

UNITED STATES PATENT OFFICE.

HARRY F. INGERSON, OF ALAMEDA, CALIFORNIA, ASSIGNOR OF ONE-HALF
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BRICK, TILE, BUILDING-BLOCK, &c.

SPECIFICATION forming part of Letters Patent No. 614,655, dated November 22, 1898.

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To all whom it may concern:

Be it known that I, HARRY F. INGERSON, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented certain new and useful Improvements in Bricks, Tiles, Building-Blocks, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of bricks, tiles, artificial stone, &c., for building and other purposes in which an essential ingredient is clinker.

My invention has a twofold object, being in part the provision of a hard and durable brick, tile, building-block, &c., and in part the utilization of the solid products of combustible or semicombustible material, especially "refuse," in which term I include garbage, ash-bin refuse, stable waste, sweepings, and all waste material which will under a forced draft burn of itself without the addition of other fuel. I do not, however, confine myself to the production of the necessary clinker from refuse, as it may be had from other fuel in furnaces other than those known as "garbage-destructors."

My invention consists in a brick, tile, artificial stone, or building-block, &c., composed, essentially, of a mixture of non-vitreous and vitreous clinker combined either alone or with the addition of one or more other ingredients serving to better cement their union. The essential elements being clinker in the non-vitreous and vitreous forms, their source of supply may be either the accidental or unintentional one from the ash-heaps or waste of ordinary coal-furnaces or from the special combustion of any fuel; but I have in mind that source of supply from the necessary consumption of refuse in suitable furnaces, and for the mere sake of illustration and description I shall herein, to make my invention clear, refer to the production of my essential ingredients in connection with the combustion of refuse.

In carrying out my invention the refuse is fed into any suitable furnace, incinerator, crematory, destructor, or other device or apparatus for consuming it and is burned until the bulk of the residual has been condensed

to a non-vitreous clinker. A portion of this residual or non-vitreous clinker is now placed in a suitable furnace and is burned until it has been condensed to a vitreous or semivitreous condition or clinker. The two portions—namely, the non-vitreous and the vitreous clinkers—are then separately reduced to a powdered state by any of the crushing methods in common practice. The powdered materials are then mixed in about equal parts, water being added to render the mass of the desired consistency. It is then molded to form, then dried, and finally burned, and when cool is the finished product. It is best, however, in some cases to add to the mixture of the powdered vitreous and non-vitreous clinkers a small percentage, say about five per cent., of slaked lime or powdered chalk, infusorial earth, volcanic tufa, carbonate of lime, &c., and after intimately mixing sufficient water is added to render the mass of the proper consistency.

There is of course considerable loss in bulk and weight not only in the production of the original non-vitreous residual, but also in the portion burned to the vitreous or semivitreous condition, although in the latter case the loss is not to the same extent as in the former. The conversion of a portion of the non-vitreous residual, which is invariably of great porosity and frequently of great absorptivity, to a condition almost entirely lacking in these characteristics and which will sustain but slight loss in volume or density upon being subjected to the heat incidental to the burning of the bricks and other articles composed of these ingredients is the object and result attained in and by the production of this vitreous or semivitreous material. It follows and is obvious that bricks, tiles, &c., composed exclusively or entirely of one or the other of these materials would partake too strongly of the individual qualities mentioned to make them of general utility. The one would invariably be too porous and frequently too absorbent, while the other would tend to the other extreme—namely, non-porosity and non-absorptivity. The combining of the two, however, results in accentuating the desirable qualities and eliminating the disadvantageous, and, moreover, by combin-

ing them in varying proportions these qualities can be regulated and kept under control. Therefore, though for the sake of illustration I have mentioned the mixture as one of
5 equal parts, I must not be confined to these proportions, for as the qualities of porosity and absorptivity or their opposites are wanted in any given case so must the proportions of the two ingredients be.

10 Additional ingredients, one or more of them—such as the slaked lime, powdered chalk, &c.—are primarily used as a temporary binding agent to make the pressed or molded forms more tenacious, so that their
15 arrises, corners, &c., will be less apt to be damaged during the handling prior to the actual burning. This ingredient or these ingredients are not, however, essential in all cases and can be omitted; nor do I confine
20 myself to the proportion of five per cent., stated, as this may be varied to suit requirements.

In case a calcareous substance is used as an additional ingredient the forms may be sub-
25 merged in water after burning in order to insure the immediate slaking of all caustic lime.

I have before stated that the sources of supply of the two clinkers may be various, and in continuation of this I will state that the
30 refuse may be burned in two or more furnaces working in conjunction or singly, and the vitreous or semivitreous clinker may be produced in the residual of one or more of such furnaces by the admixture of sufficient
35 fuel prior to the burning or by the introduction of heat or gaseous fuel, or both, produced by the operation of either or any of the furnaces or by the introduction of liquid or other fuel at any stage prior to the actual removal
40 of the residual from the furnace or furnaces.

I desire it understood that where I herein employ the term "brick" the same is intended to comprehend tiles, building-blocks, paving-blocks, artificial stones, &c.

45 I am aware that it has been proposed to use

the refuse of furnaces, called sometimes "cinders" and sometimes "clinkers," in compositions of matter to form bricks, artificial stone, &c., and that the suggestion of using the product from "refuse or garbage furnaces" in articles of like kind is not new; but in every instance of which I am aware (not counting those in which the term "clinker" is erroneously used to indicate the "slag" of metal-reducing furnaces) no intimation whatever is
55 given of any intention to use such product other than as the non-vitreous common and usual clinker, which by reason of its porosity and absorptiveness is not adapted to my use, requiring, as my invention in its best form
60 contemplates, a final burning, in which a great loss of bulk and weight is sustained by such clinkers; nor am I aware of any instance in which the use in connection with such non-vitreous clinkers of the vitreous or semi-vitreous clinkers is contemplated, much less provision made for their deliberate production, and by their use the correction of these undesirable qualities of the non-vitreous clinker, which in its turn reacts to eliminate the opposite but equally disadvantageous qualities of the vitreous or semivitreous clinker. I do not therefore claim, broadly, the use of furnace-clinkers in brick and stone compositions; but

75 What I do claim as new, and desire to secure by Letters Patent, is—

1. A brick consisting of a compound comprising non-vitreous and vitreous or semivitreous clinkers.

2. A brick consisting of a non-vitreous, vitreous or semivitreous clinkers and a binding agent.

In witness whereof I have hereunto set my hand.

HARRY F. INGERSON.

Witnesses:

D. B. RICHARDS,

WALTER F. VANE.