Oct. 30, 1928.

F. M. REDMER

1,689,683

SNOWPLOW

Filed Jan. 14, 1927

3 Sheets-Sheet 1

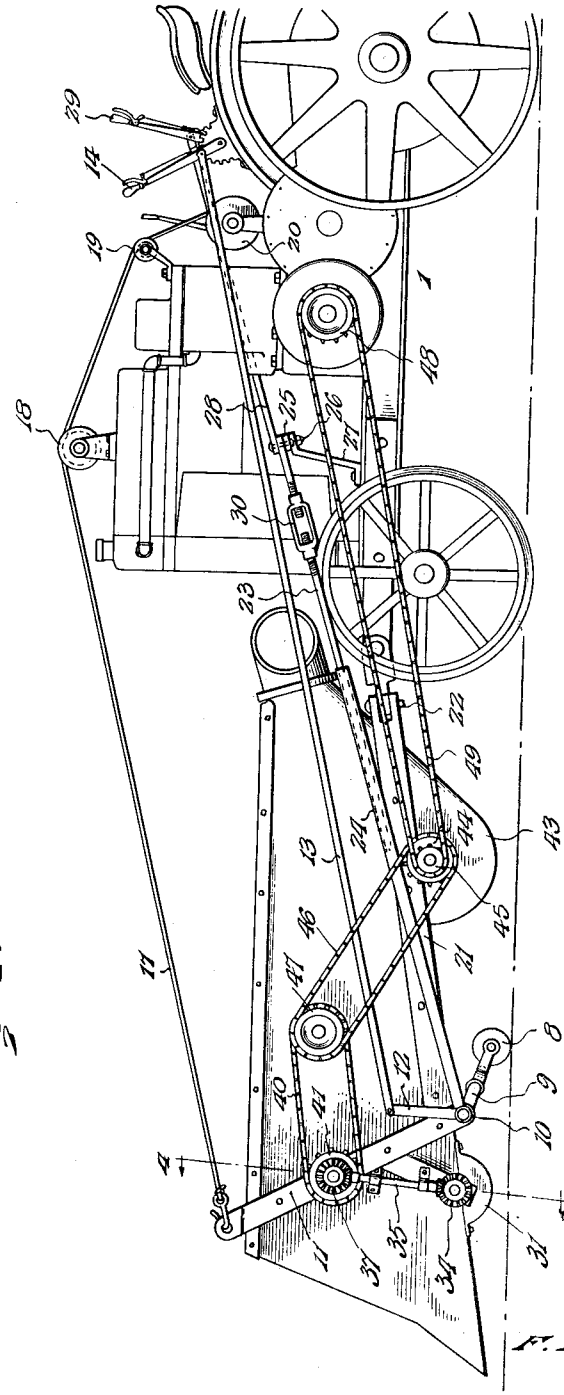


Fig. 1.

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Fig. 2.

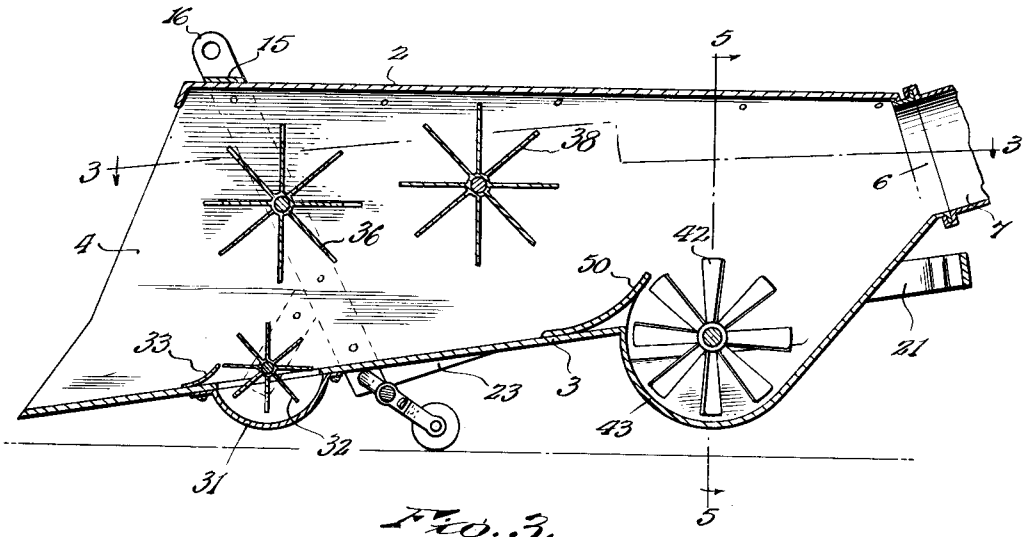
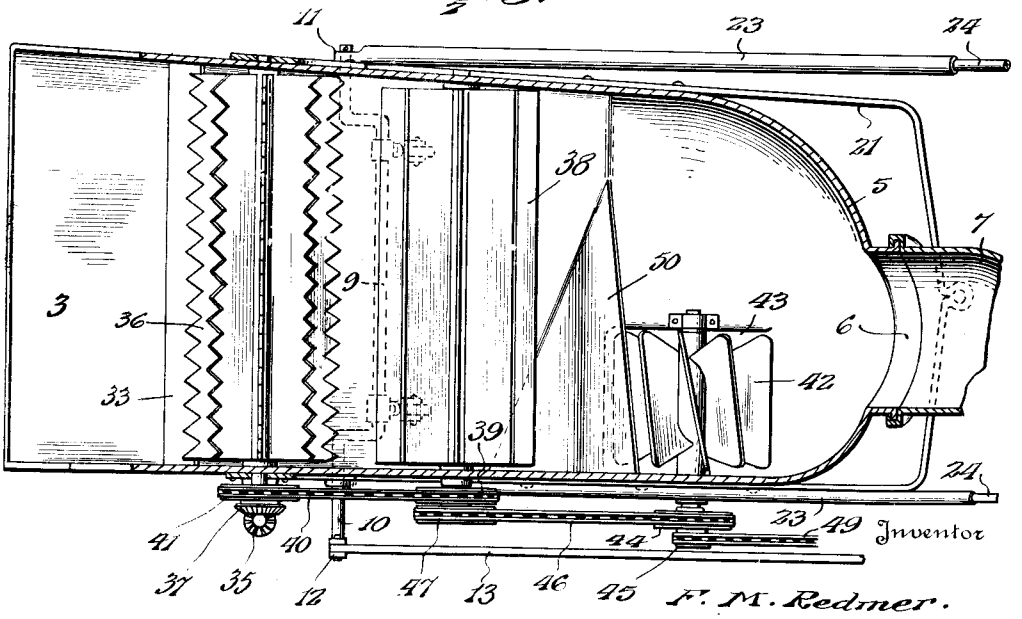


Fig. 3.



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Fig. 4.

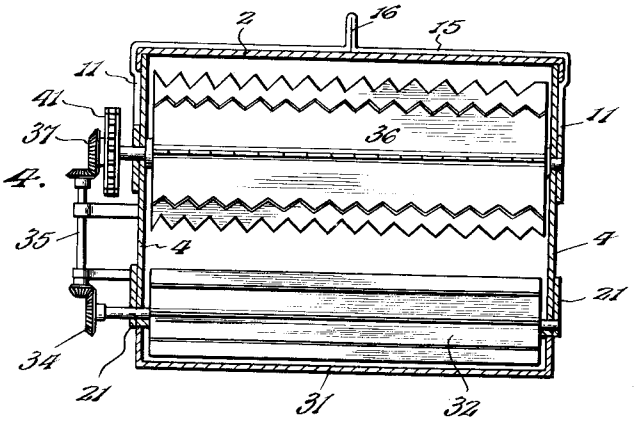


Fig. 5.

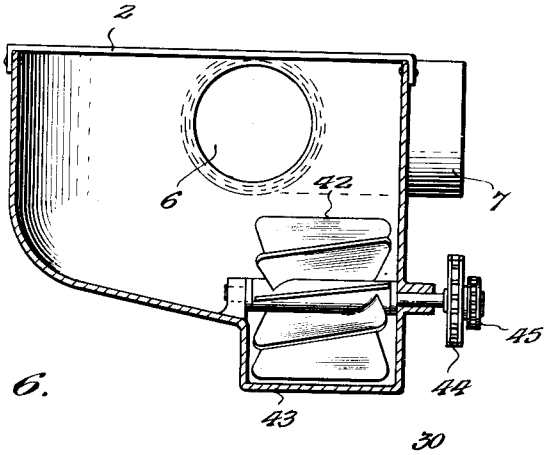
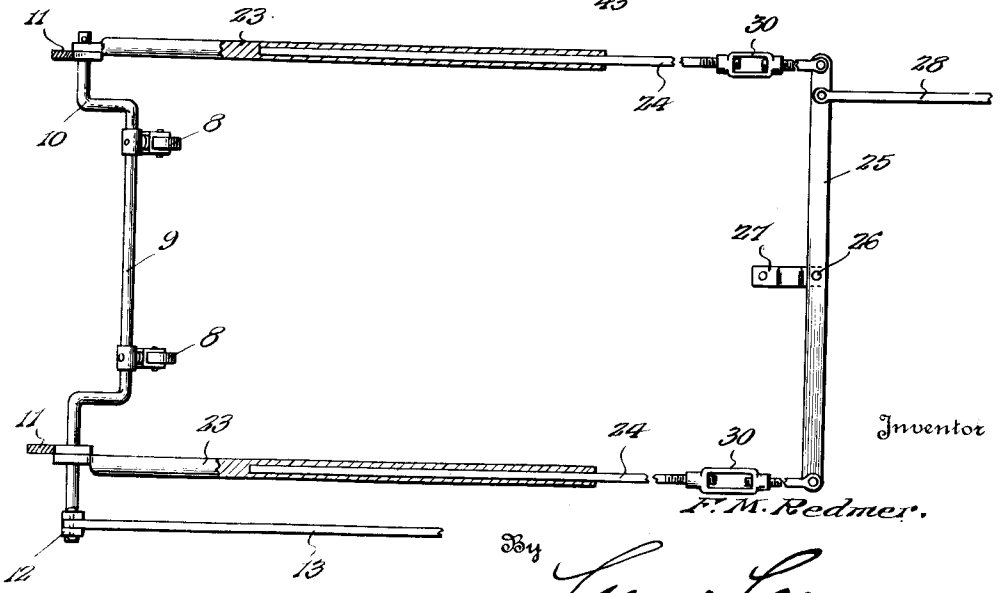


Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANK M. REDMER, OF NORFOLK, NEBRASKA, ASSIGNOR OF FORTY-NINE ONE-HUNDREDTHS TO CHARLES W. HASS, OF NORFOLK, NEBRASKA.

SNOWPLOW.

Application filed January 14, 1927. Serial No. 161,140.

The invention relates to a road cleaning machine and aims to provide mechanically operated means for the removal of snow which is elevated during the progress of the machine and thrown to one side of the path.

The invention contemplates an attachment which may be coupled to a tractor and which is independently adjustable laterally for steering and adapted to be elevated to insure a short turn being made when required.

The invention furthermore provides means for vertically adjusting the front end of the attachment, whereby to clear obstructions or for other purposes.

While the drawings illustrate a preferred embodiment of the invention, it is to be understood that in adapting the means to meet specific needs and requirements, the design may be varied and such other changes in the minor details of construction may be resorted to within the scope of the invention as claimed, without departing from the spirit thereof.

For a full understanding of the invention and the merits thereof, reference is to be had to the following description and the drawings hereto attached, in which,—

Figure 1 is a side view of a snow plow, or road cleaning machine, embodying the invention, showing it coupled to a tractor.

Figure 2 is a vertical, longitudinal sectional view of the device.

Figure 3 is a plan sectional view on the line 3—3 of Figure 2.

Figure 4 is a vertical transverse sectional view on the line 4—4 of Figure 1, looking in the direction of the arrows.

Figure 5 is a vertical, transverse sectional view on the line 5—5 of Figure 2, looking in the direction of the arrows.

Figure 6 is a plan view of the steering mechanism partly in section.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The numeral 1 designates a tractor which may be of any make, the same being illustrated to demonstrate the application of the invention, which is coupled thereto in a manner to admit of lateral adjustment for steering, vertical adjustment for clearing obstructions and elevating to provide for a short turn.

The plow, or cleaning machine comprises an elongated hollow casing, which is designed to operate in advance of the tractor to which it is coupled, said casing receiving the snow as the plow advances and containing means, such as rotary beaters and fans, for positively moving the snow therethrough and provided at its rear end with a spout for discharging the snow, said spout having a swivel connection with the casing, whereby it may be turned to discharge the snow to the right or to the left of the road, as may be found most advantageous.

The casing comprises a top 2, a bottom 3, sides 4, and a back 5, the latter curving laterally, as indicated most clearly in Figure 3, to an outlet 6 from which projects a collar to which a spout 7 is connected by means of a swivel joint, whereby provision is had for turning the spout to discharge the snow upon either side of the road, as required. The top 2 of the casing normally occupies an approximately horizontal position. The bottom 3 of the casing inclines upwardly and rearwardly from its forward end, so as to gradually elevate the snow in its rearward movement through the casing. The sides 4 of the casing are substantially parallel so as not to offer any appreciable resistance to the movement of the snow through the casing. The front end of the bottom 3 approaches close to the surface of the road so as to leave as little snow thereon as possible. The front end of the plow, or casing, is mounted upon caster wheels 8, the frames of which are secured upon the crank portion 9 of a transversely disposed shaft 10, located below the casing and mounted in side braces 11, which strengthen and reinforce the sides 4. An arm 12 secured to a projecting end of the transverse shaft 10 is connected by means of a rod 13 to a lever 14 mounted upon the tractor within convenient reach of the driver's seat. Upon operating the lever 14 the transverse shaft 10 is rotated in its bearings and changes the inclination of the crank portion 9, with the result that the forward end of the plow or casing may be raised, or lowered, to clear obstructions, or for any other required purpose.

The upper ends of the braces 11 are connected by means of a cross piece 15 from which an extension 16 projects vertically, as shown most clearly in Figures 1 and 4. A

cable 17 attached to the extension 16 passes over a guide-pulley 18 upon the tractor, thence over a guide pulley 19, and is attached to a drum 20, upon which it is adapted to be wound for elevating the forward portion of the plow or casing to lift the same a distance to admit of a short turn being made by swinging the attachment clear of the ground, as the tractor is turned.

A U-shaped frame 21 has its side members secured to opposite sides of the casing and its rear cross member pivotally coupled to the tractor, as indicated at 22, in Figure 1, the connection being such as to admit of the lateral and vertical movements of the front portion of the plow. The steering of the device is effected by the means shown most clearly in Figure 6, the same consisting of telescoping side rods 23 and 24 and a cross bar 25, the latter being pivoted intermediate its ends, as indicated at 26, to a bracket 27 mounted upon the tractor. A rod 28 connects one end of the cross bar 25 to a lever 29 mounted upon the tractor so as to be readily accessible from the driver's seat. The rods 23 are loosely connected to opposite end portions of the shaft 10, and are tubular for the major portion of their length to receive the rods 24. The rods are so proportioned and arranged that when the plow is set to travel straight ahead the front ends of the rods 24 touch the inner ends of the openings formed in the rods 23, as indicated most clearly in Figure 6. When the cross bar 25 is turned, one of the rods 24 is advanced, and the opposite rod 24 drawn rearward, as will be readily appreciated. A reverse movement of the cross bar 25 reverses the relative position of the rods, thereby steering the device in an opposite direction, as will be readily appreciated. The steering arrangement is sturdy and normally holds the plow in position to travel straight ahead and is not affected by shock or jolts. A turnbuckle 30 is interposed in the length of each of the rods 24 to admit of lengthening or shortening the same, as may be required in adapting the plow to different tractors.

The bottom 3 of the casing is formed with a half-round depression 31 a short distance in the rear of its forward end, and a rotary beater 32 is disposed to operate therein. The beater 32 extends the entire width of the casing and its upper portion projects above the plane of the bottom 3 and is driven to rotate rearwardly, so as to move the snow through the casing. A deflector 33 is located forwardly of the depression 31 to lift the advancing snow and insure its delivery to the upper portion of the beater. A bevel gear wheel 34 fast to a projecting end of the shaft or journal of the beater 32 meshes with a companion bevel gear fast to the lower end of a vertical shaft 35. A rotary beater 36 is located within the forward portion of the casing directly above the rotary beater 32 and its blade or tooth, as shown most clearly in Figure 3 to penetrate the snow and assist in loosening the same, as well as cause it to move rearwardly through the casing. A bevel gear 37 fast to a projecting end of the shaft or journal of the beater 36 meshes with a companion bevel gear fast to the upper end of the vertical shaft 35. A rotary beater 38 is located rearwardly of the rotary beater 36 and both beaters 36 and 38 are driven so that their lower portions travel rearwardly to positively move the snow through the casing. The projecting end of the shaft or journal of the rotary beater 38 is provided with a sprocket wheel 39 which is connected by means of a sprocket chain 40 with a sprocket wheel 41 fast to the shaft or journal of the rotary beater 36.

A rotary fan or blower 42 is arranged to operate in a depression 43 formed in the bottom 3 adjacent the back 5, and this fan effects a positive delivery of the snow through the outlet 6 and spout 7. The shaft or journal of the fan 42 projects and is provided with sprocket wheels 44 and 45, the sprocket wheel 44 being connected by means of a sprocket chain 46 with a sprocket wheel 47 fast to the shaft or journal of the rotary beater 38. A sprocket chain 49 connects the sprocket wheel 45 with a sprocket wheel 48 fast to the shaft of the motor or like part of the tractor. The fan or blower 42 is driven so that its upper portion travels rearwardly to effect positive delivery of the snow through the outlet 6 and spout 7. A deflector 50 slopes upwardly and rearwardly from the bottom 3 forwardly of the depression 43 and directs the snow to the upper portion of the fan or blower 42.

The device is coupled to a tractor by means of the frame 21 and pivot connection 22 and the shaft or journal of the fan or blower 42 is connected to a rotating part of the tractor by means of the drive chain 49. As the tractor moves over the road the several beaters 32, 36 and 38 are rotated together with the fan 42, and the snow scooped by the lower forward portion of the bottom 3 is positively moved through the casing and discharged through the outlet 6 and spout 7 by the combined action of the beaters and the fan 42. The device is steered by operating the lever 29 in the manner stated, and the front portion of the casing is adapted to be adjusted vertically by manipulating the lever 14 which changes the inclination of the crank portion 9 of the transverse shaft 10, thereby raising or lowering the front end of the plow or part 3. To effect a short turn the drum 20 is rotated to wind a portion of the cable 17 thereon, thereby lifting the front portion of the device clear of the ground so it may swing with the tractor as the latter is turned.

Having thus described the invention, I claim:

1. A snow plow, comprising a hollow casing having a discharge outlet at its rear, and an inlet at its front, and having its bottom upwardly and rearwardly inclined from its front edge which is adapted to dig into and lift the snow, and said bottom having front and rear depressions, a rotary beater mounted within the front depression, a fan located within the rear depression, and rotary beaters within the upper portion of the casing and adapted to coact with the lower beater and fan to positively move the snow through the casing and discharge the same through the outlet.

2. A snow plow, comprising a hollow casing having a discharge outlet at its rear, and an inlet at its front, and having its bottom upwardly and rearwardly inclined from its front edge which is adapted to dig into and lift the snow, and said bottom having front and rear depressions, a rotary beater mounted within the front depression, a fan located within the rear depression, rotary beaters within the upper portion of the casing and adapted to coact with the lower beater and fan to positively move the snow through the casing and discharge the same through the outlet, and deflectors forwardly of the depressions in the bottom to elevate the snow and effect delivery thereof to the upper portion of the lower beater and fan.

3. A snow plow comprising a casing having an inclined bottom for scooping up the snow and provided in its length with depressions, the rear of the casing having an outlet and sloping towards the outlet to obviate the formation of corners, a reversible spout connected to said outlet, a rotary beater and a rotary fan arranged to operate within the respective depressions formed in the bottom of the casing and deflectors forwardly of the depressions for initially elevating the snow in advance of the respective beater and fan.

In testimony whereof I affix my signature.

FRANK M. REDMER. [L. S.]