

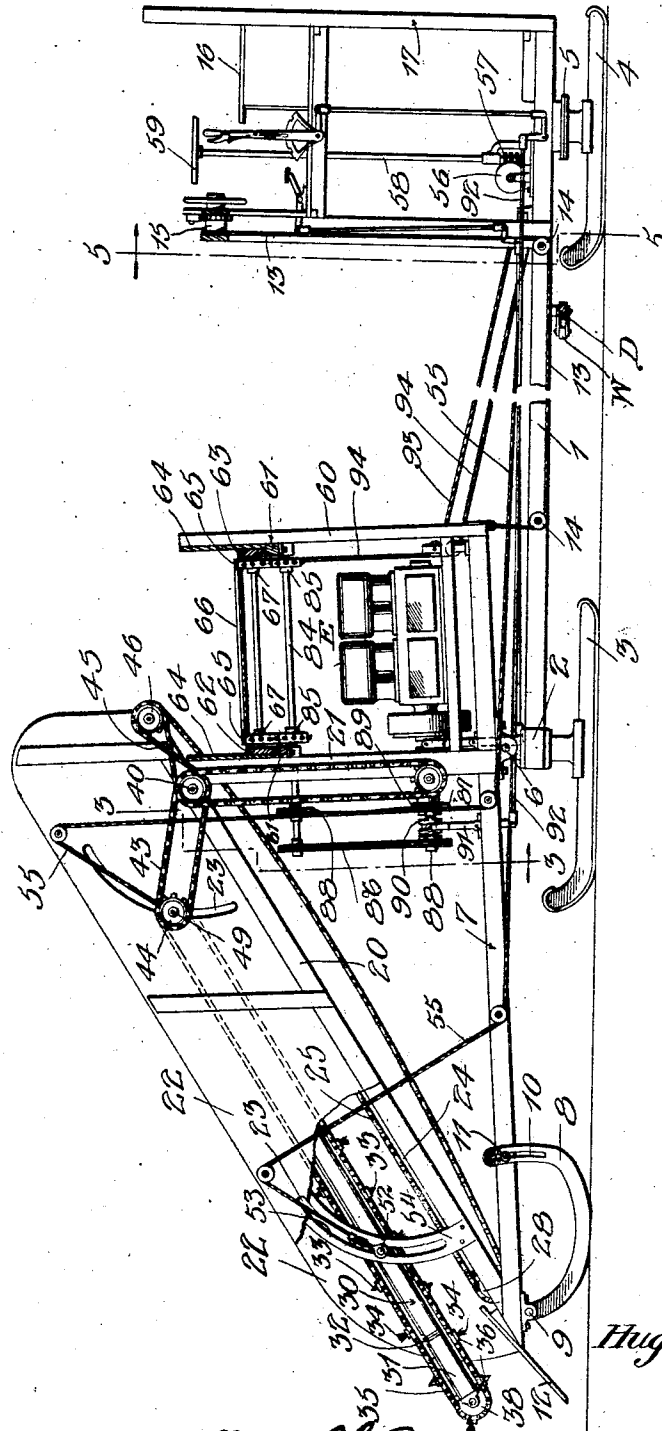
H. CARR.
STREET AND HIGHWAY SNOW CLEANING MACHINE.
APPLICATION FILED FEB. 26, 1914.

1,148,954.

Patented Aug. 3, 1915.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses

W. H. Rockwell

E. E. Luntz

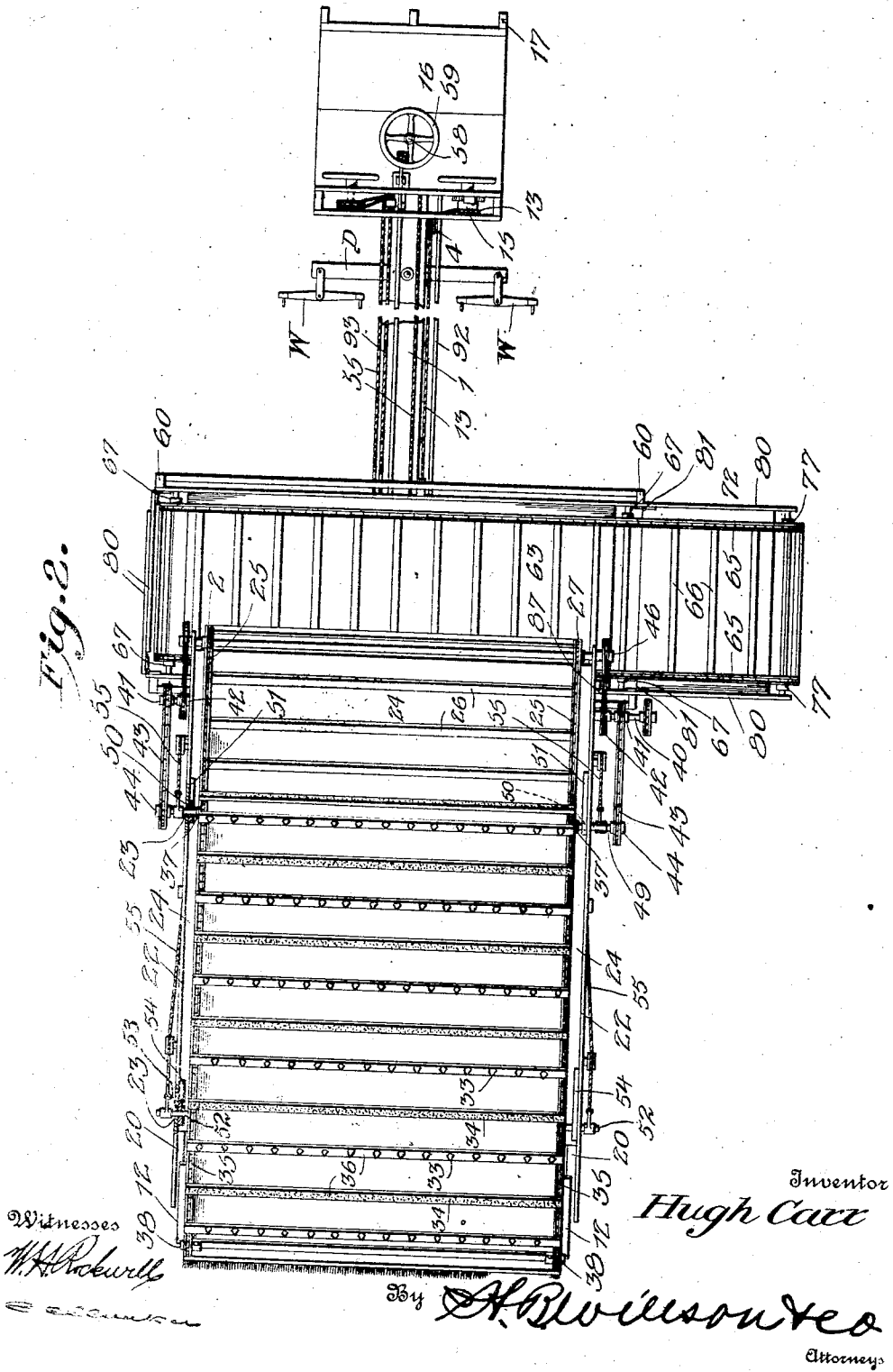
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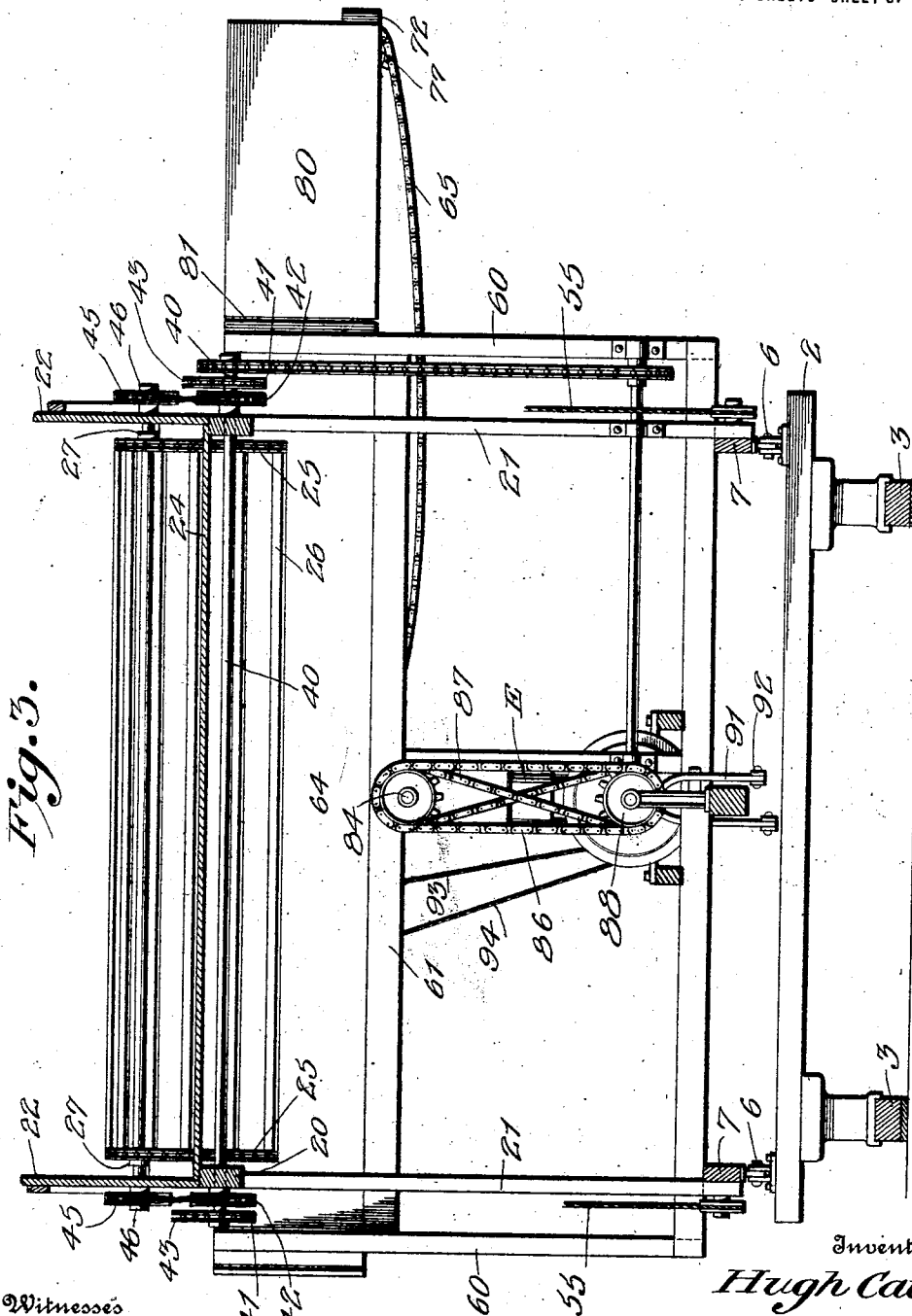


Fig. 3.

Witnesses
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Fig. 4.

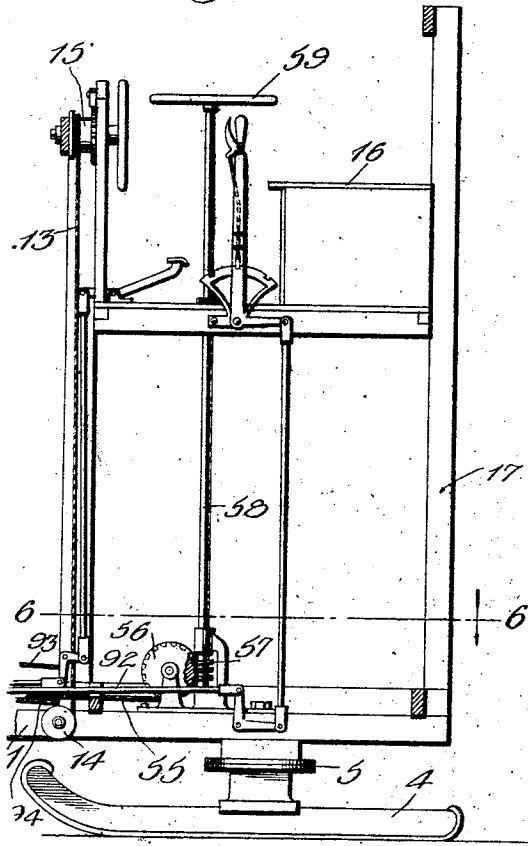


Fig. 5.

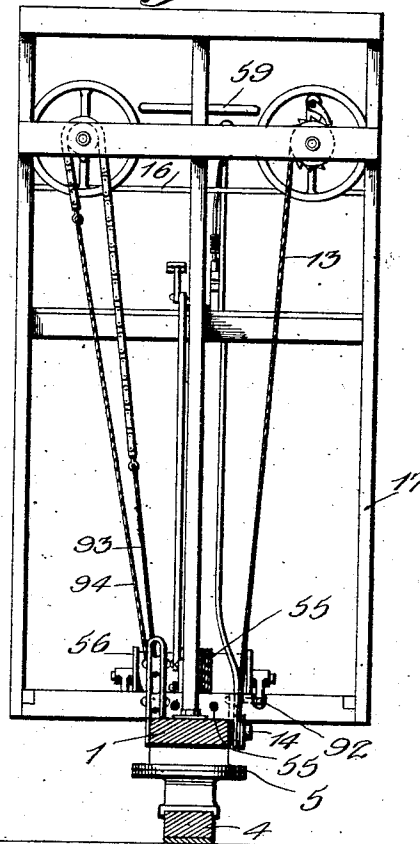
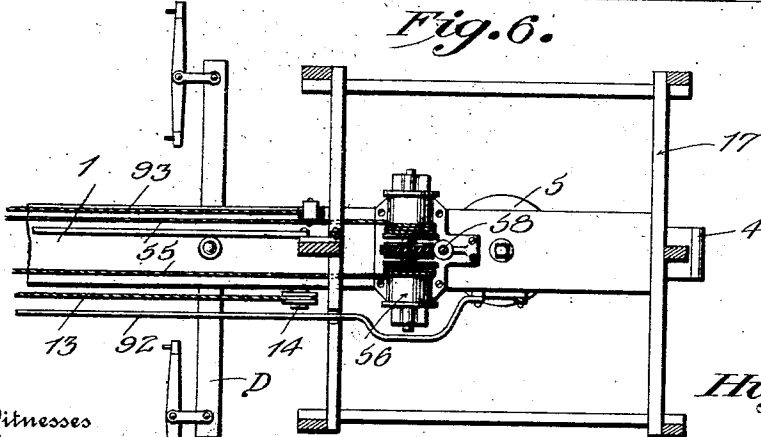


Fig. 6.



Witnesses

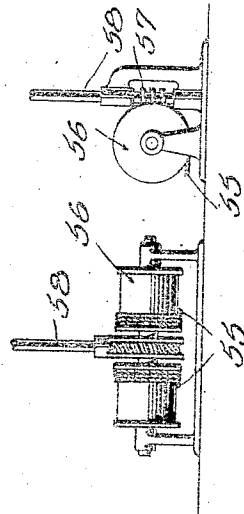
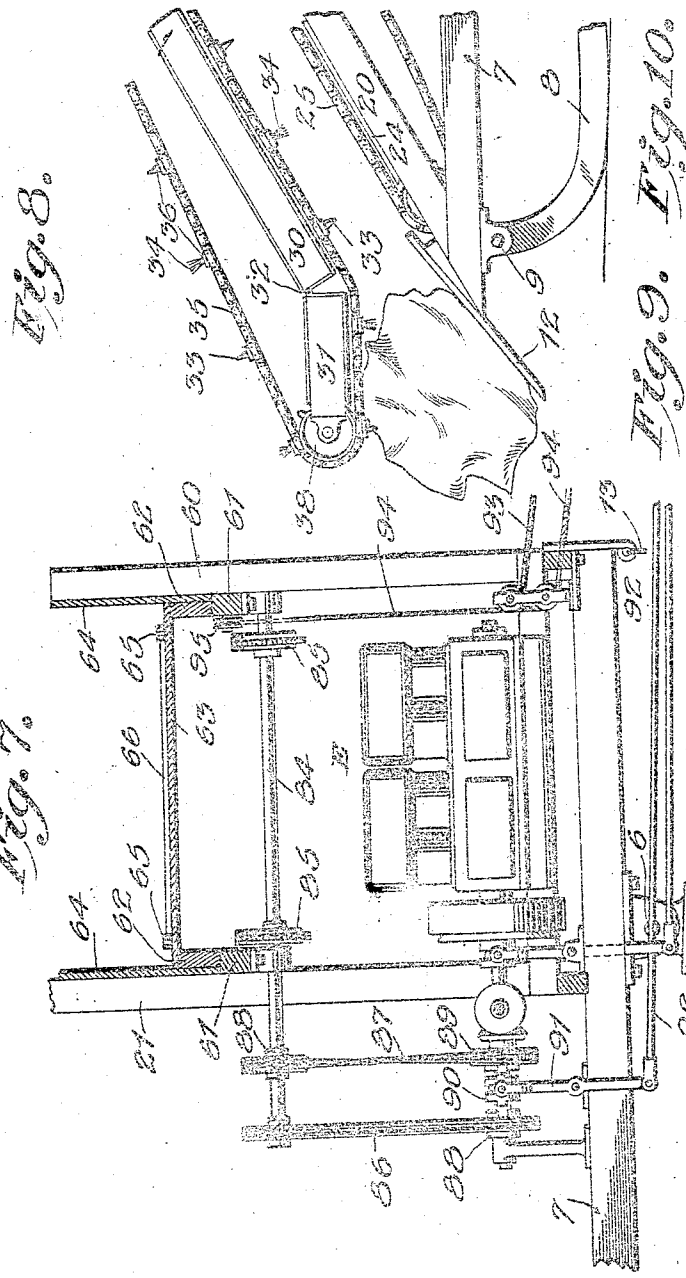
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UNITED STATES PATENT OFFICE.

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HUGH CARR, OF HAUGAN, MONTANA.

STREET AND HIGHWAY SNOW-CLEANING MACHINE.

1,148,954.

Specification of Letters Patent.

Patented Aug. 3, 1915.

Application filed February 23, 1914. Serial No. 821,213.

To all whom it may concern:

Be it known that I, HUGH CARR, a citizen of the United States, residing at Haugan, in the county of Missoula and State of Montana, have invented certain new and useful Improvements in Street and Highway Snow-Cleaning Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the class of excavating, and more especially to those machines which include a plow and a carrier; and the object of the same is to produce a snow-cleaning machine for use on streets or highways and by means of which the snow and ice will be scraped or plowed from the surface, carried upward by a suitable elevator, and then delivered at either side of the machine either back onto the street or highway or into a vehicle which may be driven alongside.

This and other objects are carried out by the construction hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a side elevation of my improved machine; Fig. 2 is a plan view thereof. Fig. 3 is an enlarged transverse section taken on the line 3—3 of Fig. 1; Fig. 4 is an enlarged side elevation of the rear portion of my improved machine illustrating the arrangement and disposition of the mechanism; Fig. 5 is an enlarged transverse section taken on the line 5—5 of Fig. 1; Fig. 6 is a horizontal sectional view taken on the line 6—6 of Fig. 4; Fig. 7 is an enlarged fragmentary view partly in section showing the central portion of the machine and illustrating the clutch mechanism thereon; Fig. 8 is an enlarged detail of the front portion of the machine; Fig. 9 is an enlarged front elevation of the windlass disposed at the rear end of my machine; Fig. 10 is a side elevation of the same.

Although I have shown my machine in the drawings herewith as mounted upon a sledged vehicle, it is quite possible that it could be mounted upon a wheeled vehicle, and the same may travel on the street or highway or could travel on the tracks of a railway without departing from the spirit of the invention. Furthermore, while I have described and intend my machine for handling snow and ice, it is quite possible—

especially if another form of plow be employed—that it could be used to handle dirt or the like which was scraped from or excavated out of the roadway or possibly even which was delivered to the plow or the inlet end of the elevator by a brush or other suitable gathering mechanism forming no part of the present invention. I make this statement to show that the machine hereinafter described as a snow plow or snow machine, is not necessarily confined to that function. I may say also that the proportions and detailed construction of parts are not essentially those herein shown and described, as considerable modification in and amplification thereof may be indulged in without sacrificing the general principles involved. While I show and do prefer a gasoline engine for driving the various belts, it is possible that some other motive power might be employed. So also with the means suggested below for propelling the entire machine, for whereas I have suggested that it might be driven by horse power, it is of course possible that if the motor were large enough the horses could be omitted and power taken from the motor to propel the machine. On this understanding it will be clear that much of the following description and the corresponding illustration in the drawings, is given for a purpose of setting forth the preferred embodiment of my machine, rather than because the details shown and described are necessary to its successful operation.

The vehicle or support illustrated in the drawings herewith is a sled which is shown as comprising a main longitudinal beam 1 having a cross head 2 at its front end and runners 3 at the extremities of said head, a single runner 4 being pivotally mounted as at 5 beneath the rear end of the beam and turned on its pivot to steer the vehicle by means not necessary to illustrate or describe. In fact, if the vehicle be propelled by horse power it may be steered by directing the horses to one side or the other; and of course if it travel on the rails of a track it will need no steering mechanism. Hinged at 6 on the cross head 2 is a movable frame 7 which extends forward of the foremost runners 3 or the foremost truck of the vehicle and carries at its front corners two adjustable supports, herein shown as runners 8 which are pivoted at one end as at 9 beneath the frame and slotted in their other ends as

at 10 to receive bolts 11 whereby they may be adjusted vertically to permit the forward end of the frame to approach nearer to the ground or to be raised above the same according as these runners are adjusted. The entire frame rocks over the pivots or hinges 6, and its forward end is supported by the runners 8; and the front end of the frame carries a scraper or plow 12 by means of which the snow, ice, or other material is taken off of the surface of the ground or dug out of it. When the machine is being driven or propelled from point to point and it is not desired that this plow shall work, the rear end of the frame 7 is depressed onto the main beam 1 or other framework of the vehicle by any suitable mechanism, herein shown as a cable 13 which is led downward and around suitable pulleys 14 whence it passes to the rear and is carried over a windlass 15 which stands adjacent the driver's seat 16, the latter being supported by a framework 17 rising from the rear end of the beam 1. When this windlass is turned in the proper direction to wind up on the cable 13, the rear end of the frame is depressed and its forward end is raised so that the runners 8 no longer contact with the ground and the plow 12 is lifted entirely out of engagement therewith. On the other hand, when the tension on the cable is relaxed, the plow drops into working position as shown in Fig. 1.

The elevating mechanism is carried by the rocking frame 7 and it comprises a trough, and an elevator and presser moving upward therethrough. Beams 20 are secured at their lower ends to the frame 7 and are mounted at their rear upper ends on standards 21 rising from the same frame 7 and the trough consists of a floor 24 and sides 22 carried by said beams. At points near their upper and lower ends said sides are provided with arched slots 23 for a purpose yet to appear. The elevator is of the ordinary endless belt type, comprising chains 25 at each side connected by suitable slats 26 which pass over the floor 24 of the trough, the chains running over sprocket wheels 27 and 28 at the extremities of the elevator as usual and the return or lower side of this endless belt running downward beneath the trough floor as seen in Fig. 1. The presser overlies the elevator and is in effect another endless carrier mounted in a frame 30 of its own, the frame being of a proper size to fit movably between the sides 22 of the trough and by preference having an extension 31 hingedly connected to its front end by a hinge joint 32 so that the extension projects forwardly and downwardly beyond the front end of the elevator, whereas the rear end of the frame 30 is not carried upward as far as the frame of said elevator. The endless carrier forming part of the presser is composed of a pair

of chains 35 connected by slats 36, the chains moving around sprocket wheels 37 and 38 whose shafts are journaled in the frame 30 at its upper end and in the extension 31 at its lower end, and the slats are provided with spurs 33 or brushes 34 or both for a purpose to appear.

The motive power for actuating the elevating mechanism is herein shown as a gasoline engine E whose controls are within reach of the operator sitting on the seat 16 and need not be described; and power from said motor is conveyed in any suitable manner to a shaft 40 which is journaled through the frame 20 of the trough and carries at each end a pair of sprocket wheels 41 and 42. Each sprocket wheel 41 is connected by a chain belt 43 with a sprocket 44 fast on the upper shaft 49 of the presser, and each sprocket wheel 42 on the shaft 40 is connected by a twisted belt 45 with a sprocket wheel 46 fast on the upper shaft of the elevator. Therefore when power is conveyed from the motor E through suitable clutches or other connections to the shaft 40, the sprocket wheels 41 and 42 thereon drive the elevator and the presser in the proper direction to cause their adjacent sides to move upwardly in parallelism and preferably at the same speed. The upper shaft 49 of the presser passes through a slot 50 in a bracket 51 similar to the slot 53 in the bracket 54 seen in Fig. 1, one bracket 51 being carried within and at each side of the trough. The shaft 49 then passes through the slot 23 in the side of said trough, and studs 52 projecting outward from the frame 30 of the presser, pass also through slots 53 in other brackets 54 carried inside the trough near its lower end, and thence through the slots 23 as best seen in Fig. 2. Connected with the extremities of said shaft 49 and studs 52 are ropes or cables 55 which are led around suitable pulleys and backward to a control mechanism standing within reach of the driver who sits on the seat 16. In the present case this control mechanism is shown as consisting of a windlass 56 having a worm and screw connection 57 with an upright shaft 58 journaled in the framework 17 and carrying a hand wheel 59 at its upper end, but I do not wish to be limited to the precise form of control here employed. However, it is obvious that by turning the windlass in one direction and drawing on the cables 55, the entire frame may be raised within the trough, its upper shaft and its studs moving upward in the slotted guides of which the uppermost are struck on true arcs around the power shaft 40; but by turning the windlass in the opposite direction, the tension on the cables 55 is relaxed and the presser descends by its own weight. Its usual function is to rest upon the snow and ice gathered up by the plow and carried up-

ward by the elevator, and its teeth or brushes engage this or any material being handled and press it onto the elevator so that the latter will reliably carry it upward. In case an extra large piece of snow or ice or other material should be taken up by the machine, as shown in Fig. 8, the hinged extension 31 at the front end of the presser will rise so as to admit the same—at least until it can become crushed or reduced in size—and the upward movement of the elevator will eventually force this piece beneath the presser and raise the latter as the flexibility of the cables permits. The entire presser swings upward and rearward on the lines followed by the arc-shaped slots 23, so that its movement is to an extent such that it assists the upward movement of the material being elevated.

The delivery mechanism employed with the gathering mechanism and elevating mechanism described above, or with any suitable mechanisms which take up the snow, ice, or other material, and raise it as shown, is in the present instance designed to carry the material to one side or the other of the machine and to a considerable distance beyond it, and thence drop it either onto the roadway or into a vehicle driven or propelled alongside. In order that as far as possible the gathering and elevating mechanisms may be counterbalanced, I preferably mount the engine and the delivery mechanism on the rear end of the rocking frame 7 as shown, although it will be understood that this is a matter of secondary importance. On this understanding, then, standards 60 rising from the rear end of the frame 7 carry a pair of cross rails 61 upon which slide the side bars 62 of a delivery carrier, said bars being connected by a flooring 63 and having sides 64 rising from them as best seen in Fig. 7. The carrier itself is of the endless type, being composed of a pair of chains 65 connected by slats 66 moving over the floor 63, the chains running around sprocket wheels 67 mounted on shafts which are journaled in the extremities of the side bars 62 in any suitable way. The carrier as thus far described is of the same length as the width of the machine, its side bars 62 being of the same length as the rails 61 which support them, and with this construction whichever way the carrier moves it will deliver the material off one side of the machine but drop it on the roadway near the latter. In order that the material may be delivered at a more remote point or possibly into a vehicle driven or propelled alongside, I make use of an extension frame for this carrier which comprises side bars 72 connected by a flooring and having through their outer ends a shaft carrying sprocket wheels 77 like those numbered 67.

For closing either end of this delivery car-

rier, I provide a pair of doors 80 connected by spring hinges 81 with the ends of the sides 64 of the main carrier, the tendency of the said hinges 81 being to close said doors. When the extension frame is applied to either end of the main frame, the doors stand outside this extension frame and are automatically opened when the entire carrier frame is moved in the proper direction, the other pair of doors at that time automatically closing against the other end of the frame. As the doors are of the same height as the sides, it follows that this end of the delivery carrier is then closed and the other end is open, and if the chains and slats are moved in the proper direction the material delivered into the carrier by the elevating mechanism will be dropped off the outer end of the extension. However, if it be desired to deliver at the other side of the machine, the entire carrier may be moved laterally upon the rails 61, the other ends of the main side bars forcing open the pair of doors shown closed in Fig. 2, and the springs of the doors shown in that view as open cause them to automatically close behind the extension frame when the latter has moved into proper position. The direction of movement of the endless chains is now reversed, with the result that the material dropped into the carrier by the elevating mechanism will be delivered at the other side of the machine in a manner which will be clear. It follows that with the use of this extension, applied to either end of the main frame, the same may be adjusted to one side or the other according as the exigencies of the case may demand, and the material—be it snow, ice, or any such material gathered by this machine—will be delivered by the delivery mechanism at that side and at a remote distance from the machine itself. If this is considered not so important, or if it be desired that the material gathered shall be dropped off the machine rather nearer to the same, the extension may be entirely removed and possibly one pair of doors, or with the extension removed the main frame could be adjusted outward a slight distance on the rails 61 and the extremities of its side bars 62 and sides 64 would force open the pair of doors at the delivery side of the machine.

The driving mechanism for the carrier employed in the delivery mechanism above described, is by preference such that it will apply power to the lower stretch of the carrier, or in other words where the chains return beneath the side bars 62. For this purpose a shaft 84 is journaled in suitable bearings within the standards 60 and the framework carried thereby, and has sprocket wheels 85 engaging said chains; and said shaft 84 in Fig. 7 is shown as connected by a plain chain 86 and a twisted chain 87 with

sprocket wheels 88 and 89 mounted loosely on the engine shaft and having clutch elements adapted to be engaged by an interposed clutch element 90 which is splined on said engine shaft as shown. The engine shaft is connected with the motor E in any suitable manner, and the clutch element 90 is moved by a pivoted lever 91 from which a rod 92 leads back to a suitable control within reach of the driver. In similar manner the movement of the entire carrier on the rails 61 is put under the control of the driver in any suitable way, by preference as follows: Cables 93 and 94 attached to the main frame of the carrier at suitable points near the ends thereof are led inward toward each other and over suitable pulleys 95 (see Fig. 7), and thence rearward along the main beam 1 to an operating windlass similar to the windlass 15 within reach of the operator. When now he rotates said windlass and draws upon one cable and pays out on the other, the entire carrier frame will be shifted in one direction over the rails 61; and conversely, when he draws on the other cable and pays out on the one remaining, the carrier frame will be moved in the opposite direction. He can then manipulate the rod 92 to swing the lever 91 and throw the clutch element 90 into engagement with the element on either sprocket wheel 88 or 89, and the plain or twisted belt will drive the shaft 84 which, through its sprocket wheels 85, will move the chains of the carrier in whichever direction he desires. Therefore it will be seen that with two controls, one for setting the position of the carrier and the other for moving it in either direction, the driver or operator may at any time regulate the delivery of the material gathered so that it can be dropped to either side of the machine according as conditions require.

As typical of one form of driving or propelling mechanism by means of which this machine may be moved over the ground, I have shown in Fig. 2 a double tree D pivoted on the main beam 1 just forward of the framework 17 carrying the driver and the controls, and whiffletrees W connected to the ends of said doubletree so that horses could be attached thereto in a manner which will be clear. The animals would stand between the framework 17 and the body of the machine, and the driver would look over them and past them to observe the operation of the various mechanisms. However, as suggested above, it is possible that if the motor E were of sufficient size and power, other types or forms of driving mechanism could be substituted for horse-power. In any event, the plow takes up the snow, ice, or other material as the machine progresses or is driven or drawn forward, and passes it to the lower end of the elevating mechanism. Here it falls onto the elevator and is

carried upward, and it passes under the presser which bears it down onto said elevator so that if it be snow, ice, or any material which is slippery, it will not slip back. The elevating mechanism carries the material upward and drops it over the rear shaft thereof onto the delivery mechanism which, as above described, may be set to deliver the material to either side of the machine and at the desired distance from it. Meanwhile the direction and speed or rotation of the shaft 84 may be controlled by the driver, and if he throw out the clutch the elevator and delivery mechanisms will come to rest. When the entire machine is to be driven to the point where work is to be done, or back to the shed, the windlass is turned so that the cable 13 draws down on the rear end of the rocking frame 7, and the front end of the machine is lifted off the ground. In fact, this adjustment might be used to cause the tip of the plow to stand nearer to or more remote from the earth's surface, or possibly to embed the same if the machine were used for scraping up dirt, or in other ways well understood by those familiar with this art.

What is claimed as new is:

1. In a snow cleaning machine, the combination with a vehicle mounted on runners, a rocking frame hinged between its ends to the forward end of said vehicle, snow-gathering and elevating mechanisms carried on the forward end of said frame, of runners under the forward corners of said frame, each pivoted at one end to the frame and having its other end lapping the frame and slotted, and bolts passing through the slots and frame for adjusting the position of these runners, for the purpose set forth.

2. In a snow cleaning machine, the combination with an obliquely disposed trough and means for moving it forward, gathering mechanism at the forward end of said trough, and an elevator moving upward from the gathering mechanism over the bottom of the trough; of a presser consisting of a frame loosely mounted within said trough above the elevator and an endless carrier moving around said frame the sides of the trough having upwardly and rearwardly inclined slots, elements projecting from the side bars of said frame through said slots and moving normally downward therein by the gravity of the presser, and means for manually raising said elements within the slots.

3. In a snow cleaning machine, the combination with an obliquely disposed trough and means for moving it forward, gathering mechanism at the forward end of said trough, and an elevator moving upward from the gathering mechanism over the bottom of the trough; of a presser consisting of a frame loosely mounted within said trough

above the elevator and an endless carrier moving around said frame and over sprockets mounted on shafts at the upper and lower ends thereof, the sides of said trough 5 having arc-shaped slots and the upper shaft of the presser projecting through one of the slots, studs on the sides of said frame projecting through the other of said slots, cables connected with said shafts and studs, 10 and means for manually drawing on said cables, for the purpose set forth.

4. In a snow cleaning machine, the combination with obliquely disposed beams and means for moving them forward, gathering 15 mechanism at the lower ends of said beams, a driving shaft through them near their upper ends, brackets rising from said beams and provided with slots struck on an arc around said shaft, and other brackets near 20 their lower ends provided with slots parallel with the first-named slots; of an upwardly moving elevator between said beams, a presser disposed above said elevator and consisting of a frame, shafts in the ends of 25 said frame, and an endless carrier moving around said shafts, the uppermost shaft projecting through the slots in the upper brackets, sprocket wheels on this shaft and on the driving shaft, a chain belt connecting said 30 sprocket wheels, studs projecting from the frame and extending through the slots in the lower brackets, and manually-controlled means for moving said uppermost shaft and studs upwardly in said slots, for the purpose set forth. 35

5. In a snow cleaning machine, the combination with an obliquely disposed elevator and means for moving it forward, and gathering mechanism at the lower end of said elevator, of a presser disposed above 40 the elevator and consisting of a frame having a driving shaft through its upper end and sprockets thereon, an extension frame hinged to the lower end of the main frame by a rule-joint, a shaft through the extension frame and having sprockets thereon, 45 endless chains moving around said sprockets, slats connecting said chains, and means for manually raising the presser.

6. In a snow cleaning machine, the combination with an obliquely disposed elevator and means for moving it forward, and a 50 plow at the lower end of said elevator, of a presser disposed above the elevator and consisting of a frame having a driving shaft 55 through its upper end, an extension frame hinged to the lower end of the main frame by a rule joint and overlying said plow, a shaft through the extension frame, an endless carrier moving around said shafts, substantially upright guides in which said 60 presser is movably mounted, and means for raising the presser in said guides.

In testimony whereof I have hereunto set my hand in presence of two-subscribing witnesses. 65

HUGH CARR.

Witnesses:

E. P. KING,
D. H. HOLLIDAY.