T. J. McDONALD.

ROAD SURFACING MACHINE.

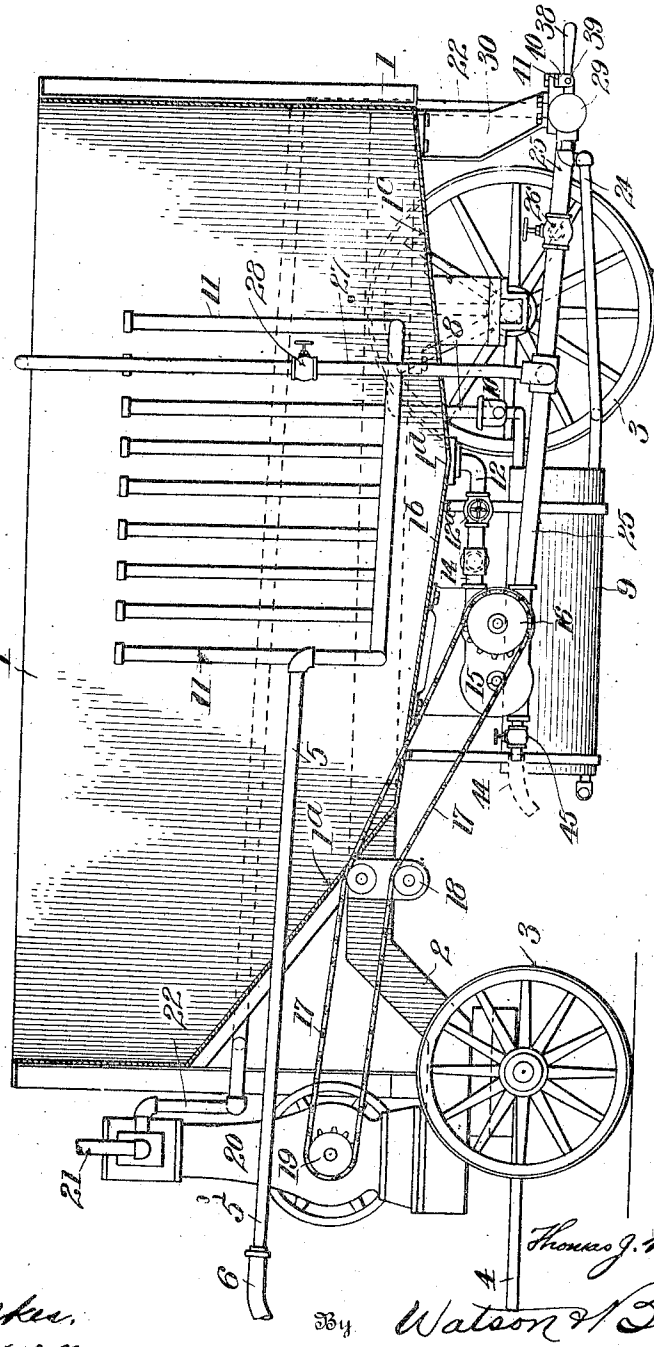
APPLICATION FILED APR. 21, 1910.

1,089,145.

Patented Mar. 3, 1914.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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4 SHEETS—SHEET 2.

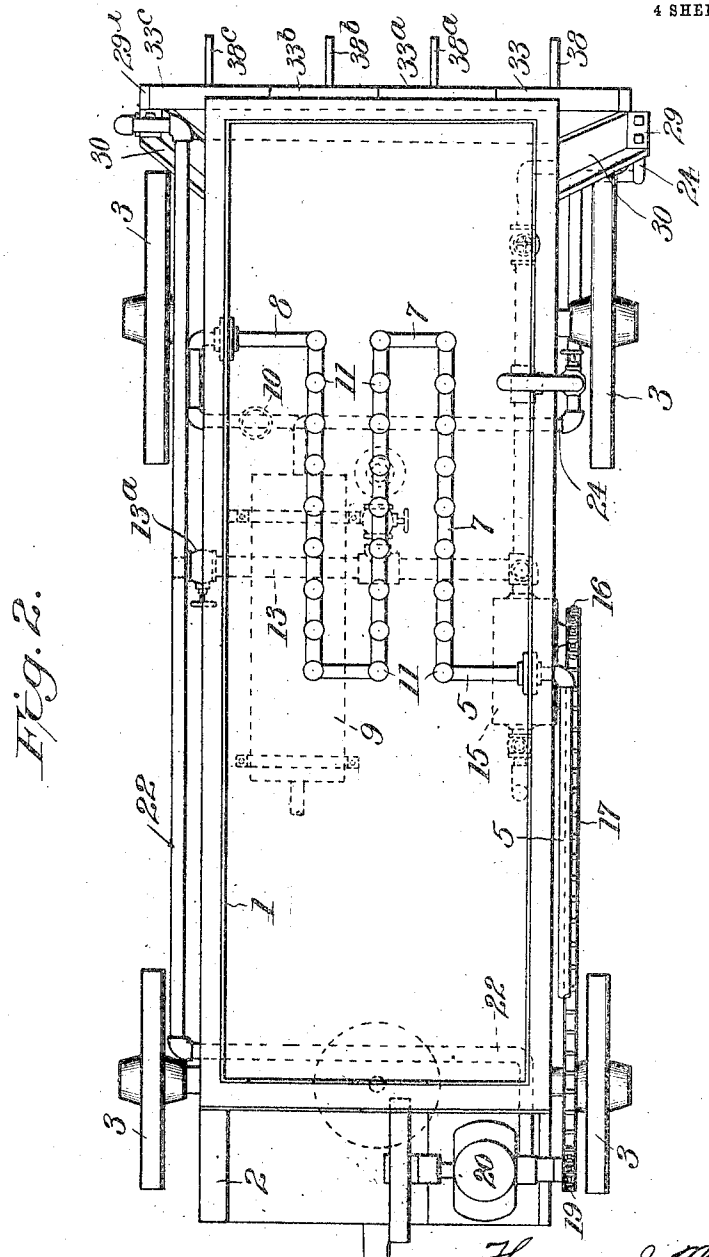


Fig. 2.

Witnesses

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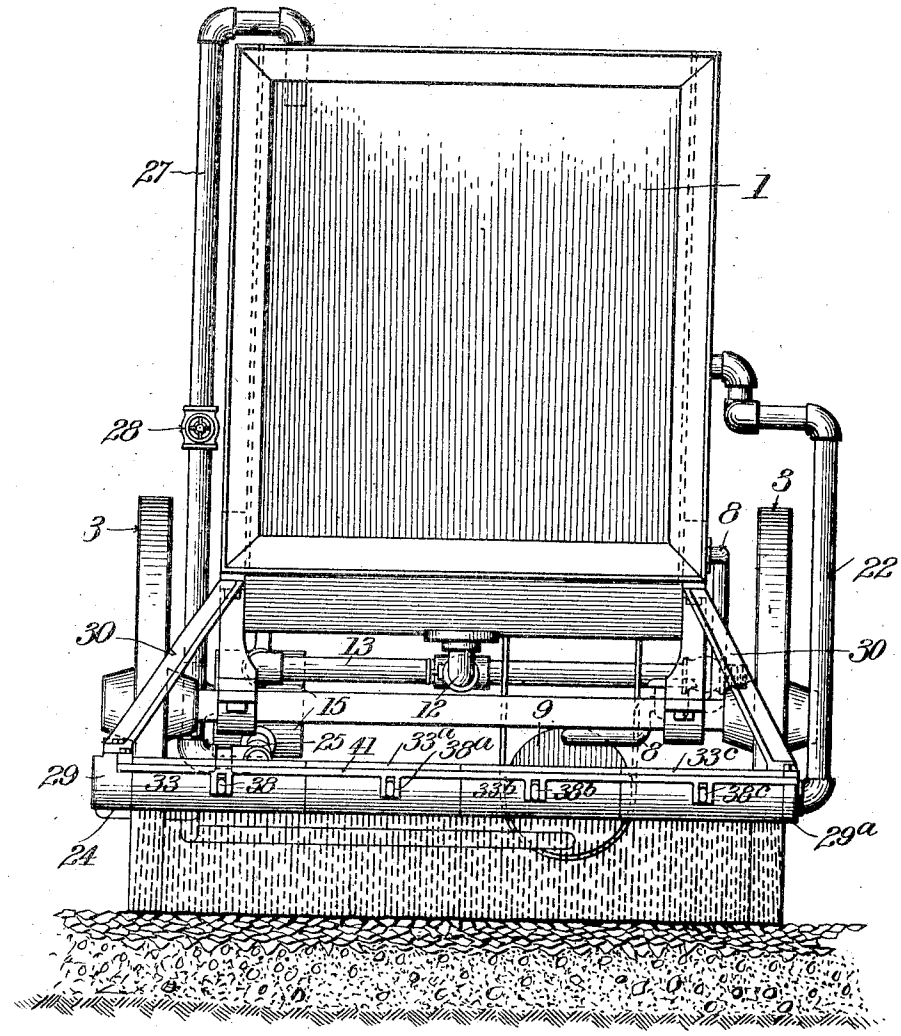
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4 SHEETS—SHEET 3.

Fig. 3.



Witnesses

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4 SHEETS—SHEET 4.

Fig. 4.

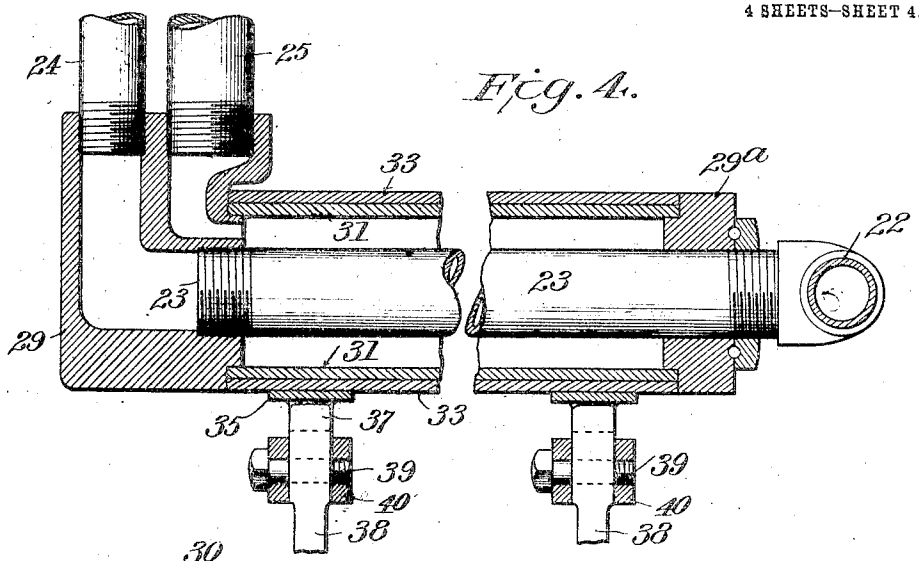


Fig. 5.

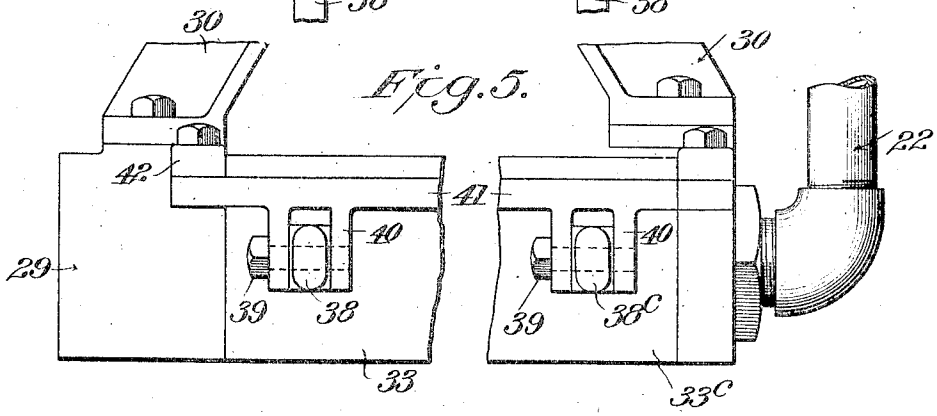
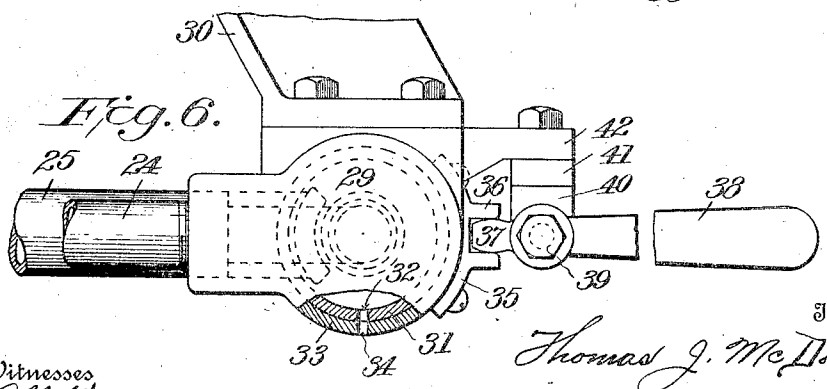


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS J. McDONALD, OF BALTIMORE, MARYLAND, ASSIGNOR TO AMERICAN CAR SPRINKLER CO., OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ROAD-SURFACING MACHINE.

1,089,145. Specification of Letters Patent. Patented Mar. 3, 1914.

Application filed April 21, 1910. Serial No. 556,773.

To all whom it may concern:

Be it known that I, THOMAS J. McDONALD, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Road-Surfacing Machines, of which the following is a specification.

My invention relates to road surfacing machines, and more particularly to machines for applying a binding material to a road-bed composed of broken stone or the like.

In building certain types of roads it is the practice to construct the bed of broken stone of various degrees of fineness, and, after thoroughly tamping or rolling the same, to apply a surfacing or binding material thereto, such binding material usually consisting of some coal tar or bituminous composition, asphalt or the like. Such substances are comparatively solid at normal temperatures, and in order to spread them successfully it is necessary to apply them hot. The usual practice has been to heat the bituminous material in tanks along the road side, and to apply the same to the road-bed manually by means of dipping and pouring from buckets. Such a method is extremely slow and tedious, and has the further objection that the material does not penetrate into the road-bed to a sufficient extent to give good results. Attempts have been made to provide machines for applying such material, but it has been found that the pipes, pumps, nozzles, etc., employed, very readily become clogged, great difficulty being experienced in maintaining the material at a temperature sufficient to insure the necessary degree of fluidity.

It is the primary object of the present invention, therefore, to provide a machine of this character in which heat is applied to the material at the point of delivery, thus insuring proper working of the distributing device, and also causing the material to penetrate better into the interstices between the stones of the road-bed.

A further object is to provide a distributing apparatus adapted to deliver a continuous stream or sheet of the material under pressure onto the road-bed, and to provide means for varying the thickness of such stream as may be necessary or desirable.

With the above objects in view, and to provide a machine which shall be simple, reliable and entirely practical, my invention consists in the construction and arrangement of parts hereinafter described, and illustrated in the accompanying drawings in which,

Figure 1 is a side elevation of my complete machine, parts being shown in section; Fig. 2 is a plan view of the same; Fig. 3 is a rear elevation thereof; Fig. 4 is a horizontal section on an enlarged scale, showing my improved distributing device; Fig. 5 is a fragmentary rear elevation of such device; and, Fig. 6 is a side elevation thereof, partly in section.

Referring to the drawings in detail, my improved machine comprises an open tank 1, preferably formed of sheet metal, and having a sloping bottom comprising the portions 1^a, 1^b and 1^c, so mounted that the material in the tank tends to flow to the lowest point 1^d, of the bottom of the tank. The tank is suitably supported on a frame 2, mounted on four wheels 3, and provided with a tongue or other coupling device 4, by means of which the entire machine may be connected to a traction engine or steam roller. Connected with the boiler of such traction engine or roller by means of a flexible hose 6, is a steam pipe 5, which extends into the tank and connects with a zig-zag, horizontally disposed pipe or manifold 7, as clearly shown in Fig. 2. From the other side of this manifold extends a pipe 8 through the wall of the tank into a reservoir 9, the pipe 8 having a steam trap 10 inserted therein. Extending upwardly into the tank from the manifold are a plurality of heating pipes 11, having closed ends. Any other suitable form of radiator or heating coils may be employed in place of that just described.

Extending from the lowest point 1^d of the tank bottom is a pipe 12, having a hand valve 12^a therein and connecting with a transversely extending pipe 13, which, in turn, is connected by a short pipe 14 with a pump 15. The other end of this pipe 13 may be closed by a valve 13^a and may, if desired, be connected with another pump. The pump 15 may be of any suitable type, but, as shown, and preferably constructed, it is of the rotary type, and is provided with a sprocket wheel 16 for operating the same. From the sprocket wheel 16 extends an end-

less chain 17 over suitable guide pulleys 18, to a driving sprocket 19 mounted on the shaft of a steam engine 20, which may be of the vertical or any other suitable type. Steam is supplied to said engine by means of a pipe 21 from any suitable source, preferably from the boiler of the traction engine or steam roller above mentioned.

Connected to the exhaust of the engine 20 is a pipe 22, which extends back to the rear of the machine and connects with a pipe 23 (see Fig. 4) extending through the distributing device hereinafter described. Extending from the other end of the pipe 23 is a pipe 24, which connects with the reservoir 9. This reservoir serves to collect the water of condensation, which water, if desired, may be fed back into the boiler.

Extending from the pump 15 is a pipe 25, which connects with the distributing device hereinafter described, and which preferably includes a hand valve 26 by means of which the flow of material to the distributing device may be cut off. Connected to the feed pipe 25 between the pump and valve 26 is a branch pipe or by-pass 27, which preferably includes a valve 28, and which extends upwardly and discharges into the top of the tank, as clearly shown in Fig. 3.

The distributing device is arranged at the rear of the machine, adjacent the road-bed. It comprises a pair of fixed heads 29 and 29a, into the first of which the pipes 23, 24 and 25 are secured, and between which extends a fixed drum 31. This drum 31 is concentrically disposed around the pipe 23 in such a manner as to leave an annular space between the pipe and itself. On its lower side the drum 31 is provided with a slit or slot 32 which extends throughout its entire length (see Fig. 6).

Surrounding the inner drum 31 is an outer drum, which is provided with a similar slit or slot 34, coextensive with the slot 32. This outer drum is preferably formed of abutting sections, four such sections 33, 33a, 33b, 33c being shown in the drawings (see Figs. 2 and 3). Means are provided for rotating each of these sections independently of the other on the inner drum 31 in such manner as to permit the slots 32 and 34 to move into and out of register with each other. As shown in the drawings, such means comprises a lug 35, secured to each section, such lug comprising spaced ears 36, between which ears engages the nose 37, of a lever 38, 38a, 38b, 38c, pivoted as by means of a pin 39 between spaced lugs 40, carried by a transversely extending bar 41, supported on suitable brackets 42.

Connected with the pump and feed pipe by means of a valve 45, is a nipple to which a hose connection 44, extending from the boiler, may be attached, in order to blow out any excessive accumulations which may collect and tend to interfere with the operation of the machine.

The broken stone having been properly laid in position upon the road bed, my improved machine, having been previously filled with binding material is drawn along over the surface by means of a traction engine or the like. The heating pipes 11 maintain the material in a molten and fluid condition, and it is forced by the pump through the pipes 12, 13, 14 and 25 to the distributing device at the rear of the machine, the exhaust steam meanwhile passing through the pipes 22, 23 and 24 and serving to heat the material at the point of delivery where it passes through the distributing device. This I regard as one of the most essential features of my invention, since I have found in practice that it is impossible to successfully apply such bituminous material without heating it at the point of discharge from the machine. Such heating prevents any possibility of the distributing device becoming clogged, and insures the material being delivered in a highly liquid condition so that it will penetrate into the interstices between the stones of the road-bed.

It will be understood that the pump drives the material from the distributing device through the slits 32 and 34 in a continuous sheet or stream, and causes it to strike the road-bed with considerable force, whereby proper penetration is assured.

It is clear that by manipulating the handles 38, 38a, etc., the thickness of the stream may be varied as desired. Not only this, but the thickness of the stream at one part of the distributer may be made different from that at another part, thereby enabling the operator to apply, if he so desires, more binding material at one point in the width of the road than at another.

When it is desired to stop the flow of material to the distributer, the valve 26 may be closed, and the material will then flow through the pipe 27 and back into the tank. Such flow may also occur at any time with the valve 26 open, if the pump is delivering the material faster than the slits 32 and 34 will permit it to escape.

It will thus be seen that I have provided an extremely simple, practical and efficient machine for applying binding material to the surface of roads and the like, and it is thought that the numerous advantages of my invention will be readily appreciated by those familiar with such matters.

What I claim is:—

1. In a machine for applying liquid material to a roadbed, a tank for containing the material, such tank having an inclined bottom, a pump, a pipe extending from the lowest point of the inclined bottom to the pump, means for heating the material in the

tank adjacent such point, a distributing device, a pipe extending from said pump directly to said distributing device, and additional means for heating the material as it passes through the distributing device.

2. In a machine of the class described, the combination with a tank, a distributing device, means for forcing liquid under pressure from said tank to said distributing device, such distributing device comprising a pair of drums, circular in cross section, and arranged snugly one within the other, the outer of such drums being formed in sections, the inner of said drums having a slit formed therein and extending throughout the length thereof parallel with the axis, each of the sections of said outer drum also having a corresponding slit, means for independently rotating the sections of said outer drum on said inner drum so as to bring the respective slits in said sections into and out of registry with the slit in said inner drum, a pipe extending axially through said drums and disposed concentrically therewith, and means for supplying steam to said pipe, whereby the material in said distributing device is maintained in a heated condition at the point of discharge.

In testimony whereof I affix my signature, in presence of two witnesses.

THOMAS J. McDONALD.

Witnesses:

EUGENE J. CRONIN,

JAMES MORAN.