

(No Model.)

W. W. BOOTH.
ARTIFICIAL PAVING STONE.

No. 428,037.

Patented May 13, 1890.

Fig. 1.

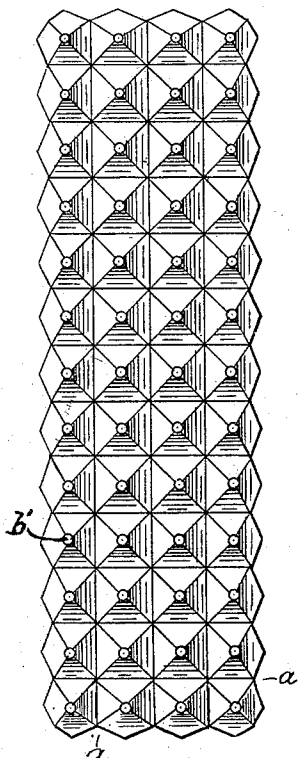


Fig. 2.

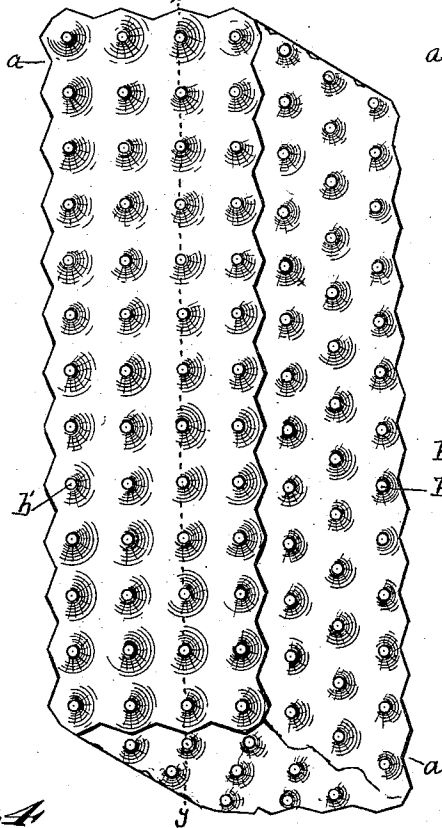


Fig. 3.

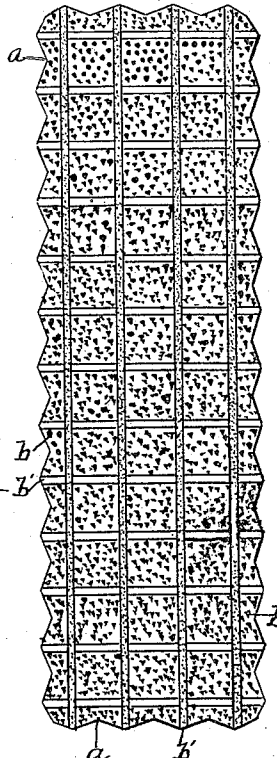


Fig. 4.

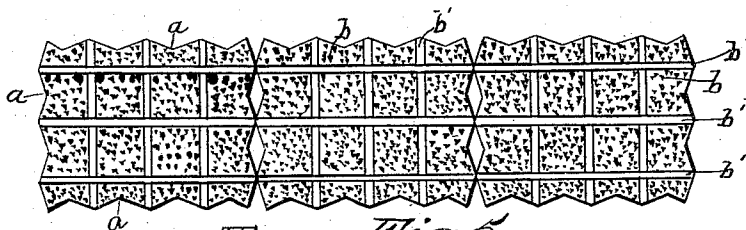
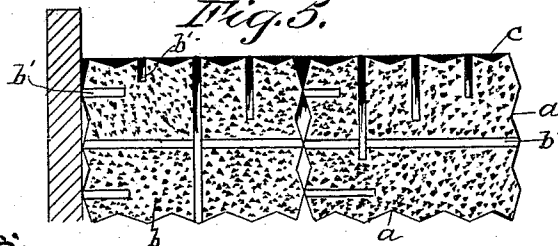


Fig. 5.



Witnesses:

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by A. S. Cushman
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UNITED STATES PATENT OFFICE.

WALTER W. BOOTH, OF ELMSFORD, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HIMSELF, FELIX C. BIVEN, OF LAKE MAHOPAC, AND JOHN ROONEY, OF BROOKLYN, NEW YORK.

ARTIFICIAL PAVING-STONE.

SPECIFICATION forming part of Letters Patent No. 428,037, dated May 13, 1890.

Application filed August 12, 1889. Serial No. 320,463. (No model.)

To all whom it may concern:

Be it known that I, WALTER W. BOOTH, a citizen of the United States of America, residing at Elmsford, in the county of Westchester and State of New York, have invented a new and useful Paving-Stone and Composite Pavement, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, in which similar letters refer to similar parts throughout the several views.

City pavements wear smooth. They are noisy and become slippery and irregular under the constant use to which they are subjected by heavy traffic. The stones vary in the character of their constituent particles, their structure or crystallization, homogeneity, hardness, and friability, and occasion uneven wear and frequent repair. They are also more or less resonant and propagate sound.

My object is to obviate these defects as far as possible and to provide stones of uniform hardness and density as to their structural parts as may be desired, combined with other lighter incombustible disintegratable matter disseminated throughout the former, so that as the harder structural parts wear such matters as become exposed thereby more rapidly disintegrate, and thus keep the surface from becoming smooth and slippery when a pavement is constructed of such stones without any further coating.

My object, also, is to provide a pavement of such stones adapted to receive and hold by the interstices, cavities, or chambers left in such structural parts, a thin layer or coating of metal, bitumen, or other material, which shall reduce sound-vibrations and diminish the noise of street traffic.

These objects I accomplish by my invention, which consists in fabricating an artificial paving-stone composed of powdered flint, powdered argillaceous aluminous clay—such as kaolin or “china-clay” of commerce—and powdered feldspar, mixed, moistened, molded, compressed, and vitrified, provided with outwardly-opening spaces or chambers adapted for percolation, or to receive and hold an ex-

terior coating of bitumen, and into whose mass sand pellets, fragments of plaster-of-paris, or other incombustible disintegratable substances are interspersed or incorporated for the purpose of preserving cells therein, since they are not liable to become vitrified.

It also consists in providing each stone with uniform depressions, elevations, or corresponding irregularities of surface to render them interchangeable on each face and capable of binding and supporting each other in place in a pavement.

It also consists in forming a pavement of stones provided with cavities adapted to receive and hold a layer or coating of a non-resonant material—such as asphalt or any suitable composition of bitumen—and applying such coating as an exterior surface for travel to form a composite pavement.

In the accompanying drawings, Figure 1 is an elevation of my paving-stone. Fig. 2 is a perspective view of the same. Fig. 3 is a sectional view taken in the plane shown by the dotted lines *xy* of Fig. 2. Fig. 4 is a like view of several stones in juxtaposition, as in ordinary pavement; and Fig. 5 is a like view in a composite pavement.

a a are grooves; *b b*, cavities containing fragments of plaster-of-paris; *b' b'*, galleries or chambers, and *c* asphalt layer.

The proportions for compounding the mixture for the structural parts can be varied according to the degree of hardness desired; but those which I have ascertained to yield a stone of great hardness after burning are equal parts, by weight, of powdered flint and of powdered kaolin or china-clay, and for each pound of their aggregate weight dry, seven ounces of feldspar, also dry. Such materials may be mixed with water and manipulated in the same manner as porcelain clays, or preferably slightly sprayed or dampened with water in mixing, and powerfully compressed in molds fitted with withdrawable transverse bars or rods to produce the desired shape and to form galleries or chambers *b' b'* when the bars or rods are removed and the spaces filled nearly to the surface with plaster-of-paris in a liquid form, which, when hardened, forms

a pencil, after introducing or incorporating into the mass while mixing a desired quantity of sand-pellets, fragments of plaster-of-paris, or of other incombustible substances not liable to become vitrified during the operation of burning the stone. The blocks are then slowly dried in the ordinary way to secure the evaporation of moisture without cracking the surface and burned as in the manufacture of porcelain. They should be exposed therein to a gradual increase of temperature until about 4,000° Fahrenheit is attained, when the heat is maintained sufficiently to vitrify the blocks without partial fusion or glazing of the exterior surfaces. The heat is then gradually reduced. The time required to vitrify a block or stone similar to the paving-stones employed in New York pavements, or about fourteen by four by eight inches, is about sixty hours, including the firing, burning, and cooling in the kiln.

Externally-opening cavities, galleries, or chambers *b'* may be formed in molding by the entire or partial insertion of rods or bars operated through suitable holes left therefor in the sides of the molds, or such cavities, chambers, or galleries may be formed in any other known ways with equal result, so as to extend through or partly through the unburned stones as may be desired, in order when filled or partially filled with plaster-of-paris introduced in a liquid form and afterward burned within and with the block to permit of the percolation of water or to diminish the weight of the stone, or to afford surfaces adapted for receiving and holding an asphalt layer to form a composite pavement. Fig. 3 shows such continuous chambers *b' b'* extending from top to bottom and incased by the vitrified mass wherein the unvitrified fragments of plaster-of-paris *b b* are embedded. The molds are also shaped so as to impart the fluted or grooved surfaces *a a*, designed for fitting the blocks to each other on any face in a pavement, as seen in Fig. 3, and presenting an additional grip for horses' feet with less liability of the upper side of the stone becoming smooth.

The proportion of such incombustible unvitrifiable substances and the sizes and shapes of the particles or fragments thereof may be varied at pleasure; but I preferably employ about equal parts of the vitrifiable mixture and incombustible substances of about the size of buckshot. As far as practicable they are disseminated equally throughout the mass. The durability depends upon the strength of the structural parts, and the wearing away of the stone will be more rapid if there be proportional increase of quantity of disintegratable materials. This mode of fabrication enables a manufacturer to construct a pavement of any desired degree of hardness or lightness,

and according to the contemplated wear to which it is to be subjected.

In order to form a composite pavement, I lay the pavement with the stones above described substantially in close supporting-contact with each other at their sides and in parallel rows or with the breaking of joints, or in any other desired rectangular pattern, as may be desired, and then apply a coat or layer of any suitable cohesive material capable of impeding, neutralizing, or destroying sound-waves, such as any bituminous composition capable of entering the cavities, chambers, interstices, or openings of the stones. Such pavement not only furnishes a stable foundation for an asphalt surface, but permits of the employment of less material, while at the same time it deadens the sound of travel.

I am aware that interior cavities as well as exteriorly-opening cavities have been formed by the partial or entire consumption or combustion of the carbonaceous materials imprisoned in the plastic block before burning, or which undergo a material diminution of bulk therefrom, and that it is not new to form tubes of plastic material and then burn them, and after burning to fill the vacant spaces of such tubes with cement or sand subsequently when in position to form a pavement; nor is it new to groove and tongue two oppositely-facing contiguous sides of plastic blocks, so as to present rectangular projections and corresponding rectangular openings to receive such projections; and I am aware that fire-linings for furnaces have been provided with serrated sides in a single direction to prevent the detachment of cracked particles, and such devices I disclaim; but

I claim—

1. A composite block of unglazed vitrified matter wherein non-vitrifiable and disintegratable bodies of incombustible matter of substantially uniform size and regularly distributed in the mass are embodied or embedded and confined.

2. An unglazed block of vitrified matter wherein are embedded unvitrified pencils of an incombustible disintegratable substance, such as plaster-of-paris.

3. An unglazed vitrified block wherein porous pencils of incombustible matter—such as plaster-of-paris—arranged transversely to each other are embedded.

4. An unglazed vitrified block with exposed cellular surfaces on every face and provided on all faces with elevations having sloping sides surrounded by correspondingly deep and sloping transverse depressions.

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Witnesses:

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