May 29, 1962 O. KEMP 3,036,391

AUTOMATIC SNOW PICK-UP AND MELTING DEVICE

Filed June 26, 1961 2 Sheets-Sheet 1

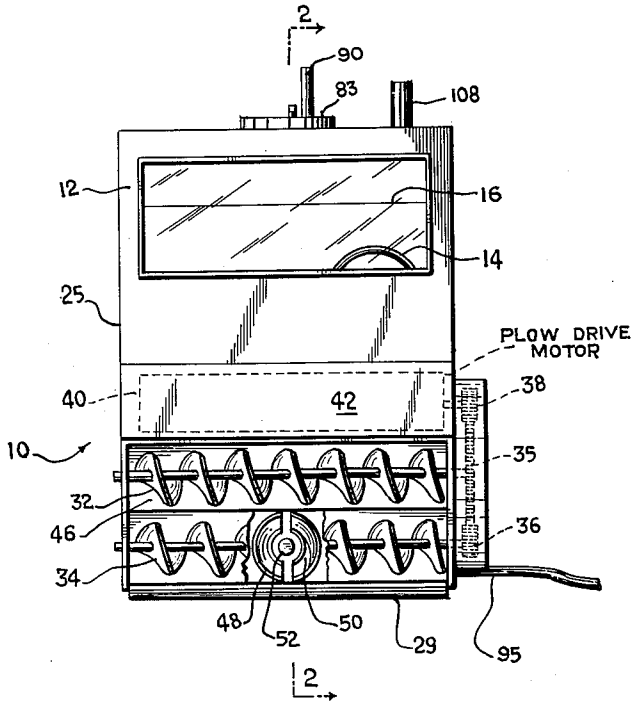


Fig. 1.

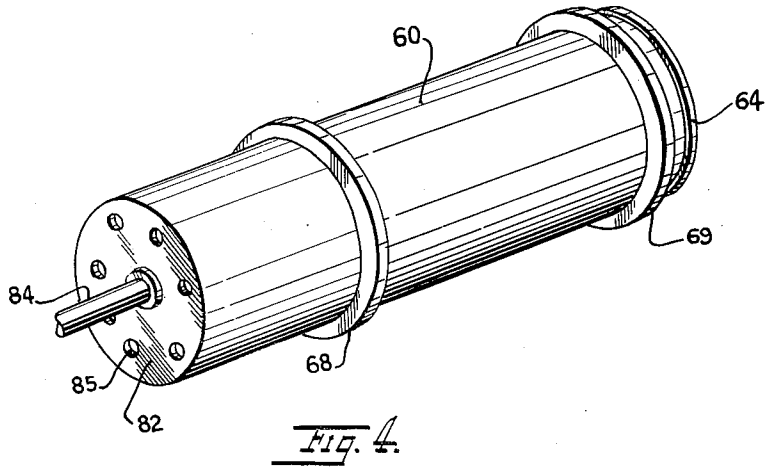


Fig. 4.

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AUTOMATIC SNOW PICK-UP AND MELTING DEVICE

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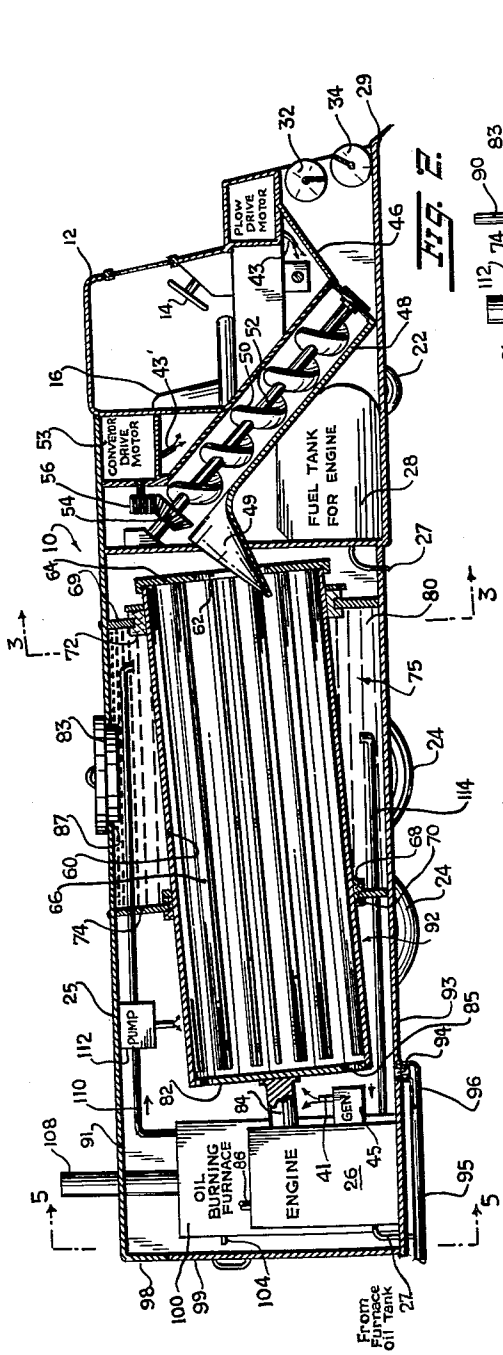


FIG. 2.

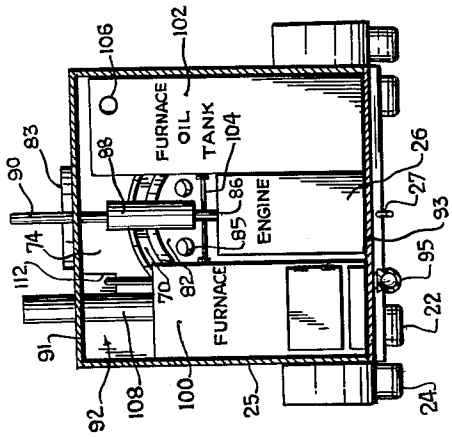


FIG. 5.

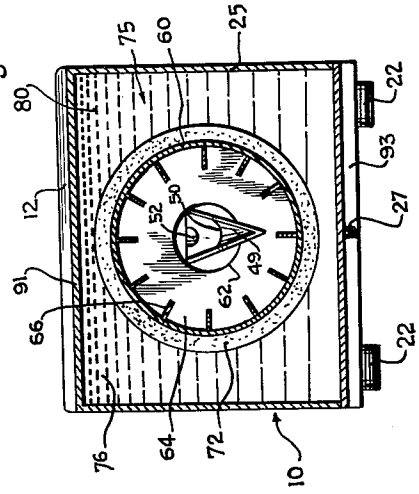


FIG. 3.

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AUTOMATIC SNOW PICK-UP AND MELTING DEVICE

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10 Claims. (Cl. 37—12)

This invention concerns an improved snow disintegrator machine.

According to the invention there is provided a snow disintegrator installed in a motor truck when can be driven along streets and roads to pick up accumulated snow. This disintegrator includes a dual, rotary disk plow, a helical conveyor receiving snow from the plow and a rotating drum which receives snow from the conveyor and reduces it to liquid form. The drum rotates in a fluid heat exchanging medium to melt the snow. The melted snow is discharged from a hose connected to the machine.

It is therefore one object of the invention to provide a snow disintegrator machine including a rotatable drum for receiving and melting snow picked up by the machine.

A further object is to provide a snow disintegrator machine of the character described installed in a motor truck, wherein the drum rotates in a waterless, non-freezing liquid bath heated by the exhaust of the engine of the truck.

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 claims in which the various novel features of the invention are more particularly set forth.

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

FIG. 1 is a front end view of a motor truck embodying the invention.

FIG. 2 is a vertical sectional view on a reduced scale taken on line 2—2 of FIG. 1.

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

FIG. 4 is a perspective view on a reduced scale of the drum per se.

FIG. 5 is a sectional view taken on line 5—5 of FIG. 2.

Referring to the drawings, there is shown a motor truck 10 having a driver's cab 12 at the front in which is a steering wheel 14, driver's seat 16 and controls 18 mounted on the instrument panel 20. The vehicle has front wheels 22 and rear wheels 24. At the rear of the vehicle in body 25 is an engine 26 supplied with fuel via fuel line 27 from a fuel tank 28 mounted in the body. To the extent described the vehicle is conventional.

According to the invention, there is installed in the vehicle body a plow having a sharp front blade 29. In the plow is a pair of helical rotatably mounted blades 32, 34. The blades are axially horizontal and are driven via gears 35, 36 mounted in a gear box 37 and engaged by drive gear 38 of a plow drive electric motor 40 mounted in a housing 42, see FIGS. 1 and 2. Power for the motor is supplied via a cable 43 connected to output cable 41 of a generator 45 mounted on and driven by engine 26. The electric cable 43 can be passed underneath the vehicle body to the generator. Partitions 46 define a hopper behind the plow blades which communicates with the open lower end of a conveyor tube 48. A helical rotary conveyor blade 50 is mounted axially in the tube. The blade has a shaft 52 driven by an electric drive motor 53 via meshed gears 54, 56. The motor 53 is energized via cable 43' which terminates at the cable 41 of generator 45.

At its upper end the tube 48 is formed with a chute

or scoop 49 which is directed into a cylindrical drum 60 through an opening 62 formed in the circular head 64 of the drum. The drum is axially inclined downward toward the rear of the vehicle body 24. Inside the drum are a plurality of circumferentially spaced, radially direcetd ribs 66, see FIGS. 2 and 3. The drum has annular flanges 68, 69 welded to its exterior near opposite ends of the drum; see FIG. 4. These flanges slidably abut packing rings 70, 72 carried inside the vehicle body on partitions 74, 76. The partitions form the ends of compartment 75 in the body in which is a quantity of liquid 80. This liquid is preferably of a waterless type which does not evaporate and does not freeze at normal winter temperatures. The liquid may be ethylene glycol or the like, generally known and commercially distributed as "permanent antifreeze."

It will be noted that the partitions 74, 76 form a liquid-tight compartment and the packing rings 70, 72 prevent leakage of the liquid while permitting rotation of the drum axially mounted therein. At its lower end 82, the drum was a shaft 84 secured axially thereto. The shaft is suitably connected to engine 26 and is driven thereby. A plurality of holes 85 are circumferentially spaced in the end 82 of the drum. A cover 83 is removably mounted in an opening 87 in the top of body 25. The engine has a manifold pipe 86 connected to a muffler 88. A tail pipe 90 is connected to the muffler and passes through the roof 91 of the vehicle body. A funnel outlet 94 is provided at the bottom 93 of the vehicle body in compartment 92, just below the end 82 of the drum. A hose 95 is connected to funnel 94 at the bottom of the outlet.

In compartment 92, located just inside the rear wall 98 and door 99, is an oil burning furnace 100. The furnace is supplied with fuel oil from a tank 102 in compartment 92. Pipe 104 connects the tank and furnace. The tank has a filler opening closed by cap 106. The furnace chimney 108 extends through the roof 91. A pipe 110 is connected via a pump 112 between the furnace 100 and the compartment 75 for supplying heated liquid 80 to the compartment. Cooled liquid 80 is drawn via pipe 114 back to a boiler chamber in the furnace to which pipe 110 is connected to receive heated liquid.

In operation of the machine, the vehicle is driven along a street or roadway to be cleaned of snow. The blade 29 cuts the snow close to the ground and the blades 32 and 34 rotate in opposite directions cutting the snow which falls into the hopper 46. The snow is taken up by the helical conveyor blade 50 and carried up the tube 48 to the chute 49 where the snow is discharged into the rotating drum 60. The drum rotates in the compartment 75 where heated liquid 80 is circulated by the exhaust of the engine. Also the hot portion of pipe 110 located in compartment 92 radiates heat to the air which circulates around the lower end of the drum. Thus the snow is melted and runs out of holes 85 and through the funnel to hose 95 to be flushed down a sewer. Since the engine 26, muffler 88 and furnace 100 are all located in compartment 92, they also radiate heat which is conducted to the drum to heat the same. The compartment 75 is closed and isolated from the drum so that liquid 80 will not be diluted by the melting snow. The several ribs define channels in the drum to guide the flow of melted snow. The ribs also serve to conduct heat in the drum.

The machine operates continuously while the engine powers the vehicle and turns the drum.

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

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

1. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein.

2. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, a furnace located in said one compartment, a pipe connected to the furnace and extending into said other compartment to supply heated liquid thereto, and another pipe connected from said other compartment to the furnace to return cooled liquid thereto for heating.

3. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, a furnace located in said one compartment, a pipe connected to the furnace and extending into said other compartment to supply heated liquid thereto, and another pipe connected from said other compartment to the furnace to return cooled liquid thereto for heating, said liquid being a waterless, anti-freeze compound which remains fluid even when the engine and furnace are not operating.

4. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, said means comprising a plow mounted at the front of said vehicle, a conveyor communicating with the plow and receiving snow therefrom, said conveyor terminating in a chute opening into said other end of the drum to discharge the snow thereat.

5. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, a furnace located in said one compartment, a pipe connected to the furnace and extending into said other compartment to supply heated liquid thereto, and another pipe connected from said other compartment to the furnace to return cooled liquid thereto for heating, said means comprising a plow mounted at the front of said vehicle, a conveyor communicating with the plow and receiving snow therefrom, said conveyor terminating in a chute opening into said other end of the drum to discharge the snow thereat.

6. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, a pair of packing rings fitted in openings in said partitions respectively and sealing said other compartment to retain the liquid in the drum while the drum rotates.

7. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, a pair of packing rings fitted in openings in said partitions respectively and sealing said other compartment to retain the liquid in the drum while the drum rotates, said drum having a plurality of circumferentially spaced ribs extending radially inside the drum to define channels for guiding melted snow to the one end of the drum.

8. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, a pair of packing rings fitted in openings in said partitions respectively and sealing said other compartment to retain the liquid in the drum while the drum rotates, said drum having a plurality of circumferentially spaced ribs extending radially inside the drum to define channels for guiding melted snow to the one end of the drum, said one end of the drum having a plurality of holes circumferentially spaced therein for passing melted snow therethrough, said drum being disposed with its axis inclined downwardly from said other end to said one end thereof.

9. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said

drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, a pair of packing rings fitted in openings in said partitions respectively and sealing said other compartment to retain the liquid in the drum while the drum rotates, said drum having a plurality of circumferentially spaced ribs extending radially inside the drum to define channels for guiding melted snow to the one end of the drum, said one end of the drum having a plurality of holes circumferentially spaced therein for passing melted snow therethrough, said drum being disposed with its axis inclined downwardly from said other end to said one end thereof, and a hose connected to the bottom of said one compartment for conveying away melted snow.

10. A snow dispersal and disintegration machine, comprising a vehicle body, a drum rotatably mounted in said body, an engine in said body operatively connected to the drum to rotate the same, a pair of partitions in said body dividing the same into a plurality of compartments, said engine being located in one of said compartments, said drum having one end opening into said one compartment, said drum extending through another of the compartments defined between said partitions, means for feeding snow into the other end of the drum, and a quantity of heated liquid in said other compartment to heat the drum for melting snow therein, a pair of packing rings fitted in openings in said partitions respectively and sealing said other compartment to retain the liquid in the drum while the drum rotates, said drum having a plurality of circumferentially spaced ribs extending radially inside the drum to define channels for guiding melted snow to the one end of the drum, said one end of the drum having a plurality of holes circumferentially spaced therein for passing melted snow therethrough, said drum being disposed with its axis inclined downwardly from said other end to said one end thereof, a hose connected to the bottom of said one compartment for conveying away melted snow, a furnace located in said one compartment, a pipe connected to the furnace and extending into said other compartment to supply heated liquid thereto, and another pipe connected from said other compartment to the furnace to return cooled liquid thereto for heating.

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