2 Sheets--Sheet 1.

A. B. WEEKS.

Lime-Kiln.

No. 165,900. Patented July 20, 1875.

Fig. 1.

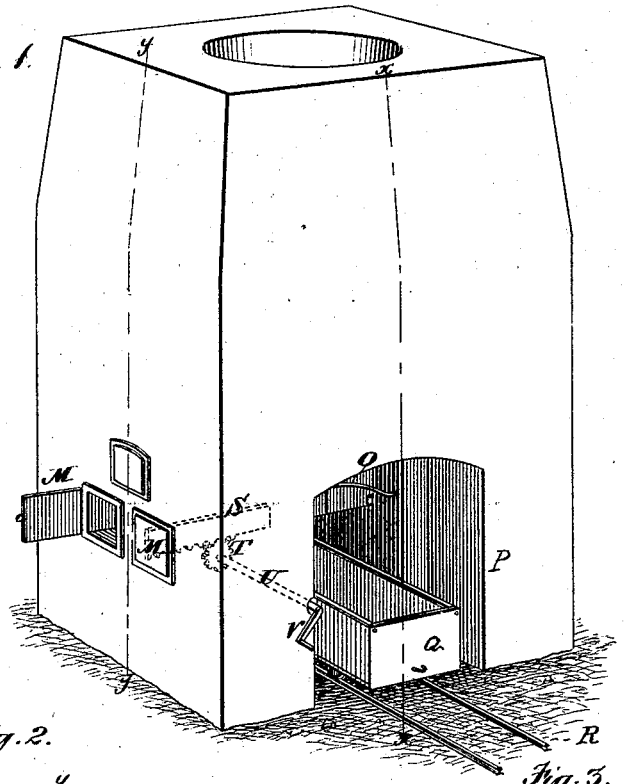


Fig. 2.

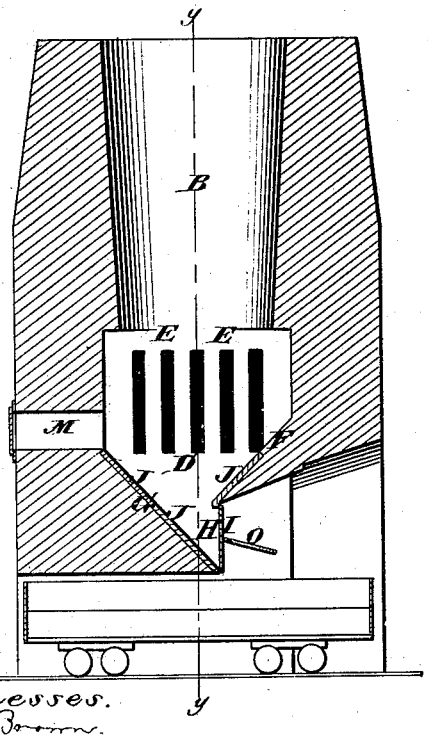
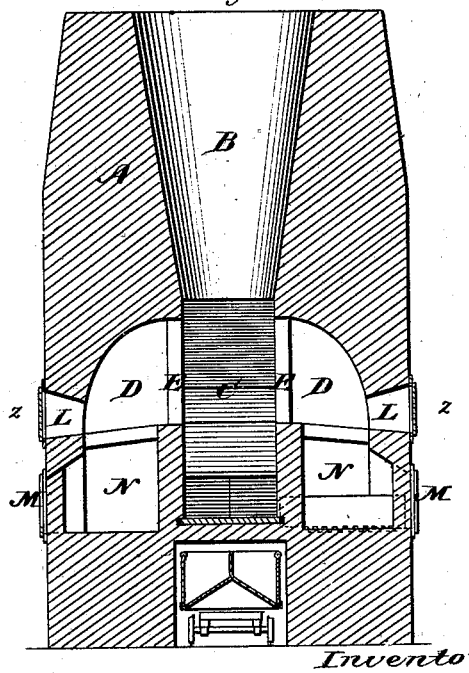


Fig. 3.



Witnesses.
C. F. Brown.
M. Blanchard

Inventor.
A. B. Weeks.
by his Attys.
Thos. Ellsworth

2 Sheets--Sheet 2.

A. B. WEEKS
Lime-Kiln.

No. 165,900. Patented July 20, 1875.

Fig. 4.

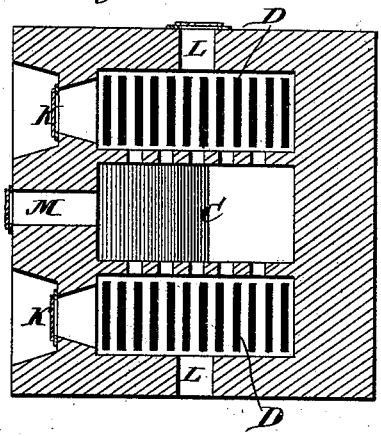


Fig. 5.

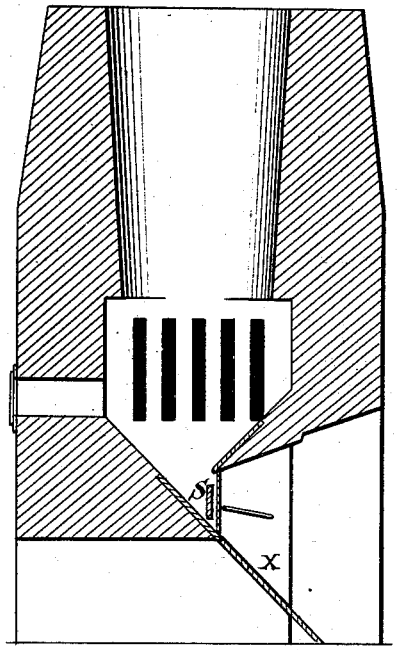
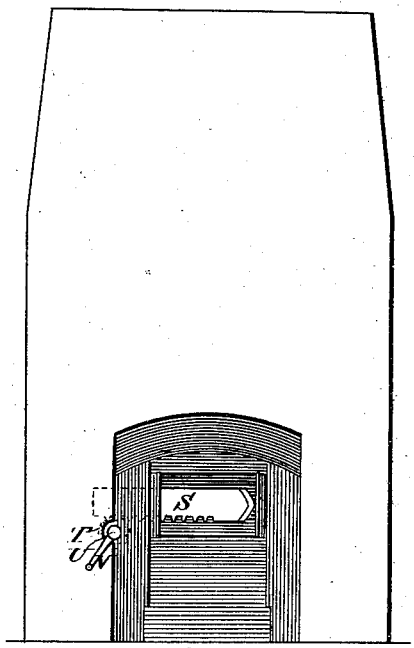


Fig. 6.



Witnesses.
C. F. Brown
M. C. Church

Inventor
A. B. Weeks.
by his Attys.
Hill & Ellsworth

UNITED STATES PATENT OFFICE.

ABNER B. WEEKS, OF ROCKLAND, MAINE.

IMPROVEMENT IN LIMEKILNS.

Specification forming part of Letters Patent No. **165,900**, dated July 20, 1875; application filed November 12, 1874.

To all whom it may concern:

Be it known that I, ABNER B. WEEKS, of Rockland, in the county of Knox and State of Maine, have invented a new and Improved Limekiln; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, Sheet 1, is a perspective view of my improved kiln, taken from the front. Fig. 2, Sheet 1, is a vertical section on the plane of line *x x*, Fig. 1. Fig. 3, Sheet 1, is a similar section on the plane of line *y y*, Figs. 1 and 2. Fig. 4, Sheet 2, is a horizontal section on the plane of line *z z*, Fig. 3. Fig. 5, Sheet 2, is a vertical section, showing the cut-off and inclined plane; and Fig. 6, Sheet 2, is a front elevation, showing the same parts, the doors of the discharge-opening being open.

Similar letters of reference in the drawings refer to like parts.

This invention relates to that class of kilns known as perpetual, in which the rock is placed in the top of the kiln, and the lime drawn from the bottom from time to time as it is burned, the operation of burning being kept up without cessation.

The object of my invention is to provide a means for rapidly discharging the lime from the kiln by its own weight, to readily checking the discharge thereof, and for holding the doors closing the discharge-way. To these ends my invention consists, first, of a pair of swinging doors, adapted to close a vertical opening in the bottom of the discharge, in combination with a pivoted bail, situated in front of the doors, and adapted to hold them in a closed position; secondly, of a cut-off or slide, adapted to extend across a vertical opening, provided with doors in the bottom of the discharge, for the purpose of checking the discharge of the lime when the doors are open.

In the accompanying drawings, A represents the kiln, having the usual opening B, leading from the top downward into the retort or thimble C. The latter is preferably constructed oblong in a horizontal section, and is located between the fire-boxes D D, as shown in Figs. 3 and 4, the fire-boxes being also oblong, and arranged with their major axes parallel with that of the thimble C, so as to expose the latter to the greatest amount of heating-surface. The fire-boxes communicate with the thimble through the flues E. The bottom of the thimble C is composed of two inclined surfaces, F G, inclining downward toward the center in opposite directions. The incline F terminates above the incline G at or near the center of the thimble, a space, H, existing between the two, provided with hinged doors I I, which open outward. J J are iron plates covering the inclines F G below the level of the fire-boxes, and serving to protect the inclines from the friction caused by the lime in sliding down. The plates J are preferably held in suitable grooves in the side of the thimble, sufficient space being allowed for the expansion of the metal, so that the plates may move in any direction in the plane of their surfaces. K K are the doors of the fire-box opening into their rear ends, and L L are openings in the sides of the kiln, communicating with the fire-boxes above the grates, and enabling the contents of the thimble to be inspected through the flues E. M is an opening in the rear of the kiln, extending to the thimble for the insertion of a rod or poker, for the purpose of stirring the contents of the thimble when clogged. N N are the ash-pits, having doors M M. O is a pivoted bail, situated in front of the doors I I, and adapted to hold them in a closed position, as shown in Figs. 1 and 2. P is a recess or passage extending through the center of the kiln from front to rear, under the thimble D. The passage P is of sufficient height to receive a car, Q, which runs on a track, R. S is a slide or cut-off, adapted to extend across the opening H and check the discharge therefrom. The slide is provided with rack-teeth, which engage with a pinion, T, the latter being located on a shaft, U, extending to the front of the kiln, and provided with a crank, Y, within convenient reach of the operator.

In the operation of my improved kiln the lime, as it is burned, falls below the flues or arches E, and cools and contracts somewhat, so that it readily fills the angular space formed by the doors I and incline G. The bail O being swung back from the doors, the weight of the lime forces the doors open, and the ac-

cumulation falls into the car Q or down an incline, X. (Shown in Fig. 5.) The unburnt rock between the arches or flues, being expanded by the heat, remains in place for a short time after the supporting lime beneath is withdrawn; hence there is usually no difficulty in closing the doors I after the withdrawal of the charge. In case, however, the lime not sufficiently burned should follow, or if for any reason it is desired to check the discharge of the lime, the sliding cut-off S is thrust across the opening H, thus stopping the flow, and allowing the doors to be closed and fastened. The car is preferably so constructed as to dump its contents when withdrawn from the kiln, thereby spreading the lime so that it can be readily sorted. The same end is attained by the use of the incline X, which forms a continuation of the incline G of the thimble, and causes the discharged lime to spread or scatter. If desired, the inclines F G may be composed entirely of iron plates without any supporting masonry, the edges of the plates being held in iron grooves let into the vertical side of the thimble. By the construction of the fire-boxes and thimble as above described I am enabled to diminish the width of the thimble and bring the fire-boxes comparatively near together, thus utilizing the greatest amount of heat, and insuring the burning of the rock at the center of the kiln. The fire-boxes, instead of opening at the sides of the kiln, receiving the wood endwise to the rock, and allowing a large portion of the draft to pass through the door and over the top of the wood, open at the back, so that when the wood is thrown in it will lie sidewise to the rock and close to the flues E, thus bringing the bulk of the wood much nearer the objective point to which the fire is to be directed. The doors of the fire-boxes are placed higher than the grate-bars, so that the boxes may be more readily filled with fuel, and when filled the necessity of closing the doors insures the passage of the draft upward from the ash-pits through the flame, thus avoiding a draft of cold air above the fuel into the kiln.

I claim as my invention—

1. The doors I I of the vertical opening H, in combination with the bail O, substantially as described.

2. The slide or cut-off S, adapted to extend across the opening H, in combination with the doors I, substantially as described.

ABNER B. WEEKS.

Witnesses:
J. P. CILLEY,
M. CHURCH.