

R. A. SMITH.

Lime Kiln.

No. 101,173.

Patented March 22, 1870.

Fig. 1.

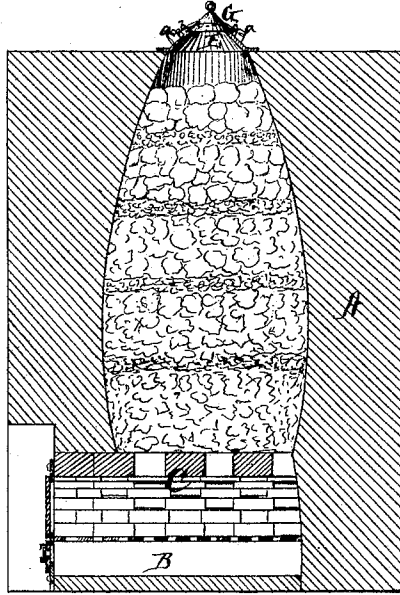
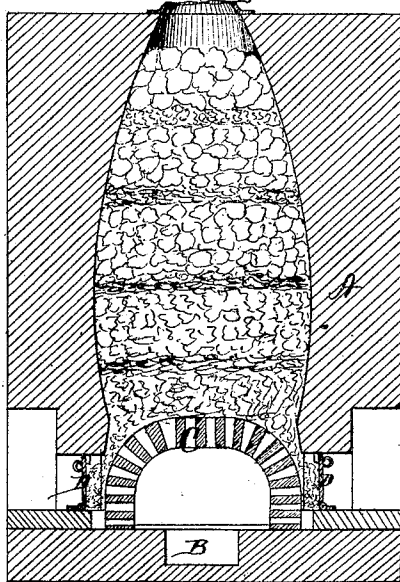


Fig. 2.



Witnesses.

Harry King
C. L. Clark

Inventor.

R. A. Smith
per

Alexander Murray
Atty.

United States Patent Office.

R. A. SMITH, OF ATCHISON, KANSAS.

Letters Patent No. 101,173, dated March 22, 1870.

IMPROVEMENT IN LIME-KILNS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, R. A. SMITH, of Atchison, in the county of Atchison and in the State of Kansas, have invented certain new and useful Improvements in Lime-Kilns; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a "lime-kiln," as will be hereinafter fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a longitudinal vertical section, and

Figure 2 is a transverse vertical section of my kiln.

A represents the kiln, built of any suitable material, the central space in which the lime-rock is to be placed being about twenty feet high, five feet in diameter at the bottom, seven in the center, and three feet at the top.

B is the ash-pit or place where the coals and ashes fall from the arch C, which is built of fire-brick, in form of a checker-board, every alternate block being left out.

D D are the draw-doors, through which the lime is drawn out.

On top of the kiln is placed a rim, E, of the shape of an inverted funnel, and on top of the same is a cover, G, provided with arms, b b, which are placed between ears, a a, on the rim E, and pins put through the said ears, so that by lifting the small cover G, the large cover or rim E will be suspended from the same.

The kiln is first filled with lime-rock broken to about the size of three inches; the large cover E is then put on the kiln. A fire is then built in the arch C, and after firing twelve hours, the draw-doors D D, which are hinged at their bottom edges, are let down, and the lime shoveled out as long as it comes down lime, after which close the doors, fire up in the arch, and fill the kiln with rock, and after the kiln is once properly heated up it will run out about three hundred bushels of good lime in twenty-four hours, and can be drawn at intervals of every four or six hours.

I have for many years been aware that some plan might be adopted whereby a great saving in fuel could be effected, and for accomplishing this object I have adopted the double-cover plan as being the best.

A kiln three feet across on top is larger than is needed for ventilation, but it would not be possible to fill and work a kiln with less room; but by using the covers the dimensions are properly adjusted.

The large cover or rim E that sits on the top of kiln is made of cast iron one inch thick, and will weigh about four hundred and fifty pounds. It is so made as to fit firmly, the bottom edge resting on the kiln about three inches, on all sides alike. It is placed there for no other purpose than to keep the hot air in the kiln, making it much hotter in the lime-rock, and consuming less than one-half the amount of fuel.

The top cover, G, is used to take off and put on the rim E by placing and fastening the top cover on the same, as already described; then a bar or lever is passed through a ring in the top cover, when both are lifted up, and can be set to one side on top of the kiln for filling the kiln, &c.

When coal is to be used the operation is as follows:

After firing twelve hours with wood, and making one draw, put in a small quantity of coal and lime-rock alternately until the kiln is filled; still continue the fire in the arch below, drawing every four or six hours, for thirty hours, after which time cease firing in the arch and close the door of the arch, raising the slide or damper of ash-pit for air. By putting in coal and lime-rock in alternate layers, as represented in the drawings, it can be run for months, if needed.

The top of the kiln should be inclined from front to back, so as to allow any water to run off without interfering with the lime below. This also causes the large cover or rim E to pitch toward the back, thereby causing the kiln to draw much better to the back. The front will take less trouble to burn than the back, as it will always get the best fire if wood is used.

When it is desired to leave the kiln from Saturday night to Monday morning, close the draught below and put on the top cover G, leaving a little space for hot air to escape.

Having thus fully described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the bottom cover or rim, E, and top cover G, constructed and arranged to operate substantially in the manner and for the purposes herein set forth.

2. The arrangement of the lime-kiln A, with arch C, ash-pit B, draw-doors D D, and cover E G, all constructed as described, and operating substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing, I have hereunto set my hand this 17th day of January, 1870.

R. A. SMITH.

Witnesses:

H. CLAY PARK,
OWEN C. SEIP.