

(No Model.)

W. S. WILKINSON.
STREET PAVEMENT.

No. 465,650.

Patented Dec. 22, 1891.

FIG. 1.

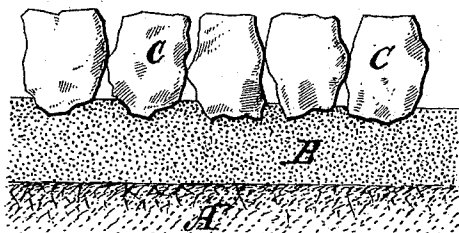


FIG. 2.

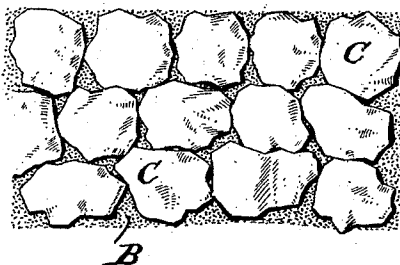


FIG. 3.

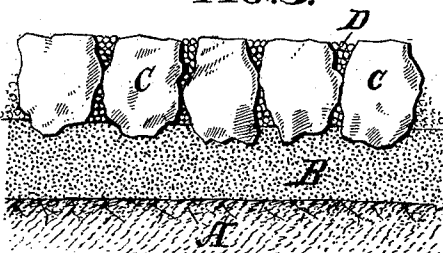


FIG. 4.

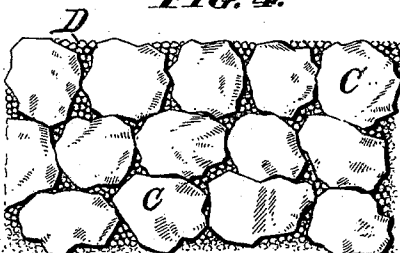


FIG. 5.

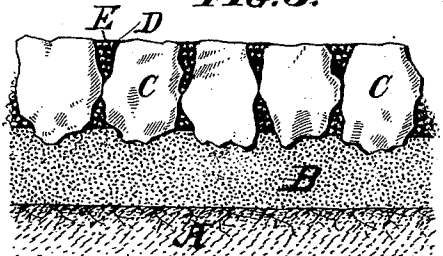
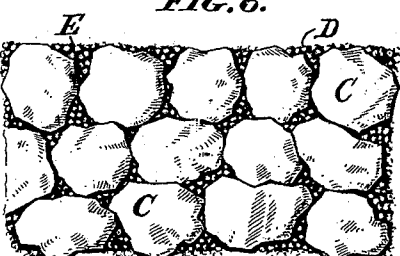


FIG. 6.



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UNITED STATES PATENT OFFICE.

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STREET-PAVEMENT.

SPECIFICATION forming part of Letters Patent No. 465,650, dated December 22, 1891.

Application filed December 10, 1890. Serial No. 374,179. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. WILKINSON, a citizen of the United States, residing in the city of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Street Pavements, of which the following is a specification.

The object of my invention is the construction of a pavement of rubble or other broken stone, and the invention relates especially to, and is an improvement upon, a well-known class of pavements in which broken stones of more or less irregular sizes but having at least one approximately plane surface of fracture dressing or clipping, are set in a bed of sharp sand, or its equivalent, with their respective plane surfaces of fracture dressing or clipping disposed in a common horizontal plane or road bed surface, the joints or inter-spaces between the stones being filled either with sand, or with pitch, or with gravel the interstices of which are subsequently poured full of pitch, or with an admixture of asphaltum, gravel, pulverized limestone, and petroleum.

In pavements of the foregoing character as heretofore constructed, it has been the practice to first manually lay and partly embed the rubble or other paving stones on and in a base of sand or its equivalent, and to then simply fill the open spaces between them with one or another of the materials or admixtures above recited.

The disadvantages which have appertained to pavements of the foregoing character may be summarized by saying that where sand alone has been employed for filling the open spaces or joints between the stones, the pavements have been unsanitary by reason of the absorption by the sand of noxious liquids, while, in common with the other constructions referred to, which, however, are not subject to the foregoing disadvantage, the stones have been liable to be tipped shifted or loosened by the ordinary travel upon them, the filling material not having been in any instance of a sufficiently firm and tough character to insure the relative permanent fixation of the stones as originally placed in the pavement.

I have discovered that a thoroughly permanent and durable broken stone pavement

adapted for the heaviest traffic can be constructed by first laying upon a suitably prepared foundation of earth, gravel, or concrete, as may be preferred, a layer of sharp paving sand, or its equivalent, of a depth, for instance, of two or three inches;—by then manually placing and partly embedding in said layer of sand the broken paving stones employed in the construction of the pavement, in such manner, first, that as to each stone a plane surface of fracture shall be brought uppermost and in coincidence with the plane of the wearing surface of the pavement, and, second, that as to one or more of its surfaces each stone shall make contact with its neighboring or adjoining stones at at least a sufficient number of points to insure the relative fixation or mutual support of each stone with respect to and by the aid of its neighbors,—it being an essential requisite of the construction of the pavement that the paving stones be so applied on and in the bed of sand and relatively to each other, that when so applied they will relatively to each other and to their bed maintain their relative juxtaposition and contact and be mutually sustaining;—by then filling the unfilled interstices between the stones so erected with respect to each other and their bed, with screened gravel which may be cold, but which has preferably been heated to a temperature of, for instance, 300° or 400° Fahrenheit;—by then ramming the pavement in the manner usually done where sand alone is used to fill the interspaces between broken stones in pavements of this character;—by then immediately, and before the gravel when heated has become cold, pouring upon it a calcareous bituminous cement, preferably composed of a powdered lime stone and a liquefied bitumen, such, for instance, as Trinidad asphaltum, and residuum of petroleum or its equivalent, heated to a temperature which will make it flow easily into the interstices of the gravel, until the said interstices are filled to a level with the wearing surfaces of the broken paving stones. Such, in general terms, being the construction to which I resort, it is proper for me to further explain that the sand employed is preferably good sharp paving sand;—that the paving stones which are as stated partly embedded in the sand, are preferably rubble

stones, produced from quarried stone, although broken cobbles, or other broken rock, of suitable dimensions, will answer the purpose;—that the gravel which I employ to fill the interstices between the paving stones above the layer of sand, is ordinary gravel, preferably, but not restrictively, however, screened through screens respectively of three-eighths inch and five-eighths inch mesh, and such gravel only as will not pass through the screen of three-eighths inch mesh but will pass through the screen of five-eighths inch mesh, being that selected and employed;—that this gravel is preferably brushed into the interstices between the stones until it fills them level with their fractured wearing surfaces;—that the ramming is preferably done by rammers manually operated, although it may be done by rollers or by mechanically-operated rams;—that the binding cement for the cementation of the gravel filling and paving stones is preferably composed of pulverized lime stone, although other finely pulverized calcareous material will subserve the purpose, and of a bitumen such as Trinidad asphaltum fluxed with residuum of petroleum or its equivalent, although certain other bitumens will measurably answer;—and that this cement must, when flowed into the interstices between the particles of gravel, fill them, and in so doing fill the interstices between them and the paving stones, and must, therefore, be in such a condition of fluidity as to permit it to permeate throughout all such interstices in order to very firmly bind the particles of gravel to each other and to the lateral surfaces of the stones.

In the drawings which form a part of this specification, and which it is proper to remark were made from photographic views of sections of my improved pavement itself,—Figure 1 is an end elevational view, and Fig. 2 a top plan view, of the paving stones as set up in mutual sustentation in their bed of sand and before the interspaces between them are filled; Fig. 3 is an end elevational view, and Fig. 4 a top plan view, of the paving stones shown in Figs. 1 and 2, as they appear when the interspaces between the said stones above the sand bed have been completely filled with compacted gravel; and Fig. 5 an end elevational view, and Fig. 6 a top plan view, of the structure shown in Figs. 3 and 4 when the interstices between the gravel in the interspaces between the paving stones have been filled by calcareous bituminous cement of the character which I employ,—to constitute said structure my completed pavement.

In all of the foregoing views, in which similar letters of reference indicate corresponding parts, A designates the foundation of earth, gravel, or concrete, on which is superimposed the layer of sand B.

C are the paving stones, D the filler of gravel between said stones, and E the calcareous bituminous cement for uniting the

pieces of gravel composing the filler to each other and to the lateral surfaces of the paving stones.

Such being a description and pictorial representation of a pavement embodying my invention, it is proper to add that the gist of the aforesaid invention resides in the employment of a calcareous bituminous cement flowed into the interstices existing between small gravel stones after the latter have been filled and compacted into the interspaces between broken paving stones as erected in mutually sustaining contact upon and from a bed of sand. It is also proper to explain that the percentage of gravel filler relative to the percentage of calcareous bituminous cement is, approximately, as 53 is to 47, and that the percentage of calcareous matter to the bitumen in the cement is, approximately, as 25 to 75. These proportions while not controlling or such as can be in no case varied, are important in that it is an essential of the invention that the ultimate filler (gravel and bituminous calcareous cement) should be composite of so large a proportion of calcareous or stony matter to so small a proportion of bituminous matter as to insure the great predominance of stony matter in the filler, to the end that permanent fixation of the paving stones and an almost uniformly hard wearing surface may be secured. In this connection the invention is to be contradistinguished from stone pavements in which the paving stones as originally set up in their bed are not only not in contact with each other so as to be mutually sustaining, but in which the interspaces between the stones so independently set up are wholly filled with a filling material being an admixture of such small percentage of calcareous matter with such large percentage of bituminous matter as alone will insure the possibility of pouring the said filling material in a fluid condition into the interspaces between the paving stones.

As will be obvious to those skilled in the art, a previous admixture of the percentage of gravel with the percentage of bituminous calcareous cement employed by me, could not be poured into the interspaces between stones embedded and erected either as I embed and erect them or as others prior to me have done.

The advantages appertaining to a pavement embodying my improvements, are that it is cheaper, less affected by changes of temperature, less soft in hot weather, less brittle in cold weather, and possesses greater coherence at all temperatures, than pavements of cognate character heretofore used.

Having thus described my invention, I claim—

A pavement composed of a foundation of sand in which are embedded the under portions of broken paving stones the upper portions of which are surfaces of fracture or dressing set to occupy a common plane, the bodies of which are in mutually sustaining

lateral contact, and the interspaces between
the unembedded portions of which are com-
pletely and closely filled with a filling of com-
pacted gravel the particles of which are ce-
5 mented and bound to each other and to the
lateral surfaces of the stones by calcareous
bituminous cement flowed into the interstices
of the said compacted gravel and between it
and the lateral surfaces of the said paving
10 stones, substantially as set forth.

In testimony that I claim the foregoing as
my invention I have hereunto signed my name
this 20th day of October, 1890.

WALTER S. WILKINSON.

In the presence of—

J. BONSALL TAYLOR,
WM. C. STRAWRIDGE.