E. M. CHADBOURNE.

ASPHALTIC ROADWAY.

APPLICATION FILED APR. 15, 1913.

1,085,667. Patented Feb. 3, 1914.

Fig. 1.

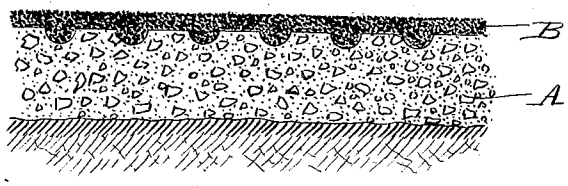


Fig. 2

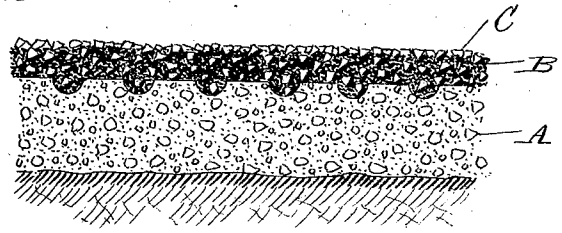


Fig. 3.

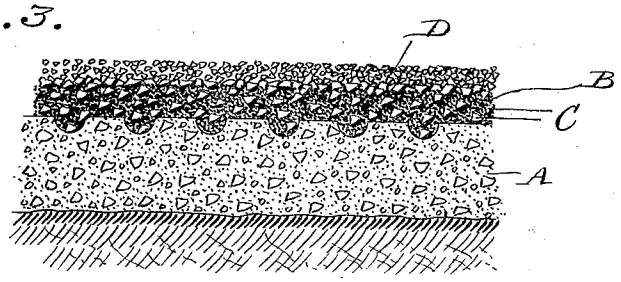
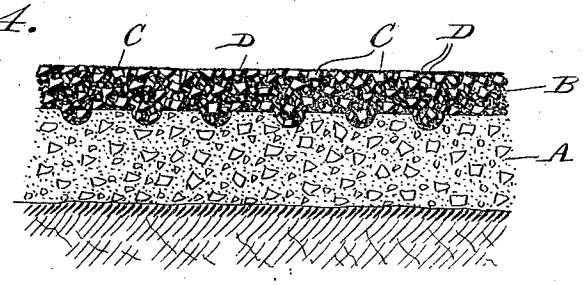


Fig. 4.



Witnesses

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ASPHALTIC ROADWAY.

1,085,667. Specification of Letters Patent. Patented Feb. 3, 1914.

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To all whom it may concern:

Be it known that I, EDWARD M. CHADBOURNE, a citizen of the United States, and a resident of San Francisco, in the county of San Francisco and State of California, have invented a new and useful Improvement in Asphaltic Roadways, of which the following is a full and exact description, such as will enable those skilled in the art to practise the same.

My invention relates to the construction of asphaltic roadways, and is an improvement upon my prior Patents Nos. 965,562, 956,940, 994,092 and 982,247.

In the construction of asphaltic concrete roadways, in accordance with my Patent No 994,092, I have taken advantage of the capillary attraction exerted in the particles of aggregate to draw up the asphaltic binder in a liquid state, with the result that I obtain as nearly perfect homogeneous mass as is possible under the conditions. As described in the above patent, I first spread on the base a heavy asphaltic binder, capable of being rendered limpid by heat. Upon this binder I next place heated aggregate, which consists of sand and rock mixed together. The heated aggregate renders the binder limpid and then, by capillary attraction, it is drawn up so as to fill the voids between the particles.

I find, in actual practice, that when I place the hot aggregate on the binder, the large pieces, in many cases, fall together and this disturbs the capillary attraction, due to the fact that numerous large voids will occur, which are beyond the limit of capillary power. In many cases, the finished pavement will be soft in some places and hard in other places and of varying thickness due to the lack of uniform distribution caused by the larger pieces falling together. I find also that, in the mechanically mixed asphaltic concrete, where it has been proposed to grade the material so as to get a minimum of voids and also to have inherent stability, the grading is practically all wasted, for the reason that the large particles fall together and the voids in the same are not filled in by the smaller particles, resulting in the forming of numerous pockets in the surface and air spaces in the mass. This weakens the pavement and makes it far from uniform. To overcome this defect in the mechanically mixed asphaltic concrete, it has been proposed to apply on the surface a so-called squeegee coat of asphalt and stone chips The function of this squeegee coat and stone chips is to fill the interstices which are formed by the particles of aggregate falling together and so forming numerous voids filled with air.

Theoretically, it is possible to grade aggregates so that there will be a minimum of voids and that there will be no pockets or air spaces formed when the materials are mechanically mixed; but practically the results obtained are as above indicated, and the mass is far from uniform. In order to overcome these defects in the machanically mixed asphaltic concrete and in the asphaltic concrete constructed by my capillary attraction method, I proposed to place the larger particles of my aggregate first and then the smaller particles, with the result that I am able to have the aggregate fall where I wish, which will result practically as the theoretical best grading originally called for. To accomplish this, I preferably, first spread on a suitable base the heavy asphaltic binder to any required depth. I next spread large aggregate, which may consist of rock from 2 inches to ½ inch in size. It is immaterial whether this course of heavy rock is heated or not. I next spread and work down into the voids of the rock aggregate a finer aggregate heated to a high temperature and containing voids from, approximately, 20 to 35 per cent. The action of this heated fine aggregate in the larger interstices and voids of the first course of rock aggregate, is such as to render the asphaltic binder limpid and then cause the same to be drawn up by capillary attraction so as to coat all the particles and to bond the mass thoroughly together. By this method I obtain an asphaltic concrete which is not only theoretically homogeneous, but practically so. The resultant pavement has the same consistency and hardness in all places, will not creep, and has the stability required under all conditions of traffic.

In the accompanying drawings, Figure 1 shows a base with an asphaltic binder spread evenly over the surface; Fig. 2 shows the large aggregate placed on top of the binder; Fig. 3 shows the finer heated aggregate placed and worked down in the interstices and voids of the larger aggregate; Fig. 4 shows the completed pavement in which the larger aggregate is surrounded by the small

aggregate, which in turn has served the purpose of drawing up the asphalt by capillary attraction, so as to completely cover and surround the large aggregate.

In said drawings, A indicates the base which may be of cement concrete; B the layer of asphaltic binder which may be non-fluid at ordinary temperatures, but capable of being rendered limpid by heat as by the heat of the fine aggregate.

C indicates the layer of coarse or large aggregate, and D is the fine aggregate which is applied hot and worked down into the layer of coarse or large aggregate, so as to form a homogeneous mass uniform throughout.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. The method of constructing pavements having a layer of commingled large and fine aggregate bonded together by an asphaltic binder which consists in first spreading a layer of large size aggregate then distributing the fine aggregate over and working the same down into the layer of large aggregate to form a homogeneous mass, and simultaneously supplying asphaltic binder to the mass by capillary attraction of the finer aggregate.

2. The method of constructing pavements having a layer of commingled large and fine aggregate having its voids filled and the particles bonded together by asphaltic binder which consists in spreading a layer of asphaltic binder on a suitable base, then spreading a loose layer of large size aggregate over the binder, and finally distributing over the same an aggregate of such size as to cause capillary action between the particles and working the same down into the layer of large aggregate to form a homogeneous mass into which the asphaltic binder will feed by capillary action.

3. The method of constructing pavements having a layer of commingled large and fine aggregate having its voids filled and the particles bonder together by asphaltic binder which consists in spreading a layer of asphaltic binder on a suitable base, then spreading a loose layer of large size aggregate over the binder, and finally distributing over the same a heated aggregate of such size as to cause capillary action between the particles and working the same down into the layer of large aggregate to form a homogeneous mass into which the asphaltic binder will feed by capillary action.

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Witnesses:
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