

March 27, 1962

R. H. STEIN
ROOFING MACHINE

3,026,780

Filed Sept. 2, 1958

3 Sheets-Sheet 1

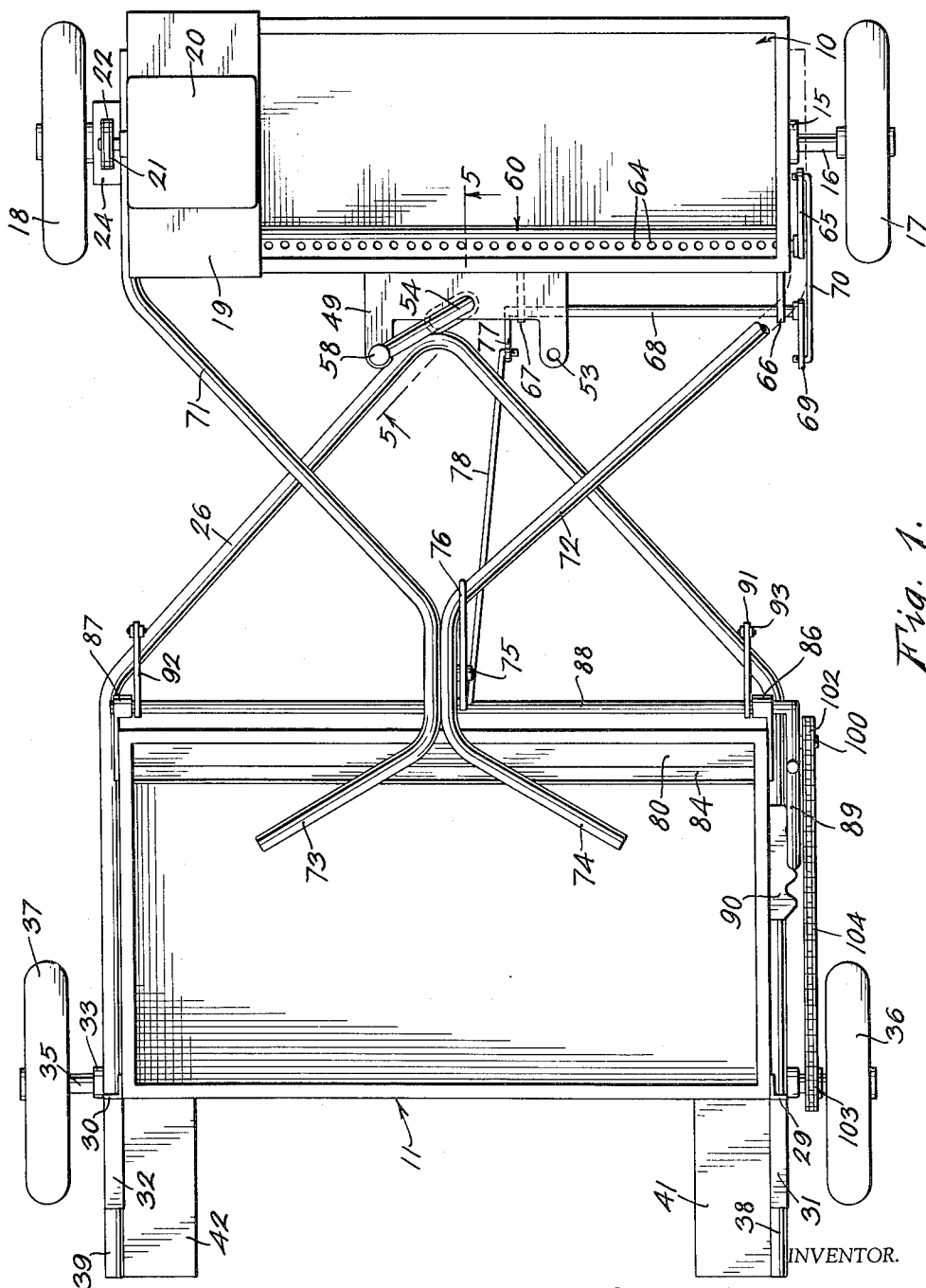


Fig. 1.

ROY H. STEIN
BY
Anderson Spangler & Wymore
ATTORNEYS.

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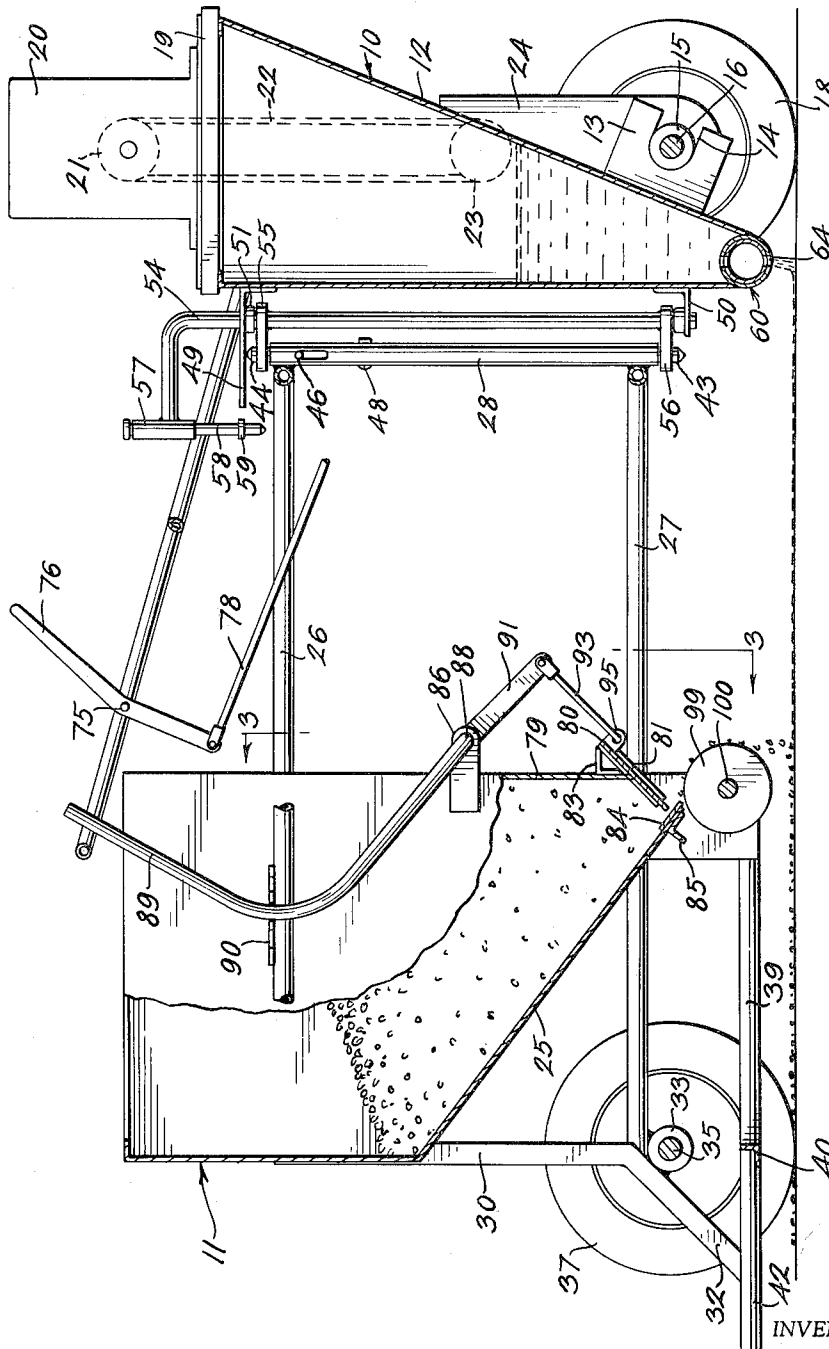


Fig. 2.

INVENTOR.

ROY H. STEIN
BY

Anderson Spangler & Wymore
ATTORNEYS

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3 Sheets-Sheet 3

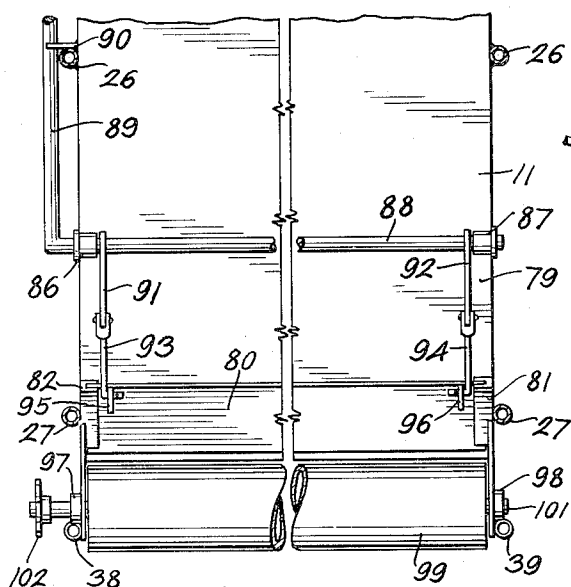


Fig. 3.

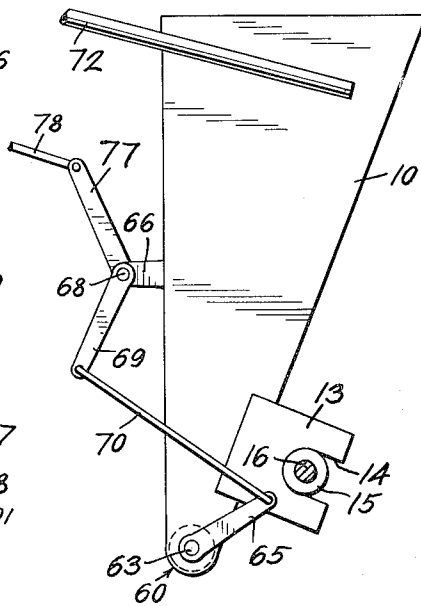


Fig. 4.

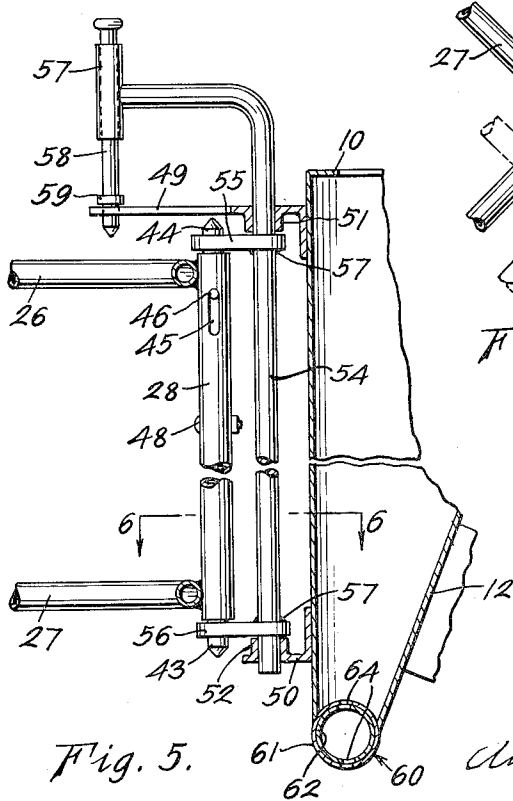


Fig. 5.

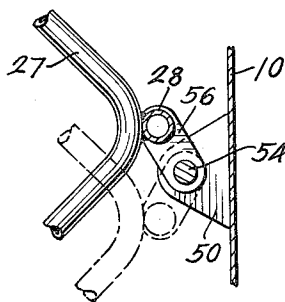


Fig. 6.

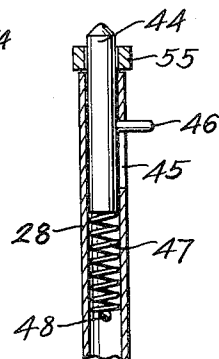


Fig. 7.

INVENTOR.

ROY H. STEIN
BY

Anderson Spangler & Wymore
ATTORNEYS

1

3,026,780

ROOFING MACHINE

Roy H. Stein, 3920 Zephyr, Wheatridge, Colo.

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6 Claims. (Cl. 94-44)

This invention relates to machines for applying crushed rock, slag or similar coating material to a roof, floor or other surface and more particularly to such a machine which is steerable and adapted to be moved easily from place to place.

It is an object of the present invention to provide an improved machine of the character described which includes a pair of storage tanks supported on wheels for transportation over a surface wherein the frame is hinged to provide for steering of the machine.

It is a further object of the invention to provide an improved machine of the type described wherein one storage tank is adapted to hold and discharge tar, pitch or similar coating material and the other storage tank is adapted to hold and discharge crushed rock and the like and means for offset positioning of one tank with respect to the other to provide an overlap of adjacent strips of roofing material.

A still further object of the invention is to provide an improved machine of the type described which is self-propelled and can be steered and operated by one man, which is of rugged, yet simple and economical construction.

For a better understanding of the present invention, together with other and further objects thereof, reference is had to the following description taken in connection with the accompanying drawings and its scope will be pointed out in the appended claims.

In the drawings:

FIGURE 1 is a plan view of the machine according to the invention;

FIGURE 2 is an elevational view of the machine, partly in section;

FIGURE 3 is a view taken along line 3—3 of FIGURE 2;

FIGURE 4 is a side view of the forward tank of FIGURE 1, showing the valve actuating mechanism;

FIGURE 5 is a view along line 5—5 of FIGURE 1;

FIGURE 6 is a view along line 6—6 of FIGURE 5; and,

FIGURE 7 is a cross sectional view of the upper pin of the hinged connection shown in FIGURE 5.

Referring to FIGURES 1 and 2 of the drawing, there is provided a forward tank generally indicated by reference numeral 10 and a rear tank generally indicated by reference numeral 11. Tank 10 is seen to be of reducing cross section from top to bottom resulting from the forward wall 12 being inclined. A pair of bearing blocks 13 are secured by suitable means to the lower part of wall 12 and to either side of tank 10. Each of the bearing blocks 13 is provided with a slot 14 inclined upwardly toward the rear of tank 10 within which bearings 15 are mounted. A shaft 16, provided with journals, is journalled in bearings 15 and a pair of ground engaging wheels 17 and 18 are affixed to either end of shaft 16 to support tank 10. A motor board 19 is mounted on the top of tank 10 near one end, having mounted thereon by suitable means a prime mover 20. Power is transmitted to shaft 16 from prime mover 20 by means of a pulley 21 and belt 22, to a pulley 23 connected to drive transmission 24 which is in turn connected to shaft 16 through suitable gears. Transmission 24 may conveniently be of a type to provide for changing the ratio between input and output to vary the driving speed and torque applied to shaft 16.

2

Rear tank 11 is generally rectangular in shape having a forwardly sloping bottom 25. Tank 11 has an upper and a lower frame member, 26 and 27 respectively, secured to each side and terminating forwardly thereof in a generally triangular configuration. The forward ends or apex of frame members 26 and 27 are connected by means of a vertical tubular member 28 which is fastened thereto as by welding and the like. Angle bars 29 and 30 are vertically positioned between the rear ends of frame members 26 and 27 and are fastened thereto and tank 11 as by welding and the like. Vertical angle bars 29 and 30 are bent rearwardly at the juncture therebetween and lower frame member 27 to provide downwardly and rearwardly extending portions 31 and 32. Bearings 33 and 34 are secured to the juncture of frame member 27 and vertical angle bars 29 and 30 as by welding and the like. A shaft 35 having journals is journalled in bearings 33 and 34, said shaft having ground engaging wheels 36 and 37 affixed thereto to provide support for tank 11 for transporting same over a surface. A pair of horizontal members 38 and 39 are fastened between the lower end of extensions 31 and 32 and an extension of the sides of the tank 11 as by welding and the like. Cross member 40 is fastened at either end to members 38 and 39 and a pair of foot platforms 41 and 42 are secured to members 38, 39 and 40 to support the operator of the machine.

Tubular member 28 is seen to have a pin 43 positioned and secured in the lower end thereof to form a pivot. The upper end of tubular member 28 is provided with an axially slidable pin 44, FIGURE 7. The upper end of member 28 has an elongated opening 45 in the side through which handle 46 is attached to pin 44. Pin 44 is urged into the uppermost position by means of a spring 47 supported on bolt 48. Pin 44 also acts as a pivot and by depressing handle 46, pin 44 may be withdrawn into tubular member against spring 47.

A pair of brackets 49 and 50 are secured centrally to the rear wall of the forward tank 10 in vertical alignment. Upper bracket 49 and lower bracket 50 are provided with a pair of axially aligned holes having flanges to form bearings 51 and 52. Upper bracket 49 is further provided with holes 53 spaced to each side of bearing 51 for the purpose to be explained as the description progresses.

A shaft 54 having journals is journalled within bearings 51 and 52 to extend beyond bearing 51 above bracket 49. Shaft 54 has attached thereto intermediate and adjacent bearings 51 and 52 an upper and lower hinge element 55 and 56 respectively as by means of welds 57 and the like. Hinge elements 55 and 56 are spaced on shaft 54 to receive pins 43 and 44 of tubular member 28 when pin 44 is depressed and released. The upper end of shaft 54 is provided with a 90° bend and a short tubular member 57 is vertically affixed to the end of the horizontal portion as by welding. Pin 58 is slidably mounted within the bore of tubular member 57, pin 58 being of a length to be received in and engage holes 53. A stop 59 may be provided adjacent the lower end of pin 58 and the top of pin is enlarged to retain pin 58 within tubular member 57.

Referring to FIGURES 1 and 6, when shaft 54 is rotated into a position where pin 58 engages one of holes 53 to either side of the axis of shaft 54, the pivot of the forward tank 10, about pins 43 and 44, is shifted to one side or the other providing an offset in the materials dispensed from the forward and rear tanks.

Tank 10 is provided with an elongated valve in the bottom thereof generally indicated by reference numeral 60. Tank 10 is used for the purpose of dispensing tar or pitch and the like and may be provided with heating means, not shown, to maintain the contents in a fluid

state. Valve 60 is seen to be comprised of an elongated tubular outer portion 61 closed at the ends and secured into the bottom of tank 10. An inner concentric tubular member 62 is rotatably mounted within tubular member 61 and a shaft 63 secured thereto passes through one end of tubular member 61. A plurality of discharge holes 64 are provided in the top and bottom of members 61 and 62 in near alignment. A lever arm 65 is connected to operate shaft 63 and rotate member 62. A pair of brackets 66 and 67 are secured to the outside of rear wall of tank 10 as by welding intermediate the top and bottom, with bracket 66 located near the end of tank 10 in proximity to shaft 63. Brackets 66 and 67 are provided with a pair of horizontally aligned holes in which a horizontal shaft 68 is journaled for rotation. A lever arm 69 is attached to the end of shaft 68 adjacent bracket 66 and arm 69 is connected to arm 65 by means of a link 70. Tubular members 71 and 72 are fastened to the ends of tank 10 by suitable means and extend rearwardly to a position above rear tank 11, being bent into the form of handles 73 and 74 for steering. Members 71 and 72 are secured together at a point rearwardly of tank 10 by means of a bolt 75 having pivotally mounted thereon a pivot arm 76 pivoted intermediate the ends. A lever arm 77 is attached to the inner end of shaft 68 and link 78 connects arm 77 with the lower end of pivot arm 76. When the upper end of pivot arm 76 is moved in a forward or reverse direction, movement is imparted to inner member 62 of valve 60 through link 78, arm 77, shaft 68, arm 69, link 70 and arm 65 to move holes 64 therein in or out of registry with holes in fixed member 61 of valve 60.

Referring to FIGURES 1, 2 and 3, tank 11 is seen to have a bottom which is sloped toward the forward wall 79 of the tank. The lower end of bottom 25 is seen to terminate short of the forward wall 79 defining a rectangular opening therebetween. The forward wall 79 is also seen to terminate at the lower edge short of the point where this wall would meet bottom 25 if extended. A lift gate 80 in the form of a metal plate is positioned substantially normal to bottom 25 over the opening between the bottom 25 and forward wall 79 is slidably secured thereover by means of channel members 81 and 82 attached at either side of the rectangular opening as by welding to the sides of tank 11. Channels 81 and 82 may be supported by a horizontally disposed angle bar 83 secured to forward wall 79 and the tops of channels 81 and 82 as by welding. Bottom 25 may be provided with a bumper plate 84 where gate 80 engages same in closed position and the lower edge of bottom 25 may be stiffened by means of an angle bar 85.

A pair of brackets 86 and 87 are secured to the sides of tank 11 intermediate the top and bottom to project forwardly beyond wall 79. Brackets 86 and 87 are provided with a pair of axially aligned holes and mating bearings. Shaft 88 is journaled for rotary movement within the bearings of brackets 86 and 87. Shaft 88 is provided with a bend beyond one bracket, i.e. 86, to form a handle portion 89 to project above the top of tank 11. A latch plate 90 is secured to member 26 intermediate the forward and rear walls of tank 11 as by welding and is provided with a series of notches to receive and adjustably engage handle portion 89 therein. A pair of lever arms 91 and 92 are attached to shaft 88 intermediate brackets 86 and 87 and links 93 and 94 connect arms 91 and 92 to gate 80 by means of lugs 95 and 96. When handle portion 89 is moved to the forwardmost notch of latch plate 90, gate 80 is closed against bumper plate 84. As handle portion 89 is moved to the rear, gate 80 is moved upwardly within channels 81 and 82 unblocking the opening between the bottom and the forward wall of the tank. The positioning of handle portion 89 in a particular notch of latch plate 90 will determine the degree of unblocking of the opening.

The extensions of the sides of tank 11 adjacent the

forward wall are provided with a pair of axially aligned holes below the lowermost edge of bottom 25 and are provided with bearings 97 and 98. A roller 99 provided with stub shafts 100 and 101, has said stub shafts journaled for rotation within bearings 97 and 98. Roller 99 being of a diameter to just clear the edge of bottom 25 on rotation. Stub shaft 100 has affixed thereon a sprocket 102 and a sprocket 103 is mounted on shaft 35 carrying wheels 36 and 37. Sprockets 102 and 103 are interconnected by a chain 104 such that the turning of the wheels 36 and 37 causes roller 99 to be rotated through sprockets 102 and 103 and chain 104.

The operation of the roofing machine is self-evident from the foregoing description. The machine is propelled along a surface by means of prime mover 20 supplying power to the front wheels. The operator is supported on foot platforms 41 and 42 in position to have access to operating controls. Shaft 54 is rotated to one side or the other, depending on the direction of travel and desired overlap, and pin 58 inserted in appropriate hole 53. Valve 60 is opened, by operating pivot arm 76, to the desired degree to discharge tar or pitch and the like from tank 10 and gate 80 is opened, by positioning handle 89 in the appropriate notch of latch plate 90, to discharge gravel and the like from tank 11 on to roller 99 to be spread on the tar or pitch and the like distributed by valve 60. During the running of a course, the machine may be steered by the operator by means of handles 73 and 74. At the end of the course, the machine may be turned around and shaft 54 shifted to the opposite hole 53 to provide an overlap on the next course. The shifting of the pivot of the forward tank with respect to the rear tank produces a seamless covering of the surface avoiding a gap in the roofing or surfacing material between courses. The eccentric pivot provided by shaft 54 and links 55 and 56 is an important aspect of the present invention.

While the machine of this invention has been described with reference to its use for applying a roofing surface, it is readily apparent the machine will find utility in any operation where it is desired to lay a surface, first of tar or pitch and the like and topping same with gravel or slag and the like.

While there has been described what at present is considered to be the preferred embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention. It is aimed, therefore, in the appended claims to cover all such changes and modifications which fall within the true spirit and scope of the invention.

What is claimed is:

1. A machine for applying a coating to a surface, prime mover means for propelling the machine over a surface, a tank at one end of the machine forming a container for a fluid material to be discharged, an elongated, transversely positioned discharge valve means connected to the lower portion of said tank and adapted to discharge fluid material in a pattern of predetermined width onto a surface over which the machine passes, another container mounted rearwardly of said tank, a transversely positioned elongated opening in the lower portion of said other container of substantially the same transverse dimension as the discharge pattern of said discharge valve means, a laterally shiftable connection connecting said tank and said container and means for moving and retaining said shiftable connection in predetermined selected position whereby the container can be offset relative to the tank.

2. A machine according to claim 1 wherein said shiftable connection is pivotally connected to said tank and means are included for turning said tank about said pivot to steer the machine.

3. A machine for applying a coating to a surface, prime mover means for propelling the machine over a surface,

5

a tank at one end of the machine forming a container for fluid material to be discharged, lateral extending discharge means adjacent the bottom of the tank for discharging fluid from said tank onto the surface over which the machine passes, another container positioned rearwardly of said tank and having a transverse discharge opening for discharging another coating material upon the surface treated with said first named material, the lateral extent of the lateral discharge means being substantially equal to the breadth of the transverse discharge opening, said machine having a pivotal connection between the ends thereof and intermediate the tank and said other container, said pivotal connection having adjusting means connected thereto for laterally shifting the pivotal axis and the discharge limits of said lateral extending discharge means with respect to the discharge limits of the transverse discharge opening and means for retaining said adjusting means in predetermined position.

4. A machine according to claim 3 wherein the lateral extending discharge means includes valve means for controlling the rate of discharge of liquid therefrom which comprises an outer tubular conduit forming the bottom of said tank and being affixed thereto, an inner tubular conduit concentric with said outer conduit being closed at the ends, a plurality of diametrically opposed holes provided at intervals along the length of said conduits providing communication between the interior and exterior of said tank and means for rotating said inner conduit with respect to the outer conduit to move the respective holes therein into and out of alignment.

5. A machine according to claim 3 wherein the discharge opening of said other container includes a lift gate located in the bottom of the container and a roller positioned with respect to the discharge opening to receive and spread material discharged therefrom, said roller being operatively connected to the prime mover means to be rotated as the machine is moved over the surface.

6. A machine for applying a coating to a surface, prime mover means for propelling the machine over a surface, a tank at one end of the machine forming a container for a fluid material to be applied to the surface

6

over which the machine passes, valve means adjacent the bottom of said tank operative to control the flow of fluid from said tank having a transversely oriented elongated discharge to discharge fluid onto the surface widthwise of the machine, another container positioned rearwardly of said tank and pivotally connected thereto, said other container having a transverse discharge opening in the bottom thereof for discharging other material upon the surface treated with fluid from said tank including an adjustable lift gate means located adjacent the bottom thereof cooperating with the discharge opening to discharge said other material at a predetermined rate, roller means mounted to receive said discharged other material and spread same over the surface, said roller being operatively connected to rotate as the machine moves, said discharge opening being of a breadth substantially equal to the lateral extent of the discharge pattern of the valve means and means cooperating with the pivotal connection to selectively shift and retain the pivot to either side of the longitudinal axis of the machine such that in the shifted condition, the discharge pattern of the valve means is offset laterally with respect to the discharge pattern of the discharge opening.

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