Sept. 23, 1941. H. R. ERICKSON 2,256,639

SPRAY BAR FOR ROAD OILERS

Filed Dec. 18, 1937

Fig. 1

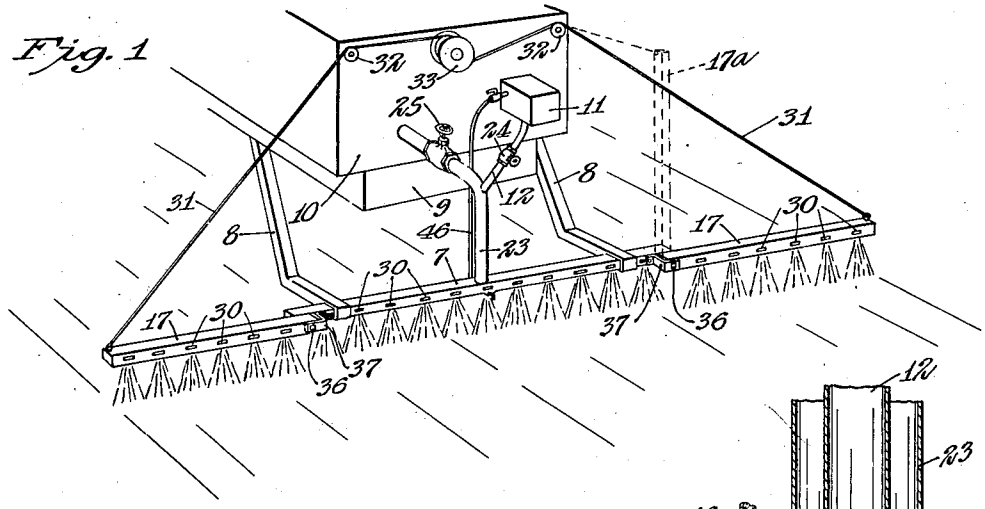


Fig. 2

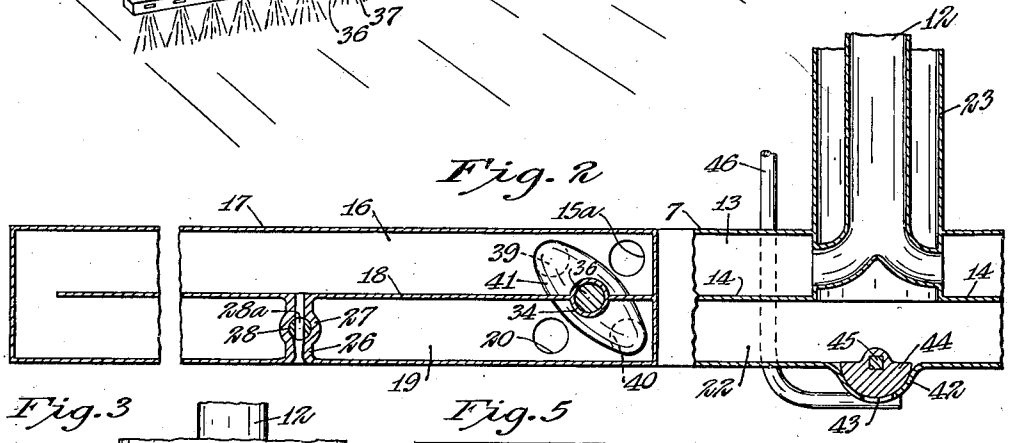


Fig. 3

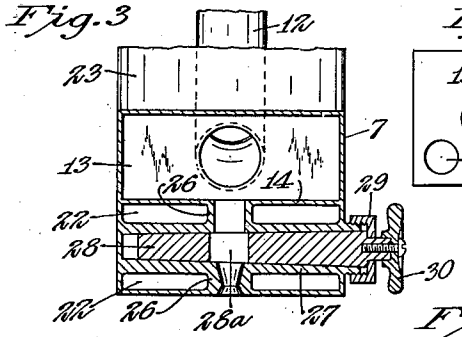


Fig. 5

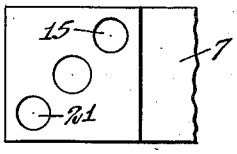


Fig. 4

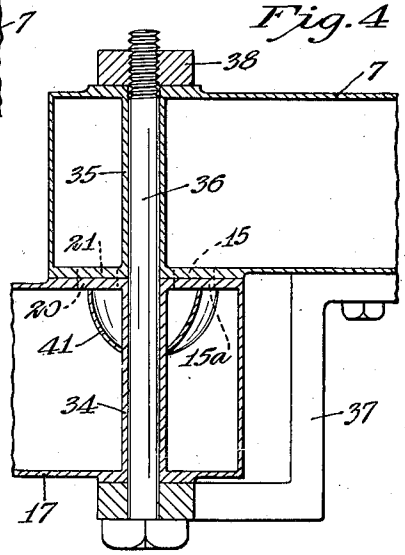


Fig. 6

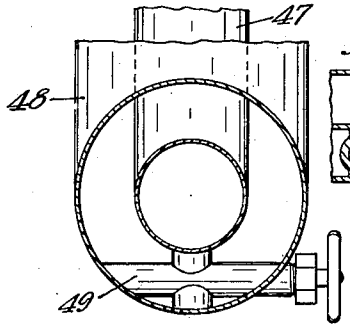
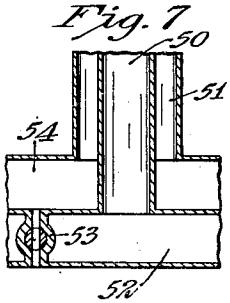


Fig. 7



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SPRAY BAR FOR ROAD OILERS

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4 Claims. (Cl. 299—34)

This invention relates to apparatus for spraying liquid or semi-liquid paving materials upon roadways, and more particularly has to do with an improved type of spray bar for distributing such liquids.

Apparatus has been in use for many years for evenly spraying liquid binders such as heavy oils or liquid asphalt upon roads to unite an aggregant, such as gravel or crushed stone. The general method utilized is to keep the oil or a cut-back asphalt in a heated condition in a tank upon a vehicle and distribute the heated surfacing material to a spray bar, which has a plurality of spaced valves connected thereto. The paving material is sprayed through the valves to form a strip of coating upon the road, which is fairly even and whose width depends upon the length of the spray bar, the spray bar, of course, lying transversely of the road and being moved along the road at a pre-determined speed to secure the desired thickness of coating.

One of the great disadvantages encountered in spraying surfacing liquids upon the road surface results from the tendency of the oil or asphalt to congeal or freeze in the relatively restricted parts of the valves. Some efforts have been made toward forcing all liquids from the spray bar and the valves after using the apparatus so that the paving material will not harden in the spray bar and valve. This has achieved some degree of success.

My invention, however, has as its general object the provision for preventing hardening of the surfacing material in the valves of the spray bar by utilizing the heat in the liquid surfacing material to maintain the valves at such a temperature that the oil, asphalt, or other paving material will not harden or freeze.

Another object of the invention is to provide a spray bar having a jointed extension in which means is provided for controlling the circulation of surfacing material through the extensions, when said extensions are being used and to cut-off flow to said extensions when they are not in use.

A further object of the invention is to provide means for simply and effectively exhausting most of the liquid paving material from the spray bar when it is not in use.

These and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawing, wherein like reference characters refer to the same or similar parts throughout the views, and, in which:

Fig. 1 is a perspective view of my improved spray bar shown in connection with a storage tank heater and control valve;

Fig. 2 is a longitudinal vertical section through approximately one-half of the spray bar with certain portions thereof broken away;

Fig. 3 is a vertical longitudinal section through one of the outlet valves;

Fig. 4 is a horizontal section through the joint between the stationary bar and its extension;

Fig. 5 is a fragmentary view in side elevation of the end portion of the stationary spray bar;

Fig. 6 is a fragmentary section through a modified form of the invention; and

Fig. 7 is a fragmentary vertical section of a modified arrangement of inlet and return conduits.

In the drawing I have illustrated a central stationary spray bar section 7 secured by suitable braces 8 to a suitable type of heater 9 or, if desired, to a portion of a piece of road machinery, not shown. The heater 9 is positioned beneath a storage tank 10 adapted to hold a quantity of liquid coating material. The liquid coating material may be drawn from the tank 10 through a suitable pump 11, and down through the inlet pipe 12 to the spray bar 7. As shown in Fig. 2, the inlet pipe 12 has a branch at its lower end to provide connections with the upper compartment 13 of the spray bar 7. The spray bar is divided into compartments by suitable partitions 14, which extend longitudinally of the stationary central spray bar 7 to the ends thereof. Thus liquid forced through the inlet pipe 12 and into the inlet compartment or conduit 13 of the spray bar will travel outwardly to the ends of the central spray bar section 7, and from each end of said central spray bar section will travel through a port 15 in the end of the central section 7 and a port 15a in the inner end of the upper inlet conduit or compartment 16 of the spray bar extension 17. The spray bar extension has a partition 18 which extends outwardly toward the ends of the extension but terminates short of the end of said extension. This permits liquid to flow out to the end of each extension, thence around the end of the partition into the lower or return conduit or compartment 19 through the extension outlet port 20 and the central spray bar return port 21. The liquid then travels along the return conduit 22 of the main spray bar

section 7 and upwardly through the return pipe 23 around the inlet pipe 12 and back into the storage and heating tank 10. Suitable valves 24 and 25 are provided to control the flow through the inlet and return pipes 12 and 23.

Positioned at spaced points along the stationary spray bar section 7 and the extensions 17 are outlet valves which control the flow of coating liquid through small outlet conduits 26 connected between the inlet conduits 13 and 16 of the main spray bar and its extensions. These valves include casings 27 of tubular formation which extend across from one side wall of the spray bar outlet conduits or compartments to the other side wall thereof. Within these tubular elements 27 are positioned valve elements 28 having openings 28a. The movable valve elements 28 extend outwardly upon the side walls of the spray bar sections, and are secured by suitable threaded caps 29. Operating handles 30 are secured to the movable valve elements 28 so that said elements can be turned to either open or close the valve outlet conduits 26. As shown in Figs. 2 and 3, the heated surfacing material flowing through the return conduit 19 and the spray bar extension and the return conduit 22 in the stationary spray bar section 7 will flow entirely around the valve structure, the heat from the flowing liquid, of course, being transmitted to the valve structure to maintain liquid standing in or flowing through the valves in heated condition, so that it will not harden and cause the valve to plug up or stick. The valve structure shown in Fig. 2 is illustrated in connection with one of the spray bar extensions, while the structure shown in Fig. 3 is a longitudinal section of the valve shown mounted upon a stationary spray bar section 7. This makes no particular difference insofar as illustration of the invention is concerned since all of the valves have identical structure.

As shown in Fig. 5, the outer side wall at each end of the stationary spray bar 7 is provided with a pair of ports 15 and 21 to permit circulation of liquid to and from each of the spray bar extensions 17. These ports are so positioned that liquid will flow into each spray bar extension through the ports 15a and out of the extension through one of the ports 20. This is the normal operating position of the entire spray bar with the extensions down in the position shown in Figs. 1 and 2. However, when the use of the extensions 17 is not desired, they may be drawn upwardly to the position 17a shown on the right-hand side of Fig. 1, by any suitable means, such as a rope or cable 31, running over a pulley 32 and wound upon a drum 33. The pivotal connection between the spray bar extensions and the stationary spray bar extension 7 includes tubular elements 34 and 35 extending through ends of the spray bar sections, as shown in Fig. 4, with a bolt 36 running through the end of a bracket 37 and through the tubes 34 and 35 with a nut 38 at one end of the bolt. The abutting surfaces of adjacent portions of the spray bar sections form a stationary seal for the joint due to the relatively high viscosity. When the spray bar extensions are in the upwardly turned position, indicated at 17a in Fig. 1, the spray bar extension ports 15a and 20 will be moved out of alignment with the ports 15 and 21 in the stationary spray bar section 7. This cuts off any flow from the stationary spray bar section to its extensions. In order to permit circulation in the stationary section 7 I have provided a pair of by-pass ports 39 and 40 adjacent the ports 15a and 20 in the inner ends of the spray bar extensions, the by-pass ports being connected by a short by-pass conduit 41. This permits circulation of liquid from the inlet conduit or compartment 13 of the stationary spray bar section 7 downwardly and into the return conduit 22 in said stationary section 7. Thus circulation through the central stationary spray bar is unobstructed whether the extensions are in their vertical or in their horizontal positions.

In order to drain any material lying in the spray bar unit, I provide a small sump 42 in the central lower portion of the main spray bar section 7. This sump has an opening 43 which may be closed by a suitable valve 44, the latter rotating with a valve pin 45. To assist drainage of surfacing material from the spray bar through the sump outlet 43, I have connected a suction line 46 to a portion of the sump, the line running up to the pump 11 and being connected to the inlet side thereof. From the pump the liquid thus drained may be returned to the storage tank 10, if desired.

In Fig. 6 I have indicated a modified form of spray bar. The small inner pipe 47 is connected to the equivalent of the inlet pipe 12 shown in the first described embodiment of my invention, and the outer large pipe 48 is intended to be connected to a return pipe similar to the return pipe 23 in the first described embodiment. One of the spray outlet valves is shown at 49, the interior construction thereof being the same as that shown in Figs. 2 and 3. It will be seen that the outlet valve in Fig. 6 is also nearly completely surrounded by the heated surfacing liquid flowing through the return pipe 48, thus keeping the valve heated to prevent hardening or freezing of liquid within the valve. It is, of course, understood that the inlet conduit 47 is open at its end spaced from the closed end of the return conduit 48 so that circulation from one conduit to the other is provided. It was thought not necessary to illustrate a joint showing the connection between a stationary spray bar construction according to Fig. 6 and an extension thereof, since such a joint would be relatively simple to construct and is not necessarily a feature of the general spray bar construction.

In Fig. 7 there is shown a portion of a spray bar structure in which the inlet pipe 50 extends through the outlet pipe 51 and communicates with the lower conduit 52 in the spray bar, and the outlet valves, one of which is shown at 53, are positioned in the lower conduit 52. The valves feed liquid from the upper outlet conduit 54. With this arrangement, the hotter incoming liquid surrounds the valves and keeps them warmer than in the other described embodiments of the invention.

From the foregoing it will be seen that I have produced a spray bar construction, which will permit free circulation of surfacing liquid therethrough, and which in addition maintains the outlet valves in such condition that there is no possibility of hardening of the material with said outlet valves. I have provided, also, a simply constructed joint between the main spray bar and its extensions, in the embodiment disclosed in Figs. 1 through 5, which will effectively control circulation through the spray bar as desired.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts

without departing from the scope of my invention.

What is claimed is:

1. In a spray bar for road oilers or the like, a first conduit, means for supplying heated surfacing material thereto, a second conduit substantially parallel to and adjacent said first conduit and in series flow communication therewith at an end thereof, spaced outlet elements connected to said second conduit substantially throughout the length thereof, said outlet elements being extended through said first conduit and terminating substantially flush with the outer side of a wall thereof, said outlet elements being of less size than the interior of said first conduit, whereby the heated material in said first conduit will circulate around said outlet elements extending therethrough to prevent hardening of the surfacing material within said outlet elements.

2. In a spray bar for road oilers, a first conduit, means for supplying heated liquid surfacing material thereto, a second conduit substantially parallel to said first conduit and having a common wall portion therewith, a series flow connection between said conduits at an end thereof, spaced outlet elements having flow connections with said second conduit through said common wall portion, said outlet elements extending through said first conduit to an outer wall thereof and having flow communication with the exterior of said first conduit, the interiors of said outlet elements being sealed off from the interior of said first conduit, and said outlet elements being of less size than the interior cross section of said first conduit.

3. In a spray bar for road oilers or the like, a horizontal relatively stationary double distributor conduit section, means for supplying heated surfacing liquid thereto, a double distributor conduit extension pivotally connected to said relatively stationary section at an end thereof, said extension being swingable from a horizontal to a vertical position, outlet valves positioned within portions of both of said sections to permit the circulation of heated surfacing material around said valves to prevent hardening of the surfacing material within said valves, and means for bypassing liquid from one portion of said stationary double conduit section to the other when said extension is swung to a vertical position.

4. In a spray bar for road oilers or the like, a header conduit, a partition longitudinally dividing said conduit into two sections, an inlet pipe communicating with the first of said sections, a communicating port through said partition to the second of said sections at a point remote from said inlet pipe, and spray outlet elements extending from an outer wall of said first section through said partition and having their interiors sealed from the interior of said first section, said outlet elements having liquid flow communication with the interior of said second section and with the exterior of said outer wall of said first section.

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