

UNITED STATES PATENT OFFICE.

FREDERICK J. WARREN, OF NEWTON, MASSACHUSETTS.

METHOD OF PREPARING THE INGREDIENTS OF STREET SHEET PAVEMENTS OR ROADWAYS.

SPECIFICATION forming part of Letters Patent No. 715,630, dated December 9, 1902.

Application filed June 21, 1902. Serial No. 112,712. (No specimens.)

To all whom it may concern:

Be it known that I, FREDERICK J. WARREN, a citizen of the United States, and a resident of Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Methods of Preparing the Ingredients of Street Sheet Pavements or Roadways, of which the following is a full, clear, and exact description.

My invention relates to the herein-described method of preparing the ingredients of street sheet pavements or roadways, and essentially to the method of selecting and combining the mineral ingredients used in the manufacture of bituminous macadam pavements.

I have invented and patented a pavement which I have termed a "bituminous macadam" pavement. It is intended for the wearing section or layer of a street sheet pavement or roadway. It consists in combining mineral ingredients of varying sizes in such proportions with each other and with the bituminous composition which is used in the pavement as, in the first place, to provide a mineral base that shall have inherent stability; in the second place, a mineral base of inherent stability which shall have a small percentage of voids, and, in the third place, a bituminous composition whose first office is to fill the voids, unite the ingredients, and form a waterproof binder, but which shall not act to receive the wear of traffic in the sense in which the bituminous composition of asphalt or other bituminous pavements has heretofore been used, the purpose of my invention being to provide a wearing section or layer which shall have much more mineral than bituminous composition in its nature and which shall show or present to wear a much larger area of mineral ingredients than of bituminous composition and some of which ingredients are of relatively large size and which mineral ingredients, being so much larger, act in a way to preserve the bituminous composition from wear and its life as well. For the construction of such a pavement it is necessary in order to secure the best results that great care be exercised in the selection of the mineral ingredients as to their sizes, as to the proportions which the varying sizes shall bear to each other in order to obtain when they are uniformly combined a structure that shall be

dense and firm and shall be relatively free from voids, which are the best conditions for a bituminous macadam pavement. It is necessary also that this selection, grading, and combining should be done in as simple a way as possible and in a way that shall be practicable and commercial. To this end I first select the ingredients as to size and as to the quantity which each size should bear to the rest roughly or approximately. These ingredients are then heated to the temperature which is usually employed in the manufacture and laying of my bituminous macadam pavement and are thoroughly dried at that temperature. They are then subjected to a screening action by which while heated they are separated into a relatively large number of different grades, each grade consisting of a number of sizes very closely approximating each other. The mineral ingredients thus heated and thus accurately separated into grades are then again separated in their heated condition into different quantities and either by weight or measure, so that the proportions which the graded sizes shall bear to each other are then accurately determined in a scientific manner and before they are associated together. They are then combined with each other and with the accurate proportion of bituminous composition which is used with them in the formation of the wearing-section of the pavement, and this percentage of bituminous composition is also obtained accurately by weight or by measure. The ingredients of the composition thus secured are then in their heated condition uniformly mixed and combined and are then laid in their heated condition in the roadway where they are to be used and are then densely compacted under very heavy pressure into a continuous dense coherent homogeneous wearing layer or section, which has for its inherent properties the qualities which I have mentioned as belonging to my bituminous macadam pavement at the beginning of this specification. The pressure under which the ingredients are combined in place is that which may be delivered by a heavy steam-roller—say of fifteen or twenty tons weight. This consolidates the ingredients, which have been before carefully proportioned as to their sizes, and also causes the bituminous composition

to fill the small percentage of voids, which in a macadam pavement would be filled by a fine powder or dust.

Having thus fully described my invention,
5 I claim and desire to secure by Letters Patent of the United States—

The method herein described of selecting and combining the mineral ingredients for use in the manufacture and construction of
10 the wearing-sections of street sheet-pavements consisting in first approximating the sizes of the various grades required and the quantity or proportion of each of said grades;
15 second, in heating the ingredients thus selected to the desired temperature for working and laying; third, in separating said in-

gredients into the desired number of grades of differing sizes; fourth, in selecting from each of said grades by weight or measure the proportions of each grade to the entire body 20 and while still heated; and fifth, in intimately associating said selected and apportioned ingredients with each other and with a predetermined quantity of bituminous composition sufficient to coat the said ingredi- 25 ents and to fill the voids which would otherwise exist in the body of ingredients as laid.

FREDERICK J. WARREN.

In presence of—

RALPH L. WARREN,
ALBERT C. WARREN.