

(No Model.)

B. W. MAY.
FURNACE FOR BRICK KILNS.

No. 529,931.

Patented Nov. 27, 1894.

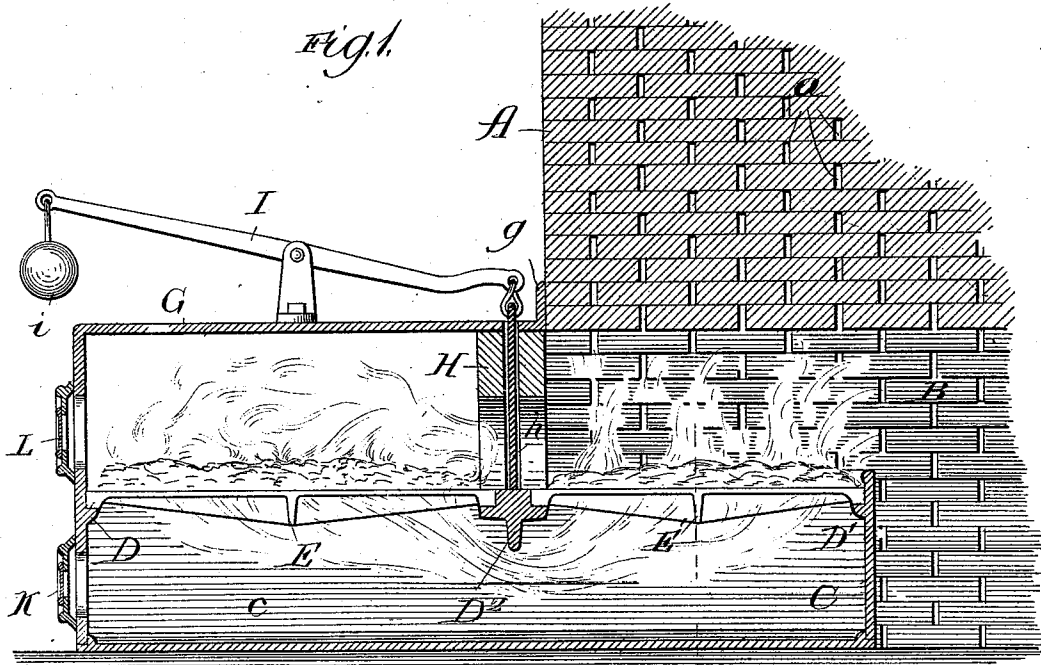
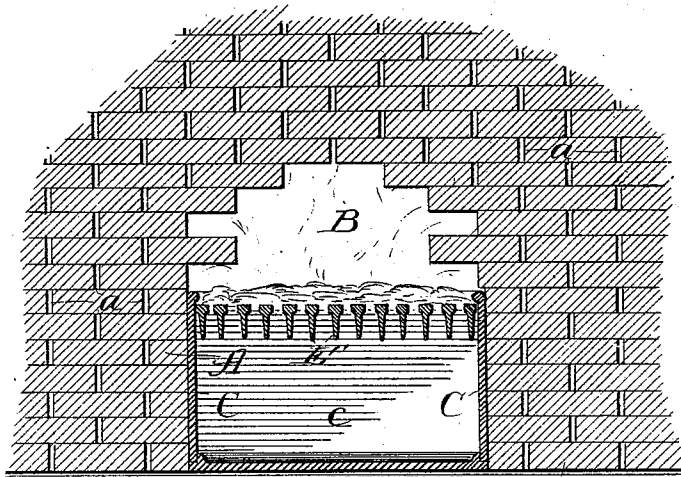
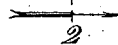


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

BENJAMIN W. MAY, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
CHARLES BONNER, OF SAME PLACE.

FURNACE FOR BRICK-KILNS.

SPECIFICATION forming part of Letters Patent No. 529,931, dated November 27, 1894.

Application filed February 1, 1894. Serial No. 493,704. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN W. MAY, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Furnaces for Brick-Kilns, of which the following is a specification.

The object of my invention is to provide a simple, economical and efficient furnace, adapted especially for use in connection with brick kilns; and my invention consists in the features, combinations and details of construction hereinafter described and claimed.

In the drawings, Figure 1 represents a vertical elevation in section, showing my improved furnace as used in connection with a brick kiln; and Fig. 2 a transverse vertical section, taken on line 2 of Fig. 1.

It is well known in the art that in the burning of brick, the desired object is to burn the green bricks until they become sufficiently dry and hard to be used for building and allied purposes. In the baking, however, the bricks are laid in such manner as to form interstices, through which a draft is created in the furnaces. The bricks nearest to the furnace are liable to become overheated, as well as covered with a deposit of soot, when coal is used—especially bituminous coal—for the reason that when the coal is put into the furnace green, it will smoke profusely, and sometimes clog up these interstices so badly that the subsequent fierce heat bakes this soot in connection with the brick, so that oftentimes a brick kiln has to be destroyed by explosives to separate the burned brick. To overcome these difficulties, wood and crude petroleum have largely been used; but the use of these fuels, while in a measure satisfactory, is very expensive. To overcome these objections, and to provide a furnace in which coal may be used, is the principal object of my invention.

In constructing my improvement and using it in connection with the brick kiln, I form the brick kiln, A, in the usual manner, having the usual interstices or flues, a, and leave an arch, B, in that place where it is desired to place the furnace. This arch may extend clear through the pile of brick, and have a furnace—such as I will hereinafter describe—

at either end; but for the purposes of my invention I will describe but one furnace.

I use a suitable framework, C, preferably made of cast iron of the desired size and shape, which incloses and forms the ash-pit, c. I provide this framework with ledges, D, D' and D². The ledge, D², forms a brace which runs across from side to side of the frame. Upon these ledges I support grate bars, E, E', and prefer to make them in two parts; but it will be understood that the brace rod, D² can be done away with and the grate bars be of one piece and extend from end to end of the furnace. I provide a cast-iron hood, G, which incloses and covers the front set of grate bars, forming what I term the "primary combustion chamber," and separate this primary combustion chamber from the rear set of grate bars by means of a bridge wall, H, which is provided with a sliding door, h, arranged to be operated by a vibrating lever, I. This lever is provided with a weighted ball, i, to counterbalance the weight of the door, h, so that the same may be operated with the least possible amount of exertion.

The hood, G, is provided with a flange, g, so that when the furnace is pushed back into place, it covers and incloses the arched opening in the brick kiln, so that no air may enter the same. The ash pit is provided with a door, K, and the primary combustion chamber with a door, L,—the latter so that fuel may be fed to the fire box or air admitted to support combustion, and the former so that the ashes may be taken out, or opened for the admission of the necessary air.

When the furnace is placed in position with the flange of the hood against the brick kiln, the second set of grate bars, E', forms a secondary combustion chamber, from which the heat rises and passes through the interstices of the brick kiln, burning the brick thoroughly, and it may be provided with an inclosing hood or not, as desired.

In using my improved furnace in connection with a brick kiln, I first build the kiln, leaving an arch of the desired size, and push the furnace back in place as shown in Fig. 1—it being understood that my furnace is portable—and close the door between the two

combustion chambers. I start a fire in the primary combustion chamber, adding a small amount of coal, so that the least possible amount of smoke will be created. I open the door, L, slightly, so that a sufficient amount of air will enter to support combustion. This creates a down-draft, as indicated in the drawings. Passing down through the hot coals there is less liability for smoke to be created, or it is converted into an invisible gas and passes up through the grates in the second combustion chamber. As soon as the coal in the primary combustion chamber has become coked, or ceased smoking, I raise the door which separates the chambers and push the hot beds of coals, or the greater portion thereof, back upon the second set of grate bars. I then close the door separating the two chambers, and supply a fresh amount of coal to the primary chamber. Combustion immediately takes place, and the gases pass down from the first combustion chamber into and through the ash pit, and up through the fuel on the second set of grate bars, thus burning the heated gases which have escaped combustion in the first chamber and minimizing the chances of creating smoke. This process is kept up as often as seems necessary. The fuel on the second set of grate bars reduces itself to ashes, and is deposited in the ash pit underneath, and as fast as the coal in the initial combustion chamber is coked, the larger portion of it is pushed back upon the second set of grate bars, only leaving enough to secure combustion again, when fresh fuel is added.

The advantages, therefore, which I derive from the use of my furnace in connection with brick kilns, are that the danger of smoke is almost or entirely obliterated, as well as economy gained in the use of fuel, for the reason that it is only necessary to use small amounts of fuel at a time, and the ability to burn bituminous coal.

While I have described the construction of my invention with more or less minuteness as regards details, I do not desire to be lim-

ited thereto unduly, any more than is pointed out in the claims. On the contrary, I contemplate changes in form, construction and arrangement, the omission of parts, and the use of equivalents, as circumstances may suggest or render expedient.

I claim—

1. In a heating apparatus for brick kilns, the combination of a furnace having a primary chamber in which fuel is partially consumed, a secondary chamber in which the combustion of the fuel is completed, a bridge wall separating such chambers, and a door in such bridge wall through which fuel may be pushed, substantially as described.

2. In a heating apparatus for brick kilns, the combination of a furnace having a primary combustion chamber for partially burning fuel provided with a door arranged above the point of burning fuel for the admission of air, &c., a secondary combustion chamber for completing the combustion of fuel and having its opening for the admission of air and products of combustion below the point of combustion, a bridge wall separating such chambers, and a door in said wall through which partially consumed fuel may be passed, substantially as described.

3. In a heating apparatus for brick kilns, the combination of a furnace having a primary down-draft combustion chamber for partially burning the fuel, a door in such chamber for the admission of air and fuel, a second up-draft combustion chamber in which the combustion of the fuel is completed, a bridge wall separating such chambers, a door in such wall through which the partially burned fuel is passed, means for opening and closing such door, an ash pit beneath such chambers through which the first products of combustion pass, and a door in the wall of such pit for the admission of air or removal of ashes, substantially as described.

BENJAMIN W. MAY.

Witnesses:

THOMAS F. SHERIDAN,
SAMUEL E. HIBBEN.