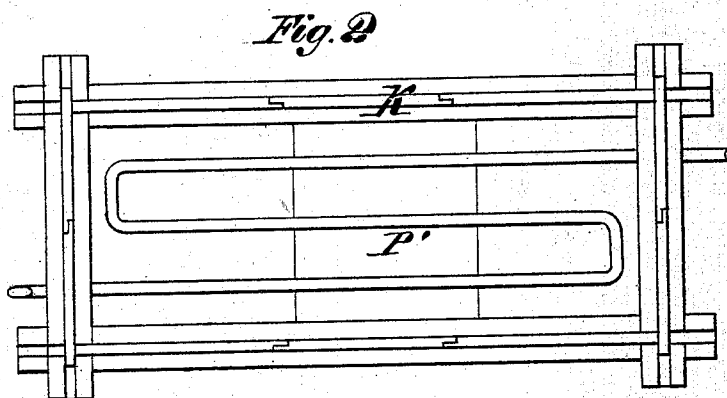
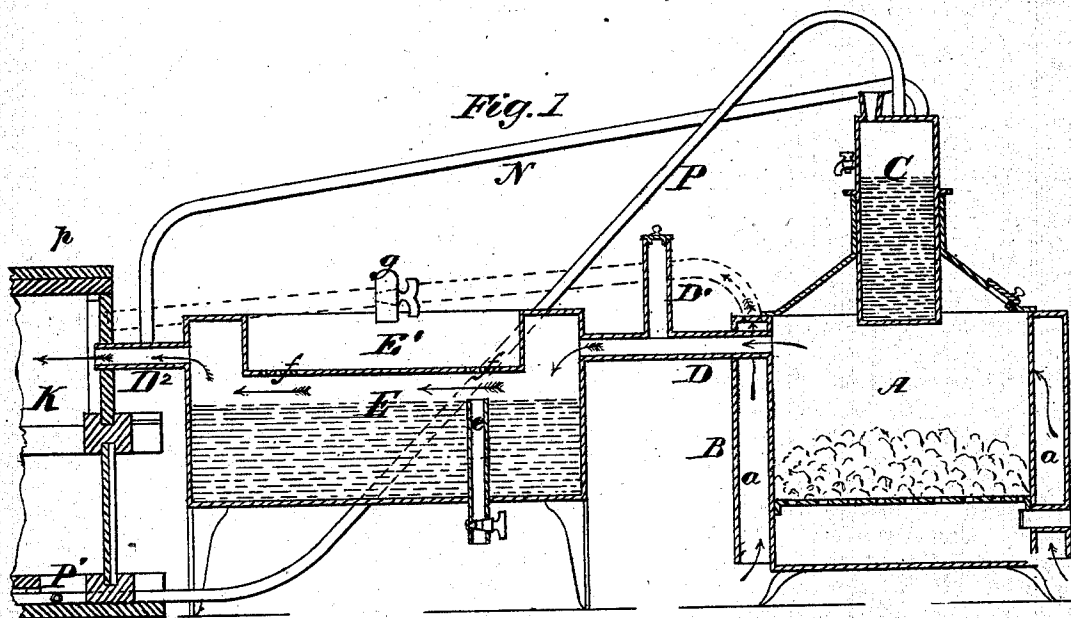


D. M. SPROGLE.

Processes of Making Artificial Stone.

No. 139,274.

Patented May 27, 1873.



Witnesses:
R. T. Campbell
J. A. Campbell.

Inventor
Daniel M. Spogle
by
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UNITED STATES PATENT OFFICE.

DANIEL M. SPROGLE, OF ANNAPOLIS, MARYLAND.

IMPROVEMENT IN PROCESSES OF MAKING ARTIFICIAL STONE.

Specification forming part of Letters Patent No. **139,274**, dated May 27, 1873; application filed October 30, 1872.

To all whom it may concern:

Be it known that I, DANIEL M. SPROGLE, of Annapolis, in the county of Anne Arundel and State of Maryland, have invented an Improved Process for the Manufacture of Stone Artificially; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a section taken vertically and longitudinally through the center of the improved apparatus. Fig. 2 is a top view of a kiln, showing a heating-pipe arranged therein.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to an improved process which is designed for manufacturing stone artificially by subjecting hydraulic cement or any calcareous substance, either alone or in concrete, to the action of vapor, carbonic-acid gas, and heat, thereby rendering the same very hard in a comparatively short time.

The following description of my invention will enable others skilled in the art to understand it.

In the accompanying drawing, A represents the gas-generating furnace in which carbonic-acid gas is made from charcoal. This furnace is surrounded by a jacket, D, which leaves an annular chamber, *a*, open at its bottom but closed at its top. The dome of the furnace has a vapor-generator, C, fitted tightly into it, in which vapor is produced from water that is heated by the burning coals beneath. D represents a pipe which leads out of the furnace A into a purifying-tank, E, and D' represents a pipe which arises from the pipe D, and which is opened during the escape of smoke from the furnace A at the commencement of making a fire. When the fire is well started the pipe D¹ is closed, when carbonic-acid gas will pass over into the purifier E, as indicated by the arrows in Fig. 1. The purifier E is provided with an overflow-pipe, *e*, and constructed with a depressed tank, E', the bottom of which is perforated at *f*, so that water which flows into the tank from a cock, *g*, will

fall in spray into the purifier. The gas is in this way washed on its way to the kiln K. D² is a mixing-pipe through which the gas passes into the kiln K, and N is a pipe which forms a communication between the pipe D² and the vapor-generator C, for the purpose of carbonating watery particles, and in this way conducting the gas into the kiln and charging the material therein. P represents another pipe which conducts steam from the generator C to a pipe-coil, P', which is arranged upon the floor of the kiln as shown in Fig. 2. This coil P' is designed for a heater for rarefying the air in the kiln and producing a circulation therein. The pipe *p* will allow the escape of the rarefied air.

Instead of using steam for heating purposes, hot air taken from the chamber *a* by means of a pipe, which is in dotted lines, Fig. 1, may be employed; or, if desired, the steam and hot-air may be used at the same time.

The material to be hardened is put into the kiln K in a green or moist condition, which prevents it from rapidly absorbing the carbonated watery particles. I therefore first apply heat to the kiln, and by creating a circulation therein the material is more or less deprived of its moisture, the watery particles being conducted off through the pipe *p* at the top of the kiln. I then allow the kiln to cool by cutting off the heat, and introduce the carbonated vapor, which will be rapidly absorbed by the material. When the material is thoroughly charged with the carbonated vapor I cut off the supply and again apply the heat, the effect of which is to drive off a large quantity of the absorbed moisture from the material and to leave carbonic acid in the substance of the same. These processes are thus alternated until the material has acquired the proper degree of hardness.

I do not claim, nor intend hereafter to claim, under this application the invention of generating carbonic-acid gas and introducing it into a kiln for the purpose of heating stone; nor do I claim the invention, under this application, of the mingling of steam or vapor with the generated carbonic-acid gas as the gas is

on its way into the kiln, as the same will be found claimed in James L. Rowland's patents, heretofore granted, and also shown in patents heretofore granted to me, and likewise in an application filed by me long prior to the present application; but

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

The process of making artificial stone by alternately subjecting the calcareous concrete to the action of carbonated vapor and a moderate degree of heat, substantially as described.

DANIEL M. SPROGLE.

Witnesses:

A. L. JOHNSON,
SAMUEL COCROFT.