Aug. 9, 1927. 1,638,150

E. EBERHARDT

SNOW REMOVER

Filed Aug. 20, 1926

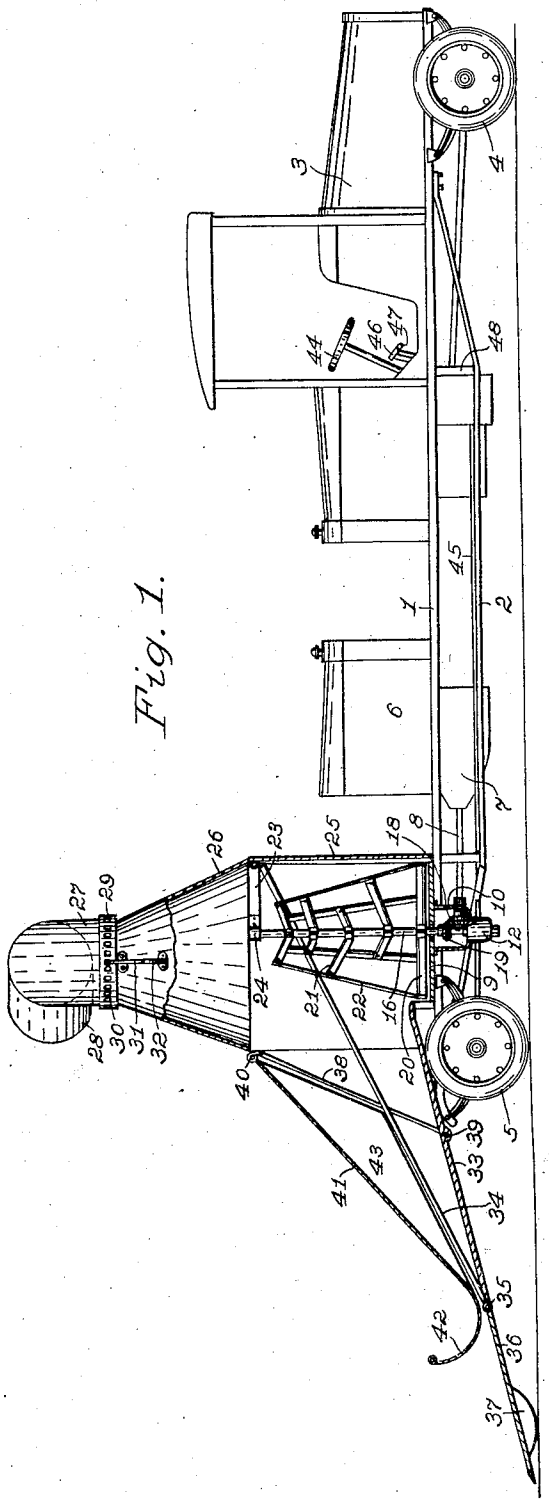


Fig. 1.

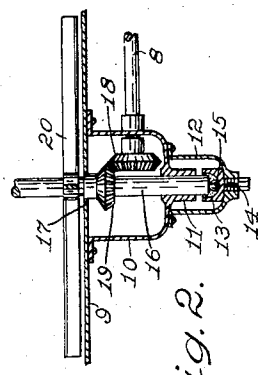


Fig. 2.

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Patented Aug. 9, 1927. 1,638,150

UNITED STATES PATENT OFFICE.

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SNOW REMOVER.

Application filed August 20, 1926. Serial No. 130,524.

My invention relates to improvements in snow removers, and the object of my improvement is to supply a self-propelled and actuated device of this class which is adapted for successful employment for removing and delivering to a desired place of deposit snow accumulated upon highways or other places.

With the foregoing 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 invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

I have accomplished the above objects by the means which are hereinafter described and claimed, and which are illustrated in the accompanying drawings, in which Fig. 1 is a side elevation of my improved snow remover, with parts in vertical longitudinal section or broken away. Fig. 2 is an enlarged central vertical longitudinal section of the step-bearing for the rotor, with elements in side elevation.

The snow remover shown is borne upon a frame 1 of longitudinally arranged and connected side beams having depending trusses 2 stiffened by struts 48. The frame 1 is mounted upon rear driving-wheels 4 which are positively rotated by means of a motor and driving connections in a body of a truck pattern as at 3 of well-known type which will not be further described, being clutch controlled as usual by means of a pedal device 47. In the cab of this device is the usual steering wheel 44 with rod connection 45 to the steerable forward carrying wheels 5, and in the same cab is another clutch control pedal 46 to control a motor 7 under a hood 6 placed upon said frame anterior to the cab device 3 and spaced therefrom for convenience in manipulating starting cranks of both motors.

Upon the frame 1 anterior to the hood 6 and motor 7, is a hollow upright casing 25 terminating upwardly in a hollow conical part 26. The front only of the casing 25 below the conical part 26 is open.

Upon the top part of the cone 26 is rotatably mounted a snow-delivery device 27, hollow and elbow-shaped at 28 to deliver substantially horizontally away from the casing and preferably to either side thereof in depositing the snow upon the ground alongside or in any receptable or conveyance ranged alongside. The basal cylindrical part 29 of the device 27 is a flat annulus having a circumferential row of sockets 30 in any of which a detent upon a medially pivoted arm 31 is designed to removably fit to thereby hold the device 27 in an adjusted position to deliver at any desired angle relative to the casing 25—26 and to assure that the delivery shall be in the path of movement of any prevailing wind. The arm 31 is resiliently controlled by a flat spring 32 mounted on the cone 26 to normally keep the detent thereof seated in one of said sockets 30 yieldingly.

The numeral 33 denotes an inclined plate which is rigidly supported at the rear upon the forward part of the frame 1 and is braced intermediately by means of braces 38 whose upper ends are connected to the upper part of the casing 25, and by means of other side braces 34 from its forward end leading to the rear part of the casing 25. The numeral 36 denotes a forward section plate or scraper pivoted on pintles 35 to the forward edge of the plate 33 and has a sharpened forward scraping or cutting edge. The scraper plate 36 has one or more slide shoes 37 fixed upon its lower face near its cutting edge to slidably ride upon the way ahead. A canopy plate 41 has its rear end pivoted at 40 to the upper part of the casing 25 to be inclined forwardly and inclose the open front of said casing and has a forward upper curved part 42 which is immediately above the pintles 35. The canopy plate 41 may have depending side parts 43 which serve to inclose the space between the plates 41 and 33 partially for a purpose to be described.

Just to the rear of the forward carrying-wheels 5 the forward part of the frame includes a stiff metallic base plate 9, centrally apertured at 17 to be traversed by a vertical rotary shaft 16. This shaft projects upwardly within and nearly to the cone 26 of the casing 25 and its upper end is rotatably mounted in an apertured bearing 24 on the forward end of a rigid bracket-arm 23. Upon that part of said shaft which is positioned within said casing are fastened a plurality of upwardly inclined vanes 21 of different lengths as arranged successively upwardly, the vanes being laterally tilted to

serve both as snow cutters and propellers to engage snow delivered to them from the front and propel it upwardly through the cone 26 and the elbow-device 27—28. Below these inclined vanes 21 a set of radial vanes 20 is mounted on said shaft immediately above the base-plate 9 to churn fragments of snow blocks falling to the rear of the raised rear end of the inclined plane 33 and reduce them to powder to be thence drawn upwardly by the suction producing action of the vanes 21. The numeral 22 denotes upwardly inclined bars which are fastened upon the outer terminations of the vanes 20 and 21 and serve to shave the face of the snow wall presented to them while these bars are rapidly rotating, to break up the snow into fragments to be more effectively dealt with and delivered upwardly by said vanes.

The lower end of the rotary shaft 16 is mounted in an anti-friction step-bearing shown in said Fig. 2. A hollow housing member 10 is removably secured upon the lower face of the base-plate 9 concentric with said shaft 16 which extends downwardly thereinto and through a depending apertured integral bearing-sleeve 11 thereof into a lower hollow housing member 12 which is removably mounted upon said housing 10.

A bevel-pinion 19 is fixed upon the shaft 16 within the upper part of the housing member 10 and is in mesh with a bevel-gear 18, preferably in about a two to one ratio, the gear 18 being also within said housing member 10 and fixed upon an end of a rotatable longitudinally arranged shaft 8 which enters said member by way of a sleeve-bearing. The shaft 8 may be the extended crank-shaft of a motor 7 in the rear.

The lower part of the lower housing member 12 is contracted to have a threaded bearing seat for a threaded stem 14 of a step-bearing cup 13 within the member 12 containing an anti-friction ball 15 supporting the lower termination of said vertical shaft 16. The cup hollow may be wider than the diameter of said shaft to receive and hold a quantity of lubricating substance, of a suitable kind. The lower and projecting end of the stem 14 may be shaped to engage a wrench used when necessary to vertically adjust the position of the cup bearing 13 in truing the position of the shaft 16.

The operator may, by the means described, operate the mechanisms of the device, both in propelling it forwardly, and in rotating the rotor in the housing 25. The forward swinging plate section 36 may ride up and down over variations in the supporting surface adjustingly, and the forward cutting edge of this plate will enter snow deposits and penetrate same to receive them thereupon to be received upon the rigid inclined plate 33 and then be delivered into the housing 25 to be treated by the vanes of the rotor. The inclined canopy plate 41 is to be made of light metal and serves to ride upon snow passing between it and the plate 33 to keep the snow together and from escaping upwardly, the depending parts 43 acting to prevent escape of the snow laterally.

The inclination of the plate 33 is of relatively small degree, which facilitates penetration into the snow ahead and also offers but small resistance to the snow when moving rearwardly over it toward the rotor.

This device is particularly designed for city streets or country highways, and the inclined plates 36—33 are such as to function with but slight side draft when they enter snow deposits which are positioned obliquely thereto or which are longitudinally upon one side of the way where the plow or excavating parts pass into the drift only at one side.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. A snow remover, comprising in combination, means for transportation having independent motors mounted thereon, an open front casing mounted on said means for transportation, an inclined plane rigidly mounted upon said casing to deliver into the casing, said casing having an adjustably rotatable delivery member in communication with it, a vaned rotor rotatably mounted in said casing and having a substantially vertical shaft, driving connections between one of said motors and said shaft, and said rotor having oblique snow propelling vanes to propel snow into said delivery member, and having connecting cutter bars connecting outer terminations of said vanes alongside and spaced from said shaft to shave and disintegrate snow masses delivered into the casing over said plane.

2. A snow remover, comprising in combination, means for transportation, an open front casing with open top mounted upon said means for transportation, a rotatable delivery elbow adjustably mounted upon said casing in communication with said open top, a vaned rotor rotatably mounted on a substantially vertical axis in said casing to deliver snow through said delivery elbow outwardly, an inclined sectional plow plane of which one section is rigidly mounted upon the casing to deliver thereinto, another section being hinged to said rigid section to swing upwardly, and a top inclosing member hinged to the upper part of said casing and inclinedly positioned over said rigid section to cover it at the top and sides in swinging upwardly to retain snow upon the rigid section while passing therebetween to the casing.

3. A snow remover, comprising in combination, an elongated frame mounted on both dirigible and positively rotated pairs of

wheels, a motor upon said frame having driving connections to the positively rotated wheels, an open front casing mounted rigidly upon the forward part of said frame, a snow-plow inclined plane mounted on said frame in front to receive excavated snow and deliver it into the casing, said casing having a delivery spout, a substantially vertical rotatable shaft in said casing having inclined propeller vanes projecting therefrom to propel snow from the casing outwardly through said spout, a vertically adjustable step-bearing mounted on said frame and supporting the lower termination of said shaft, another motor mounted on said frame, and driving connections between said last-mentioned motor and said shaft.

4. A snow remover, comprising in combination, a frame mounted upon means for transportation, a snow plow sectional device inclinedly mounted upon the forward end of said frame with its rear section rigid with the frame and its forward section hinged to the rear section to swing upwardly, said forward section having a depending slide-shoe and a transverse forward cutting edge, a rotatable snow beater and propeller device mounted operatively upon said frame to receive snow passing over said snow plow to direct it outwardly in a desired direction, and a closure device hinged to said frame structure spaced at the rear from the delivery end of said snow plow and inclined downwardly over the rear rigid section thereof with upwardly curved upper end to ride upon snow passing along the snow plow preventing escape of snow upwardly therefrom.

In testimony whereof I affix my signature.

ERNEST EBERHARDT.