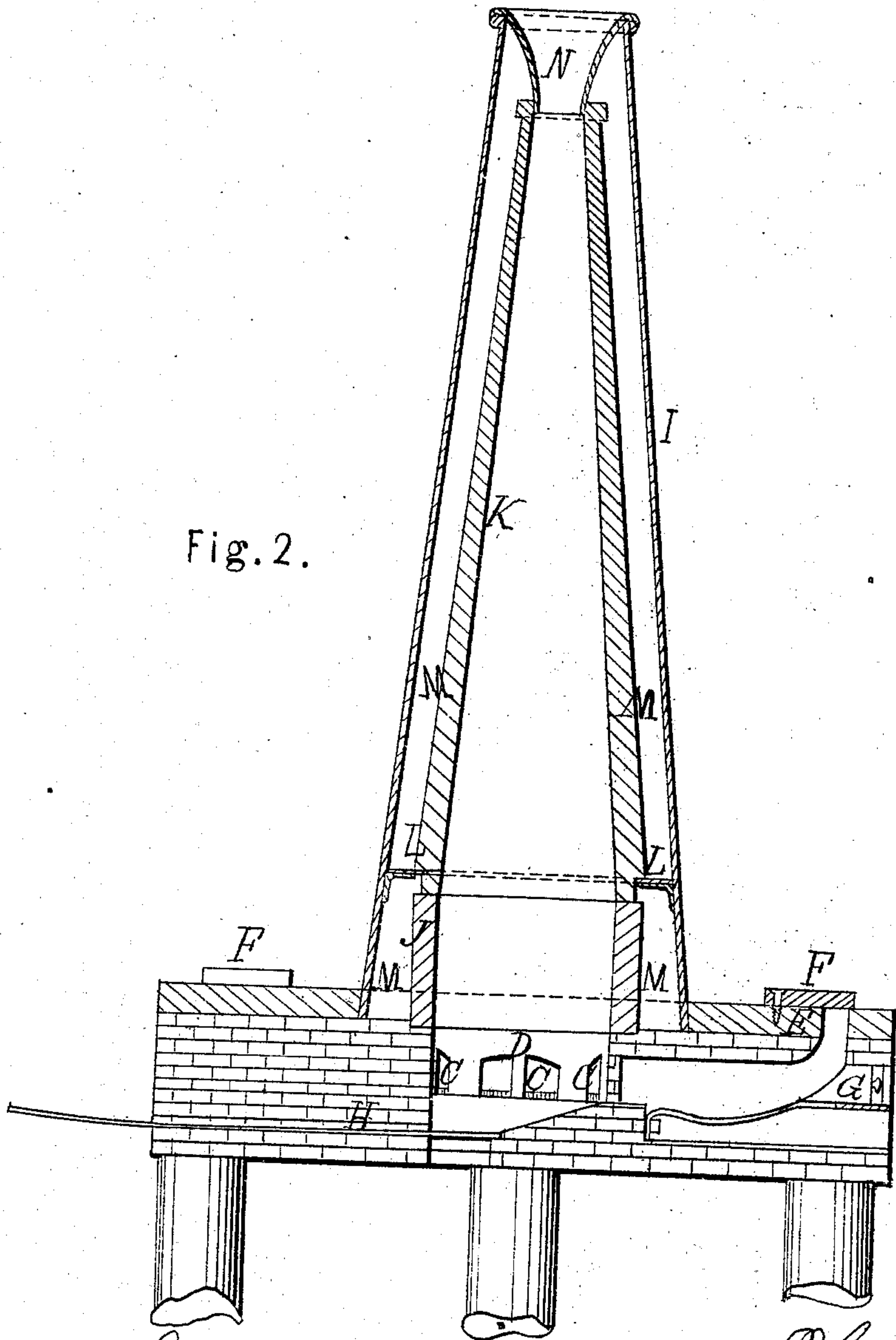
*H. Pelton.*  
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Fig. 2.



*Wm E Lyon*  
*Wm Trewin*

*H Pelton*  
*per Munroe*  
*Attorneys*



# UNITED STATES PATENT OFFICE.

HALSEY PELTON, OF ERIE, PENNSYLVANIA.

## IMPROVED LIME-KILN.

Specification forming part of Letters Patent No. 54,943, dated May 22, 1866.

*To all whom it may concern:*

Be it known that I, HALSEY PELTON, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and useful Improvement in Draw Lime-Kilns; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of a lime-kiln made according to my invention. Fig. 2 is an axial section thereof. Fig. 3 is a detail view of one of the coal-guides.

Similar letters of reference indicate like parts.

This invention consists in several particulars, one of which is giving a cylindrical form to the base of a kiln and placing the furnaces or fire-chambers of the kiln radially about it, so as to heat the kiln on all sides equally, and so reduce all parts of the charge to lime with uniformity. Another is constructing the furnaces so that they can be used with either wood or coal. Another is making that part of the kiln which is above the flues of boiler or other iron, inside of which is a lining of fire-brick, an annular space being left between the two, which is filled up with leached ashes or other poor conductor of heat. Another is placing a draw-gate at the lowest part of the bottom of the kiln, through which the lime falls, in contradistinction from a gate at the side, through which it is hauled out. Another is converging the bottom of the kiln so that its lowest place comes at one side of its axis, in line with the wall. Another is dividing the fire-brick lining of the kiln into an upper and a lower part by means of a flange projecting inward from the inner cylinder, so that the lower part, which is most exposed to the action of the fires, can be repaired without requiring the upper part to be removed.

A designates the base of the kiln, in which are placed the furnaces by means of which the charge is reduced to lime. The furnaces are arranged in radial positions, having horizontal doorways in the circumference of the base A, which are closed by doors B. Each furnace has an ash-pit. The grates take a concave form for the inner half of their length, being

depressed at that part for the purpose of retaining the fuel and preventing it from falling into the kiln or from being forced therein by the draft. The furnaces communicate with the kiln through flues C, which may be divided by pillars D, that support the arches above.

The letters E designate openings made into each furnace from above, for the purpose of supplying fuel when coal is used. Each opening E has a door, F. When wood is used for fuel it is introduced into the furnaces through the doors B, but in cases where coal is used, or any other fuel which is more conveniently introduced through the upper doors or openings, E, the horizontal doorways are closed by blocks G, which should be made of iron, one of which is seen in detail in the drawings.

The kiln here shown is of the kind commonly known as a "draw-kiln," because the lime, as fast as made, is removed from the kiln. This has heretofore been done from the side, the lime being drawn out in a hot state by a shovel. My improvement embraces a material change from this mode of operating draw-kilns. The sides of the lower part of my kiln, below the level of the flues C, are made to converge in a downward direction, so as to bring the bottom or lowest part in line with one side of the interior wall. The bottom of the kiln has an opening through it, which is closed by a draw-gate, H, operated from without by a handle. The hot lime falls through the draw-gate into a space left below the base A, from whence it can be taken at pleasure, after time has been given it to become cool.

I designates a metallic cylinder, preferably of iron, which forms the outside of the kiln above the tops of the flues. It is lined with fire-brick nearly to its top, such lining being divided into a lower section, J, and an upper section, K, which are separated from each other by an annular flange, L, projecting in a horizontal direction from the inner sides of cylinder I. The upper section, K, of the lining rests on the flange. In consequence of this arrangement I am enabled to repair the lower section, which is exposed to the greatest heat, and will therefore be sooner injured or destroyed, without disturbing the upper section. An annular space, M, is left between the fire-brick linings J K and the metallic cylinder, both above and below flange L, and this space is filled with



leached ashes or other suitable non-conducting material. The top of the fire-brick lining is surmounted by a hollow movable mouth-piece, N, made of metal, of the shape of an inverted truncated cone, whose flaring rim fits over the top of the metallic cylinder.

One advantage which is derived from giving a round form to the base of the kiln is that the furnaces can be more numerous and can be arranged so that the heat to which the charge will be subjected will be equal, or nearly so, the flues of the several furnaces converging toward the center of the kiln. By having many fires instead of few there is less danger of over-taxing the furnaces in producing the intense heat which is required to reduce the stone into lime.

My invention enables the operator to use either wood or coal or peat as the fuel to operate the kiln, and can change from one to the other without other preparation than removing or replacing the blocks G. It will be observed that these blocks are so made as to fill the front parts of the furnaces, thereby lessening their dimensions, and that the inner ends of the blocks are inclined toward the grates in order to promote the easy descent of the fuel toward the grates when poured in through the upper openings, E.

The cylinder or shell I of the kiln may be made of boiler-iron or other suitable metal. One of the advantages derived from making it of metal and lining it, as set forth, is that less heat will be lost from the charge than is lost in kilns whose bodies are made of stone.

The draw-gate at the bottom and the converging sides of the lower part of the kiln en-

able the attendant to draw the lime from time to time as it is produced, with much less labor than in ordinary kilns, where the lime is drawn by shoveling and hauling it out from the side. The draw-gate H having been opened, the lime will fall to the ground without the necessity of handling it in removing it from the kiln.

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

1. Making the furnaces of lime-kilns with upper openings or doors for admitting coal, in combination with horizontal doors or openings for admitting wood, so that either kind of fuel can be used, substantially as described.

2. The block G, made substantially as described, for filling the front part of a furnace when coal is to be used as fuel and for conducting the coal to the grate, as above shown.

3. Making the body of a lime-kiln substantially as above described—that is to say, with a metallic outer cylinder, a fire-brick or equivalent lining, and a non-conducting material between the two, with a projecting base for the arrangement of flues.

4. Making a horizontal flange on the inside of the metallic cylinder I, for the purpose of separating the upper part of the inner lining from the lower part, substantially as above described.

5. The arrangement of the gate H and base of the kiln in the manner and for the purpose herein specified.

HALSEY PELTON.

Witnesses:

SAML. H. METCALF,  
CHAS. METCALF.