Aug. 7, 1928. 1,679,409

A. E. DELANEY

SNOWPLOW

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Fig. 1.

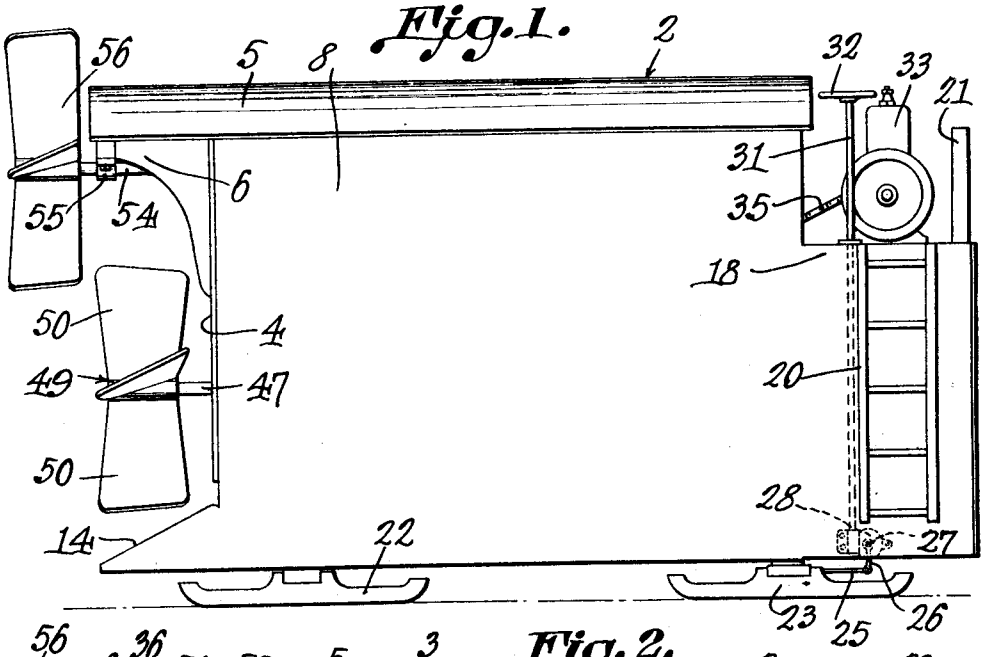
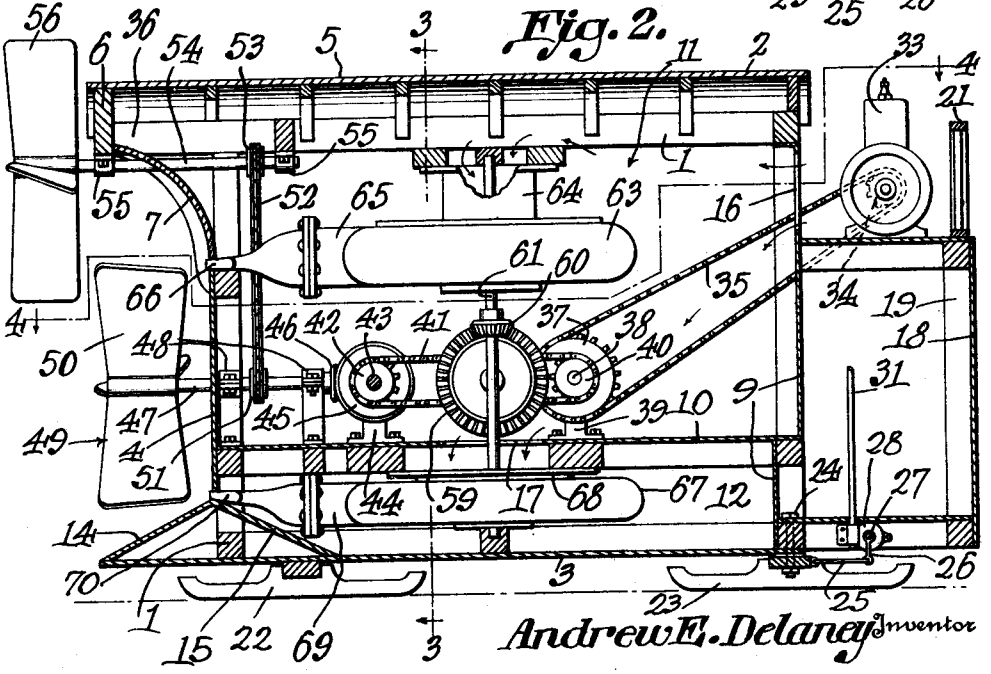


Fig. 2.



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Fig. 3.

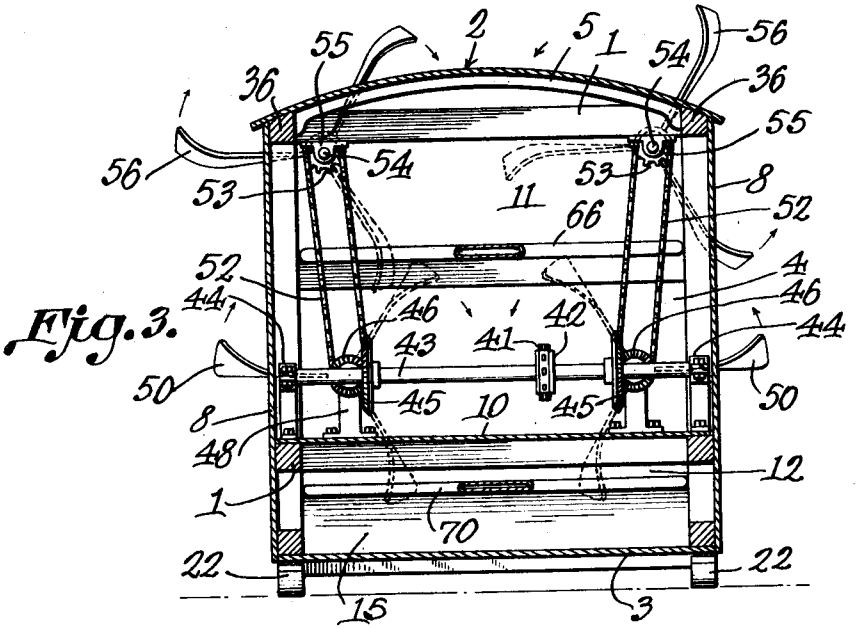
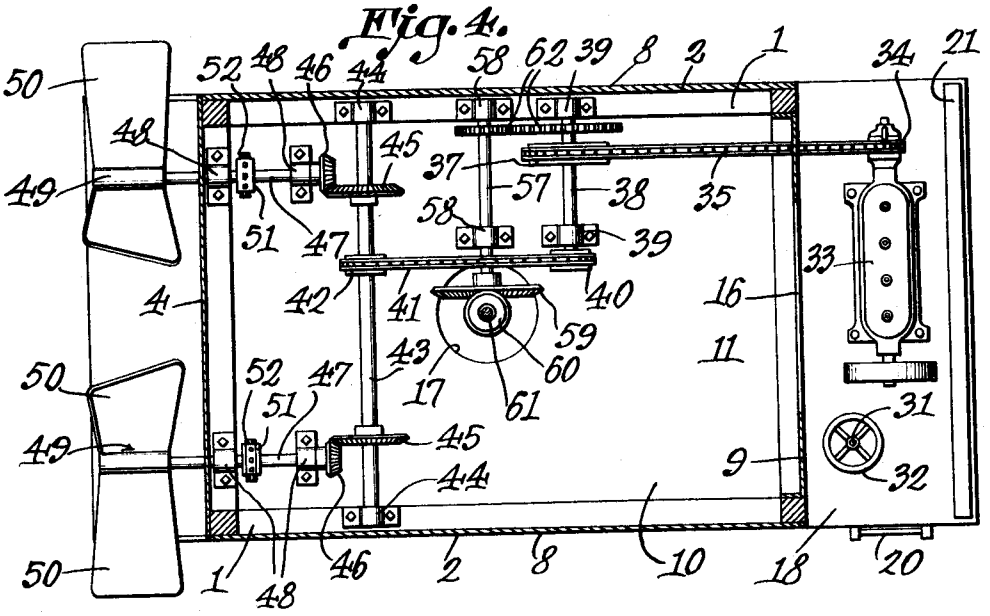


Fig. 4.



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Fig. 5.

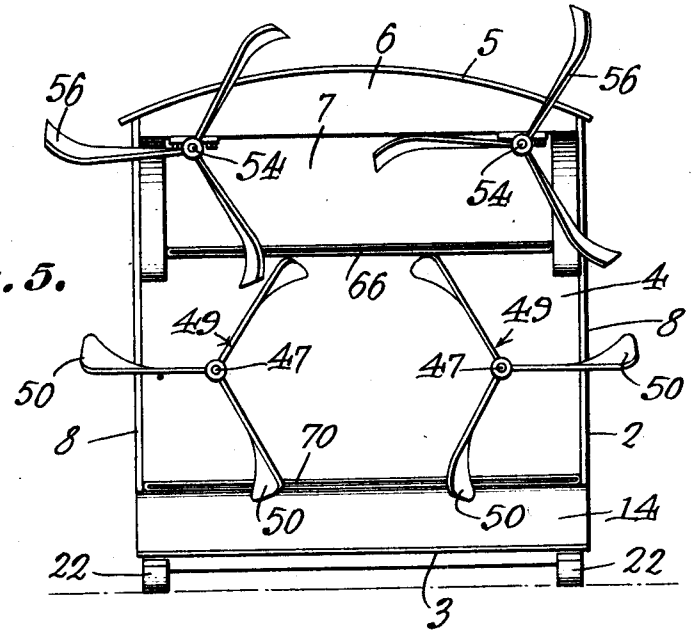


Fig. 6.

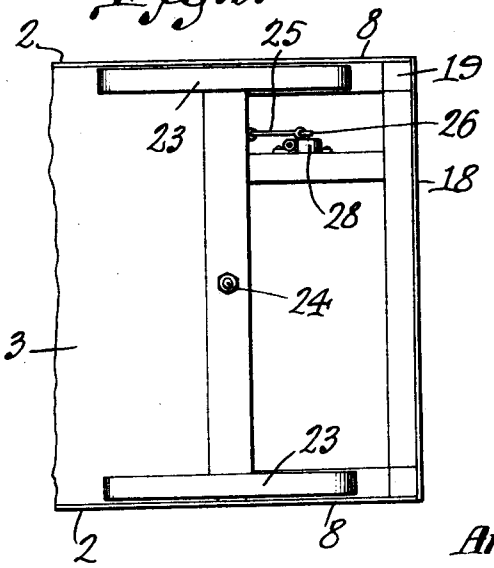
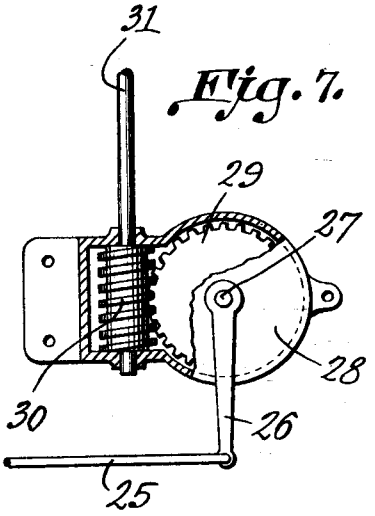


Fig. 7.



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Patented Aug. 7, 1928. 1,679,409

UNITED STATES PATENT OFFICE.

ANDREW E. DELANEY, OF ASHLAND, WISCONSIN.

SNOWPLOW.

Application filed November 4, 1927. Serial No. 231,070.

This invention aims to provide a novel snow plow adapted to cut its way through drifts, novel means being provided for cutting into the snow and casting it aside, novel means being provided for creating an air blast, to aid in discharging the snow which has been loosened by the cutters.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the drawings:—

Figure 1 shows in side elevation, a device constructed in accordance with the invention;

Figure 2 is a longitudinal section of the structure shown in Figure 1;

Figure 3 is a cross section on the line 3—3 of Figure 2;

Figure 4 is a section taken approximately on the line 4—4 of Figure 2;

Figure 5 is a front elevation;

Figure 6 is a fragmental bottom plan showing the rear end of the machine;

Figure 7 is a detailed sectional view showing a part of the steering mechanism.

In carrying out the invention there is provided a frame 1, which need not be described in detail, because it may be constructed as desired. The frame 1 forms part of a vehicle, including a casing 2 carried by the frame 1. The casing 2 includes a base plate 3 and a front wall 4. The roof appears at 5 and embodies a forwardly extended overhanging portion 6 carried by a corresponding part 36 of the frame 1. The numeral 7 indicates a forwardly and upwardly curved front wall which extends up to the part 36 of the frame, beneath the forwardly extended overhanging portion 6 of the roof 5. The side walls are shown at 8, and the rear wall at 9. A partition 10 is mounted horizontally on the frame 1 and divides the interior of the casing 2 into an upper compartment 11 and a lower compartment 12. An upwardly inclined plow 14 is mounted on the forward portion of the base plate 3 and is sustained from the base plate by a rearwardly and downwardly inclined brace 15. The apex defined by the parts 14 and 15 is located below the lower edge of the front wall 4 of the casing 2. The rear wall 9 is provided in its upper portion with an air inlet 16, and there is an air inlet 17 in the partition 10, the construction being such that the air can be drawn in through the opening 16, into the upper compartment 11, the air finding its way through the opening 17 into the lower compartment 12.

The casing 2 has a box-like rear extension 18 supported by a corresponding part 19 of the frame 1. An operator may stand on the extension 18, and in order that he may assume his position thereon, a ladder 20 may be mounted on the side of the extension 18, as shown in Figure 1 of the drawings. A rail 21 is mounted on the extension 18, for the safety of the operator. The forward end of the vehicle is carried on a sled 22 attached to the base plate 3. The hind end of the vehicle is carried on a rear sled 23 which is pivoted at 24 to the frame work 1 of the vehicle. The forward end of a link 25 is pivoted to the sled 23 and the rear end of the link 25 is pivoted to a depending arm 26 on a shaft 27 journaled in a casing 28 secured to the part 19 of the frame 1. The shaft 27 carries a worm wheel 29 located within the casing 28. The worm wheel 29 meshes with a worm 30 on a shaft 31, the shaft 31 being vertically disposed, and being extended upwardly through the extension 18 of the casing. On the upper end of the shaft 31 there is a hand wheel 32. The construction is such that the operator, standing upon the part 18, may manipulate the shaft 31 through the instrumentality of the hand wheel 32. When the hand wheel 32 is used to rotate the shaft 31, as aforesaid, the worm 30 is rotated, and rotation is imparted thereby to the worm wheel 29, the shaft 27 being rocked in the casing 28, (Figure 7). The arm 26 imparts motion to the link 25, and the link 25 swings the sled 23 on its pivotal mounting 24. In this way, a steering of the vehicle may be brought about: although, if desired, the steering mechanism may be dispensed with, should it be found expedient to push the device by a tractor, or move it otherwise.

It is preferred that the machine itself include a propulsion means, and with this

means in view, a motor, such as an internal combustion engine 33, be mounted on the extension 18. The shaft of the engine 33 carries a sprocket wheel 34 engaged with a sprocket chain 35, the chain 35 being extended downwardly into the compartment 11, as shown in Figure 2. The sprocket chain 35 is engaged with a sprocket wheel 37 on a shaft 38 mounted to rotate in bearings 39 on the platform 10 and on the frame work 1 of the machine. The shaft 38 is disposed transversely of the vehicle. On the inner end of the shaft 38 there is a sprocket wheel 40 about which is engaged a sprocket chain 41 extended lengthwise of the machine. The sprocket chain 41 cooperates with a sprocket wheel 42 on a countershaft 43 disposed transversely of the vehicle and located in the casing 2 at a point near to the front end of the casing, the countershaft 43 being journaled for rotation in bearings 44 mounted in the frame work 1 of the machine. Beveled gears 45 are secured to the countershaft 43 and mesh with beveled pinions 46 on the rear ends of shafts 47 extended longitudinally of the machine, the shafts being journaled in bearings 48 on the platform 10 and on the frame work of the machine. The shafts 47 are extended outwardly through the front wall 4, and on the forward ends of the shaft 48 are mounted rotary cutters 49 comprising a plurality of arms 50 so constructed that they will cut into the snow and cast it laterally. There are sprocket wheels 51 on the shafts 47, and about the sprocket wheels 51 are engaged upwardly extended chains 52 cooperating with sprocket wheels 53 on shafts 54 journaled in bearings 55 on the frame work of the machine. The shafts 54 are extended outwardly beyond the part 36 of the frame of the machine and carry cutters 56 which are constructed like the cutters 49. The cutters 56 are disposed above and slightly in advance of the cutters 49, as Figures 2 and 1 will show.

A shaft 57 is disposed parallel to the shaft 38, and the shafts 57 and 38 are operatively connected by intermeshing gears 62 on the said shafts. The shaft 57 is journaled for rotation in bearings 58 mounted on the frame work 1 of the machine and on the partition 10. There is a beveled gear 59 on the inner end of the shaft 57, and the beveled gear 59 me hes with a beveled pinion 60 secured to the intermediate portion of a vertical shaft 61 which is journaled for rotation in the upper and lower portions of the frame work 1 of the machine, as Figure 2 of the drawings will show clearly. A blower 63 is located in the upper compartment 11, and the shaft 61 passes through the blower 63 to operate it. The blower 63 has an upwardly extended neck 64 which is connected to the upper portion of the frame work 1. The outlet for the blower is designated by the numeral 65 and has a laterally elongated nozzle 66 which projects outwardly between the wall 7 and the wall 4, the slit in the nozzle 66 being very narrow, so that a blast of air under high pressure will be discharged outwardly behind the upper portions of the cutters 49 and behind the lower portions of the cutters 56. The shaft 61 drives, also, a blower 67, having an inlet neck 68 that is mounted on the frame work of the machine, the blower 67 being located in the lower compartment 12. The outlet for the blower is designated by the numeral 69 and it terminates in a laterally elongated nozzle 70 which discharges between the lower edge of the front wall 4 and the upper edge of the plow 14. The nozzle 70, like the nozzle 66, has a discharge slit which is very narrow, so that a blast of air will be discharged with great force near to the lower portions of the cutters 49 and at the upper end of the plow 14.

The driving trains are as follows:—

The engine 33 operates the sprocket chain 35, and rotation thereby is imparted to the shaft 38. From the shaft 38, motion is transmitted to the countershaft 43 by the sprocket chain 41. The intermeshing beveled gears 45 and 46 rotate the shafts 47 and thereby the upper cutters 49 are driven. From the shafts 47, motion is transmitted to the upper shafts 54 by the sprocket chains 52, and the shafts 54 drive the upper cutters 56. The intermeshing gear wheels 62 drive the shaft 57 from the shaft 38, and the beveled gears 59—60 impart rotation to the vertical shaft 61, the said shaft operating the blowers 63 and 67.

The snow is engaged by the rotating cutters 49 and by the rotating cutters 56, the cutters 49 operating below and to the rear of the cutters 56. In this way, the snow is loosened up to a maximum extent, and after the snow has been loosened by the cutters it is cast laterally by the cutters. As the snow is loosened, it is blown forwardly by the blowers 63 and 67, the air blast proceeding outwardly through the narrow slits in the nozzles 66 and 70. Owing to the fact that the nozzles 66 and 70 discharge at the points shown in Figure 5 of the drawings, the snow is prevented from clogging up the cutters 56 and 49 and the efficiency of the machine is enchanced accordingly. The blower 63 draws its air through the opening 16, and downwardly through the neck 64. Some of the air entering the upper compartment 11 through the opening 16 is drawn downwardly through the opening 17, and in this way, air is supplied to the lower blower 67.

Although, as shown in Figure 5, there are but four of the rotary cutters 56—49 in the present embodiment of the invention, it will

be understood that there may be as many or as few of the said cutters, as occasion may render necessary.

What is claimed is:—

1. In a device of the class described, a vehicle, upper rotary cutters journaled on the forward end of the vehicle, lower rotary cutters journaled on the forward end of the vehicle, the lower cutters being located to the rear of the upper cutters and behind the upper cutters, a blower having a blast nozzle discharging adjacent to the lower portions of the upper cutters and adjacent to the upper portions of the lower cutters, a blower discharging adjacent to the lower portions of the lower cutters, means for operating the cutters, and means for operating the blowers.

2. In a device of the class described, a vehicle, shafts extending longitudinally of the vehicle, cutters on the shafts and located at the front of the vehicle, a countershaft disposed transversely of the vehicle, means for connecting the countershaft with the first-specified shafts, a blower discharging toward the cutters, a substantially vertical shaft journaled on the vehicle and operating the blower, a third shaft disposed transversely of the vehicle, a fourth shaft disposed transversely of the vehicle, means for connecting the third and fourth shafts, and means for driving one of the said third and fourth shafts, means for connecting the fourth shaft with the countershaft, and means for connecting the third shaft with the vertical shaft.

3. In a device of the class described, a vehicle, vertically spaced shafts extended longitudinally of the vehicle, cutters on the shafts and located at the front of the vehicle, means for connecting the shafts operatively, a countershaft disposed transversely of the vehicle, means for connecting the countershaft with one of the vertically spaced shafts, a third shaft journaled for rotation on the vehicle and disposed transversely thereof, a fourth shaft journaled for rotation on the vehicle and disposed transversely thereof, means for driving the fourth shaft, means for connecting the third and fourth shafts operatively, means for connecting the fourth shaft with the countershaft, a substantially vertical shaft journaled on the vehicle, means for connecting the third shaft operatively with the vertical shaft, and a blower driven by the third shaft and discharging toward one of the cutters.

4. In a device of the class described, a vehicle, vertically spaced cutters journaled on the front of the vehicle, means for driving the cutters, blowers spaced apart vertically and discharging toward the cutters, a substantially vertical shaft driving both blowers and journaled for rotation on the vehicle, a transverse shaft journaled for rotation on the vehicle, intermeshing beveled pinions on the vertical shaft and on the transverse shaft, and means for driving the transverse shaft.

5. In a device of the class described, a vehicle, longitudinal shafts journaled on the vehicle, cutters carried by the longitudinal shafts and operating at the front of the vehicle, a countershaft disposed transversely of the vehicle, intermeshing beveled pinions connecting the longitudinal shafts with the countershaft, a third shaft journaled on the vehicle and disposed transversely thereof, a fourth shaft journaled on the vehicle and disposed transversely thereof, a chain and sprocket connection between the fourth shaft and the countershaft, intermeshing gears connecting the third and fourth shafts, a substantially vertical shaft journaled for rotation on the vehicle, intermeshing beveled pinions on the third shaft and on the vertical shaft, and a blower mounted on the vehicle and discharging toward one of the cutters, the blower being driven by the vertical shaft.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

ANDREW E. DELANEY.