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1,567,495

E. H. FAHRNEY

SNOWPLOW

Filed Nov. 24, 1924

3 Sheets-Sheet 1

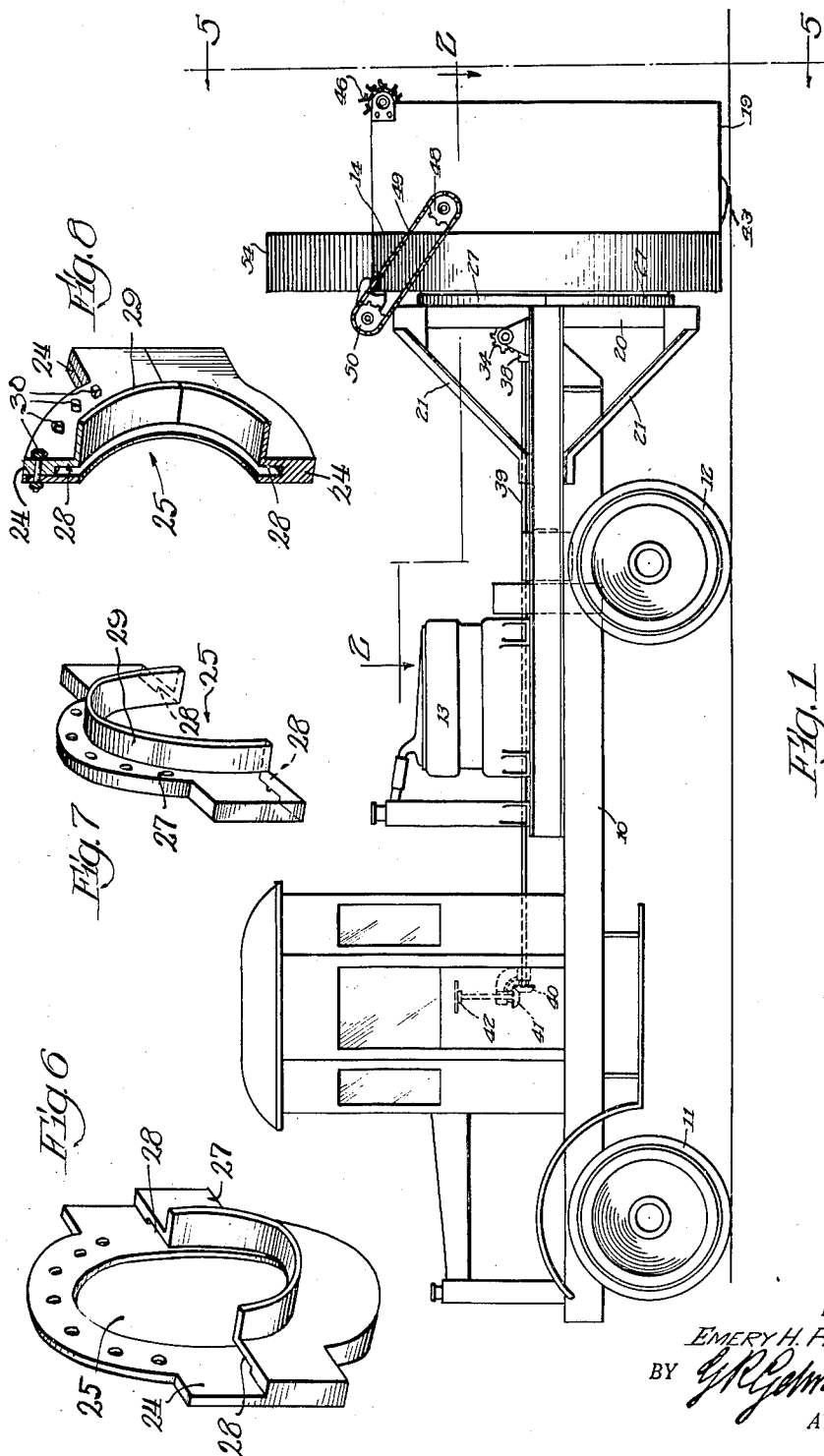


Fig. 1

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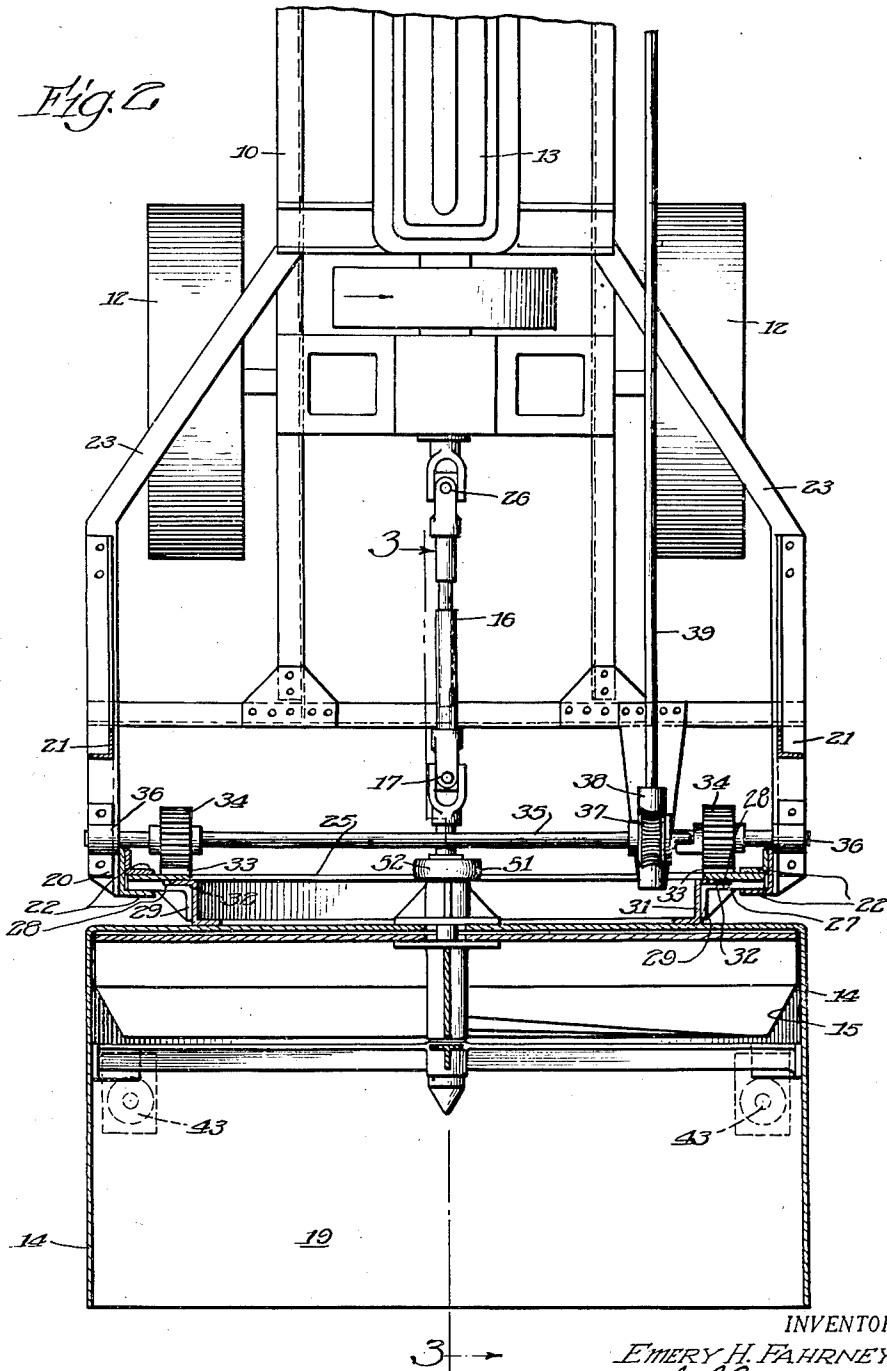
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3 Sheets-Sheet 2



INVENTOR.

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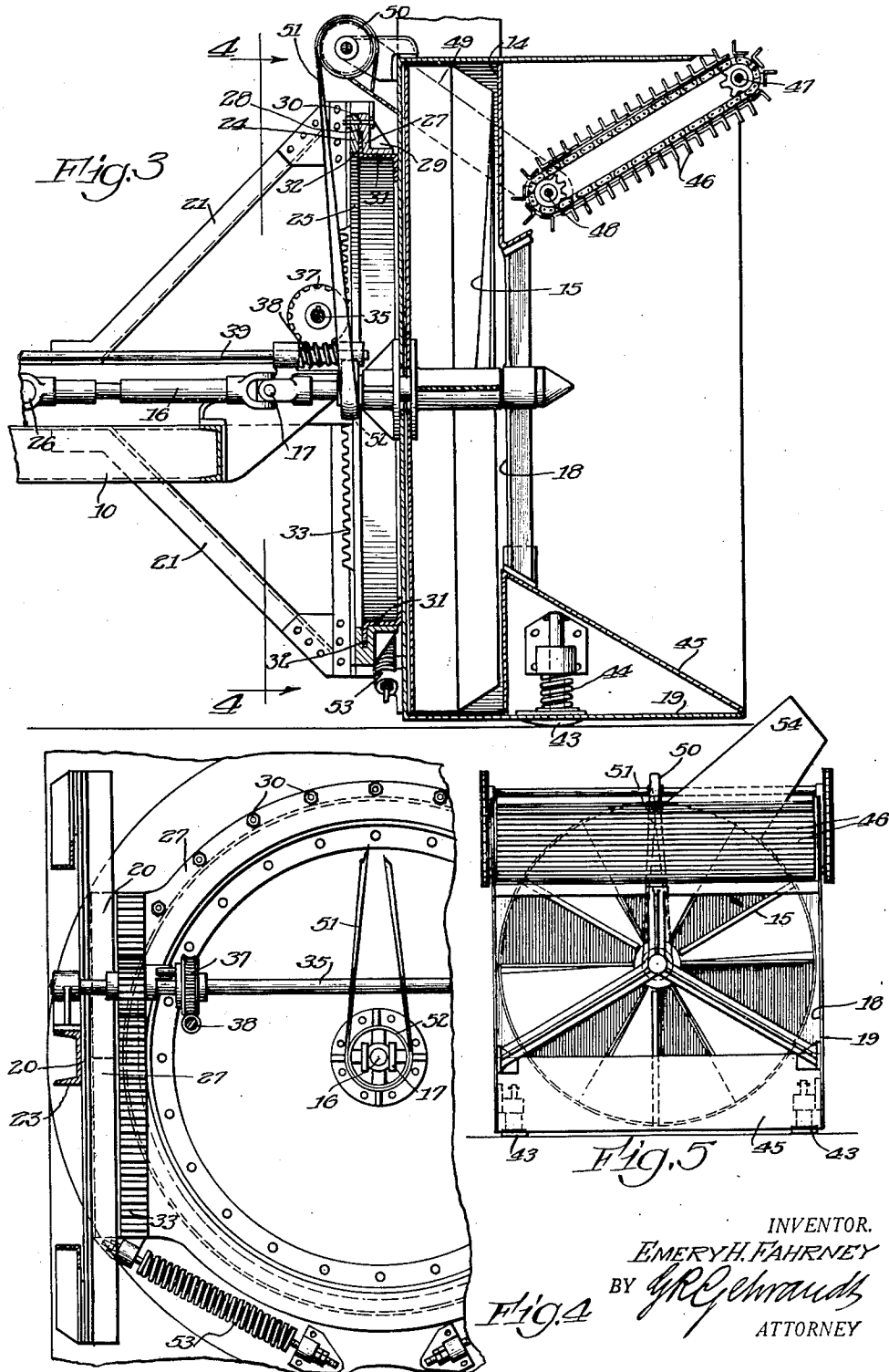
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SNOWFLOW

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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE.

EMERY H. FAHRNEY, OF CHICAGO, ILLINOIS.

SNOWPLOW.

Application filed November 24, 1924. Serial No. 751,988.

To all whom it may concern:

Be it known that I, EMERY H. FAHRNEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Snowplows, of which the following is a specification.

This invention relates to improvements in a snow plow particularly adapted, though not necessarily limited in its use, for removing snow from streets, roads or highways, and one of the objects of the invention is to provide an improved motor propelled vehicle like structure of this character which may be readily controlled and operated from the vehicle.

A further object is to provide improved mechanism for handling and conveying away the snow and improved means whereby the snow handling mechanism may be raised or lowered with respect to the vehicle so as to position such mechanism as desired with respect to the work to be performed, and which mechanism is also adapted to be shifted by the engagement therewith of an object or obstruction, and improved means for arighting the mechanism after the object or obstruction has been passed.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a diagrammatic view in side elevation of an improved machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a view taken on line 2—2, Figure 1.

Figure 3 is a detail vertical sectional view taken on line 3—3, Figure 2.

Figure 4 is a sectional view taken on line 4—4, Figure 3.

Figure 5 is a view in elevation taken from the right hand side of Figure 1.

Figure 6 is a detail perspective view of the adjustable supporting member for the fan casing and with a portion removed to permit the positioning of the fan casing.

Figure 7 is a detail perspective view of the top portion of the fan casing support.

Figure 8 is a vertical sectional view of the assembled parts of the fan casing support.

Referring more particularly to the drawings the numeral 10 designates a suitable wheel supported vehicle, having wheels 11 and 12, the wheels 11 constituting the steering wheels and being controlled through the medium of the usual steering mechanism (not shown).

The vehicle is propelled by a suitable motor through the medium of connecting driving mechanism (not shown).

The snow handling mechanism consists essentially of a casing 14 in which is mounted an impeller 15 which is driven by means of a suitable shaft 16 from any source of power. The shaft 16 is preferably connected by means of a universal joint 17 with the impeller 15, so that the raising and lowering movement of the casing 14 will not interfere with the operation of the impeller 15.

The casing is provided with an inlet opening 18 for receiving the snow or material delivered to the impeller by means of a scoop like attachment 19 arranged in advance of the impeller.

The casing thus formed is mounted upon the vehicle for vertical movement and also for rotary movement on a horizontal axis so that the snow handling mechanism may be raised and lowered with respect to the vehicle and to position the same as desired with respect to the work. The rotary movement of the casing as well as the scoop is provided as a means for preventing injury to the mechanism when the casing strikes an object or obstruction or when it is desired to remove snow from the road which is not directly in the line of travel of the scoop, when the latter is in its normal position.

The vertical adjustment of the snow handling mechanism is preferably accomplished through the medium of the following mechanism.

Rigidly supported by the vehicle is a guide frame 20 held in position in any suitable manner such as by means of braces 21, and this frame consists of guideways 22 arranged on opposite sides of the vehicle. The frame is preferably of a width somewhat greater than the end of the vehicle, and a supporting member 23 may be provided for assisting in holding the guides in position.

Movable in the guides 22 is a supporting member 24, having an opening 25 there-

through and through which opening the impeller is connected with the driving shaft 16. The latter is also preferably connected by means of a universal joint 26 with the shaft of the motor 13.

The opening 25 also serves as a means for permitting the vertical adjustment of the snow handling mechanism and also of the axial rotation of the impeller casing 14.

Secured to the member 24 is an annular member 27 which is provided with a cut away portion 23 and a laterally projecting flange 29. This member 27 is of a sectional construction, as shown more clearly in Figure 4, the upper section thereof being removably secured to the member 24 by means of suitable fastening devices 30, such as bolts or the like, for a purpose to be set forth.

Connected with the rear of the impeller casing 14 is an annular flange 31 having a laterally deflected and radially disposed flange 32 which is adapted to enter the guideway formed between the member 24 and the cut away portion 28 of the member 27, thereby mounting the impeller casing upon the member 24 for axial rotation with respect thereto.

In assembling these parts the removable section of the member 27 is detached by removing the fastening devices 30 and the portion 32 of the flange 31 is inserted in the guide space 28 after which the detached section of the member 27 is placed in position.

When the parts are thus assembled, it will be manifest that the impeller casing 14 will be mounted for axial rotation with respect to the member 24, and as the fan casing is also connected with the member 24 and as the latter is adapted to be moved vertically in the guides 22, the snow handling mechanism may be bodily raised and lowered with respect to the vehicle.

Any suitable mechanism may be provided for imparting such vertical movement and to that end there may be provided racks 33 secured to the rear face of the member 24, and with which racks pinion wheels 34 mesh. These pinion wheels are carried by a shaft 35 journaled in suitable bearings 36 and connected with the shaft 35 is a worm gear 37 with which a worm 38 carried by a shaft 39 meshes. The shaft 39 extends lengthwise of the vehicle and terminates at any convenient point. The shaft is adapted to be rotated in any suitable manner, preferably through the medium of intermeshing gears 40—41 and an operating handle 42.

With this construction it will be manifest that the entire snow handling mechanism may be bodily raised and lowered without interfering with the axial rotation of the impeller casing and vice versa.

As a means for assisting in supporting the impeller casing and scoop, skid devices 43

may be provided and connected with the scoop casing, springs 44 being provided for cushioning the casing with respect to the skid devices 43.

The scoop device is provided with an inclined surface 45 for directing the material to the inlet opening 18 of the impeller casing 14.

As an additional means for assisting in delivering the snow to the impeller there may be provided a plurality of endless flexible members having flights 46 secured thereto. This device is located preferably adjacent the upper portion of the impeller casing and passes over suitable sprocket wheels 47—48, motion being imparted to this device in any suitable manner, preferably by means of an endless flexible member 49 passing over a pulley connected with the sprocket wheel 48 and over a pulley 50, which latter is driven by means of a suitable belt 51, which in turn passes over a pulley 52 connected with the shaft 16 that drives the impeller 15.

As the material is fed into the scoop by the advancing of the machine, the conveyor or elements 46 will operate upon the snow to assist in delivering the same to the impeller through the opening 18.

The flights 46 extend entirely across the front of the snow handling mechanism and any number of the flights 46 may be provided. The endless members, carrying the flights are preferably located in an inclined position with respect to the horizontal and operate to gradually force the material into the opening 18.

In operation as the machine is advanced the snow will be fed in a manner already described to the impeller, the impeller together with the scoop being adapted to be raised and lowered with respect to the vehicle to position the same with respect to the work, in a manner as already described.

Should there be an obstruction which is engaged by the scoop portion of the snow handling mechanism during the travel of the machine, the scoop device and the impeller casing will be deflected with respect thereto by being given an axial rotation with respect to the vehicle and with respect to the supporting plate or member 24. After the snow handling mechanism has passed the obstruction the latter will be returned to its normal position by being rotated in a different direction about its axis, in any suitable manner preferably through the medium of springs 53, and which springs are so arranged that they will be placed under tension when the snow handling mechanism is rotated by the obstruction. The energy stored in the springs during this operation will return the snow handling mechanism to its proper position.

The snow which is delivered into the im-

PELLER casing will be discharged therefrom through a suitable delivery spout 54.

With this improved construction it will be manifest that all of the operating parts will be protected and at the same time the free movement, operation and adjustment of the parts will not be interfered with.

While the preferred form of the invention has been herein shown and described it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A snow plow including a supporting structure, means for propelling the same, a casing having a snow inlet and a discharge outlet, a rotor in the casing, means mounting the casing for vertical and axial adjustments with respect to the said structure, and means for vertically adjusting the casing.

2. A snow plow including a supporting structure, means for propelling the same, a casing having a snow inlet and a discharge outlet, a rotor in the casing, means mounting the casing for vertical and axial adjustments with respect to the said structure, means for vertically adjusting the casing, and means operating automatically to return the said casing when axially adjusted in one direction.

3. A snow plow including a supporting structure, means for propelling the same, a casing having a snow inlet and a discharge outlet, a rotor in the casing, a support, guideways in which the said support is vertically movable, means connecting the said casing with the said support for bodily movement therewith and for axial rotation with respect thereto, and means for moving the said support vertically in said guideways.

4. A snow plow including a supporting structure, means for propelling the same, a casing having a snow inlet and a discharge outlet, a rotor in the casing, a support, guideways in which the said support is vertically movable, means connecting the said casing with the said support for bodily movement therewith and for axial rotation with respect thereto, means for moving the said support vertically in said guideways, and resilient means for normally maintaining the said casing in a predetermined position with respect to the said member and against the stress of which resilient means the said casing moves when rotated in one direction.

5. A snow plow including a supporting structure, a casing having a snow inlet and a discharge outlet, a rotor in the casing, a support, guideways in which the support is vertically movable, means connecting the

said casing with the said support for vertical movement therewith and for free axial rotation with respect thereto, means operating automatically to return the casing when axially rotated in one direction, and gear and rack mechanism for vertically moving the said support.

6. A snow plow including a supporting structure, a casing having a snow inlet and a discharge outlet, a rotor in the casing, a support, guideways in which the support is vertically movable, means connecting the said casing with the said support for bodily vertical movement therewith and for free axial rotation with respect thereto, and resilient means normally tending to resist the axial rotation of said casing in either direction and against the stress of the said resilient means the said casing is adapted to be automatically rotated.

7. A snow plow including a supporting structure, a casing having a snow inlet and a discharge outlet, a rotor in the casing, a support, guideways in which the support is vertically movable, means connecting the said casing with the said support for bodily vertical movement therewith and for free axial rotation with respect thereto, and opposed resilient means cooperating with each other and tending normally to maintain the said casing in a predetermined position with respect to the said support and against the stress of each of said resilient means the said casing is adapted to be rotated with respect to the said support.

8. A snow plow including a supporting structure, a casing having a snow inlet and a discharge outlet, a rotor in the casing, a support, guideways in which the support is vertically movable, means connecting the said casing with the said support for bodily vertical movement therewith and for free axial rotation with respect thereto, resilient means normally tending to resist the axial rotation of said casing in either direction and against the stress of the said resilient means the said casing is adapted to be automatically rotated, and means including gear and rack mechanism for vertically adjusting the said support in the said guideways and at will.

9. A snow plow including a supporting structure, means for propelling the same, a casing having a snow inlet and a discharge outlet, a rotor in the casing, means mounting the casing for vertical and axial adjustments with respect to the said structure, means for vertically adjusting the casing, and ground engaging means connected with said casing for assisting in supporting the casing.

10. A snow plow including a supporting structure, a casing mounted thereupon and having a snow inlet and a discharge outlet, a rotor in the casing, a scoop like formation in advance of the said inlet for deliver-

ing the snow directly to the rotor in the casing, additional means also operating in advance of the said casing and co-operating with the scoop for delivering the snow
 5 directly to the rotor in the casing, and means for actuating the said additional means, the said additional means including an extended traveling conveyor structure
 10 operating within the scoop, one end of the conveyor being disposed in close proximity to the inlet of the rotor casing.

11. A snow plow including a supporting structure, a casing mounted thereupon and having a snow inlet and a discharge
 15 outlet, a rotor in the casing, a scoop like formation in advance of the said inlet for delivering the snow directly to the rotor in the casing, additional means also operating in advance of the said casing and co-operating
 20 with the scoop for delivering the snow directly to the rotor in the casing, and means for actuating the said additional means, the said additional means including an extended traveling conveyor structure operating with-
 25 in the scoop in a direction transverse to the axis of the rotor and extending across the scoop, one end of the conveyor being disposed in close proximity to the inlet of the rotor casing.

30 12. A snow plow including a supporting structure, a casing mounted thereupon and having a snow inlet and a discharge outlet, a rotor in the casing, a scoop like formation in advance of the said inlet for directing the
 35 snow thereinto, and an extended endless conveyor like formation operating within the scoop for assisting in directing the snow to the said inlet, the said conveyor also operating upon the snow in a downwardly
 40 inclined plane from the front of the scoop rearwardly, one end of the conveyor being disposed in close proximity to the rotor casing.

45 13. A snow plow including a supporting structure, a support upon the structure and vertically adjustable with respect thereto, a casing having a snow inlet and a discharge outlet connected with the said support for
 50 bodily movement therewith and for axial movement with respect thereto, a scoop like formation connected with the casing for directing the snow into the said inlet, and conveyor mechanism operating in the scoop

for assisting in feeding the snow to the said inlet in any position of the said casing with
 55 respect to the said support.

14. A snow plow including a supporting structure, a support upon the structure and vertically adjustable with respect thereto, a casing having a snow inlet and a discharge
 60 outlet connected with the said support for bodily movement therewith and for axial movement with respect thereto, a scoop like formation connected with the casing for directing the snow into the said inlet, con-
 65 veyor mechanism operating in the scoop for assisting in feeding the snow to the said inlet in any position of the said casing with respect to the said support, and means upon the vehicle for operating the said convey-
 70 ing mechanism.

15. A snow plow including a supporting structure, a support upon the structure and vertically adjustable with respect thereto, a casing having a snow inlet and a dis-
 75 charge outlet connected with said support for bodily movement therewith and for axial movement with respect thereto, a scoop like formation connected with the casing for directing the snow into the said inlet, con-
 80 veyor mechanism operating in the scoop for assisting in feeding the snow to the said inlet in any position of the said casing with respect to the said support, and means com-
 85 mon to the said rotor and the said conveying mechanism for actuating them.

16. A snow plow including a supporting structure, a support mounted thereupon for vertical adjustment with respect thereto, a casing mounted upon the support for bodily
 90 movement therewith and for axial rotation with respect thereto, said casing having a snow inlet and a discharge outlet, endless conveyor mechanism co-operating with the scoop for assisting in directing the snow
 95 to said inlet, in any position of the casing and scoop with respect to the support, and means for actuating the conveyor mechanism, said conveyor mechanism operating in an inclined plane extending downwardly
 100 towards the said casing.

In testimony whereof, I have signed my name to this specification, on this 20th day of November, 1924.

EMERY H. FAHRNEY.