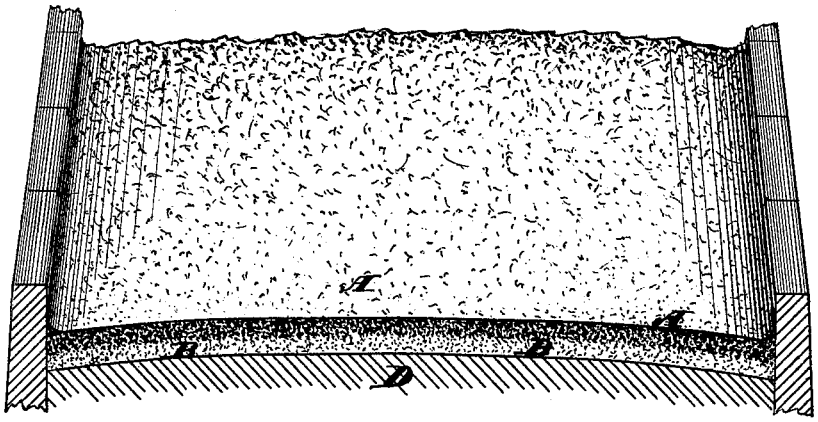
S. E. GROSS.

Pavement or Roadway.

No. 220,234. Patented Oct. 7, 1879.

Fig.1



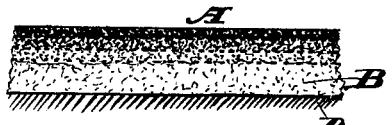


Fig.2

Fig.3

Attest:

W. L. Baker.

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INVENTOR:

Samuel E. Gross

UNITED STATES PATENT OFFICE.

SAMUEL E. GROSS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN PAVEMENTS OR ROADWAYS.

Specification forming part of Letters Patent No. **220,234**, dated October 7, 1879; application filed September 2, 1879.

To all whom it may concern:

Be it known that I, SAMUEL E. GROSS, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Pavements or Roadways, which is fully set forth in the following specification and accompanying drawings.

Figure 1 is a perspective view of one form of my pavement or roadway, and Figs. 2 and 3 are longitudinal vertical sections of modifications of the same.

The object of my invention is to construct a composite pavement or roadway for streets, parks, boulevards, &c.; and it consists in uniting or combining particles or pieces of crushed granite, quartz, slag, sandstone, feldspar, hornblende, or other rocks of a similarly hard, insoluble, or non-plastic nature with particles or pieces of crushed limestone or other rocks of a similarly soft or soluble nature, or possessing similarly cementing, plastic, or binding qualities, or with a cementing-gravel, substantially in the manner hereinafter described.

Referring to the drawings, A represents the upper layer of fine-crushed granite, quartz, slag, sandstone, feldspar, hornblende, or other rocks of a similarly hard, insoluble, or non-plastic nature.

B represents an under layer or matrix of the particles or pieces of crushed limestone or other rocks of a similarly soft or soluble nature, or possessing similarly cementing, plastic, or binding qualities, or a cementing-gravel.

C designates in Fig. 3 a course composed of the intermingled materials of the layers A and B; and D desigates in all of the figures a suitably-prepared road-bed, which may consist of sand, macadam, wood, stone, gravel, slag, earth, or other desirable material.

In the construction of my improved composite pavement, I prefer and generally use particles or pieces ranging from the size of a hazelnut down to that of a bird-shot, together with pulverized material usually sufficient in quantity to fill the interstices between the larger pieces; and when, either before or at the time of laying, I intermingle the materials of the layers A and B, as designated at C in Fig. 3, I prefer to do so in about equal proportions of each; but the size of the particles and pieces may be lessened or increased, and the proportion of materials of each kind used modified and varied to suit the particular kind, and in a considerable measure the variable relative degrees of quality of the rocks used in any particular instance.

The burden of travel to which the pavement or roadway will be subjected is also to be taken into consideration in determining the size of the pieces, thickness of the layers, and proportions of intermingled materials, as I prefer, when the travel is relatively more heavy and constant, to increase the size of the pieces and thickness of the respective layers, as well as the proportionate quantity of the materials of the layer A.

When I do not previously intermingle the materials, I usually put down each layer about three inches thick, as shown in Fig. 1; and I prefer to put down the upper layer in several successive thin layers, well ramming, packing by puddling, rolling, and driving each layer into the under layer, or allowing sufficient intervals of time to elapse between putting down each layer to enable it to be driven into and mingled with the under layer or matrix by the burden of travel, as shown in Fig. 2.

I frequently facilitate the packing of the materials of the layers by using a quantity of broken, crushed, or pulverized lime or iron, preferably by previous mixture with water sprinkled upon the roadway, and I often and for many years after completion, both to consolidate and preserve the pavement and to allay the dust, sprinkle the pavement or roadway with a mixture of water with lime, oxide of iron, or other similar cementing and preservative rocks and minerals.

When I use cement-gravel, and it is coarse, I sometimes find it advantageous to break or crush it, and especially when I use in a roadway a coarse size of what is usually termed "Joliet cement-gravel" or analogous kinds.

I have obtained in laying my pavement one of the best and most favorable results by the specific use of the fine-crushed screenings or refuse rock, consisting, principally, of hard quartz and a small percentage of hard allied rocks, left in and after the process of separating therefrom the ores of copper in the mining districts of Lakes Superior and Huron.

I often use crushed and broken lake or river

bank or other hard gravels for the materials of the layer A when I find them constituted, as they most frequently are, in great part, of the kinds and qualities of rocks herein designated for the upper layer.

By my method of laying a pavement or roadway the sharp and cutting particles or dust which arise from a roadway formed solely of hard, insoluble, and non-plastic rocks, and which is so injurious and discomforting to residents and travel upon and along the streets, is in a very considerable degree prevented, while at the same time the less acute, but nevertheless annoying, dust or fine pulverized particles arising from a roadway composed solely of crushed limestone or analogous rocks is also very materially lessened and avoided.

The particles and pieces of the harder rocks are better retained in position by their combination with those of the softer and more plastic rocks, while the former, from their superior resisting qualities, give a firmer consistence and more enduring character to the pavement, and very materially prevent the soluble action and muddy or slushy condition of the roadway, which otherwise is produced by rain-falls, snow, &c.

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

1. The pavement herein described, consisting, substantially, of an upper layer of pieces and particles of crushed granite, quartz, slag, feldspar, sandstone, hornblende, or other rocks of a similarly hard, insoluble, and non-plastic nature, and an under layer or matrix of particles and pieces of crushed limestone or other rocks of a similarly soft and soluble nature, or possessing similarly cementing, plastic, and binding qualities, or a cementing-gravel, the whole constructed substantially as described, and for the purposes set forth.

2. The process, as herein described, of both allaying the dust and consolidating and preserving a pavement or roadway by sprinkling with a mixture of water with lime, oxide of iron, or other similar cementing and preservative rocks and minerals.

In testimony that I claim the foregoing I have hereunto set my hand this 18th day of July, A. D. 1879.

SAMUEL E. GROSS.

Witnesses:
W. S. BAKER,
LAWRENCE PROUDFOOT.