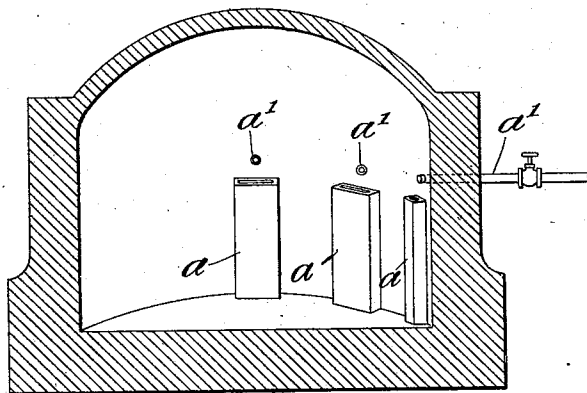


No. 729,562.

PATENTED JUNE 2, 1903.

B. J. FALLON.
PETRIFACTION OF CLAY.
APPLICATION FILED OCT. 13. 1902.

NO MODEL.



Witnesses
Chas. R. King
Arthur L. Helmer

Inventor
Bernard J. Fallon
By his Attorney
Wm. V. Becken

UNITED STATES PATENT OFFICE.

BERNARD J. FALLON, OF SUMMIT, NEW JERSEY.

PETRIFICATION OF CLAY.

SPECIFICATION forming part of Letters Patent No. 729,562, dated June 2, 1903.

Application filed October 13, 1902. Serial No. 126,974. (No specimens.)

To all whom it may concern:

Be it known that I, BERNARD J. FALLON, a citizen of the United States of America, and a resident of Summit, Union county, State of New Jersey, have invented certain new and useful Improvements in the Petrification of Clay, of which the following is a specification.

My invention relates generally to the burning of bricks or other material of clay, and has, more particularly, reference to a process whereby clay can be converted into a product resembling trap-rock.

I shall describe a process of burning brick, terra-cotta, or the like and the product obtained by such process embodying my invention, and afterward point out the novel features in the claims.

It has long been desired to obtain a product from clay of a uniform texture throughout the entire substance having the characteristics of great density or weight, hardness, and toughness, and imperviousness to water or moisture. Heretofore it has only been possible to obtain a glazed or superficial effect in the substance acted upon, such as is known in glazed tiles, drain-pipes, &c.; and the object of my invention is to find some method whereby this desirable substance above mentioned can be produced.

In my process the bricks are partially burned by heating them in a kiln in the usual way up to what is known as the "settling-point" or the point at which the bricks are most porous. The firing then ceases and the bricks are allowed to cool until the bricks in the kiln are dark or at a low heat. This cooling may conveniently be obtained by introducing steam into the kiln and by opening the dampers, thereby obtaining a gradual and uniform cooling of the bricks. While in this cool and porous condition steam or water under pressure is introduced and the dampers are almost entirely closed, thereby producing a pressure in the kiln which I judge to be sufficient when it can be felt by placing the hand about two inches away from the usual peep-holes or other openings in the kiln. This steaming should continue for about two hours, and possibly longer in the case of more refractory clays. When the bricks then have been sufficiently steamed, as above noted, the firing is renewed until

the heat has reached substantially the same point to which the bricks were previously heated, the dampers being opened sufficiently to aid combustion, while the steam or water is kept on during this time. When this point has been reached, the pressure of the steam or water can be reduced to a minimum while the burning of the bricks is completed, the object of the steam or water now being chiefly to hold the exterior of the brick and to prevent the sticking and twisting of the latter during the course of fusion. The firing is continued under these circumstances until a sufficient "settle" or shrinkage has taken place to insure the perfect petrification of the bricks, when the firing ceases and the kiln is closed and the steam or water turned off altogether as soon as the heat has fallen below the fusion-point of the bricks.

The main feature of this process lies in cooling the bricks after the settling-point has been reached, at which time they are naturally most porous, and by injecting sufficient steam or water into the kiln under pressure, so that they will become saturated with moisture throughout, and by keeping sufficient steam or moisture on them while raising the heat again. If steam or moisture is not kept on the bricks while the heat is raised, the latter would drive practically all the moisture off, and the result would be an inside core of great density, hardness, and toughness, while the outside would be in the form of an ordinary red brick. If, on the other hand, the steam is applied in great quantities before the bricks are cooled sufficiently, the heat will either prevent the moisture from acting on the bricks or the result will be an outside shell of hardness, while the core will be like the usual red brick. By following my process as above described a brick will be produced of a uniform texture throughout its entire body, having the characteristics of great density or weight, hardness and toughness, and imperviousness to water, resembling closely trap-rock even in color. The color, however, could be varied by mixing the clay with various substances in a well-known manner or by introducing solutions of coloring-matter with the steam or water. It will be understood that I do not limit myself to the use of steam or water, as other substances

could probably be found which would accomplish the result equally well, and the claims should be so construed. Thus with more refractory clays I generally use a slight admixture of sodium chlorid. Obviously it is impossible to describe the exact length of time necessary in each case to accomplish the desired results, as local conditions, as the size of the kiln, the size of the bricks, the composition of the clay, &c., would make individual treatment necessary. With the facts and steps disclosed herein, however, any one skilled in the art of brick-making will be enabled to practice my process. Likewise it is apparent that I do not limit my process to the burning of bricks. That is but one illustration of the use to which it can be put. No particular structure of kiln is necessary. For the sake of illustration I have shown in the accompanying drawing a conventional representation of a kiln provided with fire-holes *a* and with a steam or water inlet *a'* over each fire-hole, through which the steam or water or other substance used in the process can be introduced. When water instead of steam is introduced, an air-blast or other means can be used.

Just what chemical change, if any, takes place in the bricks I cannot state; but what I particularly wish to protect is the saturating of the bricks while porous and comparatively cool with any substance which will change the texture of the clay in the manner set forth.

Having thus described my invention, what I claim is—

1. The herein-described process of petrifying bricks or the like, which consists in partially burning the bricks, then cooling the same, then subjecting them to the action of a substance as steam, which will penetrate the entire body of the bricks, and then completing the burning.

2. The herein-described process of petrifying bricks or the like, which consists in partially burning the bricks, then cooling the same, then subjecting them to the action of a substance as steam under pressure which

will penetrate the entire body of the bricks, and then completing the burning.

3. The herein-described process of petrifying bricks or the like, which consists in partially burning the bricks by heating them up to the point at which they are most porous, then cooling the same, then subjecting them to the action of a substance as steam which will penetrate the entire body of the bricks, then reheating the bricks up to substantially the point at which they were previously heated, still keeping the steam on, and then completing the burning of the bricks.

4. The herein-described process of petrifying bricks or the like, which consists in partially burning the bricks by heating them up to the point at which they are most porous, then cooling the same, then subjecting them to the action of a substance as steam under pressure while in the cool condition which will penetrate the entire body of the bricks, then reheating the bricks up to substantially the point at which they were previously heated, still keeping the steam on, then reducing the pressure of the steam to a minimum, and completing the burning of the bricks.

5. That step in the petrification of bricks or the like, which consists in cooling the partially-burned bricks, and in subjecting the same, while in that condition to a substance, as steam which will penetrate the entire body of the bricks.

6. That step in the petrification of bricks or the like, which consists in cooling the partially-burned bricks, and in subjecting the same, while in that condition to a substance, as steam which will penetrate the entire body of the bricks, and in subsequently increasing the heat while maintaining the bricks subject to the steam.

Signed at New York this 1st day of October, 1902.

BERNARD J. FALLON.

Witnesses:

WILLIAM R. DORMAN,
AXEL V. BEEKEN.