

(No Model.)

J. H. DRAKE.
COMPOSITION PAVING BLOCK.

No. 451,466.

Patented May 5, 1891.

Fig. 1.

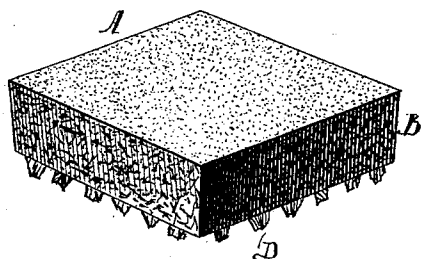


Fig. 2.

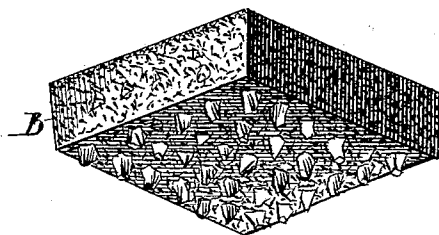
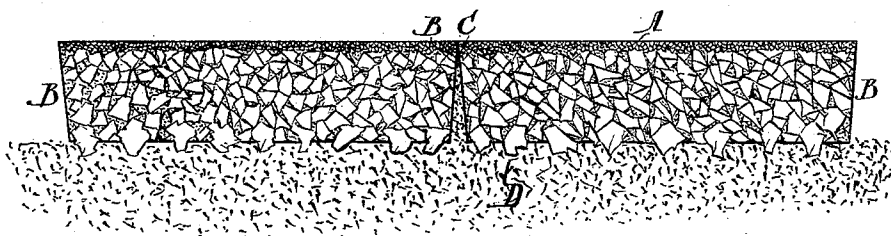


Fig. 3.



Witnesses:

Fred Gerlach

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UNITED STATES PATENT OFFICE.

JAMES HAINES DRAKE, OF ST. PAUL, MINNESOTA.

COMPOSITION PAVING-BLOCK.

SPECIFICATION forming part of Letters Patent No. 451,466, dated May 5, 1891.

Application filed December 3, 1890. Serial No. 373,459. (No specimens.)

To all whom it may concern:

Be it known that I, JAMES HAINES DRAKE, a citizen of the United States, residing at St. Paul, in the State of Minnesota, have invented certain new and useful Improvements in Composition Paving-Blocks and in Methods of Producing the Same, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In the manufacture of paving-blocks of composition material it is of great importance that the upper surfaces of the blocks shall be of intense hardness, with the material so closely and firmly bound together and of such homogeneous character that the surface shall resist the wear incident to the traffic on the roadway, and while presenting a smoothness shall not become so slippery or polished by wear as to afford an insecure footing for horses. A further desideratum is that the paving-blocks shall have their upper edges closely jointed, since otherwise the wear would be at the joints and the desired smoothness of the surface would be speedily destroyed. Again, it is highly important, particularly in the construction of pavements for streets on which heavy traffic prevails, that the paving-blocks shall be so firmly bedded and bound in place as to prevent any movement whatever when heavily-laden wagons pass over them or from the impact of the horses' feet. By my present invention I have produced a paving-block whereby the several desired ends above mentioned are effectually attained.

My invention consists in the novel features hereinafter described, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a top perspective view of a paving-block embodying my invention. Fig. 2 is a bottom perspective view thereof. Fig. 3 is a view in vertical section through two adjoining paving-blocks in position upon the foundation.

In the practice of my invention I prefer to employ for the body B of the blocks a composition consisting of hydraulic cement, clean, coarse, and sharp sand, and quartzite rock. The proportions of these materials may be varied; but I have obtained the best results

by using one portion of hydraulic cement to three portions of clean, coarse, sharp sand and three portions of crushed quartzite rock, the crushed rock varying in size from pieces which at their largest part will barely pass through a ring one-half inch in diameter up to pieces of rock which at their largest part will barely pass through a ring two and one-half inches in diameter.

In Letters Patent No. 273,824, granted to David G. Weems and myself March 13, 1883, is described a composite stone of which quartzite rock is the characteristic ingredient, and in such patent the advantages incident to the use of this peculiar stone are fully set forth, and such advantages have been fully demonstrated by long practice. The ingredients, preferably in the proportions above indicated, are moistened with water or other suitable liquid and thoroughly triturated and molded in form, great care being taken to tamp about the edges of the forms. Before the composition thus prepared is set within the mold or form I place upon the bottom of the mold a layer of about one-half to one inch of sand, and then set by hand in this sand pieces of broken quartzite D, with their larger ends upward. The pieces of quartzite are preferably embedded in the sand to a depth of about one-half inch; but the upper ends and larger ends of these quartzite pieces will project to a distance above the top of the sand, so as to be thoroughly embedded in and form part of the body of the block. The ingredients in substantially the proportions above indicated are then rammed into the forms or molds. The interstices in the tops of the blocks are then filled with a mixture A, composed, preferably, of about equal parts of hydraulic cement and finely-crushed quartzite, the particles of quartzite varying from the size of a pea to that of grains of sand, and this mixture will be thoroughly troweled into the interstices immediately after the composition has been tamped in the forms and before it has set. To this mixture a solution of soda silicate may be added, if desired, to hasten induration. The result of thus applying the mixture of finely-broken quartzite and cement to the surface of the blocks is to give to such surface a smooth and at the same time a sharp finish. The hard fine particles of the quartz-

5 ite resist wear more effectively than does the
 bond of hydraulic cement, and as a conse-
 quence, while the upper surface of the blocks
 when in use remain smooth, still the result of
 10 the inequality of wear in the quartzite and cem-
 ent gives to the surface of the blocks a grain
 which prevents the blocks from being slippery
 and insures a secure footing for the horses.
 The blocks will be indurated by any of the
 15 usual processes known to the art. When the
 blocks are withdrawn from the molds, it will
 be found that the broken pieces of quartzite
 will extend to a distance beyond the bottom sur-
 face of the blocks corresponding to the depth to
 20 which such pieces projected into the sand
 within the bottom of the mold, and the bottom
 of the block therefore is furnished with a
 sharp jagged surface, or rather a series of
 sharp jagged projections of irregular outline.
 25 These blocks will be placed upon a concrete
 or similar base or foundation, and before the
 cement of this base or foundation has set the
 blocks will be firmly seated, so as to drive
 the protruding pieces of quartzite into the
 30 foundation, and thus create a bond at the
 bottom of each block that firmly unites such
 block to the concrete base or foundation upon
 which it rests. By preference the molds in
 which the composition is formed have their
 35 sides inclined, as shown, in order to form the
 edges of the blocks beveled or inclined, as at
 C, so that the close joining of the blocks can
 be secured when crowning a roadway there-
 with. Moreover, this inward bevel gives
 40 space for an application of hydraulic cement
 or other binding-cement in the apertures pro-
 duced by the beveled edges of the blocks,
 thus enabling the blocks to be more securely
 united together when set in place.
 The quartzite which in practice I have
 found to produce the best results as an in-

gredient of the composite paving-blocks is
 found in South Dakota and southwestern
 Minnesota and also in Wisconsin; but, while
 I prefer the use of quartzite by reason of its
 45 peculiar affinity for hydraulic cement, I do
 not wish my invention to be understood as
 restricted to the use of quartzite in the bottom
 of the block, since other suitable hard stone
 may be employed as a substitute therefor, al-
 50 though, as I have stated, the best results will
 be attained by the use of the quartzite. Nor
 do I wish my invention to be understood as
 restricted to the proportions of the ingredi-
 ents above stated, as these may be varied;
 55 and, if desired, the lower portions of the blocks
 may be formed of a composition different from
 that of the upper portion or containing broken
 pieces of stone of larger size than are used
 for the upper portions of the blocks. 60

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

1. A composite paving-block the body
 whereof is formed of a concrete mass and the
 65 lower surface of which is provided with pro-
 truding pieces of broken stone securely em-
 bedded in the block, whereby the block may
 be firmly united to the foundation of the
 pavement, substantially as described. 70

2. A composite paving-block the body
 whereof is formed of a concrete mass and the
 top whereof is provided with a dressing of
 finely-crushed quartzite and hydraulic cem-
 75 ent and the bottom whereof is provided with
 pieces of broken stone firmly embedded
 therein and projecting therefrom, substan-
 tially as described.

JAMES HAINES DRAKE.

Witnesses:

M. DWYER,
 HUGO SCHLENK.