March 22, 1966 F. A. McKEE 3,241,253

SNOW REMOVAL UNITS

Filed Aug. 26, 1963 3 Sheets-Sheet 1

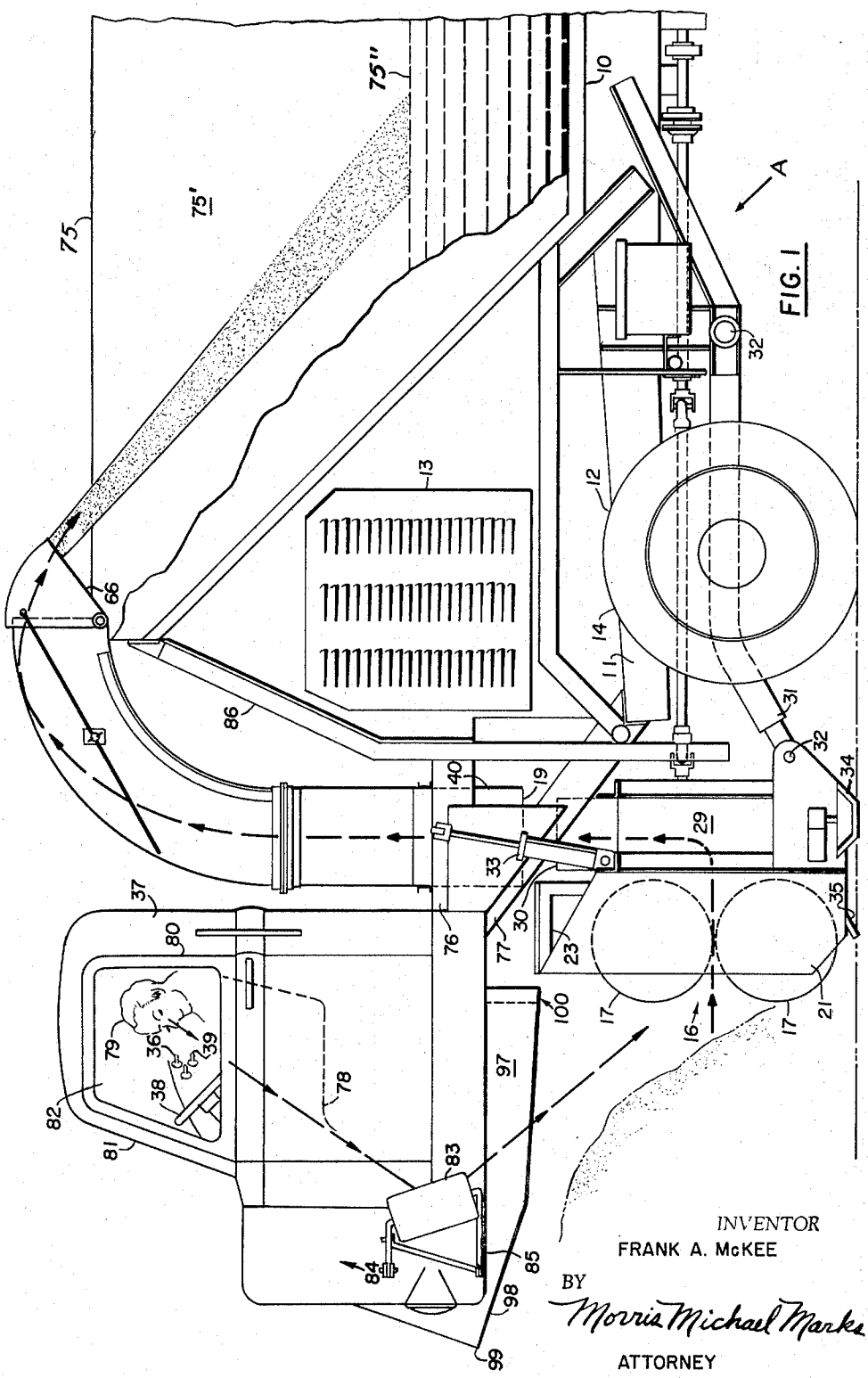


FIG. 1

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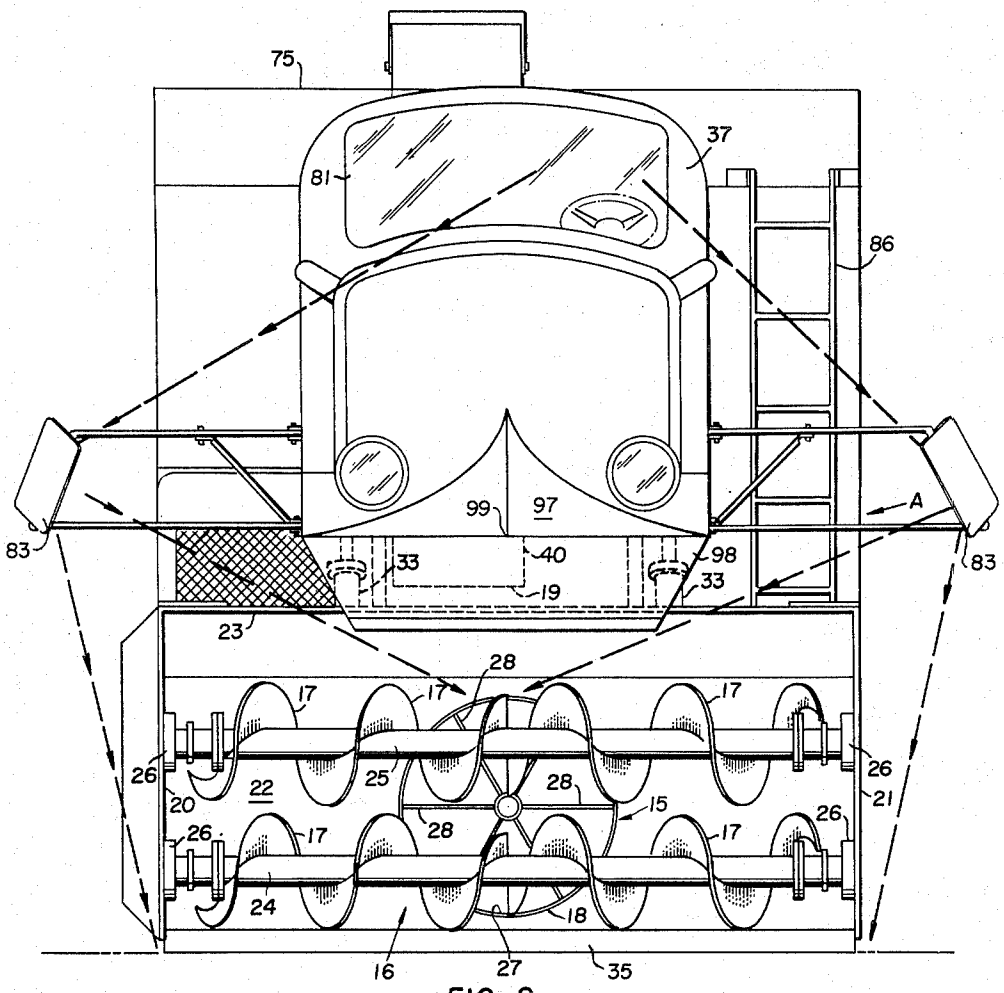


FIG. 2

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SNOW REMOVAL UNITS

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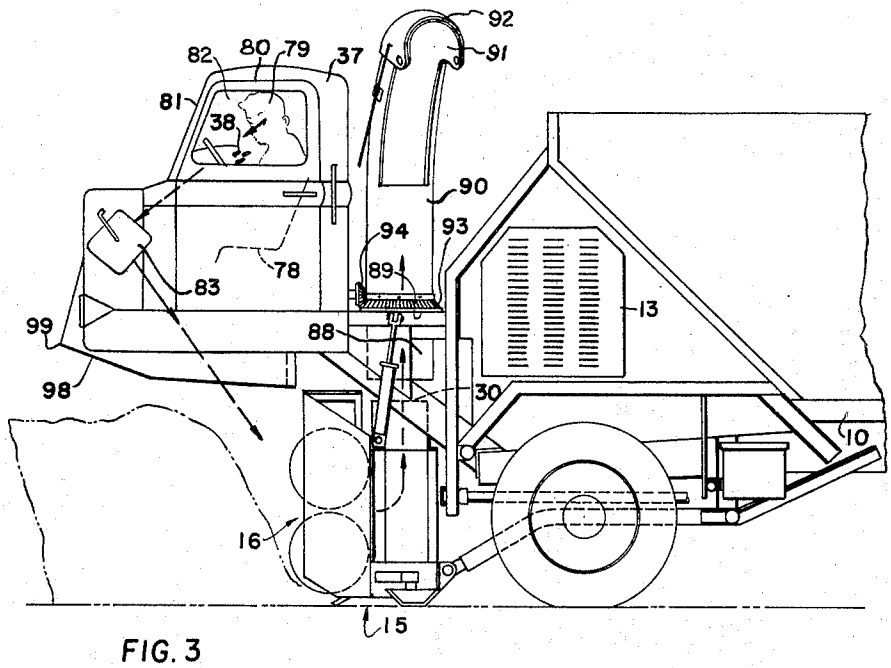


FIG. 3

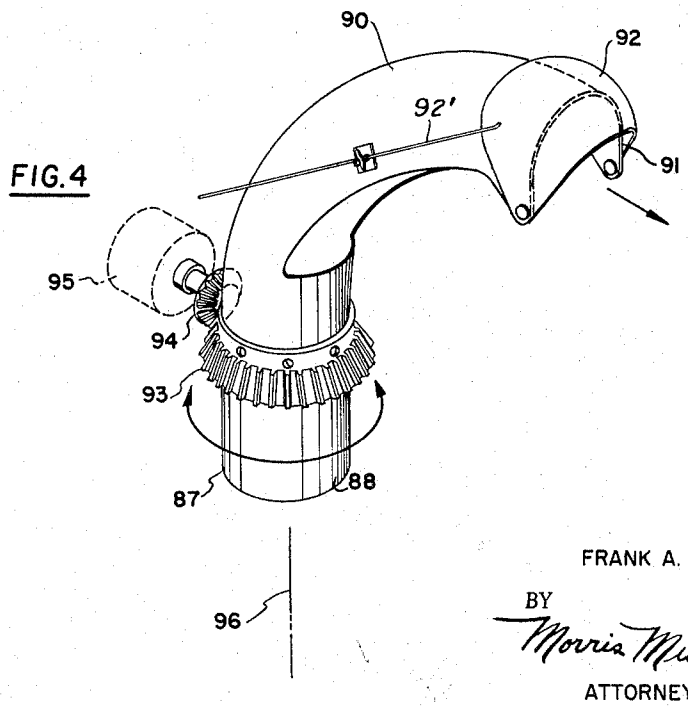


FIG. 4

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SNOW REMOVAL UNITS

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2 Claims. (Cl. 37—12)

My invention relates to snow removal units, and it relates more particularly to mobile units having means for gathering snow and conveying it to a desired location.

Among mobile snow removal units heretofore known, particularly in units comprising high speed snow blowers, the means for gathering and conveying the snow at high speed often creates a snowy mist which interferes with the vision of the operator, thereby reducing the speed of the operation and affecting the safety thereof. Also, the means for gathering and conveying the snow comprises an intake which hitherto has been out of range of the operator's view. As a result, the operator was required to maniplate the controls without being able to observe the operation of the mechanism at the critical intake region thereof. Moreover, various means have been employed to remove the snow. These include conventional snowplows, snow blowers, snow removal trucks and snow melters. But hitherto, there has been considerable difficulty experienced in providing a self-contained unit which will remove the snow over an area of unlimited range, such for instance as airport loading areas, parking areas, city streets or highways.

One object of my invention therefore, is to provide a self-contained snow removal unit which will gather the snow and melt it so that it can be removed as water at any convenient location, and which will provide the operator with a maximum of control of its mobility and operation.

Another object of my invention is to provide a snow removal unit which is so constructed as to dispose the operator in a position wherein he can observe the operation of the snow gathering and conveying intake while operating the controls thereof.

A further object of my invention is to provide a snow removal unit which assures maximum clarity and range of vision to the operator, thereby making it possible safely to drive the unit rapidly through a snow covered area while at the same time gathering and conveying the snow at a high rate of speed.

Another object of my invention is to provide a snow removal unit of maximum efficiency and dependability while requiring minimum space for its operation.

Additional objects will appear from the more detailed description which follows.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized, and that my invention is not limited to the precise arrangements and organizations of the instrumentalities as herein shown and described.

Referring now to the drawings in which like reference characters indicate like parts:

FIGURE 1 represents a side elevational view of the forward end region of a snow removal unit embodying my invention.

FIGURE 2 represents a front elevation view of a snow removal unit embodying my invention.

FIGURE 3 represents a side elevational view of the forward end region of a snow removal unit of modified construction, embodying my invention.

FIGURE 4 represents an enlarged perspective view of the discharge portion of the snow removal unit illustrated in FIGURE 3.

According to my invention, I provide a snow removal unit such for instance as the unit designated as A, and which may include a chassis 10 comprising a frame 11, mounted on wheels 12 which may comprise drive wheels (not shown) operated by an engine 13, and steering wheels 14. A suitable snow gathering and conveying means, such for instance as the blower mechanism 15 may be mounted on the forward end region of the chassis 10, and may be of any desired construction. Thus it may comprise an intake region such as the intake 16 in which is disposed rotary cutters such for instance as the spiral conveyor blades 17 adapted to cut the snow and convey it to a suitable impeller 18 disposed behind the cutter and conveyor blades 17, and immediately beneath a suitable chute or discharge portion 19. In a preferred form, the intake may comprise side walls 20 and 21, a rear wall 22 and a top 23. The spiral conveyor blades 17 may be carried by suitable shafts 24 and 25 to which they are fixedly secured, said shafts extending transversely of the intake 16 and mounted on suitable bearings 26 inwardly projecting from the side walls 20 and 21, the shaft 25 being disposed parallel to the shaft 24 and vertically spaced therefrom.

The impeller 18 may comprise a vent 27 in which is disposed impeller blades 28 adapted to guide a mixture of snow and air into a suitable impeller chamber 29 immediately behind the vent 27 and comprising an outlet 30 disposed beneath the discharge portion 19.

The intake 16 and the impeller chamber 29 together with the mechanism carried thereby, may be mounted on suitable forwardly projecting struts 31 pivoted as at 32 to the frame 11; and may also be carried by suitable raising and lowering mechanism such as the hydraulic device 33 carried by the frame 11. Suitable skids 34 may be positioned below the impeller chamber 29, and a scraper 35 may be disposed beneath the lower conveyor blades 17 in a manner to guide snow upwardly from the road bed toward said blades 17.

The raising and lowering device 33 may be operated by a suitable control device 36 disposed in the cab 37. Other controls 38 are disposed in the cab 37 for operating the vehicle in a forwardly and rearwardly direction by means of the engine 13, and for turning the steering wheel 14, as well as for governing other features of the operation of my invention.

Suitable mechanism (not shown) is provided for rotating the shafts 24 and 25 in opposite directions and at a relatively low rate of speed, in a manner to cause the blades 17 to cut and convey the snow as the vehicle chassis 10 advances forwardly, and to guide said snow toward the impeller vent 27 in which the blades 28 are rotated at a high rate of speed by suitable mechanism (not shown) operably to draw a mixture of said snow and air into the impeller chamber 29 and to discharge the same vertically through the outlet 30 thereof. The controls 38 in the cab 37 may include a control device 39 for operating the conveyor and impeller mechanism.

The discharge portion 19 may comprise a base portion 40 mounted on the frame 11 and a discharge outlet 66. A container 75 may be carried by the chassis 10 for the reception of snow emanating from the discharge outlet 66. In a preferred form, the container 75 may be part of a snow melter 75' having heated water 75" disposed in the container in a manner to receive and to melt the snow discharged through the outlet 66.

The cab 37 is carried by a suitable cantilever construction such for instance as the beam 76 and truss 77 in a manner to be disposed above the intake 16 of the blower mechanism 15 and to project forwardly thereof. A snow diversion member 97 may be mounted on the cab 37 in a manner to provide a snow diversion surface 98 extending from a leading edge 99 forward of the cab 37 to a

rearward region 100 beneath the cab and in the vicinity of the intake 16, and adapted to divert snow downwardly and rearwardly toward said intake 16 as said cab 37 is advanced in the forward progress of the snow removal unit. A suitable seat 78 is provided for the operator 79, and a door 80 is provided for his ingress and egress. The cab is provided with a windshield 81 and side windows 82. A mirror 83 is mounted on one or both sides of the cab 37 at a forward region 84 thereof, and is in full view of both the operator 79 and the inlet 16. In a preferred form, the mirror 83 is disposed above the bottom 85 of the cab 37, and said bottom 85 extends substantially forward of the intake 16. A ladder 86 or other suitable means may be provided for giving the operator 79 access to the cab 37.

In FIGURES 3 and 4 a modified construction of the discharge portion 87 is illustrated. In this construction, a tubular base portion 88 is provided of an internal diameter greater than the diameter of the outlet 30. The tubular base portion 88 is mounted in a suitable bearing 89 carried by the chassis 10 and is adapted to rotate about a vertical axis. A suitable duct 90 is mounted on the tubular base portion 88 in a manner to receive the blast of snow-air mixture passing therethrough. The duct 90 is curved upwardly and away from the vertical axis substantially to a horizontal axis, and terminates in a discharge outlet 91. A hood or capper 92 may be pivoted to the discharge outlet 91 in a manner to adjust the vertical angle of the "throw" of the snow emanating from the discharge outlet 91, and may be retained in adjusted position by any suitable means such for instance as the rod 92'.

Suitable means may be provided for rotating the duct 90 about a vertical axis. Thus, the duct 90 may be fixedly secured to the base portion 88 which is rotatably mounted on the bearing 89, and a suitable gear 93 may be mounted on said base portion 88 and in mesh with a gear 94 operated by a suitable motor 95 governed by one of the control members 38 in the cab 37. By this means, the operator 79 may cause the base portion 88 to rotate about its vertical axis 96, carrying with it the duct 90 whose discharge outlet 91 is thus caused to swing to any desired angle with respect to the longitudinal axis of the chassis 10. The direction of the "throw" of the snow can thus be adjusted as desired by the operator 79, and its placement can further be controlled by the adjustment of the hood 92.

My invention thus provides means whereby a self-contained snow removal unit may occupy a minimum of space while efficiently gathering and conveying the snow either to a location exterior of the unit, or to a container forming part of the unit, and in which it may be melted for disposal as water at a conveinent location, all at the option of the operator who remains within the cab.

Moreover, the bottom region 85 of the cab 37 being disposed above and substantially forward of the intake 16, the mist of snow generated by the operation of the blower mechanism 15 is prevented from rising in front of the windshield 81.

The forward view of the operator 79 is therefore maintained completely unobstructed. Yet, should any obstruction enter the intake 16, or other difficulty arise in the operation thereof, the operator 79 will have a clear view of said intake 16 from within the cab by means of the mirror 83. The operator is thus aided in manipulating the controls 36, 38 or 39, while keeping the intake 16 fully in view, and without leaving the cab 37. Also, the disposition of the cab 37 so that it is mounted above and forwardly of the intake 16 assures the operator 79 a clear view out of both side windows 82.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

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

1. A mobile snow removal unit including in combination:
- a chassis comprising wheels including a wheel which can be steered. the bottoms of said wheels substantially defining a plane;
- snow gathering and conveying means mounted on the forward portion of said chassis;
- a cab containing controls for said steerable wheel and said means;
- said cab comprising:
  - room for an operator, and
  - a window region adapted to provide said operator with a view required for the forward progress of said unit;
- a cantilever construction rigidly mounted on said chassis and supporting said cab in a manner to project said cab above and substantially forward of said means for gathering and conveying said snow, with the floor of said cab being substantially fixedly disposed substantially parallel to said plane;
- a snow melter mounted on said chassis;
- said snow gathering and conveying means comprising:
  - power driven intake and impeller means pivotally mounted on said chassis for vertically swinging movement about an axis located rearwardly of said intake and impeller means;
- means mounted on said chassis for raising and lowering said intake and impeller means with respect to said cab; and
- a chute mounted behind said cab in substantially fixed relation with respect to said chassis, and located substantially above said impeller means, and adapted to convey snow to said snow melter.

2. A mobile snow removal unit including in combination:
- a chassis comprising wheels including a wheel which can be steered, the bottoms of said wheels substantially defining a plane;
- snow gathering and conveying means mounted on the forward portion of said chassis;
- a cab containing controls for said steerable wheel and said means;
- said cab comprising:
  - room for an operator, and
  - a window region adapted to provide said operator with a view required for the forward progress of said unit;
- a cantilever construction rigidly mounted on said chassis and supporting said cab in a manner to project said cab above and substantially forward of said means for gathering and conveying said snow, with the floor of said cab being substantially fixedly disposed substantially parallel to said plane;
- a snow melter mounted on said chassis;
- said snow gathering and conveying means comprising:
  - power driven intake and impeller means pivotally mounted on said chassis for vertically swinging movement about an axis located rearwardly of said intake and impeller means;
- means mounted on said chassis for raising and lowering said intake and impeller means with respect to said cab;
- an intake region disposed beneath said cab and extending rearwardly to said intake and impeller means;
- a chute mounted behind said cab in substantially fixed relation with respect to said chassis, and located substantially above said impeller means, and adapted to convey snow to said snow melter; and
- an optical system disposed between said cab and said intake region, in a manner to give said operator a

view of said intake region during the forward progress of said unit.

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