

S. E. FINLEY.
METHOD OF APPLYING BINDING MEDIA TO ROAD SURFACES.
APPLICATION FILED SEPT. 21, 1921.

1,411,777.

Patented Apr. 4, 1922.

Fig. 1.

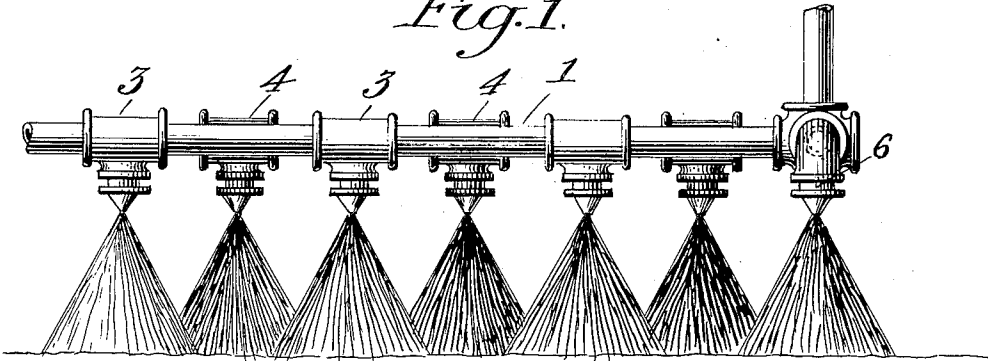


Fig. 2.

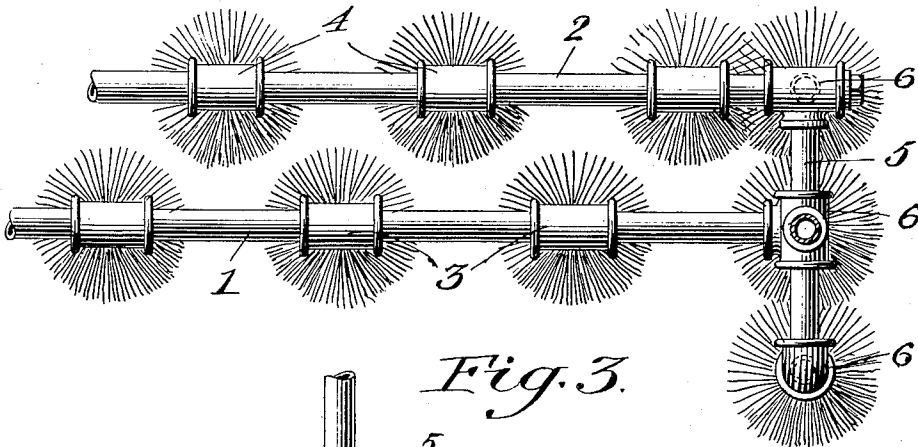
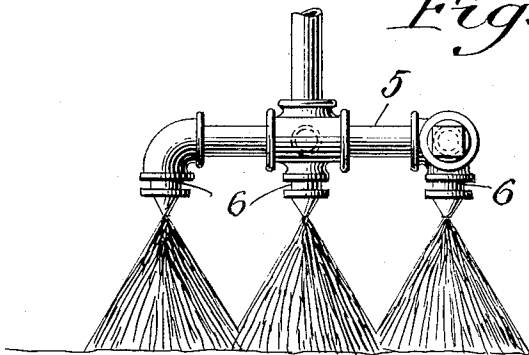


Fig. 3.



Inventor:
Sam E. Finley
by *Chas. W. Mc*
att'y

UNITED STATES PATENT OFFICE.

SAM EVERETT FINLEY, OF ATLANTA, GEORGIA.

METHOD OF APPLYING BINDING MEDIA TO ROAD SURFACES.

1,411,777.

Specification of Letters Patent.

Patented Apr. 4, 1922.

Application filed September 21, 1921. Serial No. 502,264.

To all whom it may concern:

Be it known that I, SAM E. FINLEY, a citizen of the United States, residing at North Avenue and Plum Street, Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Methods of Applying Binding Media to Road Surfaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a method and apparatus for applying binding media to road surfaces in the form of sprays and has for its object to insure a uniform distribution of the binder to the surface of the road and the application of a sufficient and uniform quantity of the medium to the lateral marginal edges of the road to effect an efficient cementing of the mineral aggregate at said edges to seal the latter against the entrance of moisture and prevent the material scouring off or ravelling out under the wheels of traffic, at or adjacent said edges.

In the application of bituminous and similar binding media to the surface of roadways, consisting of broken stone, gravel, or other mineral aggregate, it has been practically impossible to effect a sufficiently uniform and heavy distribution of cementing material at the marginal edges of the roadway or pavement, to enable the wearing material to resist the heavy disintegrating effect of traffic, since, with all the ordinary forms of nozzles, whether they deliver a conical or fan shaped spray, there is always a sufficient overlap of the applied material to equalize the distribution over the main portion of the roadway, which overlapping and equalization, however, does not prevail at the sides or marginal edges of the road, where the medium is applied by a single nozzle. The result of this mode of application is that the marginal edges of the road or pavement, even where a curb or header is employed, do not receive sufficient binding medium to produce a thorough cementing of the mineral aggregate or to properly water-proof the said edges, so that the latter will be broken down rapidly by the effects of traffic or of the weather. The result is that the portions of the roadway which should be the strongest, to wit the marginal edges, have always proven the

weakest, and disintegration of the road surface usually begins and is more pronounced at the edges. The present invention completely and satisfactorily remedies these difficulties and produces a roadway which is quite as strong, if not stronger, along the marginal edges thereof, to resist the disintegrating effects of traffic and the weather, as the portions of the roadway between the edge portions.

To effect these objects, the invention involves a mode of applying the binding medium to the mineral aggregate at the marginal edges of the roadway or pavement in longitudinal strips of sufficient width to define a header or curb, and in sufficient quantity to effect a thorough cementing together of the aggregate for the full depth thereof, whether the aggregate includes the base or foundation and the wearing course or the wearing course alone, the desired result being accomplished by supplying the marginal strips of the roadway, which are to constitute the curbs or headers, with a sufficient excess of the binding media not only to secure the desired and indicated cementing effect, but also to thoroughly coat and impregnate the marginal edges to exclude water and moisture from the interior of the road structure.

The invention further contemplates the provision of a relatively simple and effective form of apparatus for producing the result aforesaid, in the form of a spray header, attached to a suitable distributing tank, which header is provided with a series of conical jet nozzles arranged longitudinally of the header, and designed to produce overlapping jets or sprays, over the entire road surface, and a transverse series of jets or nozzles located at the end or ends of the header, adapted to deliver the binding medium to the marginal edge or edges of the roadway in superposed layers, and ordinarily in quantities in excess of that applied to the parts of the roadway intermediate the curbs or headers.

A suitable form of apparatus for carrying out the method aforesaid is illustrated in the accompanying drawings, in which:—

Fig. 1 is a fragmentary vertical elevation of the spray-header, adapted to function as indicated;

Fig. 2 is a plan view thereof;

Fig. 3 is an end elevation.

Referring to the drawings, 1 and 2 repre-

110

sent the parallel conductor members of a distributor header, which may be connected in the usual manner at the rear of a tank wagon, or, if desired, disposed laterally of the wagon and at the rear thereof as exemplified in my companion application Serial No. 334,315, filed October 29, 1919. Each of the header pipes 1 and 2 is provided with a longitudinal series of conical jet spray nozzles 3 and 4 respectively which deliver overlapping sprays of the binding medium to the road surface, so that a regulable but uniform layer of binding medium is applied to the road surface. At the end 5 of the header there is provided a transverse series of similar spray nozzles 6-6 which deliver overlapping and successive layers of binding medium to the subjacent portion of the road surface, so that the section of the roadway underlying these transverse nozzles receives an amount of the binding medium in excess of that received by the other portions of the road surface, and which not only serves to bind the mineral aggregate constituting the curbs or headers firmly together, and furnish a reserve of binding media to replace that which may evaporate or be otherwise displaced, but also effects a complete sealing of the voids or interstices in the structure of the curb or header to prevent the access of moisture to the interior structure of the roadway, thereby obviating the dangers of disintegration of the road structure of the curb or header to prevent the access of moisture to the interior structure of the roadway, thereby obviating the dangers of disintegration of the road structure due to the water washing out the binding media and, what is more serious consideration, the freezing of the water within the road structure. It will be understood that the individual nozzles include means for excluding them from operation, so that all or any particular number of the nozzles may be operated as desired. In the particular form of nozzle shown, the conical cap containing the discharge orifice is adjustably threaded to the body portion, so that the orifice may be completely closed or opened to any desired extent, by a stationary needle valve, located axially in the nozzle, by turning the cap portion up or down on the body portion.

In applying the invention to the construction of a roadway which involves the laying of a suitable foundation and superposition of a wearing surface of mineral aggregate, when the foundation is of a character to admit of the application of a bituminous or asphaltic binding medium to the lateral edges thereof, to form the base or foundation of the curbs or headers, the lateral spray nozzles 6 alone may be operated to apply binding medium to the marginal edge or edges, in sufficient quantity to entirely coat

the elements of the foundation, fill up the voids therein, and seal the edges of the foundation against the entrance of water. After the wearing surface, usually of broken stone, gravel, sand or other mineral aggregate, has been applied to the foundation course, the entire header system is brought into operation to apply a uniform coating of the binding medium to the surface of the roadway in accurately regulable quantities per given surface area, to bind the wearing course together and form a permanent wear resisting water-proof roadway, intermediate nozzles 3 and 4, serving to effect the uniform application of the binding medium to the road surface between the curb or header sections, and the lateral nozzles 6, effecting a relatively heavier application of the binding medium to the curb or header sections, so that the curbs or headers will be constituted by what is in effect asphalt or bituminous concrete of a uniform and homogeneous structure throughout both the foundation and wearing courses, which will effectively resist the tendency of the roadway to ravel out under the wheels of traffic at the edges and will effectively prevent the penetration of water into the structure of the road bed.

The invention is not only applicable to the formation of a relatively strong wear-resisting water-proof curb or header along the marginal edges of suburban or rural roadways, which are not usually bounded by sidewalks and gutters, but is also admirably adapted to the application of the binding media to the marginal edges of roadways which are bounded by set curbing, gutters or sidewalks, in that it insures the application of sufficient quantities of the binder at the points where the road structure meets the curbing, gutter or sidewalk construction, where the older types of machines and methods, as heretofore employed, invariably fail to supply sufficient of the binder to effect a thorough cementation of the elements of the road structure, and to exclude moisture.

When the road treatment involves the mere resurfacing or repair, without the rebuilding of the foundation, as for example, when a road is to be resurfaced with mineral aggregate, the latter is applied and distributed uniformly over the road bed and properly worked and brought to grade, after which the binding medium is applied to the surface layer in the manner just described, that is to say, the intermediate nozzles 4 apply an evenly distributed and regulable quantity of the medium to the surface of the roadway between the marginal edges, while the lateral nozzles 6 apply a relatively large quantity of the binding medium to the marginal edge traversed by these nozzles, so that the excess of the binding medium penetrates the entire body of the wearing course con-

stituting the gutter, curb or header section, binds the same firmly to the foundation course, and seals the lateral faces of the wearing course and the binding course 5 against the entrance of water. In both modes of application of the invention, it will be found entirely feasible to effectively build up a curb or header along each marginal edge of the roadway that will be regular 10 and uniform and as solid and wear resisting as a preformed and set curbing of concrete or macadam, that will not only prevent the ravelling out of the road surface at the edges, but will protect the entire road structure from the deleterious effects of the elements, as indicated.

What I claim is:—

1. The method of treating roadways which comprises applying a wearing surface 20 course of mineral aggregate to the roadway, applying a uniform coating of binding medium to the entire surface, and applying an extra quantity of binding medium to the lateral marginal edges in strips of sufficient 25 width to form a curbing.

2. The method of constructing roadways which comprises applying a base or foundation course of mineral aggregate to the roadway, supplying the lateral edges of the base 30 with a binding medium applied in longitudinal strips of sufficient width to form the base of a header or curb, applying a wear-

ing surface course of mineral aggregate over the entire foundation, cementing the same together and to the base by a layer of binding medium, and applying an extra quantity of binding medium to the marginal edges of the surface course, in strips of substantially equal width to those applied to the foundation to form the upper portion 40 of the header or curb.

3. The method of constructing roadways which comprises applying a base or foundation course of mineral aggregate to the roadway, supplying the lateral edges of the base 45 with a binding medium applied in longitudinal strips of sufficient width to form the base of a header or curb, distributing a wearing surface course of mineral aggregate over the entire foundation, supplying the 50 wearing surface course between the curb or header sections with a uniform layer of binding medium for cementing the same together and to the base, and applying an excess quantity of the binding medium to those 55 portions of the wearing surface overlying the base of the header or curb, to form the upper portions of the header or curb.

In testimony whereof I affix my signature.

SAM EVERETT FINLEY.

Witnesses:

R. D. KNEALE,
ELIZABETH LEDBETTER.