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W. J. SINEK & R. S. BLOME.

PAVEMENT AND METHOD OF MAKING THE SAME.

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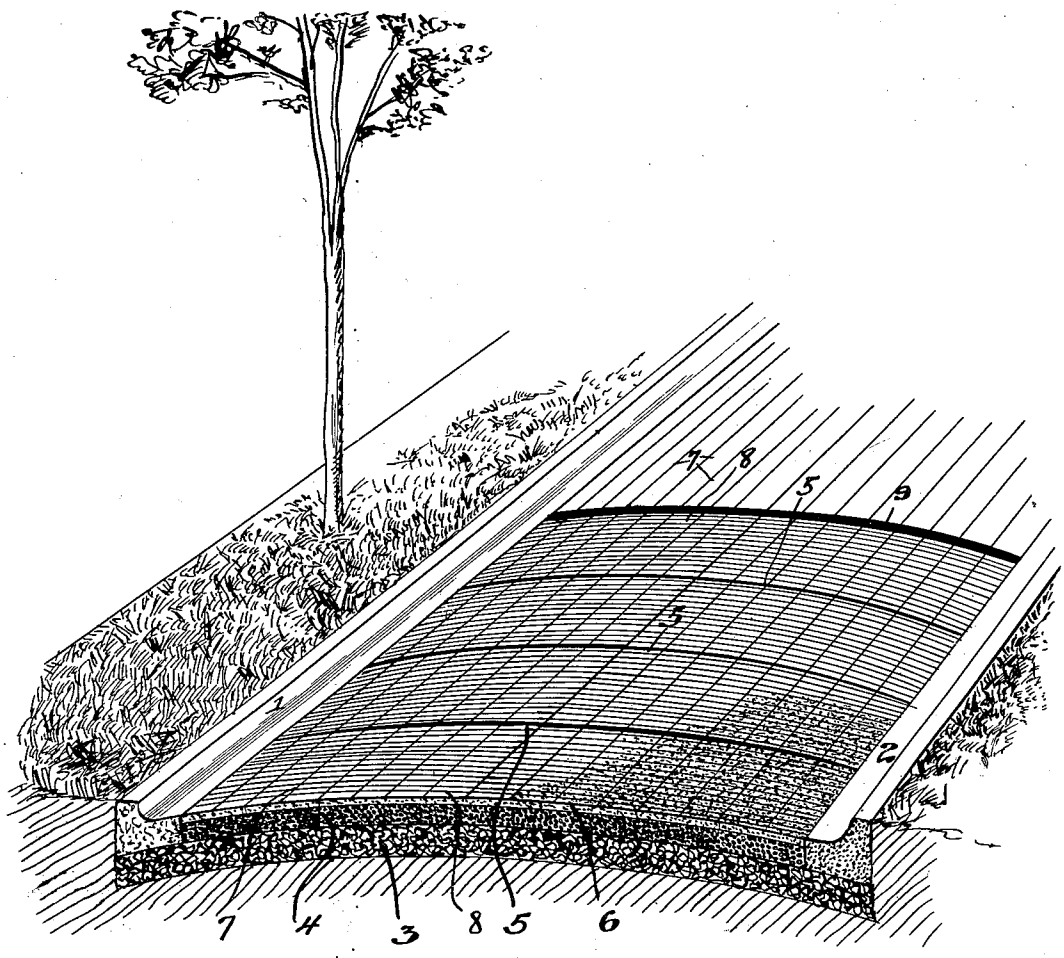

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UNITED STATES PATENT OFFICE.

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PAVEMENT AND METHOD OF MAKING THE SAME.

No. 856,105. Specification of Letters Patent. Patented June 4, 1907.

Application filed November 17, 1906. Serial No. 343,894.

To all whom it may concern:

Be it known that we, WILLIAM J. SINEK and RUDOLPH S. BLOME, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pavements and Methods of Making the Same, of which the following is a specification.

Our invention relates to pavements and methods of constructing the same, its main object and purpose being to provide a pavement which will have much better wearing qualities than those now in use, which will not become unduly smooth or slippery, which will not settle, which may contract and expand with changes of temperature without harmful effects, which will permit excavations to be made to render water and other pipes or conduits accessible without materially injuring the pavement, which will not retain puddles of water and consequently will not favor the production of ice thereon, and which will have the appearance of a block pavement and afford effective foothold for horses without having the defects of block pavements,

The facing or top surface of our improved roadway is made in such a manner that it has a tendency during use and when subjected to heavy teaming to become slightly rough and consequently non-slipping. This desirable result as well as long life of the pavement is accomplished by constructing the top layer or stratum of cement and crushed granite [very hard] or other hard material, all dust and small particles below a definite caliber being eliminated and avoided as by the well known process of screening. These retained particles or pieces of hard stone are more or less jagged and irregular in shape so that they become firmly embedded and anchored in the cement, consequently there is no tendency for these pieces of stone to become loosened, and, owing to their great hardness, they give the pavement a wearing surface which will successfully and satisfactorily withstand the worst conditions of traffic. When sand, dust, or very small pebbles are allowed or purposely used in the facing of a pavement they are comparatively easily loosened from the binding cement and then act as an abradant to smooth or polish the surface of the roadway thereby rendering it slippery.

The accompanying drawing forming a part of this specification illustrates a preferred and desirable embodiment of our invention, and therein we have shown the pavement in sectioned perspective.

After the roadway has been excavated to the proper depth, combined gutters and curbs 1 and 2, preferably of cement or the like, are formed along the edges or margins of the roadway and are allowed to harden before the road bed proper is completed. These gutters and curbs rest upon and are supported by a course or bed of macadam 3 which also forms the foundation for the main portion of the pavement, the macadam of course being rolled to render it compact and solid. This stratum or layer of macadam may be made of crushed stone or gravel and is preferably formed about six inches thick. Upon this macadam bed is superposed a layer of concrete 4, of suitable thickness [about five inches], consisting preferably of approximately one part of Portland cement, two parts of crushed granite or sand, and four parts of crushed stone. This concrete layer as well as the facing 6, described below, is laid in independent sections extending across the full width of the street and desirably about five feet lengthwise of the road, the division lines of these sections being indicated by the reference characters 5 on the drawing. The crown top facing or wearing surface 6 of $1\frac{3}{4}$ inches to $2\frac{1}{2}$ inches in thickness, depending upon conditions as to usage, is placed on top of the intermediate concrete layer 4 and is composed preferably of cement and crushed granite of very hard quality, desirably what is known as "monument granite." For this purpose we prefer to use 60% of granite of $\frac{3}{8}$ inch size or caliber, 20% of $\frac{1}{4}$ inch size, and 20% of $\frac{1}{8}$ inch size. We desire to direct especial attention to the fact that all the granite dust and all particles under $\frac{1}{8}$ inch size as well as any foreign particles are carefully excluded from the crushed granite for this facing or top surface as by screening or any other well known method. The proportions of parts mentioned above have been found by experience to produce a pavement of excellent wearing qualities. As stated above, this wearing surface as well as the concrete layer below it is laid in a series of adjacent independent arched sections to partially allow for expansion and contraction and permit an easy removal of a section or part thereof. At about every fifty feet we provide a transverse separation 9 of the parts of the pave-

ment approximately one inch in width and fill this gap with an elastic composition consisting of substantially 15 to 20% of ground rubber and the remainder of rock asphalt containing about 20% of bitumen or flux. This gap allows a substantial expansion or elongation of the parts of the pavement without detriment and owing to the elastic character of the filling especially when heated by the summer sun the crack is always filled. We have discovered that the filling elastic compound of rubber and asphalt in the proportions mentioned above gives satisfactory results, although the percentages of ingredients may be varied considerably without depriving the compound of its characteristics which render it especially suitable for the purpose indicated. Before the facing has hardened it is grooved or scored both longitudinally and crosswise on the lines 7 and 8, respectively, to a depth of about $\frac{3}{8}$ inch to $\frac{1}{2}$ inch and width of approximately $\frac{1}{4}$ inch to provide footholds for the calks of horses' shoes. Such scoring divides the surface into block-like divisions about 4x9 inches in dimensions. Before the top stratum has set we also brush it crosswise with a bristle brush to slightly scratch its surface so that the same will not be too smooth or slippery.

By forming the gutters and curbs preliminary to building the pavement subjected to traffic and allowing them to set or harden we provide rigid and effective side supports or abutments for the layers constituting the upper portion of the pavement proper. The concrete stratum 4 and the top surface or hard wearing face 6 being both of arch form and abutting at their ends against the gutters and curbs cannot settle even though the dirt therebeneath becomes depressed or is undermined to a considerable extent. In a block-pavement of the usual construction any portion may settle with the sinking of the sustaining foundation below it, resulting in the accumulation and retention of pools of water when it rains and patches or sheets of ice if a freezing temperature prevails. Our pavement cannot settle either in part or as a whole, and therein lies one of the marked advantages thereof. Owing to building the same in sections, which may be separated from each other to a slight extent if desired, contraction and elongation of the sections is permitted without detriment to the pavement, such as cracking or upheaval. We prefer, however, to bring the sections of the pavement substantially into contact and at intervals provide the gaps or separations 9 filled with an elastic composition. Our improved pavement has the appearance and all the advantages of a block-pavement without possessing the detrimental and objectionable characteristics of having one or more blocks become depressed thereby not only causing an uneven surface but a receptacle for the retention of water and ice. The scoring or grooving of the surface renders the same non-slipping and provides depressions or recesses large enough to accommodate the calks of horses' shoes whereby the draft animals are enabled to secure effective footings or footholds. Since the granite employed in the top layer is of the hardest quality obtainable and since all dust and small particles are carefully removed, the wearing qualities of the pavement are greatly enhanced, and there is no polishing, smoothing, or grinding by small particles of granite as is the case when dust or sand or other hard but very small pieces of stone are used in the top dressing. Provided it becomes desirable or necessary to have access to underlying pipes or the like a whole section of the pavement or a part of the section may be removed and replaced so that the pavement is in substantially as good a condition as before the removal. As is well known, patching of an asphalt or similar pavement cannot be neatly done, and usually the patch afterward sinks to a lower level than the top face of the pavement, but our pavement can be mutilated and repaired without affecting its appearance or substantially changing its surface or wearing qualities.

Although we have specified the exact dimensions and parts of ingredients to secure favorable results it is to be understood that such dimensions and quantities of ingredients may be materially modified without sacrificing any of the advantages of our invention. Even though we have specified crushed granite as the most desirable ingredient for the top facing or wearing surface, it is obvious that other hard material may be used, but all dust and very small particles should be removed, however. The statement that all of the dust and small particles is eliminated from the ingredients of the pavement is not to be taken as literally true. It is sufficient if substantially all of the small and fine material is avoided or removed from the crushed stone or other material forming the body of the finishing layer or top wearing surface of the pavement. Also other changes may be made in the construction of the pavement without departing from the essence or substance of our invention.

We claim:

1. A pavement having a facing or top wearing surface composed of cement and crushed stone from which all dust and fine particles have been eliminated, substantially as described.

2. A pavement having a facing or top wearing surface composed of cement and crushed granite from which all dust and fine particles have been eliminated, substantially as described.

3. A pavement having a facing or top wearing surface composed of cement and

crushed granite, the latter consisting of approximately 60% of ⅜ inch size, 20% of ¼ inch size, and 20% of ⅛ inch size, said crushed granite being free from all dust and particles smaller than ⅛ inch caliber, substantially as described.

4. A pavement consisting of a layer of concrete and a superposed top wearing surface composed of cement and crushed granite from which all dust and extremely small particles have been eliminated, substantially as described.

5. A pavement consisting of a suitable foundation, an intermediate layer of concrete, and a top wearing surface composed of cement and crushed granite from which all dust and extremely small particles have been eliminated, substantially as described.

6. A pavement consisting of a foundation of macadam, an intermediate layer of concrete, and a top wearing surface composed of cement and crushed granite from which all dust and extremely small particles have been eliminated, substantially as described.

7. A pavement made in sections to allow for expansion and contraction due to changes of temperature, and having a suitable foundation, a layer of concrete above said foundation, and a face or wearing surface composed of cement and crushed granite from which all dust has been screened or otherwise removed, substantially as described.

8. A pavement composed of sections to allow for expansion and contraction due to changes of temperature, and having a foundation or bed of macadam suitably rolled into compact condition, a layer of concrete above said macadam foundation, and a face or wearing surface composed of cement and crushed granite from which all dust has been screened, the upper surface of said face being grooved to afford footholds for horses, substantially as described.

9. A pavement made in sections to allow for expansion and contraction and having a suitable foundation, a layer of concrete above said foundation, said concrete consisting of substantially one part of Portland cement, two parts of crushed granite or sand, and four parts of crushed stone, and a top face or wearing surface consisting of cement and very hard crushed granite of substantially ⅛ inch to ⅜ inch caliber, all fine dust having been eliminated therefrom, substantially as described.

10. A pavement composed of sections to allow for expansion and contraction due to changes of temperature, and having a foundation or bed of macadam suitably rolled into compact condition, said macadam including crushed stone or gravel, a layer of concrete above said macadam foundation, said concrete consisting of substantially one part of Portland cement, two parts of crushed granite or sand, and four parts of crushed stone, and a top face or wearing surface consisting of cement and very hard crushed granite of substantially ⅛ inch to ⅜ inch caliber, all fine dust having been screened or otherwise removed from said crushed granite, the surface of said face being grooved both longitudinally and laterally to afford footholds for horses, substantially as described.

11. A pavement, parts of which are separated to a small extent, the gap being filled with a composition of ground rubber and asphalt, substantially as described.

12. A pavement, parts of which are separated to a small extent, the gap being filled with a composition consisting of approximately 15 to 20% of ground rubber, the remainder being rock asphalt containing about 20% of bitumen, substantially as described.

13. The method of making a pavement which consists in first constructing on opposite sides of the roadway combined gutters and curbs, allowing the same to harden, then forming a sectional pavement between said gutters and curbs, and grooving the top surface of said pavement before it has hardened, substantially as described.

14. The method of making a pavement which consists in constructing on opposite sides of the roadway combined gutters and curbs, allowing the same to harden, laying and rolling into compact condition a macadam bed between said gutters and curbs, constructing on top of said macadam bed and between said gutters and curbs a layer of concrete, providing the latter with a top face or wearing surface composed of cement and crushed granite from which all dust and extremely small particles have been removed, and scoring or grooving the face of said wearing surface before it hardens, substantially as described.

15. The method of making a pavement which consists in constructing on opposite sides of the roadway combined gutters and curbs, allowing the same to harden, laying and rolling into compact condition a macadam bed between said gutters and curbs, constructing on top of said macadam bed and between said gutters and curbs a layer of concrete, providing the latter with a top face or wearing surface composed of cement and crushed granite from which all dust and extremely small particles have been removed, and scoring or grooving and brushing the face of said wearing surface before it hardens, substantially as described.

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