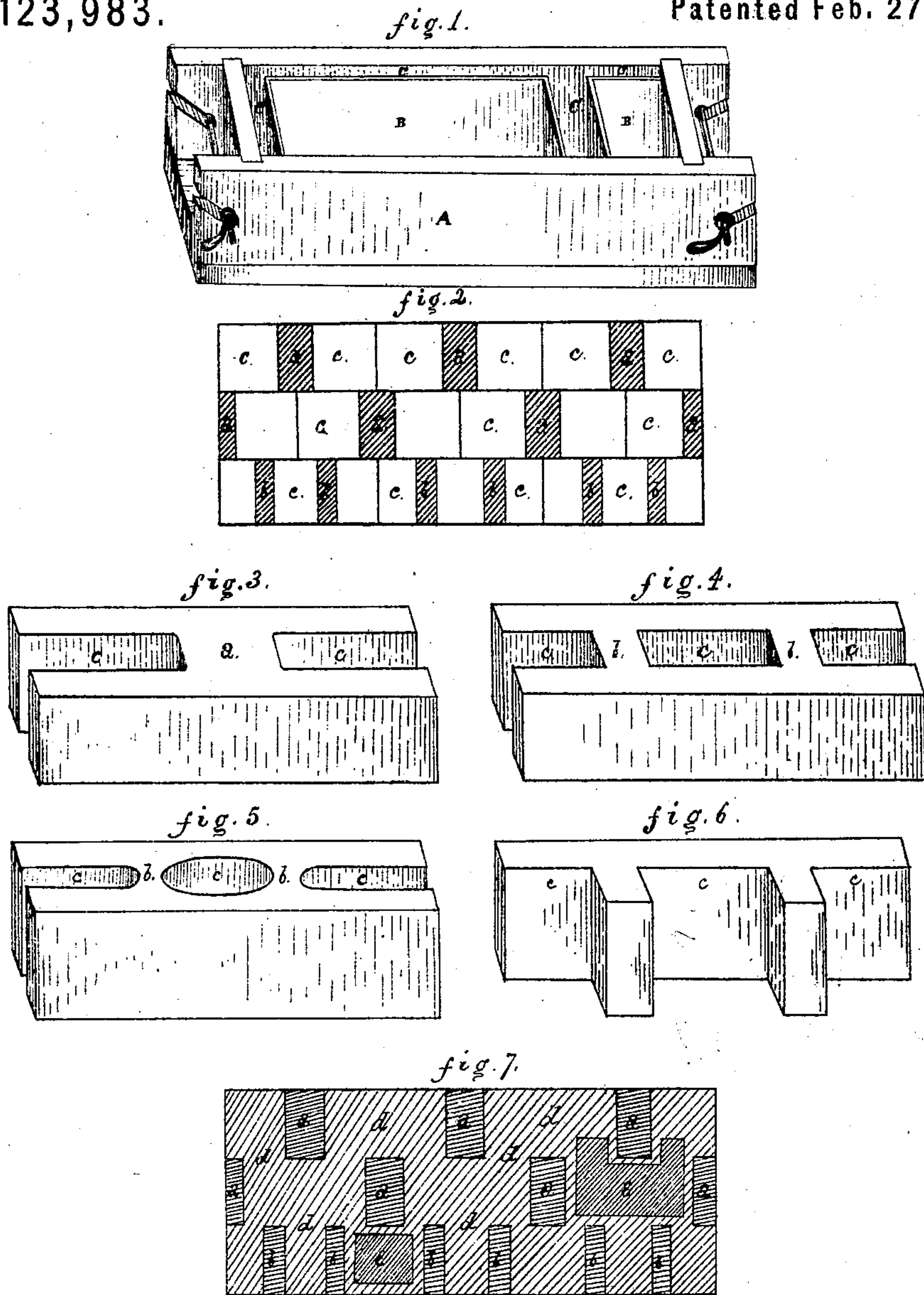


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Improvement in Artificial Stone Blocks and Walls.

No. 123,983.

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Witnesses:

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IMPROVEMENT IN ARTIFICIAL-STONE BLOCKS AND WALLS.

Specification forming part of Letters Patent No. 123,983, dated February 27, 1872; antedated February 24, 1872.

IMPROVEMENT IN FORMING ARTIFICIAL-STONE BLOCKS AND WALLS.

I, JOSEPH E. DICKSON, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain Improvements in Forming Artificial-Stone Blocks and Walls, of which the following is a specification:

Nature and Objects of Invention.

My invention relates to the manufacture of artificial stone, especially to the forming of artificial-stone blocks, slabs, &c., used in building, and for other purposes, the improvements consisting in the mode of forming such blocks; &c., and also in the manner of forming and combining artificial-stone blocks in the construction of walls, the objects and results of my invention being a considerable diminution of the cost, an increase of the strength and durability of the blocks themselves, and likewise of the walls thereof constructed, while at the same time a stone of fine and natural appearance is obtained, since the whole or any desired side or portion of the blocks, or the outer portion merely of the wall thereof constructed, is caused to possess a hard, smooth-faced, fine-grained surface, while the body or main part, or interior of the blocks and the walls thereof constructed, possesses a structure formed, it may be, if desired, of materials of a coarser and cheaper nature, yet equaling or even surpassing the exterior in point of strength and durability.

In the manufacture of artificial stone it is well known that the strength and durability of the stone are often, in a measure at least, sacrificed to its appearance, since it is found that those stones are the strongest and most durable which are formed by the use of coarse sand, the rough, sharp, angular fragments of rock, crushed for the purpose, or as found in nature in the form of coarse gravel, and even pebbles of considerable size; with such material, however, when subjected to the solidifying process of percussion or pressure by means of tamping with a bar, or tamping or pressing by a suitable machine, the rougher and coarser materials or fragments are in some measure forced through the finer particles of sand, cement, lime, &c., to the surface, thus detracting from its appearance and rendering it very difficult or quite impossible to form upon the

artificial stone the desired smooth and fine-grained surface. Consequently, in forming blocks, the surface of which it was desired should be well finished, smooth-faced, and fine-grained, it has been found necessary to use altogether or for the greater part, throughout the stone, a comparatively large quantity of a much finer and more expensive mixture of plastic artificial stone material than was either necessary to form the interior or in fact suitable to form the body of the stone, which fine and expensive material not being well adapted to that purpose, failed to furnish a stone of the desired or even sufficient strength.

In order to improve the appearance of artificial stone, the plan of kneading or pressing fine sea-sand into the surface of the stone after molding, was devised and patented, (see Letters Patent No. 85,231;) but I have found that the process just named, in addition to detracting from the natural appearance of the stone, does not work advantageously, especially when the fragments of stone or gravel have already formed a portion of the exterior of the stone, having been forced by pressure or percussion to or quite near the surface.

The idea of using two qualities of sand, the coarser for the interior and the finer for the surface, in forming artificial stone is, consequently, not original with myself, hence I lay no claim to the use of mixtures of plastic material of different qualities in forming the same artificial-stone block; but confine myself to what is properly my own invention, the particular modes, cheap, convenient, and efficient, of forming artificial-stone blocks, and walls constructed of artificial-stone blocks, by the use of two artificial-stone plastic mixings or mixtures, viz., a surface mixture and a mixture for the interior.

The advantages of so forming artificial-stone blocks, &c., having been in some degree set forth, I proceed to describe my modes of producing the desired result.

Description of the Accompanying Drawing.

Figure 1 represents a mold, A, suitable for making artificial-stone blocks, provided with temporary or movable partition, partitions, or inner boxes B, used in my method, herein described, of forming such blocks of two different plastic artificial-stone mixtures or mate-

rials. Fig. 2 is a longitudinal vertical section; and Figs. 3, 4, 5, and 6 are perspective views of blocks of one artificial-stone mixture or material before made solid, and combined in forming the wall by another plastic artificial-stone mixture or material, or other such mixtures or materials in the mode herein described. Fig. 7 is a longitudinal vertical section of wall, constructed of different artificial-stone mixtures or materials, in the mode herein described; in this figure *a b* is the first or finer, and *d e* the coarser plastic artificial-stone mixtures or materials, *e* being some of the material in the form of blocks.

Like letters of reference indicate like parts in the several figures.

General Description.

First, it being desired, for the reasons before mentioned, or for other reasons, to form blocks by the use of two different qualities, or it may be, to some extent or altogether, of different materials or colors—for instance, for the interior, a plastic material composed in the main of any cheap, coarse material, suitable for that purpose, such as rough fragments of rock, as found in nature, or crushed for the purpose, coarse gravel, pebbles, or the refuse of marble-yards, together with the necessary cement or cements, and other ingredients to form the matrix or combining medium, and a finer artificial-stone plastic mixture composed of fine, clean, sharp sand, combined with the same, similar, or different, but suitable materials, to serve as the matrix or combining medium, yet possessing more of a water-repelling quality, if desired—in the first place I provide my mold or molds, being of the suitable shape and size, and of any convenient and desirable construction to form the artificial-stone block or blocks, with one or more thin pieces, *B*, which I deem proper to term temporary or movable partitions, constructed of wood, iron, or other suitable material. These I place upright, and parallel or otherwise, with and at a distance greater or less from the sides or ends, or both sides and ends of the molds; if, for instance, I desire to form one smooth-faced and fine-grained side or end in the case of a block or a continuous wall of artificial stone, I use one such piece, extending the whole or a part of the length or width of the mold, according to the portion, part, or side that I desire to form of the finer mixture or material, and at a distance from the side or end of the mold varying according to the depth that I desire the finer material to extend into the stone. In case I desire to form two, three, or more sides or ends of the finer plastic artificial-stone material I provide two or more such pieces, attached or not, as most convenient or desirable, at that point or those points where their ends meet and form angles, right angles, or otherwise. In forming four or more smooth-faced, fine-grained, and sharp-edged sides to my artificial-stone blocks I find it very convenient to provide my molds, instead of detached

pieces or what form the partition or partitions, with pieces connected or combined, or having the form of what may be termed when so used an inner box or inner boxes, square, circular, or of other shape, without top or bottom, if desired, between the side or sides of which and the inside of the mold, there being formed the desired space or spaces *C*, is placed the finer material to form the hard smooth surface of the artificial-stone block, while within the inner box or boxes, upon the inside of the inner upright pieces or partitions, is placed the coarser material. Thus the two mixtures, being kept from intermixing except at just those points and at just such time or times as may be desired in forming the block, and the rapid and efficient combination and blending of the two mixtures being thus greatly facilitated, I then carefully and thoroughly tamp, ram, or press the finer and the coarser simultaneously and evenly, and, as the different materials are added from time to time, each in its proper place, I gradually raise vertically the inner piece, pieces, partition, or box *B*, as the case may be, tamping, ramming, or pressing more or less obliquely or otherwise, and in such a manner as to weld or blend the two mixtures or materials intimately together. By not continuing the inner and coarser material to the top of the mold, space is left on the side that is then uppermost, by filling which with the finer material, when the partition or pieces have been entirely withdrawn, that portion may be smoothly faced with a portion of the finer plastic artificial-stone mixture, and, if a supply of the same has been placed in the bottom of the mold before filling in any coarse material, a block, the interior of which possesses a compact durable structure, cheaply obtained; and the surface, in part or altogether, according to what was desired, is composed of a fine hard finish, providing the stone with firm sharp edges. Sometimes, also, I cause a space or spaces to be formed in the artificial-stone block at its sides or ends by the tamping or pressing of the coarse material upon the inner side of a suitable partition or suitable partitions, and omitting to fill in and tamp or press the finer material within some, according to what block is desired, of the space or spaces formed within the mold, as before described, there are formed in the artificial-stone block apertures or recesses, which, being filled when the blocks are rendered solid, combined in the construction of walls in the mode hereafter described, the cost of the wall is greatly lessened, its appearance enhanced, and its strength and durability greatly increased. In this way, or in any convenient and efficient manner, I form artificial-stone blocks, to be temporarily of the forms substantially as represented in the accompanying drawing, for the purpose herein specified, viz., that they shall ultimately be made solid and composed of two different mixings or different mixtures or qualities of material; or it may be, to some extent or entirely, of different materials, thereby gaining the advantage of rendering the blocks of

less weight, for the time being, for transportation, but more especially deriving the very great advantage that is gained by causing the plastic artificial-stone material that is to form the interior of the block, being therein firmly and efficiently tamped or pressed in the manner hereafter described, to serve the two-fold office of cheaply rendering the interior of the block strong and durable, while the exterior, or any portion of it, may be formed of similar and finer material, if desired, and likewise of forming, when hardened, continuous bonds, arms, branches, or binding medium of hard, solid, artificial stone throughout the wall, binding together in a solid mass, the entire structure. I accomplish this in the following way: I first form blocks of artificial stone, preferably of fine material, especially as regards the side that is to form a portion of the surface of the wall, by tamping or pressing it into the space or spaces similar to those already described, for receiving and confining the finer material already described, or in any convenient and proper molds, and by delaying the tamping of the other, and it may be coarser plastic artificial-stone mixture until, later, I obtain, for the time being, hollowed or box-like artificial-stone blocks, substantially as represented, which, when placed in position in the wall, are, one by one or course by course, filled with the second artificial-stone material, preferably in a more or less plastic state, each course being successively filled and firmly and efficiently rammed, tamped, and pressed as the wall rises in the progress of construction. Thus each block in the place where it may be desired it should remain for centuries, is formed, as regards a great part of its bulk and weight, being there in position at small expense, rendered solid as regards itself, and the wall in

this mode constructed rendered firm and solid by means of thus rendering solid, blending, and combining the blocks of which it is constructed.

Instead of using the second artificial-stone material altogether in a plastic state I sometimes allow some of it to harden in the form of blocks *e*, of the suitable size and shape, which I use, together with some material, in a plastic state, or cement in filling in, and rendering solid the blocks and firm and solid the combination of the blocks in forming the wall. The blocks may easily be so formed, arranged, and combined with reference to each other as to form flues in the wall.

Claims.

What I claim as my invention is—

1. The mode herein described of forming artificial-stone blocks, &c., of two or more different plastic artificial-stone mixtures or materials by the employment of a movable partition or movable partitions, *B*, used within suitable molds, substantially as described, and for the purpose set forth.

2. The manufacture of artificial-stone blocks, &c., of two or more different plastic artificial-stone mixtures or materials by means and with the use of a movable partition or movable partitions, *B*, used within suitable molds, substantially as described, and for the purpose set forth.

3. The mode herein described and shown of forming artificial-stone walls of two or more artificial-stone mixtures, substantially as set forth.

JOSEPH E. DICKSON.

Witnesses:

CHAS. W. GRAY,
E. A. DICKSON.