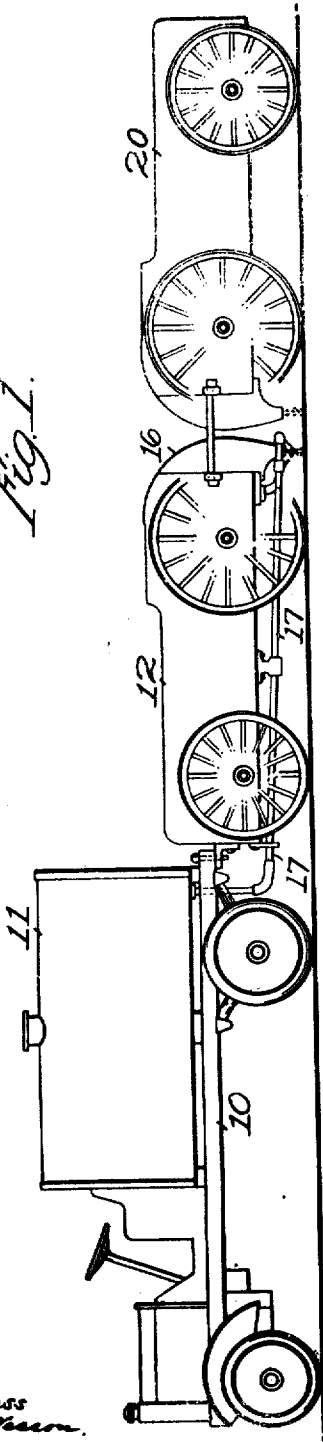


J. A. JOHNSTON.
METHOD OF AND APPARATUS FOR ROAD MAKING.
APPLICATION FILED JUNE 14, 1915.

1,242,558.

Patented Oct. 9, 1917.

Fig. 1.



Witness
B. F. Mason.

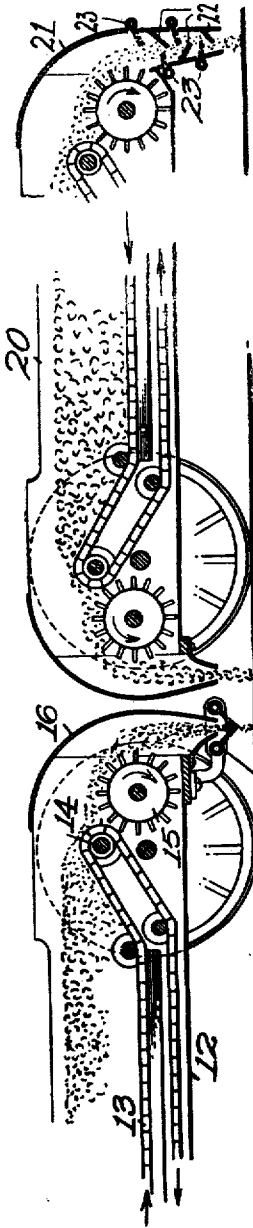


Fig. 3.

Fig. 2.

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METHOD OF AND APPARATUS FOR ROAD-MAKING.

1,242,558.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN A. JOHNSTON, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Method of and Apparatus for Road-Making, of which the following is a specification.

This invention relates to the making of roads of either the bitumen or cement concrete type.

The principal objects of the invention are to provide for thoroughly and expeditiously mixing the aggregate and matrix material during the travel of a vehicle or train of vehicles over the road bed and almost simultaneously applying the mixture to the road bed; and especially to provide for mixing the liquid or semi-liquid matrix material with the aggregate material during the descent of the same into position on the road bed.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which,

Figure 1 is a side view of a road-making apparatus constructed in accordance with this invention;

Fig. 2 is a longitudinal central sectional view of a portion of the same; and

Fig. 3 is a similar view showing a construction suitable for depositing cement concrete.

There is a well-known type of road building in which sand is mixed with heated bitumen, usually with equal parts of sand and bitumen, and the mixture is used for filling the interstices in the previously prepared bed of stone particles. This is open to some difficulties by reason of the fact that the sand has a tendency to sink, and to so segregate as to make the uniform application of the mixture a difficult problem. This disadvantage is overcome by this invention, which can be used for making new roads or resurfacing. Furthermore, complaint is often made of the ordinary road surfacing methods because the tar is laid and often left exposed for a period of time before it is covered, thus leaving a sticky surface.

The apparatus is shown as comprising a vehicle 10 provided with a tank 11 thereon for receiving and transporting the liquid material. This is shown as drawing a second vehicle 12 which is provided with a load of fine aggregate material, preferably in the form of sand or fine stones, but it may range in size from an impalpable powder to stones or fragments two or more inches in diameter. This vehicle is also provided with a moving bottom 13 for constantly forcing the solid particles rearwardly and delivering them over a roller 14 to a distributing cylinder 15. The material then falls in a sheet from the vehicle and is deposited on the road bed. A shield 16 is provided to prevent scattering.

From the tank 11 there extends a pipe 17 rearwardly and this is connected with a transverse spray pipe 18. Although one such pipe is enough in some cases, any number may be used and I have shown two in the present instance, both connected with the pipe 17 so as to receive a supply of fluid therefrom. One is located in front of, and the other at the rear of, the descending sheet of fine aggregate material. These two supply pipes are so located that the spray openings will eject a spray of liquid therefrom toward the stream of fine particles and come into contact with the same on both sides before it reaches the road bed. In this way the matrix and aggregate material are thoroughly mixed, or in other words the particles of aggregate material are substantially covered by the matrix while they are in a separated condition. This action, of course, takes place just before the aggregate material reaches the road bed so as to be deposited upon it. The surfaces are still molten and sticky and the force of the falling particles is so increased by the liquid being forced against them, as to assist in compacting the mixture on the road bed and causing it to fill and seal any interstices which may be present.

Although in the above description I have referred to the aggregate and matrix material as falling on the road bed, it will be understood that if fine sand is used, in the mixture as described the mass can be de-

posited on a previously prepared bed of coarser aggregate material, as for example, broken stone. However, in the present case, I have shown a third vehicle 20 trailing behind the vehicle 12 and provided with a movable bottom and distributing mechanism similar to that shown on the vehicle 12 for distributing a coarse aggregate material on the surface produced by the mixture of sand and bitumen or cement. It will be understood that this coarse aggregate material is then immediately rolled into the soft surface on which it is deposited. This constitutes an expeditious and practical method of producing a roadway of this character.

It will be understood, however, that the invention is not limited to the use of any particular matrix material or any particular aggregate material or materials, as it can be applied in the manufacture of cement roads in which case the previously mixed cement in a thin creamy condition may be used as a matrix material, or the cement may be mixed in a dry state with the aggregate material and the combination wet with the sprays. The latter is shown in Fig. 3. In this case the dry cement, usually mixed with sand or gravel, is fed down the chute 21 so as to fall over the alternately slanting guides 22 and water is sprayed on it during its descent from pipes 23.

The coarse aggregate material can be distributed by the vehicle 12 and coated with the matrix material in the manner shown in Fig. 2 in connection with that vehicle without the use of the third vehicle and in fact some of my claims are not limited to any number of vehicles.

Although I have illustrated and described only one form of apparatus and a certain procedure and by which the method can be carried out, I am aware of the fact that many modifications can be made in both without departing from the scope of the invention as expressed in the claims.

Therefore, I do not wish to be limited in these respects, but what I do claim is:—

1. A method of road building which consists in discharging a thin sheet of particles of aggregate material on the road and during its progress toward the road-bed and while falling freely in the air discharging liquid or semi-liquid matrix material in thin sheets on both sides of the sheet of aggregate material, whereby the individual particles of aggregate material will be covered with the matrix material during their travel toward the road-bed and before the particles of aggregate material are compacted together and the aggregate material will be deposited on the road-bed in a, freshly covered condition, the matrix material being directed in sprays against the falling ag-

gregate material in such direction as to assist gravity in forcing the mixture into the road surface.

2. In an apparatus for making a roadway, the combination of a tank for receiving and holding matrix material in a liquid or semi-liquid condition, a receptacle for receiving aggregate material, means connected with said receptacle for discharging the aggregate material and dropping it on the road-way in a thin sheet, and means connected with said tank for spraying the matrix material therefrom on the two opposite surfaces of said sheet of aggregate as it drops toward the road bed.

3. The combination of a vehicle having a receptacle thereon for containing a body of matrix material adapted to harden upon continued exposure, a second vehicle with the same adapted to support a body of aggregate material, mechanical means on the second vehicle for positively discharging the aggregate material, separating it in the air and dropping it in a continuous stream on the roadway, and means extending from the matrix receptacle for delivering a spray of the matrix material on the body of the aggregate material while in the air.

4. The combination of a vehicle having a tank thereon, a trailer behind the same, means on the trailer for discharging a thin sheet of aggregate material downwardly, a pipe extending from the tank and supported by the trailer, and two transverse spray pipes connected with said pipe and located on opposite sides of said sheet.

5. In an apparatus for road building and the like, the combination of a vehicle, and means supported thereby for producing two sprays of liquid material under pressure, with mechanical means whereby particles of solid material are carried in a constant and uniform manner and delivered in a thin sheet so as to fall between the lines of sprays produced by the first-named means to insure a liquid coating on both sides of the sheet of solid particles, the pressure of the sprays being so directed as to assist gravity in forcing the mixture into the road surface.

6. The combination of two vehicles, one trailing behind the other, means carried by said vehicles for carrying and discharging matrix and aggregate materials, and means whereby the matrix and aggregate materials are directed toward the road way at points between the vehicles, the matrix material all being deposited in advance, and aggregate material being deposited upon it, whereby the wheels of the vehicles will not have to pass over an uncoated matrix layer.

7. The combination with means for discharging matrix material on a road bed, of a vehicle adapted to carry aggregate mate-

rial, and means for discharging the aggregate material immediately after the matrix material is discharged, said means comprising means for conveying the aggregate material along said vehicle, and a positively driven distributing device located at the discharge end of said conveying means in

position to receive a regular and uniform deposit of aggregate material therefrom by gravity.

In testimony whereof I have hereunto set my hand.

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JOHN A. JOHNSTON.