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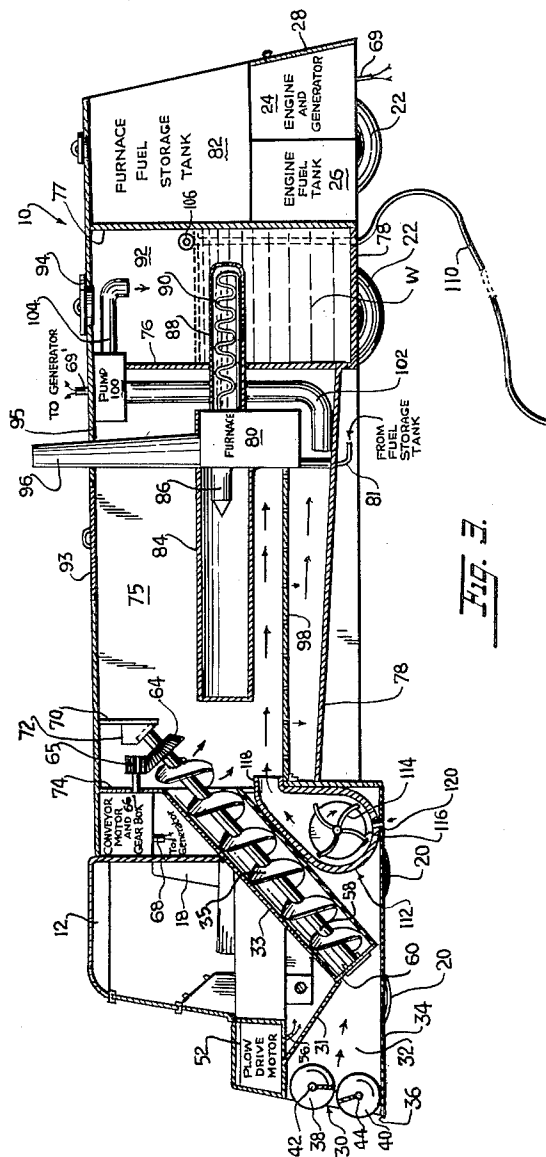
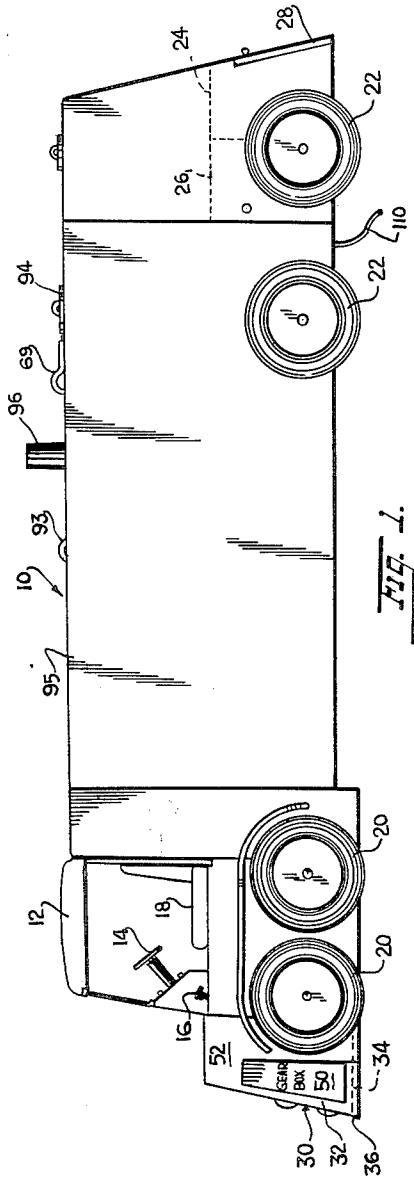
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3,066,428

AUTOMATIC SNOW MELTING TRUCK

Filed April 14, 1961

2 Sheets-Sheet 1



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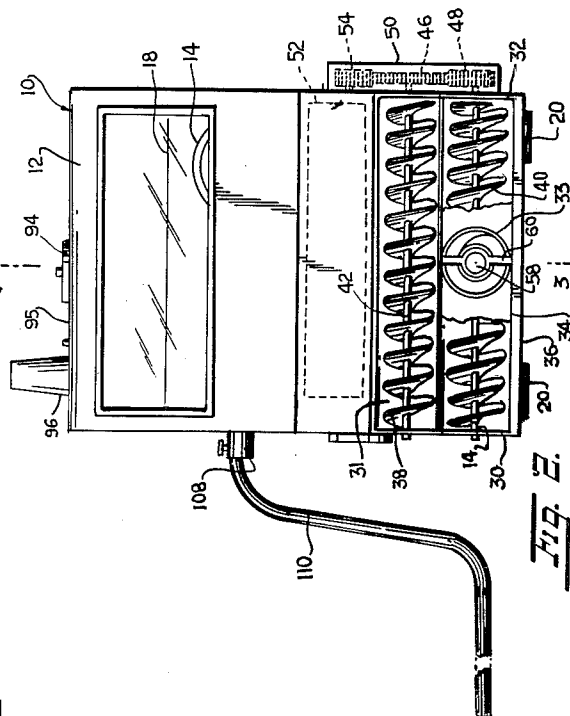
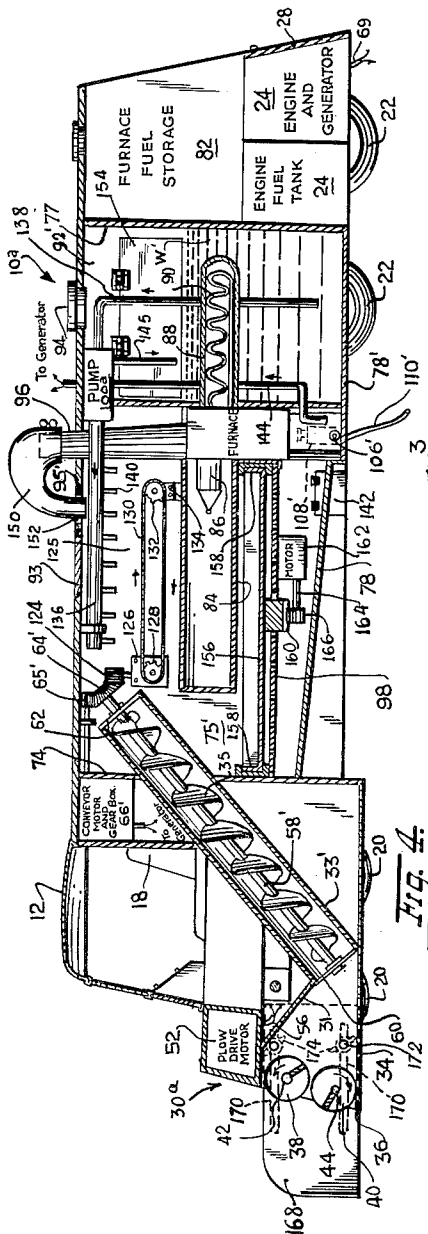
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AUTOMATIC SNOW MELTING TRUCK

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2 Sheets-Sheet 2



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AUTOMATIC SNOW MELTING TRUCK
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1 Claim. (Cl. 37-12)

This invention concerns an improved snow disintegrator and disposal machine.

According to the invention, there is provided a machine which is self-propelled and includes a snow plow, furnace, hot water tank, a snow receiving compartment, means for conveying snow to the snow receiving compartment and means for dispersing the snow to the hot water tank. In a modification of the invention, hot water is sprayed upon the snow in the snow receiving compartment. The melted snow is then passed via a valve to an external hose for flushing down a sewer.

It is a principal object of the invention to provide a machine including a plow having rotary blades for chopping the snow, a conveyor and snow receiving compartment, with means for dispersing the snow conveyed to the snow receiving compartment.

Another object is to provide a machine of the character described wherein the machine includes a furnace and hot water tank with pump means for feeding hot water to the snow receiving compartment, or for pumping disintegrated snow to the hot water tank.

Another object is to provide a machine of the character described, wherein the snow dispersing means is an air blower or a water sprayer.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claim in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 is a side elevational view of a snow disintegration and disposal machine according to the invention.

FIG. 2 is a front elevational view of the machine.

FIG. 3 is a sectional view taken on line 3-3 of FIG. 2.

FIG. 4 is a sectional view similar to FIG. 3 showing another embodiment of the invention.

Referring to FIGS. 1-3, there is shown the machine 10 which is a self-propelled vehicle having a driver's cab 12 at the front. The vehicle has steering and driving controls 14, 16 such as provided in conventional trucks, and a driver's seat 18. The vehicle has two pairs of front wheels 20 and two pairs of rear wheels 22. The rear wheels are driven by a rear mounted engine 24 in conventional fashion. At the rear of the vehicle body is a gasoline or diesel oil tank 26 for supplying fuel to the engine 24. The body has a rear door 28 providing access to the engine. To the extent described the vehicle is conventional.

According to the invention there is provided at the front of the vehicle a plow 30 including a hopper 32 having a horizontal floor 34 with sharpened forward edge 36. The hopper has vertical sides which carry helical blades 38, 40 mounted on shafts 42, 44. The blades are driven by meshed gears 46, 48 located in gear box 50. The machine has a motor 52 mounted over the plow driving a gear 54 which drives gears 46, 48. The blades 38, 40 rotate in opposite directions. The blades extend or project just beyond the hopper as best shown in FIGS. 1 and 3. Motor 52 may be an electric motor driven by power supplied via cable 56 extending from an electric generator (not shown) associated with and driven by engine 24.

The hopper has a top wall 31 which slants downward to the open end of a conveyor conduit 33. In conduit 33 is axially rotatable a rotary screw conveyor 35. The conveyor has a shaft 58 journaled in spider bearings 60 at

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the lower end of the conveyor. At the upper end of the conveyor is a gear 64 engaged with a gear 65 driven by a motor 66. The motor may have associated speed reduction gearing. The motor may be electrically operated and energized via a cable 68 which terminates at the generator associated with the engine 24. Cables 56 and 68 may be run outside the machine underneath the machine body, along a side thereof, or over the top of the body, to connect with cable 69 at the generator. A bracket 70 supports a bearing housing 72 in which is journaled the upper end of conveyor shaft 58. Two vertical partitions 74, 76 spaced apart define a snow receiving compartment 75 in the machine body. The compartment has a downwardly inclined floor 78. In the compartment 75 is an oil burning furnace 80 of conventional type. The furnace is supplied with fuel via oil line 81 from a fuel oil storage tank 82 mounted over the engine fuel tank 26 and engine 24.

The furnace has a combustion chamber or fire box 84 extending horizontally in the compartment 75. In the combustion chamber is an oil burner 86. Extending laterally out of the furnace is a perforated cylindrical jacket 88 in which are pipe coils 90 through which circulate hot gases from the furnace 80. The jacket 88 is disposed in a water storage tank 92 defined between vertical partitions 76 and 77. The tank 92 may be filled with water via a removable door or hatch 94 mounted in the roof 95 of the machine body. A door 93 provides access to compartment 75 through roof 95. The furnace has a chimney 96 extending upwardly through the roof 95. Under the fire box 84 is a horizontal grating 98. This is a perforated metal plate through which snow discharged from the open top end of the conveyor 33 passes to the inclined floor 78.

A pump 100 is mounted on partition 76. It is electrically driven via cable 69'. The pump has an inlet pipe 102 extending from the lowermost end of compartment 75 at floor 78. The pump has an outlet pipe 104 which discharges into the hot water storage compartment 92. At the side of compartment 92 is an opening 106 at which is a valve 108. A hose 110 is connected to the valve and discharges water from the compartment 92 at a controlled rate while the machine is in operation.

An air blower 112 is located below the conveyor conduit 33. It has a rotary fan 114, motor 116 and outlet conduit 118. The conduit 118 opens through partition 74 just above grating 98. An air inlet pipe 120 extends into the blower casing underneath the machine.

In operation of the machine, it is driven along a road or over any surface to be cleared of snow. The rotating blades 38, 40 cut or chop the snow which falls into the hopper 32 of plow 30. The chopped snow is conveyed by the rotating screw 35 upwardly and is discharged into compartment 75. The compartment is heated by the combustion chamber 84 of the furnace and the snow is partially melted. The blower 112 spreads and disperses the snow in the compartment 75 so that it falls in finely divided form through grating 98. The grating screens out any debris which may have been taken up with the snow. The snow flows or drifts down the inclined floor 78 to the open end of conduit 102 where it is taken up by the pump and discharged into the hot water W in compartment 92. The level of water in compartment 92 is limited to the height of opening 106 above the floor 78 in the compartment. Excess water is discharged through hose 110 to a sewer.

Machine 10^a shown in FIG. 4 is similar to machine 10 and corresponding parts are identically numbered. The machine has a lengthened conveyor conduit 33' whose shaft 58' is journaled at its upper end in a spider bearing 62. Gear 64' is engaged with gear 65' driven by motor 66'. Gear 64' is also meshed with another gear 124 at

the top of gear box 126 supported on the sidewall 125 of compartment 75'. A sprocket roller 128 is driven by gears in box 126. On sprocket roller 128 is entrained a chain belt 130 carried over idler sprocket 132 journaled in bearing bracket 134. The upper run of the chain belt 130 receives chopped snow from the open top of the conveyor and carries it the full horizontal length of the heated compartment 75'. At the top of compartment 75' is an outlet pipe 136 of pump 100^a. This pump has an inlet pipe 138 which takes up hot water W' from the water storage compartment 92' and discharges it through spray nozzles 140 distributed along the pipe 136. The hot water is sprayed on the belt 130 so that the snow is melted and passes the grating 98 to run down inclined floor 78. A door 142 is provided at the lower end of floor 78 in side wall 125 to clean the floor 78 of debris. Valve 103' controls passage of excess water to outlet hose 110'. Another inlet pipe 144 for pump 100^a is disposed near door opening 142 and takes up water from the bottom of compartment 75'. This water is discharged through outlet pipe 145 into compartment 92' to maintain the level of water W' therein.

In this form also, the chimney 96 is provided with a return pipe 150 passing through an opening 152 in the roof 95' of the machine body to a point just inside the roof where the products of combustion from the chimney are dissipated in the compartment 75'.

If desired, in place of the opening 106', valve 108' and hose 110', the excess water in compartment 92' may be discharged through a hole in the floor 78' at which point an air blower or water sprayer such as the blower 112 may be mounted on the lower surface of the floor 78' to blow the discharging water and dissipate the same in the atmosphere or into the open field.

A hinged door 154 is also provided in the side wall of compartment 92' to gain access to the interior thereof for cleaning, repairing or the like.

Provision is also made for gathering and removing debris such as cans and the like, likely to be shoveled up with the snow. For this purpose, below the belt 130 and above the grate 98, there is provided a slidable perforated tray 156. The openings in tray 156 are larger than the openings in grate 98. The tray slides between opposed channel guide plates 158. On the bottom surface of the tray at its center there is an elongated toothed rack 160. A motor 162 is supported on the grate 98 and the drive shaft 164 of the motor supports a pinion 166 in mesh with the rack 160 whereby the tray 156 is moved in and out of the compartment 75'. The tray is readily dumped when outside the machine for discharging the contents thereof.

The invention also contemplates providing means on the machine for cutting through piles of snow to facilitate removal of the snow. For this purpose, the plow 30^a at the front carries an elongated vertically disposed plate 168. The plate has upper and lower horizontally disposed slots 170 through which extend bolts 172 with wing nuts 174. The plate may be manually moved inwardly and outwardly for adjustment and secured in moved adjusted position by the nuts 174. When the plate is extended outwardly, by moving the machine in and out between parked cars, for instance, the snow therebetween can be cut and loosened for ready removal.

The machine 10^a differs basically in operation from that of machine 10 in that the hot water W' is sprayed

upon the snow dispersed in compartment 75' instead of the snow being conveyed to the hot water storage compartment. Also, water is recirculated from the snow melting compartment 75' to the water storage compartment to keep up the level of water in compartment 92'.

In both forms of the invention, snow is effectively disintegrated, melted and discharged as water through a hose. The machine can be made in small and large sizes depending on the snow handling capacity desired. The size of the furnace 80 will determine the snow melting capacity of the machine.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claim.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

A snow disposal machine comprising a vehicle having a wheel-supported body, a snow plow mounted at a forward end of the body, said plow including rotary snow cutting means, spaced walls defining a snow receiving compartment in said body, a conveyor in the body having an inlet at the plow for taking up cut snow therefrom and having an outlet in said compartment, means for dispersing the snow received in said compartment from the outlet of the conveyor, a furnace in the body having a heated portion in said compartment to melt snow dispersed therein, further walls defining a hot water storage compartment in said body separate from said snow receiving compartment, said furnace having another portion in the water storage compartment to heat water therein, and pump means having an inlet in the snow receiving compartment and an outlet in the water storage compartment for conveying water therebetween, the first-named means comprising an air blower in said body opening in said snow receiving compartment, said snow receiving compartment having a slanted floor, and a grating extending over said slanted floor to screen snow dispersed in the snow receiving compartment, the inlet of the pump being located at a lower end of said floor to draw water therefrom for transfer to the water storage compartment, said water storage compartment having a valved outlet for draining excess water therefrom, a chimney leading from the furnace and a return pipe connected to the chimney and leading into the snow receiving compartment for returning products of combustion from the chimney to the compartment.

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