Feb. 12, 1929. 1,701,767

J. BARRY

SNOWPLOW

Filed March 14, 1927 2 Sheets-Sheet 1

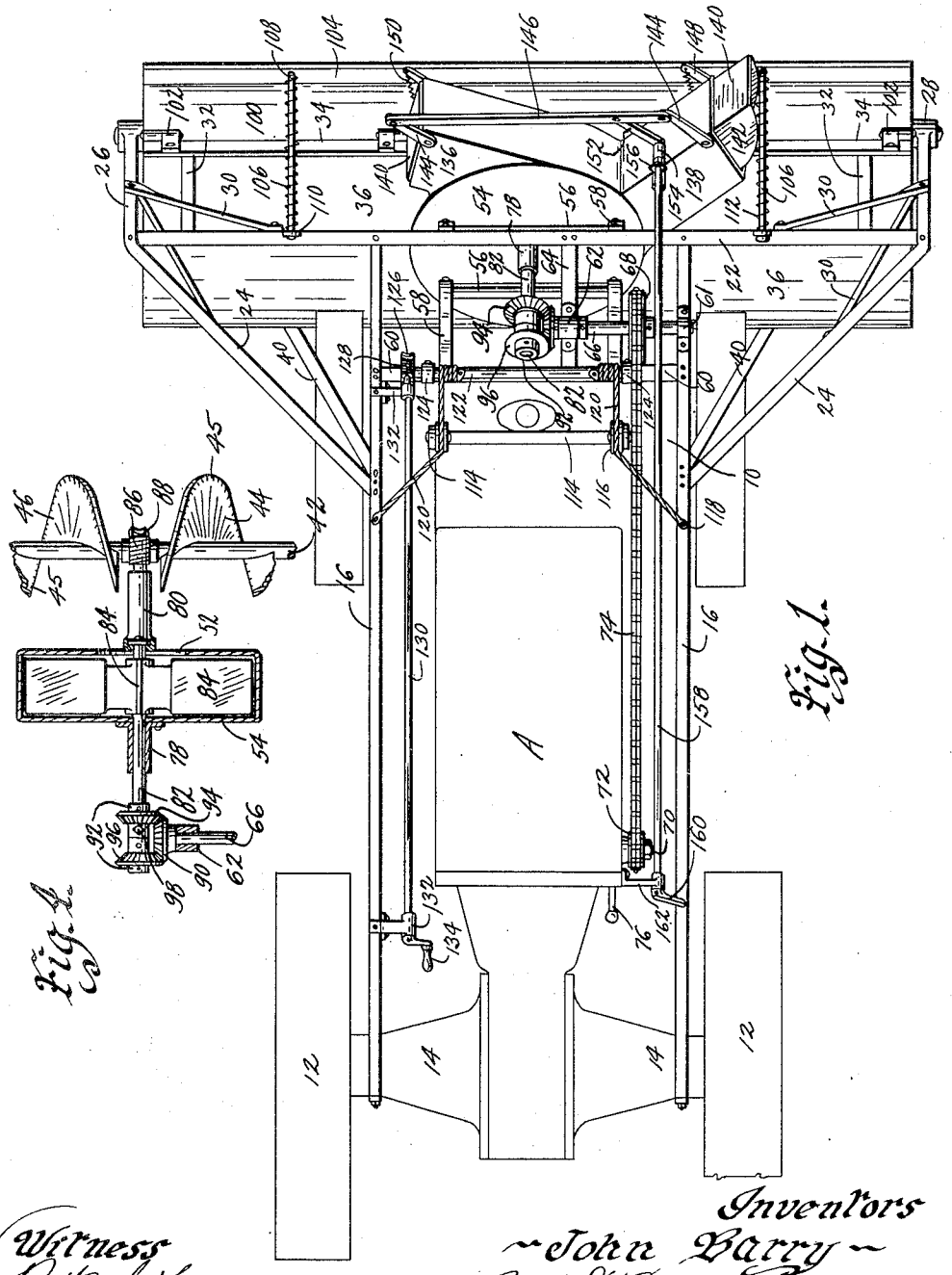

Fig. 1.

Fig. 2.

Witness
Roy Rusher

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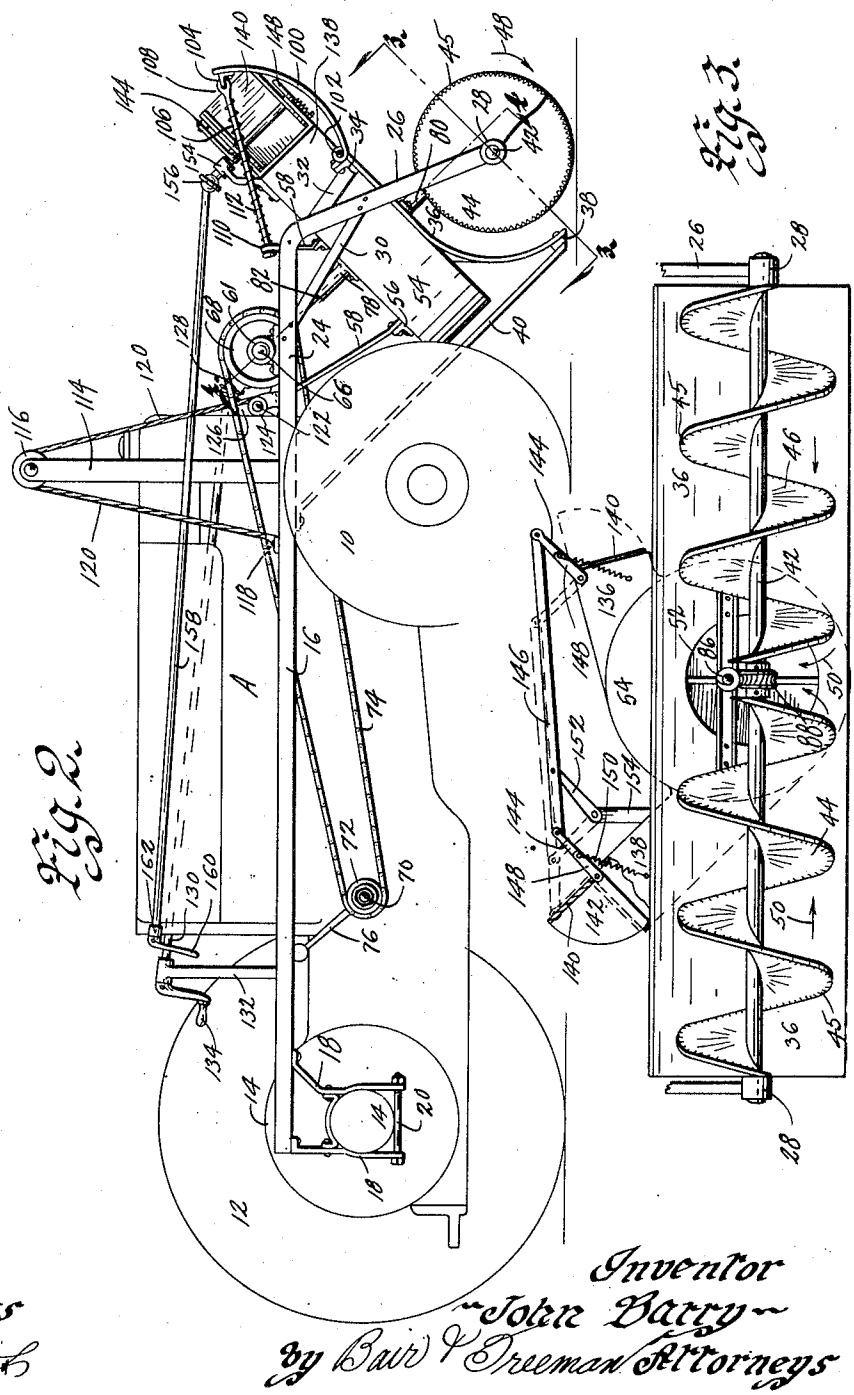

Fig. 2.

Fig. 3.

Witness
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Patented Feb. 12, 1929. 1,701,767

UNITED STATES PATENT OFFICE.

JOHN BARRY, OF MARCUS, IOWA.

SNOWPLOW.

Application filed March 14, 1927. Serial No. 175,226.

The object of my invention is to provide an efficient snow plow of comparatively simple, durable and inexpensive construction.

A further object of my invention is to provide a snow plow adapted to be attached to a tractor or the like and having an auger thereon adapted to be carried in position adjacent the ground being traveled over whereby the auger upon rotation will move the snow transversely relative to the tractor.

Still a further object is to provide a snow plow having little head resistance as compared with a snow plow of the ordinary scoop or V blade plate type.

Still a further object is to provide the auger made in two oppositely wound sections so that the snow will be carried from the ends of the auger toward the center thereof to be discharged into a blower.

Still a further object is to provide a plate back of the auger adapted to aid in controlling the snow and a blower mounted back of the plate for receiving the snow from the center of the auger and discharging it to the side of the road.

Still a further object is to provide mechanism for reversing the augers so that in case the snow becomes packed until it is difficult to operate the machine, the auger can be reversed to clear it of the packed snow.

Still a further object is to provide a pair of discharge tubes on the blower pointing in substantially opposite directions whereby the snow may be blown to either side of the road.

Still a further object is to provide doors on the discharge tubes and a means of connecting these doors whereby one of them is open while the other one is closed so that the snow may be blown selectively to either side of the road.

Another object of my invention is to provide a snow plow which is improved in several details over the snow plow illustrated in my Patent No. 1,569,531, issued January 12, 1926.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various elements of my snow plow, whereby the objects contemplated are attained, as hereinafter set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a tractor illustrating my improved snow plow secured thereon.

Figure 2 is a side elevation of the same.

Figure 3 is a detail sectional view taken on the line 3—3 of Figure 2 and illustrates the construction of the auger and the relation of the blower to the auger; and

Figure 4 is a detail sectional view taken on the line 4—4 of Figure 2 illustrating the driving mechanism of the blower and the auger and the reversible feature of this mechanism.

On the accompanying drawing I have used the reference character A to indicate generally a tractor. The tractor A is provided with the front wheels 10 and the drive wheels 12 and may be any of the well known types which are now on the market. The drive wheels 12 are secured to axles which are mounted in the axle housings 14.

My snow plow is mounted entirely upon a frame work comprising the longitudinal side bars 16 each having a bracket 18 secured thereto which are adapted to rest on the rear axle housings 14. Retainer bolts 20 are provided to prevent displacement of the brackets 18 from the housings.

The construction just described allows for pivotal movement of the frame members 16 on the housings 14.

At the forward ends of the side members 16 is a cross member 22. A brace 24 extends from each frame member 16 and is secured to an end of the cross member 22. The brace 24 extends downwardly as at 26 and is provided with a bearing 28 on its lower end. Suitable bracing 30 is provided for maintaining the parts of the frame work rigid relative to each other.

Secured by brackets 32 to the portions 26 of the brace 24 is a blade supporting bar 34. The bar 34 has secured thereto a blade 36. The lower end of the blade 36 is provided with a reinforcing bar 38 and braces 40 extend from the bar 38 to the side frame members 16.

Rotatably mounted in the bearings 28 is a shaft 42. On the shaft 42 are secured augers 44 and 46. It will be noted that the auger 46 is wound in a direction opposite to the auger 44 whereby rotation of the auger shaft 42 in the direction of the arrow 48 will cause snow which has been engaged by the auger to travel toward the center of the auger, through a blower opening 52 and into a blower 54 as indicated by the arrows 50 in Figure 3 of the drawings.

The blade 36 extends over the top of the augers 44 and 46 and is curved over the back of them as clearly illustrated in Figure 2 of

the drawings. The blade 36 serves to catch any loose snow falling from the augers 44 and 46 and prevents this snow from being left by the snow plow.

The augers 44 and 46 have teeth 45 cut in their peripheries to break up the snow and thereby facilitate the handling thereof.

The large opening 52 is adjacent the center of the blade 36. The blower device 54 is mounted on the back of the blade 36 and has its intake opening registering with the opening 52 in the blade 36. The casing of the blower 54 is provided with reinforcing bars 56 which are secured by braces 58 to the cross member 22 and a second cross member 60. The cross member 60 is secured to, and extends between, the side frame members 16.

For driving the blower 54 and the auger shaft 42 I provide the following described mechanism. Mounted in a bearing 61 on one of the side frame members 16 and in a bearing 62 secured to a frame member 64 extending between the members 22 and 60 is a drive shaft 66. A sprocket 68 is secured to the drive shaft 66. On the pulley shaft 70 of the tractor I mount a sprocket 72. The sprockets 68 and 72 are operatively connected together by a chain 74. The pulley shaft 70 is provided with a clutch mechanism controlled by the clutch lever 76.

From the construction of the parts just described, it will be obvious that the shaft 66 may be driven from the motor of the tractor A when the clutch lever 76 is properly manipulated.

Mounted in bearings 78 and 80 on the blower 54 is a shaft 82. The shaft 82 has the blower rotor comprising the blades 84 secured thereto. The lower end of the shaft 82 has a worm 86 secured thereto which is adapted to mesh with a worm gear 88 secured to the auger shaft 42. It will be obvious that rotation of the blower shaft 82 will operate the blower and will also operate the auger at a considerably lower speed.

For operatively connecting the shaft 82 to the drive shaft 66 I provide a bevel gear 90 secured to the shaft 66. Mounted between collars 92 on the shaft 82 are bevel gears 94 and 96. The bevel gear 94 is connected to the shaft 82 by a bolt 98 extending through a hub formed on the gear and a hole in the shaft. The bevel gear 96 is mounted for free rotation. From the foregoing construction it will be obvious that rotation of the drive shaft 66 will cause the blower to operate and the auger to rotate.

For preventing snow from falling over the top of the blade 36 I provide an extension blade 100 hinged by the connections 102 to the bar 34 of the blade 36. The extension blade 100 is provided with a reinforcing angle 104 and a plurality of rods 106 are provided with eye connections 108 extending through openings in the angle 104. The rods 106 extend through perforated brackets 110 and springs 112 are interposed between the brackets and the eyes of the rods. In case the snow should be too deep, it will push the extension blade 100 backwards against the tension of the springs 112.

In the operation of the machine, it is desirable to adjust the augers 44 and 46 relative to the ground from which the snow is being plowed. This is accomplished by raising or lowering the front end of the frame. For doing this I provide a frame 114 secured to the front end of the tractor. The frame 114 is provided with pulleys 116. Secured at 118 to the side frame members 16 are cables 120 which extend over the pulleys 116 and then downwardly. A shaft 122 is mounted in bearings 124 on the frame member 60 and the downwardly extending ends of the cables 120 are wound on the shaft 122. For rotating the shaft 122 I provide a worm gear 126 secured thereto. A worm 128 is in mesh with the worm gear 126 and is secured to an operating shaft 130. The shaft 130 is journaled in bearings 132 and is provided with a crank 134 adapted to be rotated by the operator.

From the foregoing description it will be obvious that a raising or lowering movement can be imparted to the frame of the snow plow and consequently to the auger itself by rotating the shaft 122. Such rotation either winds or unwinds the cables 120 from the shaft.

In a machine of the class described, it is desirable to dispose of the snow by blowing it to either one side or the other of the road. It is also desirable to have the blower under control so that the snow can be disposed of on either side of the road. To accomplish this result I provide the blower 54 with two discharge tubes 136 and 138. The discharge tubes are provided with doors 140 pivoted relative to the tubes. The doors 140 are provided with side flanges 142 adapted to form a hood when the door is open.

In order to control the doors 140 so that one will be open while the other one is closed I provide arms 144 secured to the doors and a link connection 146 between the free ends of the arms. Movement of the link 146 causes the doors to operate in unison whereby one is being opened while the other one is being closed and vice versa. I also provide a pair of arms 148 with the spring connections 150 to the blower casing so that either door will positively stay in an opened or closed position. In opening or closing the door, the spring 150 passes over the center of the pivotal connection of the door.

For manually operating the link 146 I provide a lever 152 having a shaft journaled in a bearing 154 which is secured to the discharge tube 138. A universal joint connection 156, a shaft 158 and a lever 160 complete

the device for operating the doors 140 in unison. The rear end of the shaft 158 is journaled in a bearing 162.

In the operation of my machine, the crank 134 is manipulated to lower the augers 44 and 46 to the desired working position. I find that the auger works best when quite close to the ground and when rotating in the direction of the arrow 48. The rotation of the auger has a tendency to aid in propelling the tractor and snow plow rather than offering a resistance to the forward motion of the machine.

The head resistance encountered by stationary blades is entirely eliminated in my machine. The snow is engaged by the augers 44 and 46 for forcing it toward the central opening 52 and into the blower 54. From the blower 54 the snow is discharged either to the right or the left depending on the position in which the lever 160 is placed. For blowing the snow to the right the doors 140 are positioned as illustrated in Figure 3 of the drawings and for blowing the snow to the left, the doors are positioned as illustrated by dotted lines in the same figure.

The starting and stopping of the blower and auger is conveniently accomplished by manipulating the clutch lever 76. When the operator has driven into snow too deep to be handled by the machine such condition will be indicated by the extension blade 100 raising against the action of the springs 112.

When the machine is clogged the augers can be reversed by transferring the bolt 98 from the hub of the bevel gear 94 to the hub of the bevel gear 96 whereby the shaft 82 will be driven in an opposite direction. When driven in reversed direction the augers 44 and 46 will cause the snow to move from the center of the auger to the outer edges thereof and if desired the machine can be operated in this way for merely delivering the snow to the ends of the auger without blowing it to some distance from the machine.

The auger may be adjusted to a position close to the ground for removing all the snow or to a position slightly above the ground for leaving part of it if so desired. My machine can also be used for surfacing roads and the like in which capacity the augers shave off the rough portions of the road and deliver the shavings to the blower to be disposed of. When used as a road surfacing machine, the teeth 45 on the augers 44 and 46, serve for effectively cutting into the road bed and thereby surfacing it.

A decided advantage lies in the positioning of the blower 54 at an angle as clearly illustrated in Figure 2 of the drawing. When placed in this position the discharge tubes 136 and 138 have a tendency to blow the snow or dirt forward instead of directly out from the sides of the machine. This prevents the snow from falling on the tractor or operator due to the forward advancement of the machine.

Some changes may be made in the construction and arrangement of the various parts of my invention, without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. A snow plow of the character described comprising a frame adapted to be secured to a tractor, an auger mounted thereon and adapted to be rotated adjacent the ground being traveled over, a blade adjacent the back and top portions of said auger, a blower mounted at an angle back of said blade the top of the blower being tipped forwardly, an opening through said blade affording a passage for snow from the auger to the blower and means for connecting said auger and said blower to the engine of said tractor.

2. A snow plow of the character described comprising a frame adapted to be secured to a tractor, an auger mounted thereon and adapted to be rotated adjacent the ground being traveled over, a blade adjacent the back and top portions of said auger, a blower mounted back of said blade, an opening through said blade affording a passage for snow from the auger to the blower and means for connecting said auger and said blower to the engine of said tractor, said means being reversible whereby the blower is rendered inoperative and the auger moves the snow in a direction opposite to its normal direction of travel for clearing the auger of snow when it becomes clogged.

3. A snow plow of the character described comprising a frame adapted to be secured to a tractor, an auger mounted thereon adapted to be rotated adjacent the ground being traveled over and to move the snow it encounters toward the center of the auger, a blade adjacent the back and top portions of said auger, a blower mounted back of said blade, an opening through said blade at the point the auger delivers the snow to thereby afford a passage for snow from the auger to the blower and means for connecting said auger and said blower to the engine of said tractor, said means being reversible whereby the auger moves the snow away from the center of the auger and discharges it from the outer ends thereof.

4. A device of the class described comprising a frame adapted to be secured to a tractor, an auger mounted thereon and adapted to be rotated adjacent the ground being traveled over, the periphery of said auger being formed with teeth, a blade adjacent the back and top portions of said auger, a blower mounted at an angle back of said blade the

top of said blower being tipped forwardly, an opening through said blade affording a passage for snow from the auger to the blower and means for connecting said auger and said blower to the engine of said tractor, said means being reversible whereby the blower is rendered inoperative and the auger moves the snow in a direction opposite to its normal direction of travel for clearing the auger of snow when clogged.

5. A device of the class described comprising a frame pivoted to a tractor, an auger adapted to be rotated adjacent the ground for the purpose of moving snow longitudinally relative to the axis of the auger, teeth formed in the periphery of said auger, said auger being mounted on said pivoted frame, means for raising and lowering said frame to thereby adjust the auger relative to the ground, a blade adjacent the back of said auger, a blower back of said blade communicating with and adapted to receive snow from said auger said blower including a snow impelling rotor adapted to operate when rotated in only one direction, a pair of discharge tubes on said blower pointing in substantially opposite directions but adapted to each receive snow from the blower and a pair of doors covering said discharge tubes and having operative connection with each other.

Des Moines, Iowa, March 11, 1927.

JOHN BARRY.