Nov. 1, 1932. D. WANDSCHEER 1,886,069

SNOW REMOVER

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Fig. 1.

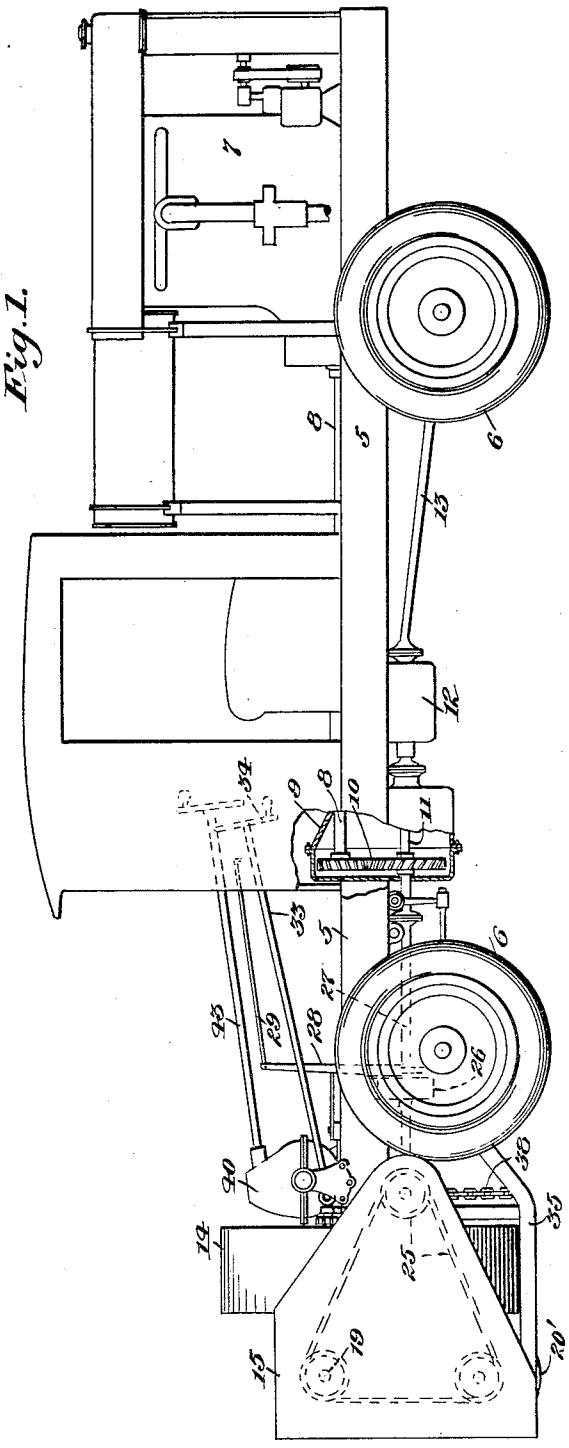
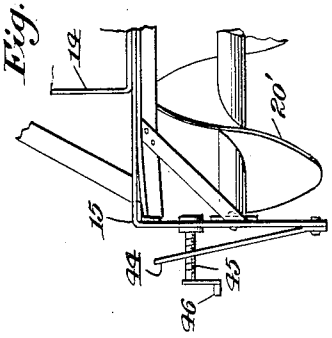


Fig. 4.



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Fig. 2.

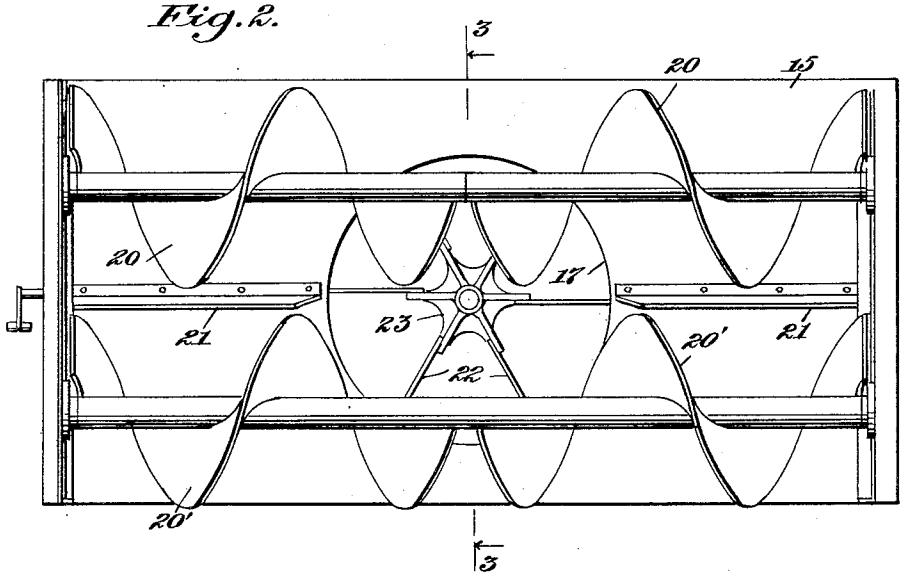
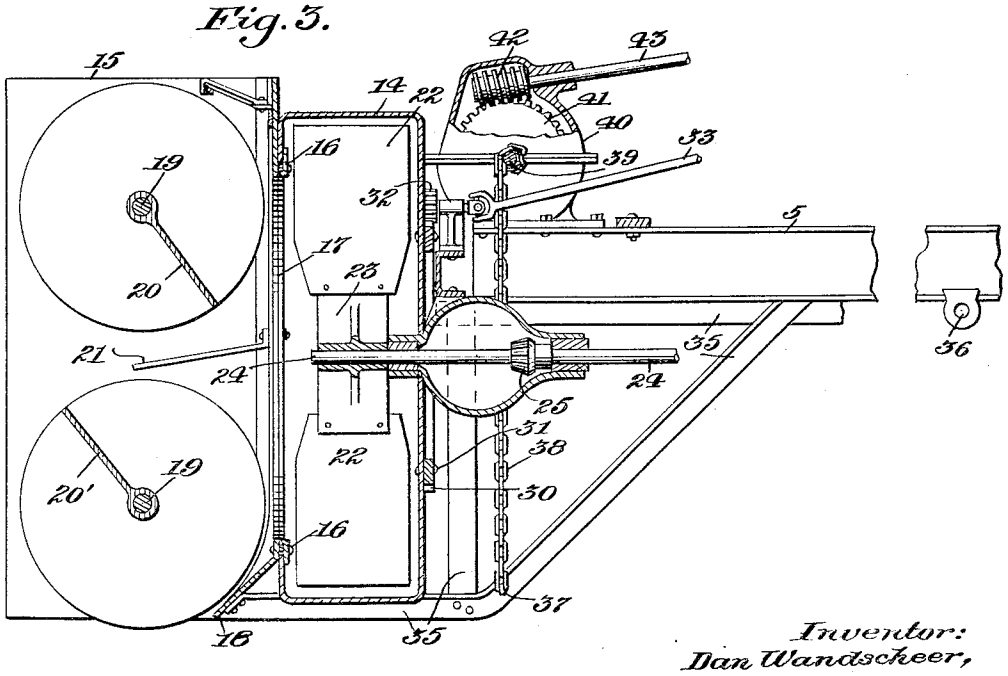


Fig. 3.



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Patented Nov. 1, 1932 1,886,069

UNITED STATES PATENT OFFICE

DAN WANDSCHEER, OF DUBUQUE, IOWA, ASSIGNOR OF ONE-FOURTH TO GERRIT WANDSCHEER, ONE-FOURTH TO JACOB WANDSCHEER, AND ONE-FOURTH TO BEN WANDSCHEER, ALL OF DUBUQUE, IOWA

SNOW REMOVER

Application filed March 20, 1928. Serial No. 263,089.

This invention relates to apparatus for removing snow and ice from streets, roads, and the like.

This invention is an improvement over the snow remover disclosed and claimed in my Patent #1,587,449, the general object of the invention being to provide numerous improvements upon the type of snow plow disclosed in said patent and copending application, in which are illustrated a snow plow to the auger type, snow disposal means cooperating with the augers, and means for mounting the plow upon a truck, railway car, or the like.

One object of this invention consists in providing means cooperating with the augers of the plow to cause uniform passage of the snow, without clogging, to the snow disposal means at the rear of the augers. While I have shown such disposal means at the center of the plow, I wish it to be understood that it may be mounted at any point longitudinally of the augers.

A further object of this invention resides in the positioning of the lower augers so that the edges of their blades extend below the plow casing to insure removal of crusted snow and ice, and eliminate the breakage and distortion of parts which ordinarily come into contact with said snow and ice.

Another object of this invention consists in providing means, in addition to the steering control, for keeping the snow plow in a chosen path.

This invention also consists in certain other features of construction and in the combination and arrangement of parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Fig. 1 is a side elevation showing the invention applied to the chassis of a truck;

Fig. 2 is a front elevation showing the sets of augers and rotary blower;

Fig. 3 is a vertical central section of the plow as indicated by line 3—3 on Fig. 2;

Fig. 4 is a fragmentary plan view showing the application of the guiding means to the auger casing.

In these views, 5 indicates the main chassis frame of a truck which is mounted on wheels 6. An engine 7 having a drive shaft 8 is mounted upon the rear end of the truck to secure better balancing and proper distribution of weight. Shaft 8 enters a casing 9 to drive gears 10. A shaft 11, gear transmission 12, and drive shaft 13 provide means for transmision of motive power to the rear wheels of the truck in a conventional manner.

14 is a blower housing which is adjustably secured at 16 to a plow casing 15 of rectangular shape with an open front and top. The casing 15 is in communication with the blower housing 14 by means of the circular opening 17 which, as illustrated, is arranged at the center of the dividing walls. A scoop 18 prevents any snow from escaping under the plow to the rear. Within the casing 15 are mounted an upper pair of augers 20 and a lower pair 20′, on shafts 19. The right and left hand member of each pair have oppositely curved blades, hence as they rotate they cut the snow from the ground and deliver it toward the center of the plow. When it reaches the center, the snow passes through circular opening 17 into the blower housing 14, after which the fan blades 22 throw it through an opening in the upper housing to a distant point to one side of the street or road being cleared. These blades 22 are secured to a hub 23 which is in turn keyed to a shaft 24, this unit being rotated at high speed by gearing 10 and a shaft 27, through a universal joint and clutch mechanism indicated at 26 (the details of which are shown in my patent #1,587,449). In this manner the plow parts may be driven from the motor of the vehicle, lever 28 and cab control 29 serving to throw the clutch in and out at will.

It is readily apparent that, when it is not desired to hurl the snow at any great distance to one side (for example, in cleaning city streets), reduction gearing may be used

to drive the fan at low speed and the snow may then be deposited in carts or other vehicles to be hauled away for disposal.

Upon shaft 24 (Fig. 3) is a pinion 25 which is adapted to cooperate with a bevel gear to drive the chain gearing 25′ (Fig. 1) in any suitable manner, for example, as shown in my above mentioned application Serial Number 129,293. In this manner the augers are driven at less speed than the rotary blower.

The fan casing 14 can be rotated so as to place its outlet in any desired position to enable the snow to be thrown to either side of the road. Its rotating means comprises an annular gear 30 fixed to the casing as at 31, a pinion 32 meshing with said gear, and a shaft 33 with hand wheel 34 for rotating the pinion.

The plow device is attached to a set of frame members 35 (Fig. 3) which are fastened together to form a rigid triangle, the upper horizontal member 35 being pivotable to the main chassis frame 5 as shown at 36 so that the plow can be vertically adjusted. The means for adjusting comprises a control shaft 43 with a handwheel in the cab, a worm 42 upon the shaft, which meshes with a gear 41 mounted upon a shaft 39, the latter being journaled for rotation within a casing 40 which is mounted securely upon chassis frame 5. A chain 38 is adapted to be wound upon shaft 39 at one end and the other end is secured to lower frame member 35 as at 37. Thus by turning the control shaft 43 the length of the chain may be varied to adjust the plow in relation to the road or street surface.

From the foregoing it will be seen that the plow is attached to the front end of a vehicle and can be adjusted in relation to the ground. The cutting and conveying augers will force the snow which enters the casing to the center of the casing, where it will pass through the opening into the fan casing, the fan blades in which will throw the snow to one side of the street or road.

The lower augers of the plow are set so that their peripheral cutting edges pass slightly below the lower extremity of casing 15 as well as below scoop 18. Thus any hard snow, ice, or other obstructions encountered on the road surface will be easily cut away by the rotating auger blades so that it cannot strike the casing or scoop to cause breakage or distortion of parts as in the constructions now in use.

The upper and lower augers as shown rotate in the same direction but it is evident that they may be designed to rotate oppositely. In either event, with the construction just described where the lower auger projects below the casing, I prefer to rotate said lower auger in the same direction as the wheels of the vehicle during forward movement. The advantages from this become readily apparent when it is seen that the lower auger thus acts as a rolling wheel support for the plow, and if it strikes material which is too hard or too well fixed to be cut away, it will ride over such material, without damage to the plow.

Another novel feature resides in the employment of plates 21 within casing 15 to distribute the snow evenly to the upper and lower sets of augers and to cause uniform passage of the snow without clogging to the center of the casing and hole 17.

It has been found that when a truck is used to push the plow in deep snow, and when the road surface is inclined and icy, the device may have tendency to be forced or to slide laterally from a straight or chosen path. In such circumstances it may be impossible to steer the truck to cut a predetermined swath by the usual method of turning the front wheels. To overcome this difficulty, a plate 44 (Fig. 4) is provided to one side of the plow, this plate being secured to the casing 15. The angle between this plate and the side surface of the casing may be varied to present more or less of the plate surface to the mass of snow and hence to change the lateral component of thrust against the plate. In this manner the plate acts, much like the rudder of a boat, to steer the plow. For varying the plate angle, a threaded spindle 45, with square or acme threads of a pitch greater than the thickness of the plate 44, is mounted perpendicular to the casing. The lower edge of the plate may ride in the threads, or an elongated slot may be cut in the plate of such size that the metal on each side of the slot rests in the threads. A crank 46, at the outer end of the spindle, is used to rotate the spindle to cause the threads to move the plate. This crank 46 may be operated by hand or through any suitable device, (not shown), from the cab.

It is thought that from the foregoing description the advantages and novel features of my invention will be readily apparent.

I desire it to be understood that I may make changes in the construction and in the combination and arrangement of the several parts, within the scope of the appended claims.

What I claim is:

1. Snow removing apparatus comprising a main casing, a casing at the rear of said main casing and in central communication therewith, sets of horizontally mounted spiral conveyors with right and left hand parts for feeding snow in opposite directions toward the center and into said second mentioned casing, snow ejecting means within the latter, and baffle plates mounted between said sets of horizontally mounted spiral conveyors.

2. Snow removing apparatus comprising a casing having an open front and an apertured

back, superposed horizontally mounted spiral conveyors for cutting the snow in front of the casing and passing it to the aperture in the back, means adjacent the peripheries of and cooperating with said spiral conveyors distribute snow evenly to each of said conveyors and to prevent clogging and cause uniform passage of the snow, and means for rotating said conveyors.

3. In a snow removing apparatus, an ejecting means, a plurality of superposed conveyors for engaging the snow in front of the snow removing apparatus and feeding it toward said ejecting means, means adjacent the peripheries of and cooperating with said conveyors to distribute snow evenly to each of said conveyors and to prevent clogging and cause uniform passage of the snow, and means for driving said conveyors.

4. In a snow removing apparatus, an ejecting means, a plurality of substantially parallel spiral conveyors for cutting the snow in front of the snow removing apparatus and feeding it longitudinally toward said ejecting means, and means adjacent the peripheries of and cooperating with said conveyors to distribute snow evenly to each of said conveyors and to prevent clogging and cause uniform passage of the snow, and means for rotating said conveyors.

5. In a snow removing apparatus, an ejecting means, a plurality of rotatable conveyors having their axes substantially in the same plane for engaging the snow in front of the snow removing apparatus and feeding it toward said ejecting means, and a plate between said conveyors and extending forwardly at least to the plane of the said axes for distributing snow evenly to each of said conveyors and for preventing clogging and causing uniform passage of the snow, and means for rotating said conveyors.

In testimony whereof, I have hereunto set my signature.

DAN WANDSCHEER.