

(No Model.)

2 Sheets—Sheet 1.

F. E. SWIFT.
BRICK KILN FURNACE.

No. 501,380.

Patented July 11, 1893.

FIG. 1.

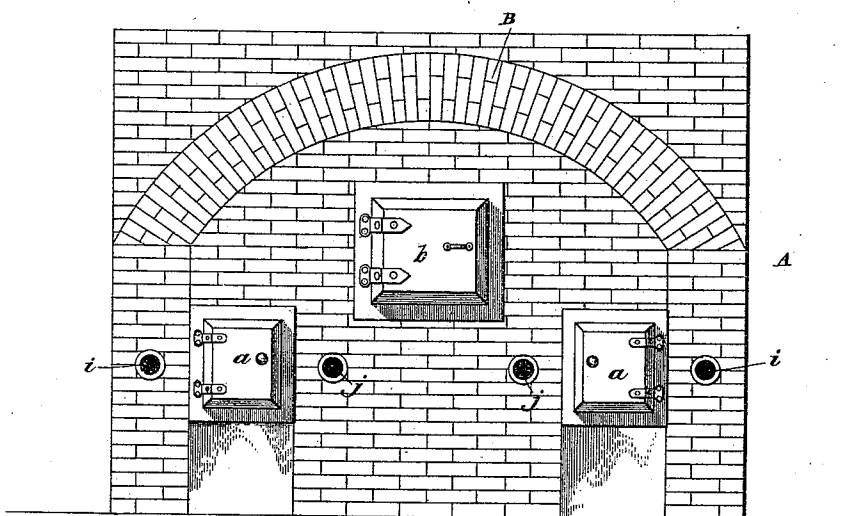
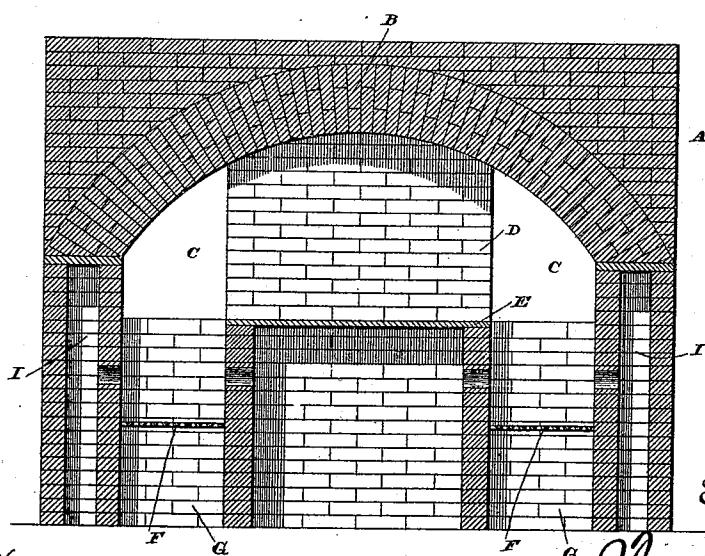


FIG. 2.



Witnesses

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(No Model.)

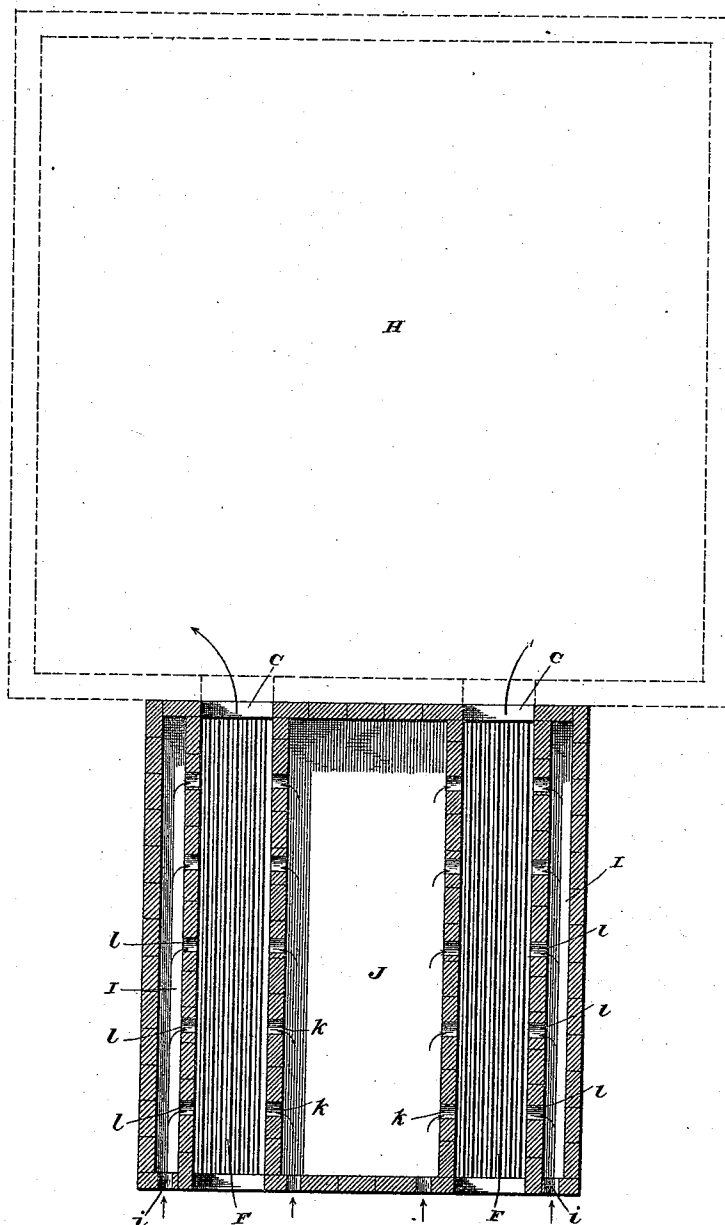
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FIG. 3.



Witnesses

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BRICK-KILN FURNACE.

SPECIFICATION forming part of Letters Patent No. 501,380, dated July 11, 1893.

Application filed August 17, 1893. Serial No. 443,342. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. SWIFT, a citizen of the United States, residing at Washington, in the county of Washington and State of Iowa, have invented certain new and useful Improvements in Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has reference to an improvement in a furnace for heating and burning purposes, its principal and preferred use being preferably in connection with a brick, tile or other kiln, the object of the invention being to provide a furnace wherein an extremely hot and effective fire may be produced with an equalization of the heat in all parts of the kiln, thereby insuring an equal burning of all of the brick, whether at the outside, top, bottom or middle of the kiln and so that also all the carbon may be consumed or in other words all of the smoke destroyed and instead of having some portions of the kiln or furnace filled with a dense black smoke, the appearance will be that of an intense white heat or light, and the invention therefore consists of the construction, arrangement and combination of the several parts, substantially as will be hereinafter described and then more particularly pointed out in the appended claims.

In the annexed drawings illustrating my invention: Figure 1 is a front elevation of my improved furnace. Fig. 2 is a vertical sectional elevation of the same. Fig. 3 is a horizontal sectional plan view with the outline of a kiln shown in dotted lines adjacent to the furnace.

Similar letters of reference designate corresponding parts in the several figures of the drawings.

A designates the furnace wall which may be of any suitable size and form, it being preferably rectangular, as shown, although it may be round, square or any other shape and capable of accommodating single furnaces or a series of several. This main wall has preferably the horizontally curved arch B formed therein as a part thereof, and at the rear side of the main wall A is the upright wall D, which is built up as far as the arch B and has

on either side thereof the openings C C of suitable size and shape, which openings after the furnace is located in position adjacent to a kiln, as H, are designed to fit up closely to those openings in the kiln where the fires are usually built as clearly indicated in Fig. 3, in order that the heat coming from the fire or fires within the furnace may pass through these openings C C in the direction shown by the arrows in Fig. 3 into the interior of the kiln for use at that point.

The front of the furnace is provided with the central door *b* and the lower doors *a a*, one on each side of the central door. Within the furnace are the two grates F F below which are the ash pits G G.

Between the grates F F, is the roasting bench or table E, the upper surface of which is preferably from about a half a foot, to a foot higher than the surface of the grates F. The purpose of the roasting table E is to provide a place whereon to roast the coal or slack before it is drawn upon the grates for the purpose of burning the same. The coal slack or other fuel is introduced upon the table E through the central door *b*.

The outside walls belonging to the main structure A of the furnace and situated on the outer sides of the grates F F are formed with the hollow interior flues I I, having at their front ends in the front wall of the furnace, the inlet holes *i* and having at their sides adjacent to the top of the grates F, the series of lateral holes or openings *ll* as shown in Fig. 3. Further, there is a chamber J under the roasting table E and this chamber is provided with a series of lateral openings *k* which is located opposite to the series of openings *l* just above the upper surface of the grates F. Obviously the holes or openings on the one side or those on the other side of the grates may be dispensed with, leaving only one series of supply openings in connection with each grate, because through said openings the air is supplied to the fires upon the grates for the purpose of causing the smoke to be consumed so that a clear white and smokeless heat may be produced in lieu of black and dense smoke which is so objectionable. Chamber J is also provided at its front end with the inlet openings *j j* through which air enters the chamber. It will thus be seen that

by the arrangement of flues which I have thus described, air comes into the flame above the grates at a point where carbon in the smoke may be ignited and the smoke thereby consumed. The design and purpose of this kind of furnace are principally to burn coal slack and other wastes from the coal mines that are totally unfit for burning in the ordinary plain furnaces in connection with brick and tile kilns.

I will now describe the operation of my improved furnace. The fires are started in this furnace by being built upon the grates F in the usual manner through the doors *a a* which are opened for the purpose. As soon as the fires are started the doors *a a* are closed and the door *b* opened and through the latter large quantities of slack or other fuel are fed in onto the roasting table E. This fuel, thus placed upon the roasting table, soon becomes heated and the gas passing off therefrom circulates through the openings C in the rear of the furnace and into the kiln and as it thus passes to the rear it comes in contact with the fresh oxygen which is admitted through the several lateral air flues and consequently the gas will in this way be consumed or destroyed in the same manner as the smoke which arises from the direct combustion upon the furnace grates. If the fuel which has thus been placed upon the roasting table had been thrown upon the grates instead, it would have been sifted by its own weight through the grate bars and into the ash pit and thus been lost. Being located however where it is, it soon becomes fused or melted together, after which it is drawn off onto the grates by means of a furnace poker or hook or other suitable means so that it can be placed direct upon the fire and when thus used it is found to be exceedingly good fuel.

In fact the best that can be used for furnace purposes, being much better in fact than the best of the lump coal of the same grade. After the fire has once been started and is under good headway in this furnace, no fuel is ever thrown directly through the doors *a* on to the grates, but it is all first thrown upon the roaster through the door *b* and is raked off the roasting table whenever it may be needed for use upon the grates. In this way the formation of cinders or clinkers upon the grates is entirely avoided and there is always an air and regular draft and consequently always a regular and steady heat which is a very necessary and important desideratum in the burning of brick and tile.

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

1. In a furnace for heating and burning purposes, the combination with the grates of an intermediate roasting table for receiving and preparing the fuel for burning before it is placed upon the grates and ash pits beneath said grates, an air chamber beneath the roasting table having lateral openings adjacent to the grates and rear passages or flues for the passage of the heat after it leaves the grates, substantially as described.

2. The combination of the grates F F, the roasting table E, the chamber J below it having lateral openings *k* and the side air passages *i* having lateral openings *l*, together with the main furnace wall A having rear openings C, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK E. SWIFT.

Witnesses:

A. S. FOLGER,

T. H. MAXWELL.