

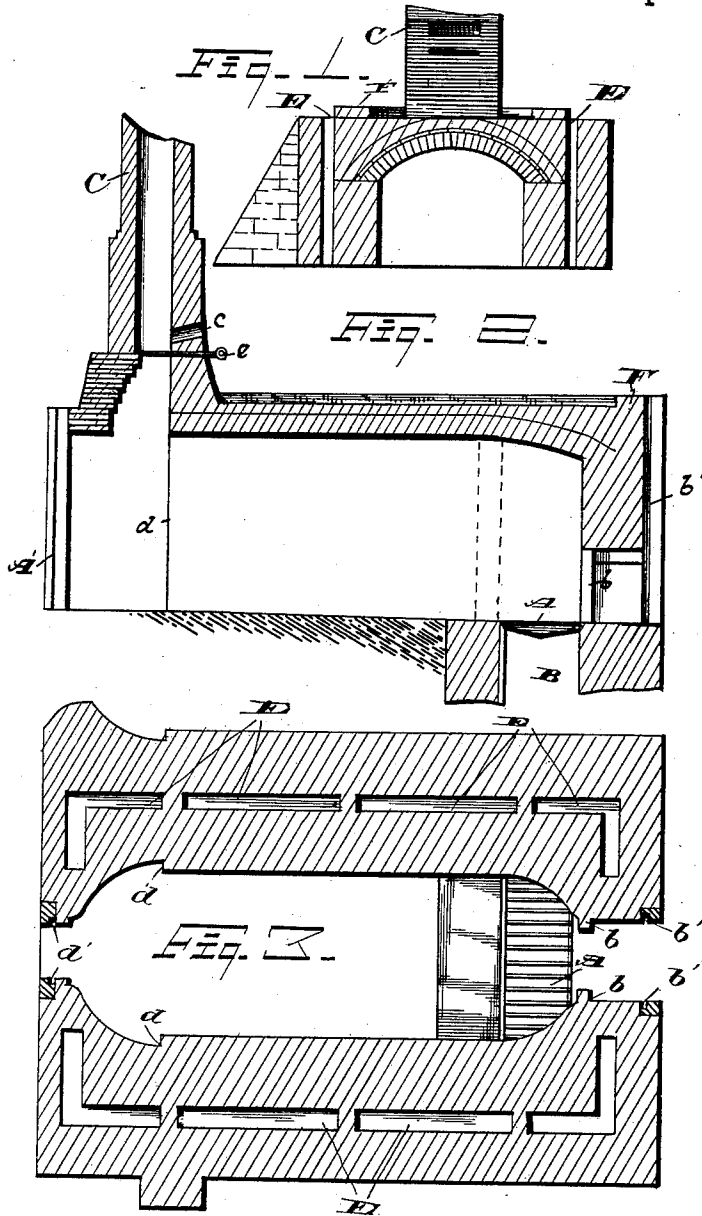
(No Model.)

F. HENGESBACH.

PROCESS OF COLORING TILES OR EQUIVALENT POROUS POTTERY MATERIAL.

No. 340,669.

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WITNESSES

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FRANK HENGESBACH, OF WILLOUGHBY, OHIO, ASSIGNOR TO HIMSELF,
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PROCESS OF COLORING TILES OR EQUIVALENT POROUS POTTERY MATERIALS.

SPECIFICATION forming part of Letters Patent No. 340,669, dated April 27, 1886.

Application filed November 4, 1885. Serial No. 181,817. (No model.)

To all whom it may concern:

Be it known that I, FRANK HENGESBACH, of Willoughby, in the county of Lake and State of Ohio, have invented certain new and useful
5 Improvements in Processes of Coloring Tiles or Equivalent Porous Pottery Material; 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
10 pertains to make and use the same.

My invention relates to a process of coloring tiles or equivalent porous pottery material, in which the tiles or other product are colored to imitate the ordinary roofing-slate, the process
15 consisting, essentially, in subjecting the tiles or other similar porous pottery, when in the highly-heated condition, to which they are raised in the process of burning the same, to the combined action of steam and smoke, to
20 the end that the tiles or other similar porous pottery are colored through and through, so that if they are broken the fractures show substantially the same color as the outside.

In carrying out my process suitable kilns
25 are prepared for burning, for instance, roofing-tile, and for this purpose, as the tiles are usually thin and cannot be piled high, the kilns are preferably of small dimensions. The tiles are set in the kiln and burned in the
30 usual manner, and when the tiles have reached the incandescent stage that denotes the completion of the burning process, a quantity of wet fuel—such as coal saturated in water, or green wood soaked in water—is placed in the
35 furnace of the kiln, and the latter is hermetically closed. The heat in the furnace converts the coal into coke, or, if the fuel be wood, converts the latter into charcoal, and in either case the gases of the fuel in the condition of
40 smoke are expelled and commingled with the steam generated from the water in the fuel. The tiles are left in the kiln for perhaps three or four days exposed to the action of the steam and smoke, or until the tiles are permeated by
45 the latter, giving the tile a desirable slate-color of a lighter or darker shade, according to the amount of wet fuel employed.

The outside walls of the kiln are carried up a few inches above the roof of the kiln, to form
50 a reservoir that during the coloring process is kept supplied with water.

At the end of the coloring process the kiln is allowed to cool down and the tiles are removed.

A suitable kiln for carrying out my process
55 is illustrated in the accompanying drawings.

Figure 1 is an elevation in transverse section through the center of the kiln. Fig. 2 is an elevation in longitudinal section through the center of the kiln. Fig. 3 is a horizontal
60 section just above the grates.

The tiles are set edgewise in the kiln, and, being quite thin, cannot be piled to any considerable height, only three or four tiles arranged the one above the other being advisable.
65 The kilns therefore are preferably quite small, the floor-space for setting the tiles being usually about six feet wide by ten or twelve feet long and about seven feet from the floor to the arch or roof of the kiln.

The kilns are provided in the usual manner
70 with grates A and ash-pits B and chimney C. An opening, D, is had at the rear for setting and removing the tiles, and the opening is of course closed when the arch is fired. The walls are made double, having spaces E, a
75 sufficient number of headers being used to bind the two walls together. The walls, especially the inner portion, will expand with the heat and crack more or less. The spaces E are
80 kept filled with fine sand that runs into and fills the cracks and renders the walls air-tight.

In closing the kiln after the introduction of the wet fuel aforesaid, metal plates or large tiles are placed against the shoulders *b* and *d*,
85 and other plates or tiles are placed in the grooves *b'* and *d'*, after which sand is filled in between the respective two sets of plates; also, a damper, *c*, is provided to close the flue in the chimney, and through an opening, *c'*, sand
90 is poured into the chimney above the damper. The walls at F are carried up a short distance above the roof of the kiln, forming a reservoir for water, a constant supply of the latter being
95 kept in the reservoir during the process of coloring the tiles.

When two or more kilns are required, it is cheaper to build them together, the side walls in the background, as shown in Fig. 3, being
100 constructed in suitable shape for this purpose.

Perhaps other means than those described might be successfully employed for keeping

the kiln "air-tight," and possibly some devices—such, for instance, as the introduction of steam-pipes into the kiln—might be employed and the water-reservoir above the kiln dispensed with. I simply give the best information on the subject that I have at the present time, and will only add that after repeated trials I have not been able to successfully carry out the said coloring process without the reservoir and water on top of the kiln.

With tiles subjected to my process the color does not seem to fade in the least, and is presumably as durable as the tile. To produce the darker shades of slate-color, the arches should be well filled with the aforesaid wet fuel, and of course a less quantity will answer for light shades.

I cannot give very definite directions as to the amount of fuel required, because different grades of fuel, both coal and wood, give off different quantities of coloring gas or smoke.

An intelligent operator after one or two trials will be able to produce the desired shade of color, and as various shades are used his experimental batch will probably be salable.

What I claim is—

1. A process for coloring tiling or equivalent porous pottery material, consisting in passing steam and smoke into the same while the tiles are in a heated condition, substantially as set forth. 30

2. A process for coloring tiling or equivalent porous pottery material, consisting in permeating the same with steam and smoke while in the heated condition of the product at the end of the burning process, substantially as set forth. 35

3. A process for coloring tiling or other porous pottery, consisting in subjecting the same to the combined action of steam and smoke while in a heated condition and excluding the air during the coloring, substantially as set forth. 40

In testimony whereof I sign this specification, in the presence of two witnesses, this 11th day of June, 1885. 45

FRANK HENGESBACH.

Witnesses:

CHAS. H. DORER,
ALBERT E. LYNCK.