

July 5, 1938.

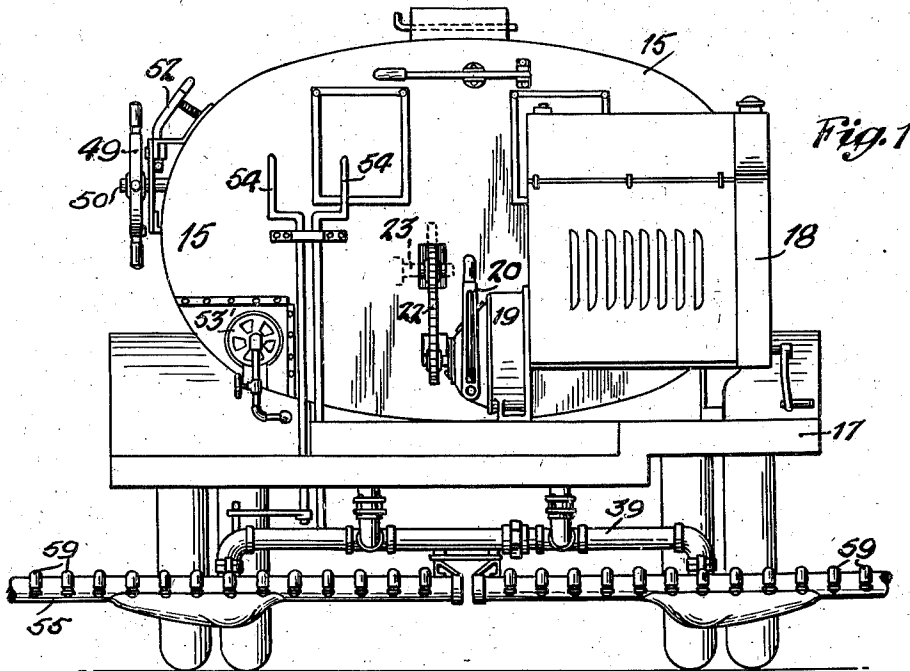
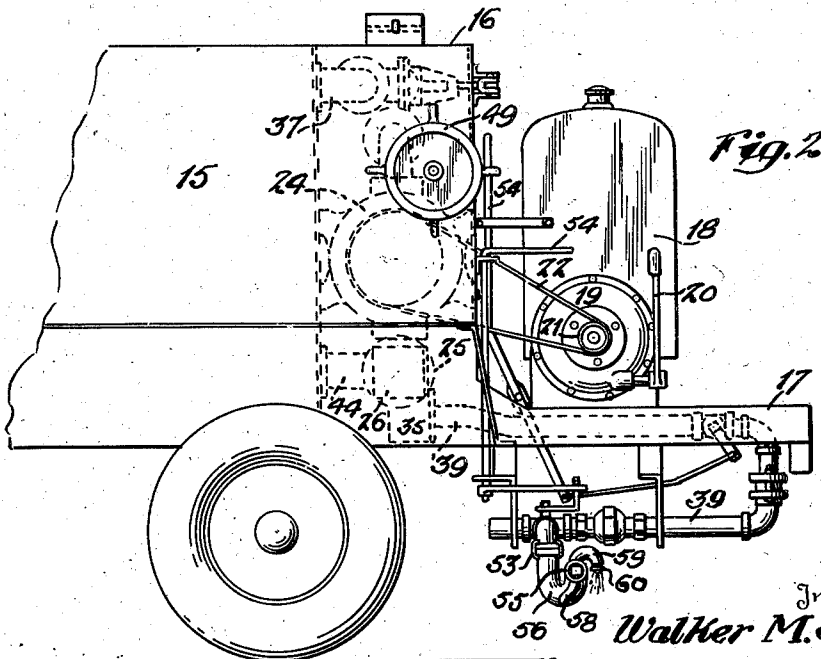
W. M. JAGOE

2,123,156

ASPHALT DISTRIBUTOR

Filed June 14, 1934

3 Sheets-Sheet 1



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July 5, 1938.

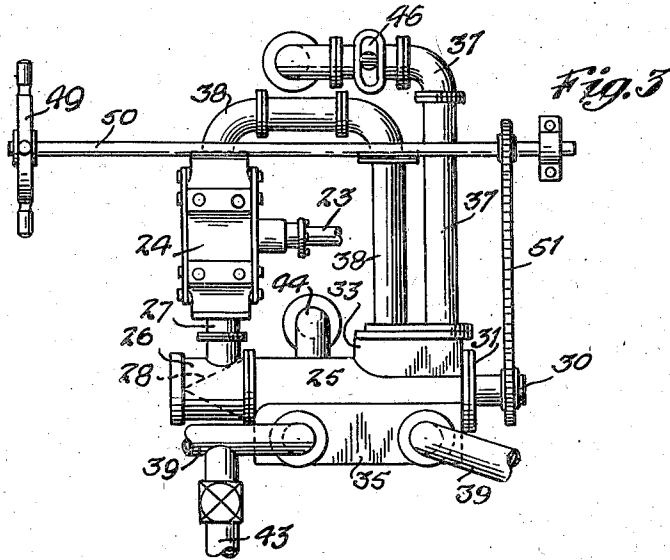
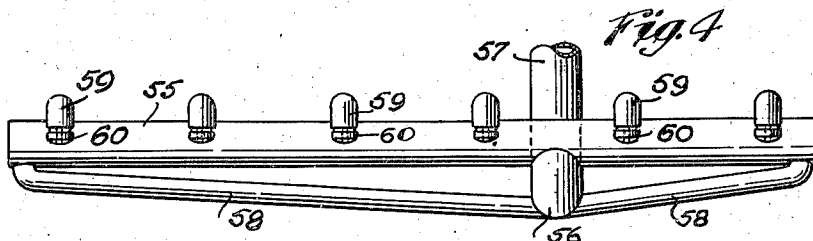
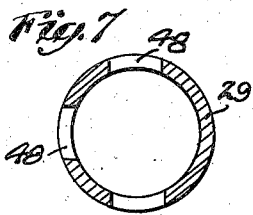
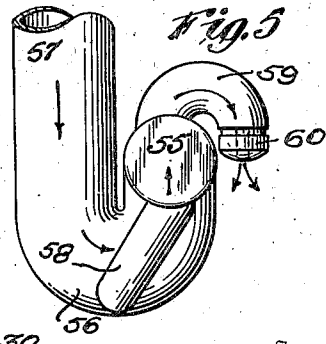
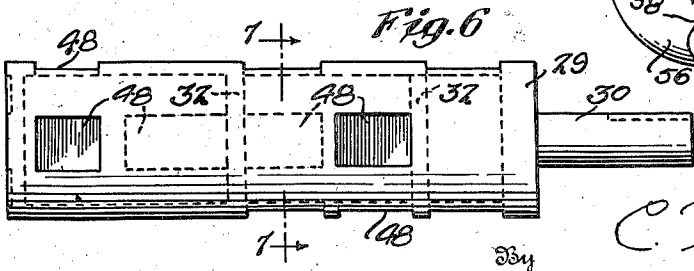
W. M. JAGOE

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ASPHALT DISTRIBUTOR

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3 Sheets-Sheet 2



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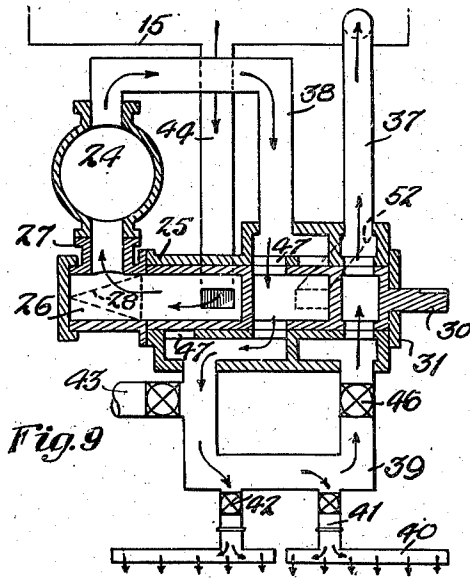
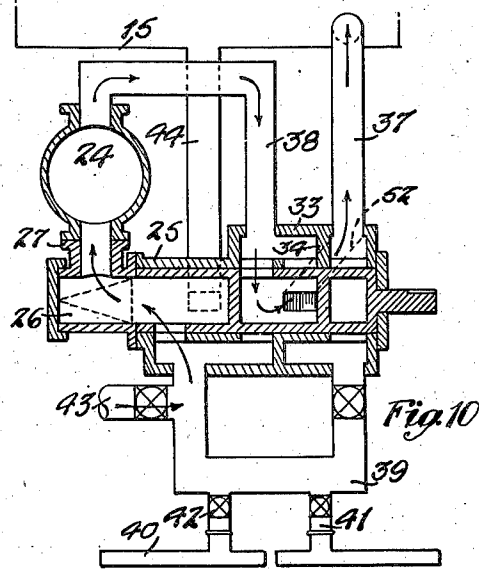
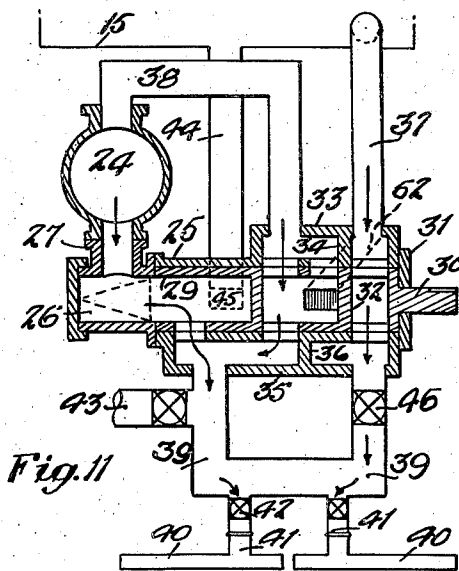
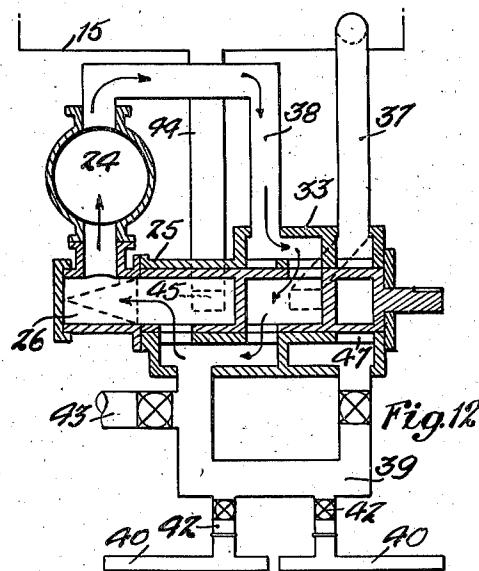
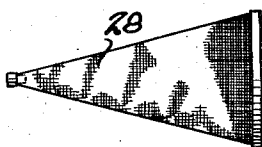
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2,123,156

ASPHALT DISTRIBUTOR

Filed June 14, 1934

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,123,156

ASPHALT DISTRIBUTOR

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Application June 14, 1934, Serial No. 730,676

13 Claims. (Cl. 299—34)

My invention relates to fluid distributors, and more particularly to sprayers or diffusers for applying oil, asphalt or the like to pavements and roads, although not necessarily restricted to this use.

In the spraying or distributing of asphalt and the like, great difficulty has been experienced in starting the flow of asphalt evenly throughout the length of the distributing bars, necessitating hand patch work. Difficulty has also been experienced in shutting off the flow of material from the bars simultaneously without dripping. An important object of my invention therefore is to provide a distributor in which the flow of material may be started uniformly, and in which the flow may be stopped uniformly without dripping.

Another object of my invention is to provide a novel spray bar for use with fluid distributors in which starting and stopping of the flow of material will be uniform throughout the length of the bar.

A further object of my invention is the provision of a novel valve and distributing system for use in a distributing device of the above mentioned character.

Other objects and advantages of my invention will be apparent during the course of the following description.

In the accompanying drawings which form a part of this specification, and wherein like characters of reference denote like parts throughout the same,

Figure 1 is a rear elevation of a tank truck having my invention applied thereto,

Figure 2 is a side elevation of the rearward portion thereof,

Figure 3 is a detail elevation of the valve and distributing system,

Figure 4 is an elevation of one of my novel spray bars,

Figure 5 is an edge view thereof, on a larger scale,

Figure 6 is an elevation of my improved distributing valve,

Figure 7 is a cross sectional view taken on the line 7—7 of Figure 6,

Figure 8 is an edge elevation of the valve,

Figure 9 is diagrammatic view of the valve and distributing system showing the spray position of the valve, and the path of the spray material being illustrated by arrows,

Figure 10 is a similar view illustrating the filling and sucking position of the valve,

Figure 11 is a similar view illustrating the drain position of the valve,

Figure 12 is a similar view showing the wash position of the valve, and,

Figure 13 is a side elevation of the conical strainer used in conjunction with the valve.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 15 designates the source of fluid supply which is the tank of a truck having a compartment 16 at the rear of the tank for the reception of the valve, pump and distributing system, and having a rear platform 17 projecting rearwardly of the rear wheels of the truck as seen in Figure 2. An auxiliary engine 18 is mounted upon the rear platform 17 and is provided with a transmission 19 of any suitable construction controlled by a lever 20 and having a driving shaft to which is connected a sprocket wheel or the like 21. A chain or belt 22 connects sprocket wheel 21 with a sprocket wheel on the shaft 23 of the pump 24. The pump 24 may be of any suitable construction and is arranged within compartment 16, as shown in Figure 2.

Below pump 24 and within compartment 16 is arranged a generally cylindrical valve casing 25 having a cylindrical strainer casing 26 bolted to one end thereof and communicating at one end with the open end of the valve casing. The lower end of the pump 24 communicates with strainer casing 26 through pipe 27. A conical strainer 28 is arranged within the strainer casing with its large open end facing the valve casing and its pointed end abutting against the closed end of casing 26, as seen in Figures 9 to 12. All material passing through valve casing 26 to pump 24 must of necessity pass through the mesh of the strainer 28. A cylindrical valve body 29 is rotatably arranged within the casing 25 and extends for the length thereof, abutting at one end against the adjacent end of the strainer casing 26 as seen in Figures 9 to 12. The valve body 29 is of tubular formation having its opposite end closed and provided with an axial shaft 30 extending out of the casing 25 for a substantial distance. A cap plate 31 has an opening to receive shaft 30 and is bolted to the casing 25 to secure the valve body 29 therein.

The valve body 29 has two transverse partitions 32 dividing the valve into three compartments, the compartment adjacent the closed end of the valve body being smaller than the other two compartments. The valve casing 25 is provided on its upper portion with a port chamber 33 extending from the closed end of the valve body to the second partition 32, and having a partition 34 in line with the first valve parti-

tion 32. A port chamber 35 is arranged on the lower side of the valve casing and extends throughout the length of the valve casing. A partition 36 is arranged in the chamber 35 and is located at a point intermediate of the two center valve body partitions 32. It will be seen that the partitions divide each of the port chambers 33 and 34 into two compartments, as shown in Figures 9 to 12. The compartment of chamber 33 nearest the closed end of valve body 29 is connected to tank 15 by conduit 37 while the other compartment of chamber 33 is connected to pump 24 by conduit 38. A conduit 39 connects the compartments of port chamber 35 and a pair of spray bars 40 communicate with conduit 39 by means of spaced pipes 41 having suitable valves 42 arranged therein. A valved supply pipe 43 communicates with conduit 39 and is adapted to be connected to a source of fluid supply when the tank 15 is to be filled.

A conduit 44 connects the tank 15 with a port 45 in the valve casing 25 adjacent the open end of the valve body and admits the oil, asphalt or other material to the valve in the operating or spraying position of the valve, indicated in Figure 9. A suitable nozzle pressure control valve 46 is arranged in conduit 39, as in Figures 9 to 12, or in conduit 37, as indicated in Figure 3, for controlling the pressure in the spray pipes 40.

The valve casing 25 is provided with suitable ports 47 adapted to connect the compartments of the port chambers with the valve body compartments when in registration with ports in the valve body. Each compartment of the valve body is provided with suitable ports 48 in the periphery of the valve body as shown in Figures 6 and 7. The valve body may be rotated within the casing in any suitable manner. I have provided an operating wheel 49 carried by a shaft 50 journaled for rotation in the compartment 16, the wheel 49 being arranged exteriorly of the compartment. A chain or belt 51 connects sprocket wheels on shaft 50 and on the valve shaft 30 so that rotation of wheel 49 will serve to rotate the valve body within its casing. A stop device 52 of any suitable construction may be provided to control operation of wheel 49.

The valve 29 has four operative positions as indicated in Figures 9 to 12. When moved to the running or spraying position indicated in Figure 9 the material is drawn by the pump 24 through conduit 44 into the end compartment of the valve, through the strainer casing to the pump, thence through conduit 38 to the middle valve compartment and to conduit 39 under pressure of pump 24. When valves 42 are open, the material passes into spray bars under pressure, although some of the material returns through valve 46 to the other end compartment of the valve and back to the tank 15 through conduit 37. By adjusting choke valve 46 which controls the return of material to the tank 15, pressure of material in the spray bars can be increased or lessened at will. The path of the material through the valve and conduits is indicated by the arrows.

When it is desired to fill the tank 15, the valve is turned to the position shown in Figure 10. Valves 42 are closed, and a hose or the like from a source of supply is connected to supply pipe 43, and pump 24 sucks material from the supply pipe through the end valve compartment into conduit 38 and through the middle valve compartment to by-pass 52 which connects the middle valve compartment with conduit 37, as indicated by the

arrows in this figure. Conduit 37 conducts the material to the tank 15.

An important feature of my invention is to utilize this fill position of the valve system to suck material from the spray bars at the end of the spraying operation. Heretofore considerable difficulty has been experienced due to the dripping of material from the spray bars. Even though the valves 42 are closed, dripping has been experienced. By moving valve 29 into the filling or sucking position shown in Figure 10, pump 24 will suck material from the spray bars and pipes back to tank 15, and thereby prevent dripping from the bars without reversing the direction of pump 24.

When it is desired to drain the system the valve is turned to the position shown in Figure 11. In this position, ports from each valve compartment are open, allowing material to drain from pump 24, conduits 37, 38 and 52 and valve compartments to the conduit 39 and spray bars 40.

When it is desired to clean out the valve system the valve is turned to the wash position indicated in Figure 12 and kerosene or other wash fluid is admitted through supply pipe 43. Pump 24 circulates the wash fluid through the valve compartments, port chambers and conduit 38, as indicated by the arrows.

The pump, valve and larger portion of the conduits are arranged within the chamber 16 which may be heated by suitable heaters such as indicated at 53' in Figure 1 to prevent congealing of the asphalt or other material.

While my improved valve system may be used with any of the conventional types of spray bars, I prefer to use the novel spray bar disclosed in Figures 4 and 5. The spray bars are detachably secured to the conduit 39 by suitable clamps 53. The conduit 39 extends under the platform 17 to the rear thereof and turns backwardly towards the front of the truck so that the spray bars are located under the forward portion of platform 17 as shown in Figure 2. The spray bars are two in number, being arranged in alignment transversely of the tank truck, as seen in Figure 1 and when not in use, they may be detached and hung at the sides of the truck. The valves which control the passage of material through conduit 39 and into the spray bars may be operated by control levers 54 which extend through the platform and are accessible to an operator standing upon the platform 17.

The spray bars each consists of a tubular bar 55 closed at both ends. A U-shaped siphon tube 56 has the upper end of one of its legs connected to the bar 55 adjacent the inner end thereof, while the other leg 57 extends above the bar 55 and is adapted for detachable connection with the conduit 39. The elbow portion of the siphon tube extends below the lower portion of the bar 55 for a substantial distance as seen in Figure 5. Pipes 58 extend from the low point of the siphon to the extreme ends of the bar 55. Although the use of the pipes 58 is preferred, for the reasons hereinafter pointed out, they may be dispensed with if desired, and the juncture of the siphon tube and bar spread out, as in Figure 1, to facilitate flow of material into and out of the bar. The use of the pipes 58 is indicated in Figures 2, 4 and 5. The two types of spray bars are obviously interchangeable, their other features being identical.

Spaced along the length of the bars 55 are nozzles which consist of inverted U-shaped pipes 59 of small diameter connected at one end to the upper portion of the bar 55 and extending

laterally beyond the bar as seen in Figures 2 and 5. Suitable removable perforated caps 60 are arranged in the ends of the nozzle pipes 59.

When the valve 29 is moved to the spraying position shown in Figure 9 and the valves 42 opened, oil, asphalt or other fluid is pumped through conduit 39 to siphon tubes 56, under pressure, and enters the spray bars at their lower ends, filling the bars from the bottom upwardly. The level of the liquid in the bars 55 will rise evenly, and as the nozzle pipes enter bars 55 at their tops, the liquid will start to flow from each nozzle cap simultaneously. When the pipes 58 are used, they will conduct the liquid to the ends of the bars 55 so that the bars are filled from both ends as well as from their juncture with the siphon tube, thereby insuring simultaneous starting of the spray nozzles.

When the supply of liquid is cut off by operating valve 29 or valves 42, the liquid in the bars 55 will not flow out of the nozzles due to the fact that they are supplied from the tops of the bars. However, in order to prevent any drip from the nozzles, the valve is moved to the filling or sucking position shown in Figure 10, and the liquid is sucked from the nozzles and bars by pump 24. By reason of the fact that the elbow portion of the siphon tube is the sump or low point in the system, the liquid will be sucked from the bars with ease, and the nozzle openings will not break the seal or vacuum. When pipes 58 are employed, as in Figure 4, the liquid will also be sucked from the ends of the bars, and there will therefore be no tendency for the liquid to hug the end walls of the bars 55.

Although it is preferred to use the improved spray bars with a system capable of sucking the liquid from the bars, the novel construction of the bar may be relied upon to prevent objectionable dripping. The bars 55 will remain filled when the spraying is stopped, and when spraying is resumed, the nozzles will start simultaneously, and there will be no need to wait for the bars to fill.

While I have shown and described the preferred embodiment of my invention, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. In a device of the character described, a spray bar for liquids comprising an elongated hollow bar, means to admit liquid through the lower wall of said bar, and a plurality of spray nozzles communicating with the upper portion of said bar through the upper portion thereof.

2. In a device of the character described, a spray bar for liquids comprising a substantially horizontal hollow bar, means to force liquid under pressure into said bar through the lower wall thereof, and a plurality of spray nozzles communicating with said bar through the upper wall thereof.

3. In a device of the character described, a spray bar for liquids comprising a substantially horizontal hollow bar, means to admit liquid through the lower wall of said bar, a plurality of spray nozzles communicating with said bar through the upper wall thereof, and means to suck liquid from the bar and nozzles through the lower portion of said bar.

4. In a device of the character described, a spray bar for liquids comprising a substantially

horizontal hollow bar, a siphon tube communicating with said bar through the lower wall thereof and extending therebelow, a plurality of spray nozzles communicating with said bar through the upper wall thereof, and means to admit liquid to said siphon tube.

5. In a device of the character described, a spray bar for liquids comprising a substantially horizontal hollow bar, a siphon tube communicating with said bar through the lower wall thereof and extending therebelow, a plurality of spray nozzles communicating with said bar through the upper wall thereof, means to admit liquid to said bar through said siphon tube, and means to suck the liquid from said bar through said siphon tube.

6. In a device of the character described, a spray bar for liquids comprising a substantially horizontal hollow bar, a siphon tube communicating with said bar through the lower wall thereof and extending therebelow, a plurality of spray nozzles communicating with said bar through the upper wall thereof, means to admit liquid to said siphon tube, and means establishing communication between the portion of the siphon tube below the bar, and the ends of said bar.

7. In a device of the character described, a spray bar for liquids comprising a substantially horizontal hollow bar, a siphon tube communicating with said bar through the lower wall thereof intermediate the ends of the bar and extending therebelow, a plurality of spray nozzles communicating with said bar through the upper wall thereof, means to admit liquid to said bar through said siphon tube, means to suck the liquid from said bar through said siphon tube, and means establishing communication between the portion of the siphon tube below the bar, and the ends of said bar.

8. In a device of the character described, a spray bar for liquids comprising a siphon tube having one leg connected to a source of liquid supply, a substantially horizontal hollow bar connected at its lower portion to the other leg of the siphon tube, and a plurality of spray nozzles communicating with said bar through the upper wall thereof.

9. In a device of the character described, a spray bar for liquids comprising a siphon tube having one leg connected to a source of liquid supply, a substantially horizontal hollow bar connected at its lower portion to the other leg of the siphon tube, a plurality of spray nozzles connected to said bar through the upper wall thereof, and means to suck liquid from said bar and nozzles through said siphon tube.

10. In a device of the character described, a spray bar for liquids comprising a siphon tube having one leg connected to a source of liquid supply, a substantially horizontal hollow bar connected at its lower wall to the other leg of the siphon tube, a plurality of spray nozzles connected to said bar through the upper wall thereof, and a pipe connecting the lower portion of said siphon tube to one end of the hollow bar.

11. In a device of the character described, a spray bar for liquids comprising a siphon tube having one leg connected to a source of liquid supply, a substantially horizontal hollow bar connected at its lower portion with the other leg of the siphon tube, a plurality of spray nozzles connected to the upper portion of said bar, a pipe connecting the lower portion of said siphon tube to one end of the hollow bar, and means

to suck liquid from said bar and nozzles through said siphon tube.

12. In a device of the character described, a spray bar for liquids comprising a siphon tube having one leg connected to a source of liquid supply, a substantially horizontal hollow bar connected intermediate its ends at its lower portion with the other leg of the siphon tube, and a plurality of inverted U-shaped nozzles connected to the upper portion of said bar.

13. In a device of the character described, a

spray bar for liquids comprising a siphon tube having one leg connected to a source of liquid supply, a substantially horizontal hollow bar connected intermediate its ends at its lower portion with the other leg of the siphon tube, a plurality of inverted U-shaped nozzles connected to the upper portion of said bar, and a pair of inclined pipes connecting the lower portion of the siphon tube with the ends of the bar.

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