H. STACEY.

LIME-KILN.

No. 183,516. Patented Oct. 24, 1876.

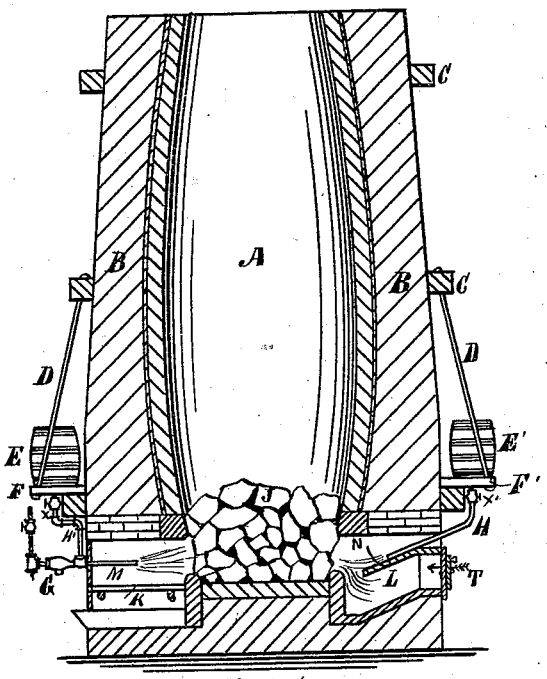

Fig 1.

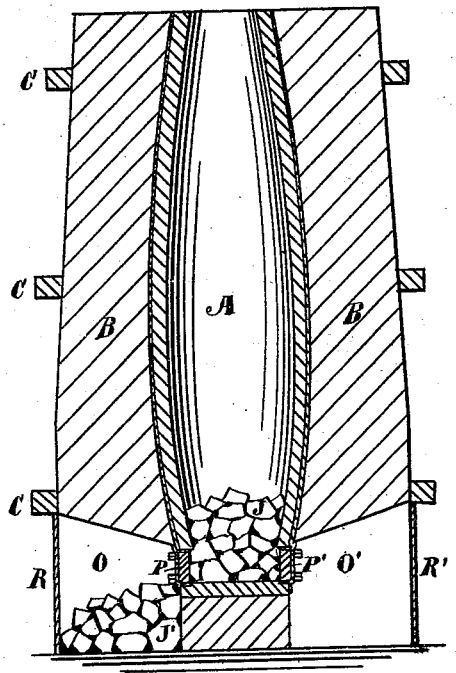

Fig 2.

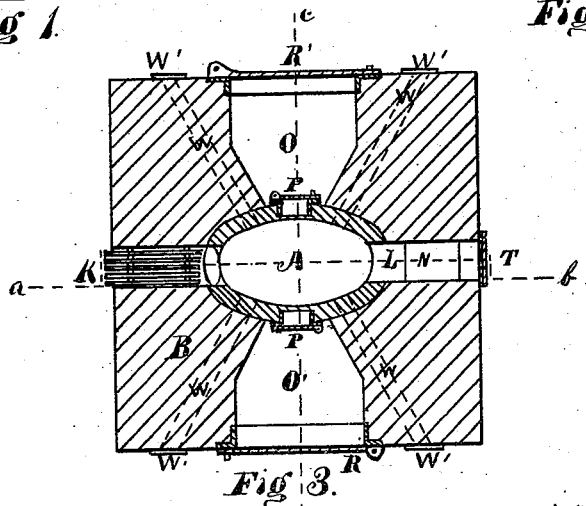

Fig 3.

WITNESSES;

E. C. Whitney

Jno. P. Patten

INVENTOR.

Henry Stacey.

Per. E. Brink

his Atty

UNITED STATES PATENT OFFICE.

HENRY STACEY, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN LIMEKILNS.

Specification forming part of Letters Patent No. **183,516**, dated October 24, 1876; application filed February 18, 1876.

To all whom it may concern:

Be it known that I, HENRY STACEY, of Indianapolis, county of Marion, State of Indiana, have invented a new and useful Method of Burning Lime in Limekilns by Means of Coal-Tar or other Heavy Oils, of which the following is a description, reference being had to the accompanying drawings.

Previous to my invention, lime has been burned in various kinds of kilns, some of which use coal and wood, turf, &c., and such inventions I do not claim.

My invention consists in using coal-tar or other heavy oils for the purposes of burning lime in limekilns, and in the construction of the various parts of the kiln for the purpose of using the coal-tar or heavy oils as the fuel to burn the lime; also, to arrange the delivery-openings at the bottom of the kilns, one on each side of the fire-chambers, in such a manner as to allow the lime, when properly burned, to be withdrawn from the central part of the kiln into cooling-chambers located at the sides in an alternate manner—*i. e.*, the lime that is burned sufficient to be withdrawn from the kiln may be drawn into one cooling-chamber, thus allowing other lime that is being burned in the kiln to become perfectly burned before it is withdrawn into the other cooling-chamber. The lime thus removed from the kiln into the cooling-chambers is there left until the temperature has been reduced sufficient to remove it from the chambers without injury to the lime.

Figure 1 represents a sectional view of my improved limekiln, taken through the line *a b* of Fig. 3. Fig. 2 is a sectional view of the same, taken through the line *c d* of Fig. 3. Fig. 3 is a plan view of the same, taken at a line above the fire-chambers.

A represents the truncated cone of the kiln, a cross-section of which shows an ellipse, as shown in Fig. 3; but the precise form of the cone in cross-section may be varied, as desired. In this cone the limestone J is deposited without any fuel below; and at the base of the cone, on each side of the longest diameter of the ellipse, are arranged the fire-chambers M L. The fire-chamber M may be furnished with grate-bars K, as in the ordinary furnace with an ash-pit below; and the front is made so as to be closed entirely up, except a small opening near the center, through which the end of a pipe attached to an injector is inserted. The fire-chamber L may be of the same construction as chamber M, or may be formed with an inclined partition or floor, N, which divides the fire-chamber into two compartments, one above and one below, the chamber below being used as an air-chamber, and is provided with an air-register, T, arranged to admit air in any quantity desired, in order to form combustion with the coal-tar or other heavy-oil fuel, that may be introduced into the fire-chamber L from above the partition or inclined floor N, as will be hereafter described.

The limekiln is secured together by the usual binders C, made to encircle the kiln, and securely fastened thereto, as shown, and to any of these binders C are secured the shelves F F′, in such a manner as to have each shelf above the fire-chambers M L. On these shelves F F′, which are supported by stay-rods D, are secured the oil or tar tanks E E′, which are designed to hold a supply of coal-tar or other heavy oils. The tank E′ has a pipe, H, provided with a cock, X, (to regulate the flow of oil,) which leads into the fire-chamber L immediately over the inclined partition N; and through this pipe H and cock X the coal-tar or other heavy oils are fed to the upper part of the inclined partition N, and are allowed to run down the incline to the fire-chamber L. Here the oils or tar are ignited, and, being supplied with the air through the register T, form combustion in the fire-chamber, and the flames are conducted to the kiln through the proper throat or connection at the base of the kiln, as shown.

The tank E is also provided with an oil-conducting pipe, H′, and regulating valve or cock, which leads into the front end of an injector operated by steam, as shown in my patent of July 13, 1875, which injects the tar or oils into the fire-place M, or any other fire-place of a limekiln, and, when injected into the fire-chamber and ignited, fills the kiln with flame. In addition to the registers T, as applied to the fire-chamber doors, I admit air to the base of the kiln by means of the air-passages W. (Shown in dotted lines in Fig.

3.) Each of these air-passages is provided with registers W′, to regulate the supply of air to the kiln.

When the limestone J has been sufficiently burned at the base of the kiln, then, by opening the doors R and R′ in the cooling-chambers O O′, the lime thus burned can be withdrawn from the kiln into each cooling-chamber O O′ alternately, and there left until sufficiently cold to be removed therefrom without injury to the lime.

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

1. In a limekiln, the arrangement and combination of the fire-chambers M L at opposite sides of the long diameter of the ellipse A, the air-passages W, the discharge-openings P P on each side of the short diameter of the ellipse A, the cooling-chambers O O′, provided with doors R R′, registers T and W′, as shown, for the purposes set forth and described.

2. In a limekiln, the fire-chamber L, constructed with an inclined partition, N, arranged to allow coal-tar or other heavy oils that are fed to the upper part of the inclined partition to run down the incline to the fire-chamber L, said chamber L being also provided with an air-register, T, all arranged and adapted to be operated for the purposes set forth and described.

3. In combination with the closed fire-chamber M of a limekiln, an oil or coal-tar injector, operated in the manner and for the purpose set forth and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY STACEY.

Witnesses:
E. O. FRINK,
E. C. WHITNEY.