No. 881,035. PATENTED MAR. 3, 1908.

B. H. THWAITE.

METHOD OF MAKING A DUSTLESS ROAD SURFACE.

APPLICATION FILED DEC. 9, 1907.

2 SHEETS—SHEET 1.

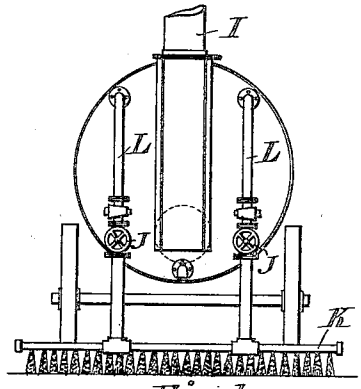


Fig. 1.

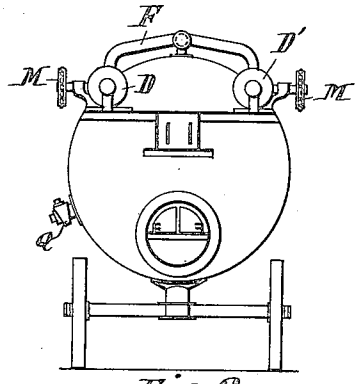


Fig. 2.

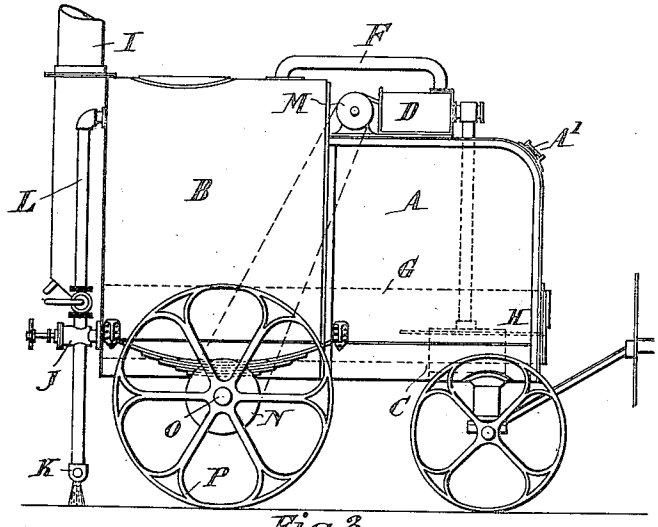


Fig. 3.

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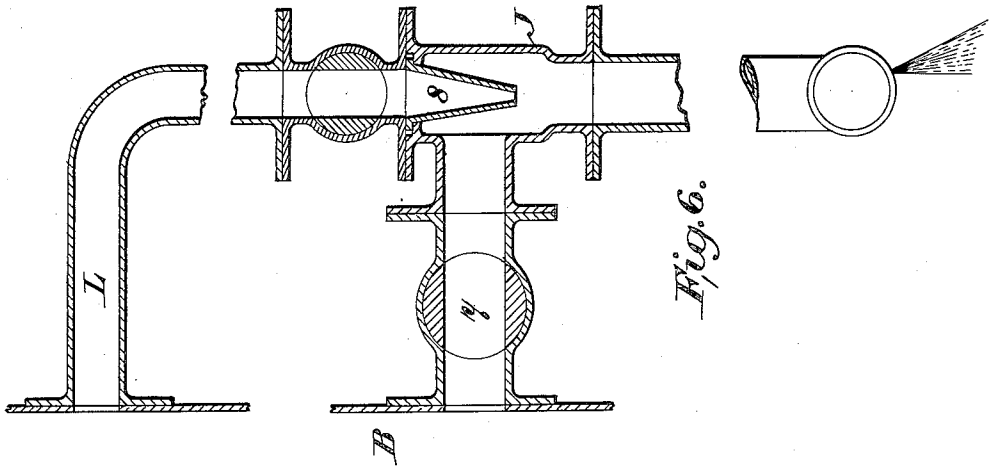


Fig. 6.

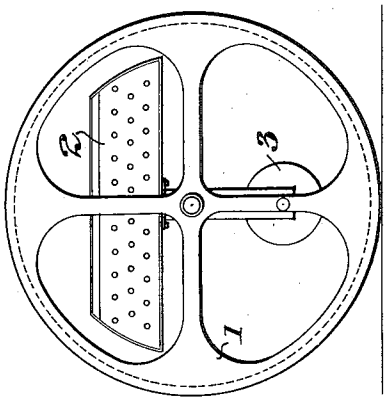


Fig. 4.

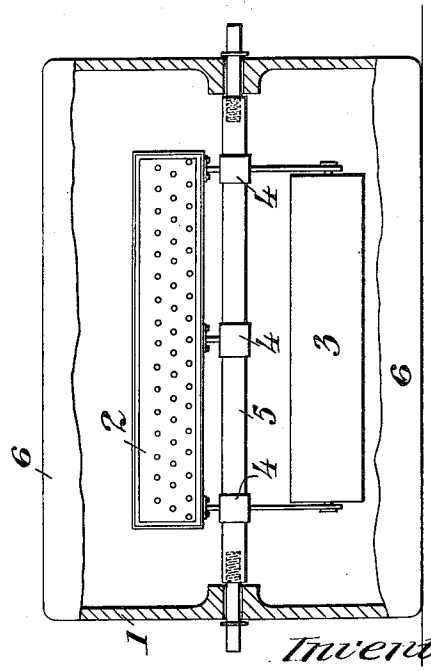


Fig. 5.

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METHOD OF MAKING A DUSTLESS ROAD-SURFACE.

No. 881,035. Specification of Letters Patent. Patented March 3, 1908.

Application filed December 9, 1907. Serial No. 405,730.

To all whom it may concern:

Be it known that I, BENJAMIN HOWARTH THWAITE, a subject of the King of Great Britain, residing at London, England, have invented a certain new and useful Improved Method of Making a Dustless Road-Surface, of which the following is a specification.

My invention relates to a method of securing the efficient surfacing of roadways and also the binding of the materials constituting roadways by means of hydrocarbons, such as tar and pitch, and thereby producing a dustless road surface.

To effect a more perfect and permanent binding of the roadway particles, I preliminarily heat the tar and liquid pitch fluid, up to a temperature that will secure the removal of any contained moisture, so that no steam will be evaporated during the subsequent heating of the tar. I feed this preliminarily heated fluid tar and pitch into a suitable apparatus, where it is raised to a temperature varying from 350° to 450° Fah. This tar-fluid is, by the effect of hot air pressure, forced into the roadway surface in fine and uniformly distributed jets, free from water or steam. Now in order to effectively secure the binding of the materials, constituting the roadway surface, with the heated hydrocarbons, I preliminarily heat the roadway surface before the heated fluid hydrocarbon is applied.

I effect the heating of the roadway surface by means of a road roller so constructed as to permit the periphery of such apparatus, which is made hollow, to be heated to a comparatively high temperature, say 500° Fah., or even higher.

The roller may be heated by means of a petroleum spray, or other liquid or solid combustible agent, introduced through the hollow shaft, or applied directly to the periphery of the roller, or oil lamps, coke cradles, or other heating devices may be suspended from the axle of the roller such heating devices having weighted pendulum rods, so that they remain vertical during the rotation of the roller. Now as the heated periphery of the roller passes over and in contact with the road surface it heats such roadway surface and evaporates the moisture from the surface of the silicious and other constituents forming the roadway surface, and thus assists in securing the binding effect of the heated hydrocarbons, on the constituent particles before mentioned.

The roller may be passed over the road surface more than once in order that the desired evaporating effect may be obtained. The last passage of the roller is immediately in advance of the spraying machine. By the distribution of such water-free compound of tar and pitch (heated to the temperature specified) on to the preliminarily heated roadway surface, I obtain a tenacity of adherence. The result is the consolidation of the roadway surface by means of a hydrocarbon environment.

In order to simplify the apparatus for the dual heating of the compound of pitch and tar, I prefer to divide such apparatus into two compartments, one of which constitutes the feed compartment, which is an open vessel, and into which the tar and pitch can be directly introduced; the other compartment consisting of a closed and pressure sustaining one, being the compartment in which the temperature is increased to the degree defined. The liquid tar and pitch are pumped from the open vessel into the closed one, and air is also pumped therein to establish any desired pressure, to assist in ejecting and spraying the hot hydrocarbon fluid through a distributing perforated pipe. A common flue and furnace serves for heating both compartments of the apparatus.

Of course I may employ the two vessels, one for feeding preliminarily heated tar and pitch and the other for distributing such compound on to the roadway.

The pumps I employ to feed the liquid hydrocarbons into the feed and into the distributing vessel or compartments are equipped with a ball type of non-return valves; they are driven by sprocket and chain or other mechanical gearing from the axle of the feed and spreading machine or apparatus.

I may utilize two independent air and hot tar pumps driven as described, or I may employ one pump only, so arranged as to pump both air and fluid, pitch and tar, into the closed and pressure compartment.

In order to secure the effective spraying of the liquid tar and pitch, by the compressed air, or other vapor or gases stored in the space over the liquid hydrocarbons, and which space is connected by valvular connections to the distributing tail pipe, I employ a cone shaped nozzle, by which the air aspires or drains and mixes with the fluid hydrocarbons before the latter enter such

distributing pipe, by which they are distributed through perforations on to the roadway surface.

When it is desired to make a temporary application of my system, I employ a tar or pitch and tar feed only, into which I introduce a small proportion of water to aid the spraying qualities of the compressed air. Such admixture of water with the tar makes the system independent of the use of the air pumps for temporary or special purposes where the complete dehydration of the tar is not essential.

Referring to the drawings accompanying and forming part of this specification Figure 1 shows the spray distributing end-view of the anti-dust machine, Fig. 2 is the fire door end-view showing the tar pressure pump, and Fig. 3 represents a side elevation of the apparatus showing the two tar containers. Fig. 4 represents the end view of the heating road roller, and Fig. 5 is a section thereof. Fig. 6 illustrates in section the distributing pipes.

A is the tar feed container, into which the tar is fed through the lid or door A′ and thence is pumped through a filter box C (shown in dotted lines) by means of the pump D, and delivered into the container B under pressure through the connecting pipe F.

The tar in both containers A and E is heated by means of a furnace flue G having an internal, or it may be external firegrate H. The chimney I serves to take away the products of combustion.

The hot tar is supplied to the tar spray distributing pipe hereinafter described through the valve equipped outlet J. The highly heated tar is sprayed by air pressure supplied by one or both of the pumps D and D′, this pressure of air being applied to the space over the tar and serves to eject the highly heated tar through the valve equipped outlet J and through the perforations of the distribution pipe K.

When it is desired to further spray the heated tar, the air under pressure is caused to flow from the container B by means of pipes L from which it flows through the tar spray distributing rear pipe K effectively spraying the hot tar as it leaves the nozzles or perforations of such pipe K.

Fig. 1 shows the tar spray distributing pipe K more clearly, as well as the tar flow valvular outlet connections J and the air pipes L.

Fig. 2 shows the air and tar pumps D and D′, the pumps being actuated by the sprocket wheels M, driven by link chain, or other gear from a sprocket wheel N on the axle O of the rear wheels P.

A valve equipped connection Q in Fig. 2 permits metallic tubing to be rapidly coupled, thus allowing the tar from an ordinary tar boiler to be fed into the vessel, whether hot or cold.

An especially contrived road roller 1 is equipped with a coke-fire basket 2 or other equivalent fire or burner, such as that produced by petroleum oil. This fire basket 2 is kept in vertical position, more or less perfect by means of the pendulum or hanging or suspended weight 3, the whole being carried by movable or loose collars 4 on the central axis or spindle 5.

The fire or flame supplied in the basket 2 of perforated plate iron heats the heavy rim 6 of the road roller and the rim in its rotation transfers the heat on to the road surface, rapidly evaporating the moisture from the road surface, and from immediately beneath it, before the heated spray is applied. The apparatus is dragged in front of the tar spray machine above described. Fig. 6 is an enlarged section of valve equipped outlet J Fig. 1, but slightly modified as to position of tar valve.

The highly heated tar escapes from the heated tar container B, through the valve 7, Fig. 6 and air under pressure from the pipe L meets the tar in the valvular chamber J at the mouth of the cone shaped nozzle 8 by which the spreading action of the tar is increased through the aspiratory influence of such nozzle.

What I claim is:—

1. The herein described method of making dustless road surfaces consisting in artificially heating the road surface and immediately spraying heated hydrocarbon thereon to provide a covering.

2. The herein described method of making dustless road surfaces which consists in dehydrating the road surface by the application of artificial heat directly thereto and immediately spraying the surface thus treated with a heated liquid hydrocarbon.

3. The herein described method of making dustless road surfaces which consists in passing a highly heated body over the road surface to dehydrate and heat the same, and immediately spraying heated hydrocarbon thereon before appreciable cooling of said surface.

4. The herein described method of making dustless road surfaces which consists in artificially heating the road surface to dehydrate the same and to effect a thorough binding thereof, and spraying heated hydrocarbon on the surface thus treated to provide a waterproof wearing surface.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

B. H. THWAITE.

Witnesses:
GEO. HARRISON,
ALEXANDER W. ALLEN.