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J. KIRSHENBLAT

3,333,354

MOBILE APPARATUS FOR COLLECTING AND MELTING SNOW

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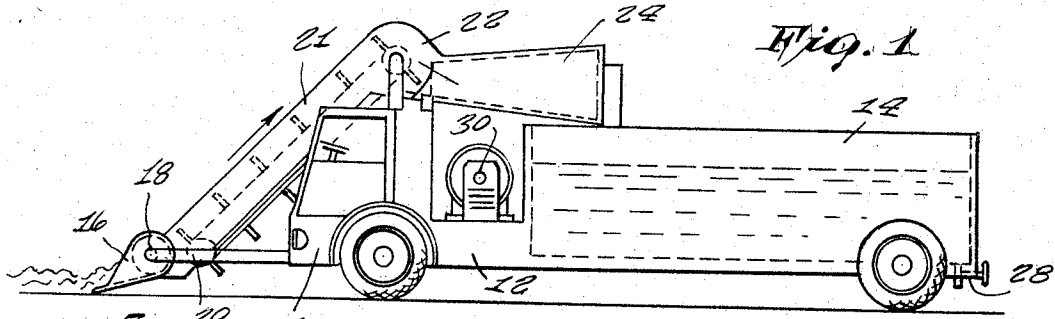
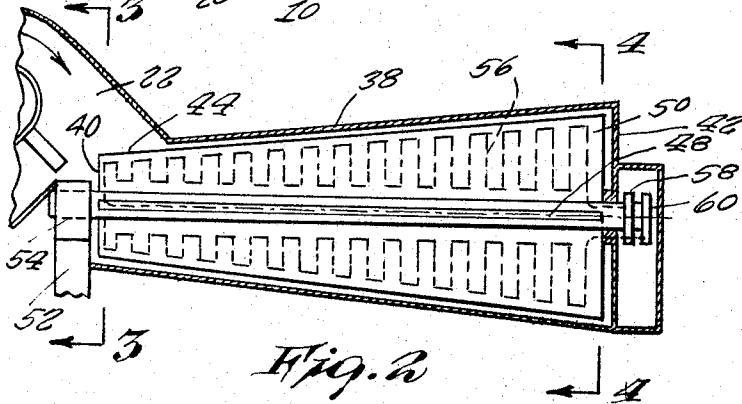
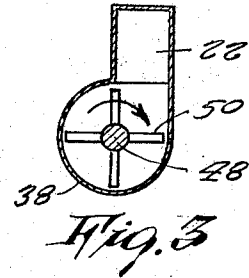
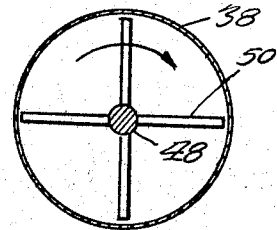
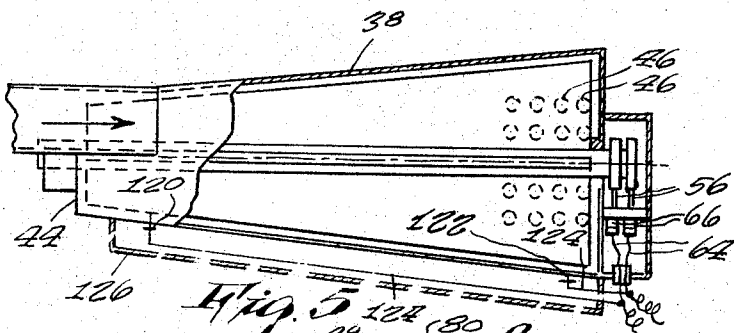
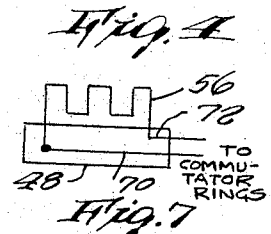
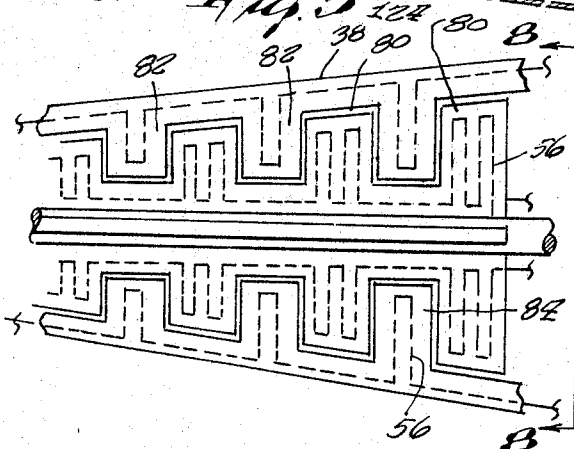


Fig. 6

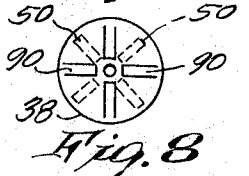


Fig. 8

JACK KIRSHENBLAT

INVENTOR

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3,333,354

MOBILE APPARATUS FOR COLLECTING AND MELTING SNOW

Jack Kirshenblat, 86—02 Park Lane S.,
Woodhaven, N.Y. 11421

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ABSTRACT OF THE DISCLOSURE

A street and highway snow clearing apparatus mounted upon a vehicle, and including a scoop at the front end for gathering snow, depositing it on a conveyor that drops the snow into a snow melting compartment having electrically heated fins, the melted snow then falling into a tank having a valve at its bottom to drain off the same into a sewer.

My invention is directed toward mobile apparatus for collecting snow and thereafter first melting the snow so collected and second having means to dispose of the snow so melted.

Accordingly it is an object of my invention to provide new and improved mobile apparatus of the character indicated which is adapted for travel over snow carrying surfaces such as a road or street and remove the snow, break same up into small pieces, further reduce the size of the pieces, melt same, and collect the water so produced into a tank which carries means such as a valve to permit the collected water to be discharged therefrom.

Another object of my invention is to provide new and improved mobile apparatus of the character indicated wherein the snow is moved by conveyors and melted electrically using current supplied from a motor-generator, gas powered, which is carried on the vehicle.

All of the foregoing and still further objects and advantages of my invention will now be explained with reference both to this specification and to the drawings wherein:

FIGURE 1 is an elevation view of my invention;

FIGURE 2 is an elevation view of my snow melting assembly;

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

FIGURE 4 is a sectional view taken along 4—4 of FIGURE 2;

FIGURE 5 is a plan view of the melting assembly, partially broken away;

FIGURE 6 is a cut away side view of a portion of the melting assembly showing a modification thereof;

FIGURE 7 is a circuit diagram of the electrical heating elements used in the rotating element; and

FIGURE 8 is a view taken along 8—8 in FIGURE 6.

Referring now to FIGURE 1, there is shown a vehicle body having a suitable driver's cab 10 and a chassis 12 carrying a water collection tank 14. The normal components of a vehicle of this type, re engine, transmission, etc., are not shown since they are conventional and not part of the invention per se.

A scoop 16 carries an auger 18 driven by belt drive 20 powered from the vehicle engine. Auger 18 is rotated horizontally to function as a screw conveyor to pick up snow from the road. The snow is discharged from the auger onto a vertically inclined belt conveyor 21, the snow being discharged downward through hood 22 on the top of the conveyor to the melting apparatus identified generally at 24. The water yielded by apparatus 24 is fed by gravity into tank 14. When desired, the water can be discharged by gravity from the tank by opening valve 28.

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The chassis intermediate cab 10 and tank 14 carries a conventional gasoline engine-electric generator 30 similar to a welder on a truck.

As shown in FIGURES 2-5, the melting apparatus 5 comprises a truncated cone housing 38 having the smaller end 40 adjacent the belt conveyor and the larger end 42 adjacent and over the top of the tank. The pitch of the housing is such that the bottom of the large end is at a lower level than the bottom of the small end. Snow is discharged from the hood 22 into an opening 44 at the top of the smaller end of the housing. After the snow is melted, the water is collected by gravity at the bottom of the large end and falls through drain holes 46 therein into the open end of the tank.

Housing 38 carries a rotatable shaft 48 axially positioned therein and journaled in bearings in both ends thereof. The shaft carries four fins 50 secured thereto which are at right angles to each other and to the shaft 48 and extend in the same direction as the shaft. When the 20 shaft is rotated by belt drive 52 secured to a pulley 54 on shaft 48 outside smaller end 40, the fins help break up the snow. In addition each fin contains imbedded therein a plurality of electrical heating elements 56 which melt the snow. The elements 56 in each fin are connected electrically in series. Each set of series connected elements in one fin is electrically connected in parallel with the series 25 connected elements in each other fin.

Electric energy is supplied to the elements via commutating rings 58 and 60 secured to the end of shaft 48 adjacent the larger end 42 of the housing 38. Wires 64 30 are connected at one end to brushes 66 which contact rings 58; the other end of wires 64 are connected to the electrical generator of the motor-generator 30.

The rings 58 and 60 are electrically insulated from shaft 48. Shaft 48 is hollow. A first insulated conductor 70 35 extends from ring 58 through the hollow shaft to make separate electrical contact with the end element 56 in each fin adjacent smaller end 40. A second insulated conductor 72 extends from ring 60 through a small portion of the shaft to make separate contact with the end element 56 in each fin adjacent larger end 42. This circuit arrangement is shown for one fin in FIGURE 7.

When desired, as shown in FIGURE 6, each fin can be slotted to have a plurality of spaced apart teeth 80, 45 each tooth carrying one or more heating elements 56, the adjacent teeth being separated by slots 82. The inner wall of the housing can either be smooth or can also carry a plurality of spaced apart teeth 84, each wall tooth 84 fitting in a corresponding slot 82 of each fin. If desired, each wall tooth can also carry series connected heating elements 56. The wall teeth are actually carried by four 50 mutually perpendicular wall fins 90 which extend axially therealong as shown in FIGURE 8. Of course these fins are stationary. The heating elements in fins 90 are connected each in series in each fin. Each set of series connected elements in each stationary fin is electrically connected in parallel with the series connected elements in each other stationary fin.

FIGURE 5 shows one set of electrical connections to one stationary fin. The others are connected similarly. 60 These connections are shown in phantom.

The end element 56 in each stationary fin adjacent smaller end 40 is connected to a terminal 120 which extends insulatedly through housing 38 adjacent smaller end 40. The end element 56 in each stationary fin adjacent 65 larger end 42 is connected to another terminal 122 which extends insulatedly through housing 38 adjacent larger end 42. Separate insulated conductors 124 connect between terminals 120 and 122 to wires 64 for connection to the motor generator. A hollow removable cover 126 is secured to the outside of housing 38 to protect conductors 124 from exposure to rain, snow, etc. 70

While I have described by invention with particular reference to the drawings, my protection is to be limited only by the terms of the claims which follow.

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

1. Mobile apparatus for collecting and melting snow, comprising a vehicle body having a cab, wheels and wheel propulsion means; a water collection tank secured to said body; a horizontal screw conveyor secured to the bottom front of said cab for collecting snow off a surface such as a street; a vertically inclined belt conveyor extending over said cab and having a top discharging hood, the snow from said screw conveyor being supplied to the bottom of the belt conveyor whereby the snow is discharged from said hood; an electrically operated snow melter positioned between said hood and said tank to receive snow, melt same and discharge the resultant water into said tank; a gasoline engine-electric generator unit mounted on said body to supply electric current to said melter, said melter having a hollow housing in the shape of a truncated cone, the small end of which is connected to said hood, the large end of which communicates with the top end of the tank, the bottom of the large end being at a lower level than the bottom of the small end, the top of the small end having an opening communicating with said hood whereby snow is fed by gravity into the melter, the bottom of the large end carrying drain holes communicating with the interior of the tank whereby water is discharged by gravity into the tank, a rotatable shaft being axially positioned within the housing and journaled therein at the ends thereof, and said shaft carrying electrically energized snow melting heating elements.

2. Apparatus as set forth in claim 1 wherein four fins

are secured to said shaft at right angles both to each other and to the shaft, said fins extending in the same direction as the shaft, each fin having imbedded therein a plurality of said elements electrically connected in series.

3. Apparatus as set forth in claim 2, wherein each of said fins is transversely slotted to form a row of teeth having spaces therebetween, and each of said teeth having a heating element therein.

4. Apparatus as set forth in claim 3, wherein a radially inwardly extending, stationary tooth is positioned within each of said spaces, said stationary teeth being affixed to the inner conical side of said housing and arranged in a plurality of four, equally spaced apart longitudinally extending rows.

5. Apparatus as set forth in claim 4, wherein each of said stationary teeth is provided with a heating element, said elements being connected in electrical series to each other and to an electrical power source.

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30 ABRAHAM G. STONE, *Primary Examiner.*

R. L. HOLLISTER, *Assistant Examiner.*