March 30, 1937. A. M. JESWINE 2,075,580

APPARATUS FOR SNOW REMOVAL

Filed Oct. 24, 1934 3 Sheets-Sheet 1

FIG. 1.

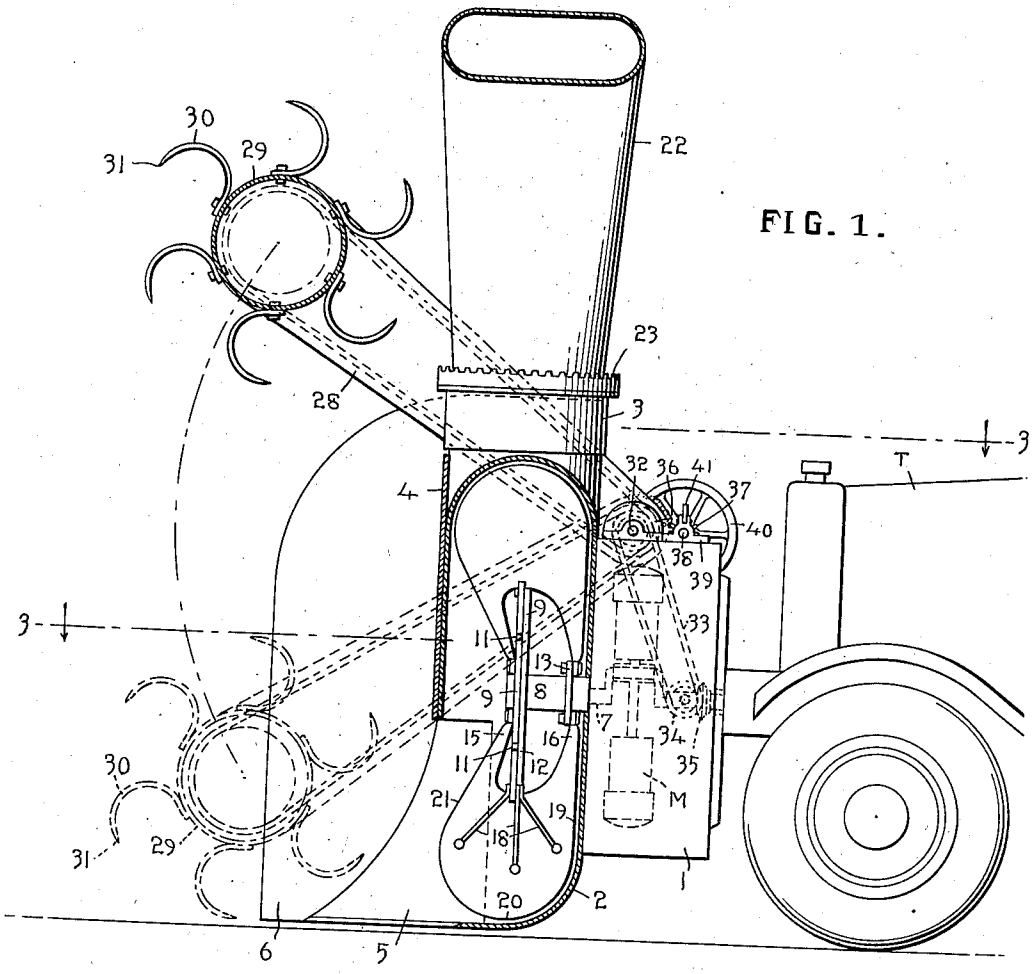
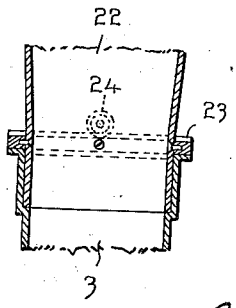


FIG. 6.



Inventor

Adolph M. Jeswine

By Carl P. Sinderbrand

Attorney

March 30, 1937. A. M. JESWINE 2,075,580

APPARATUS FOR SNOW REMOVAL

Filed Oct. 24, 1934 3 Sheets-Sheet 2

FIG. 2.

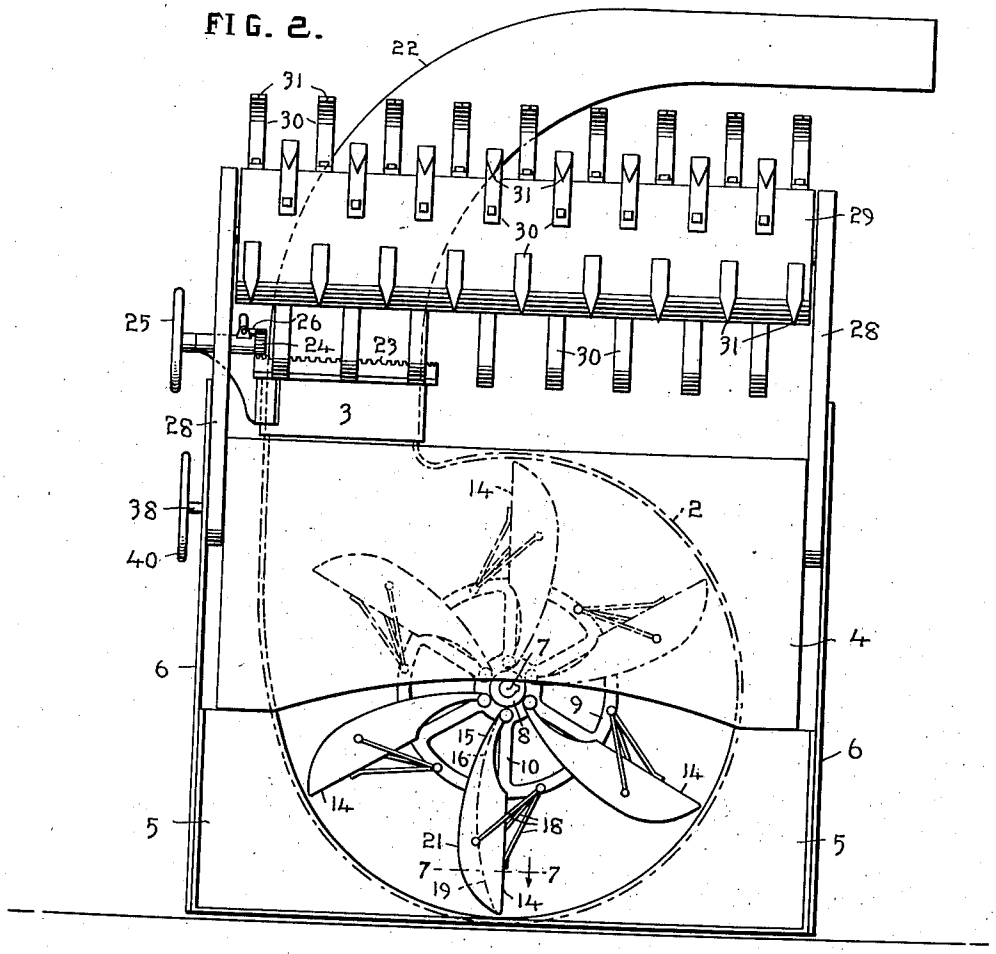
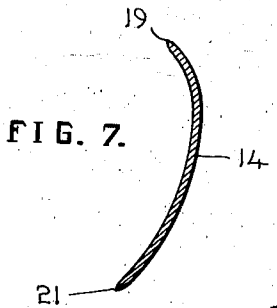


FIG. 7.



Inventor

Adolph M. Jeswine

By Clyde R. Singleton

Attorney

March 30, 1937. A. M. JESWINE 2,075,580

APPARATUS FOR SNOW REMOVAL

Filed Oct. 24, 1934 3 Sheets-Sheet 3

FIG. 3.

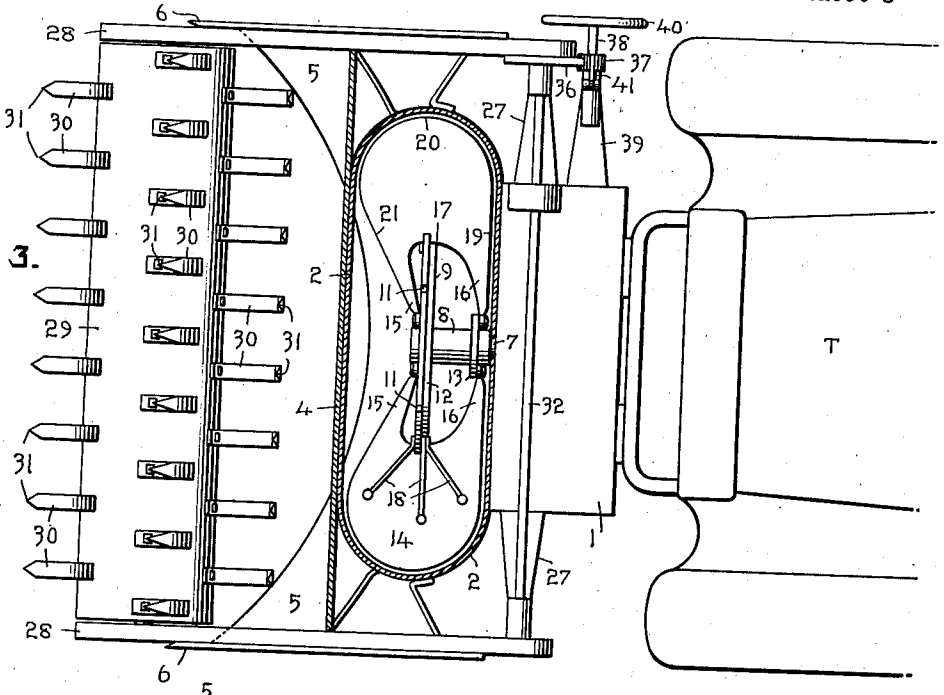


FIG. 4.

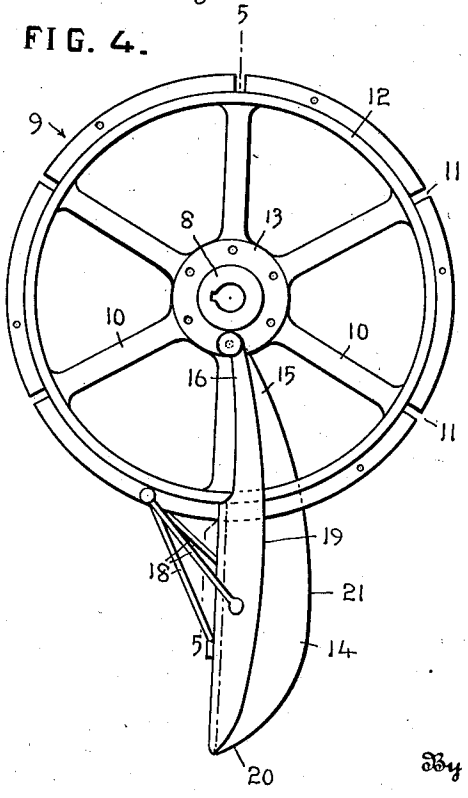
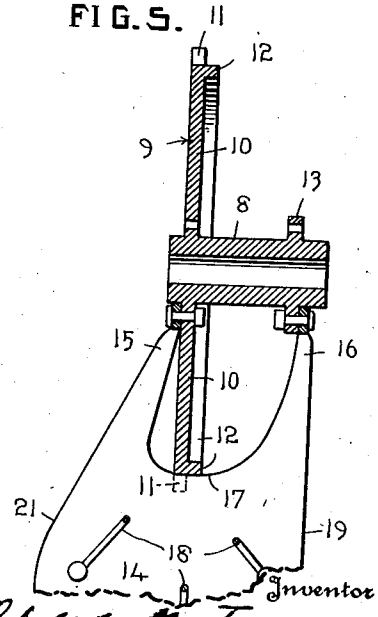


FIG. 5.



Inventor

Adolph M. Jeswine

By Cole & Singleton

Attorney

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2,075,580

UNITED STATES PATENT OFFICE

2,075,580

APPARATUS FOR SNOW REMOVAL

Adolph M. Jeswine, Helena, Mont.

Application October 24, 1934, Serial No. 749,856

7 Claims. (Cl. 37—43)

My invention consists in a new and useful improvement in apparatus for snow removal and is designed particularly for operation against snow banks or drifts and in such conditions of snow removal as that the depth of snow is considerable and the snow has become tightly packed and hardened. Such conditions, quite common in places of frequent and long continued snows and exceedingly low temperatures, render useless ordinary snow removal devices, such as plows and brushes. My improved device is designed to disintegrate hard frozen and densely packed snow banks and rapidly remove the loosened snow.

The particularly novel and useful features of my device are the scarifier, in the form of a heavy drum having steel hooks with sharp points by which the hardened snow is disintegrated, an improved form of concave scoop to supply the disintegrated snow to the removal mechanism, and my improved rotor for ejecting the loosened snow, supplied to it by the concave scoop, through its discharge throat and spout. The particularly novel feature of my improved rotor is the novel scoops with which it is supplied. These rotor scoops are so designed and mounted that they extend forwardly from the hub of the rotor toward the supply scoop below the scarifier so that the loose snow is guided by the concave scoop into these rotor scoops. I also provide a shield over the upper half of the forward side of the rotor so that the snow is supplied by the concave scoop only on the lower half of the rotor.

My device is supplied with its own motive power and I prefer to use a radial airplane motor attached directly to the rotor and geared to drive the scarifier, thereby securing adequate power for efficient operation. The device is mounted upon the front of a motor truck whereby it may be driven into the snow bank upon which it is to operate. It is to be understood of course that it can as equally well be mounted upon a wheel vehicle for track travel, as in cases of clearing railroad or street railway rights of way.

While I have illustrated in the drawings filed herewith one specific embodiment of my invention, it is to be distinctly understood that I do not consider my invention limited to said specific embodiment, but refer for its scope to the claims appended hereto.

In the drawings:

Fig. 1 is a side elevation, partly in section.

Fig. 2 is a front elevation.

Fig. 3 is an horizontal section on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged rear elevation of one of the rotor scoops with the rotor hub and spider upon which the scoop is mounted.

Fig. 5 is a vertical section on the line 5—5 of Fig. 4.

Fig. 6 is a vertical section through the joint of the discharge throat and its spout.

Fig. 7 is an horizontal section on the line 7—7 of Fig. 2.

As illustrated in the drawings, the device is mounted upon the front of an automobile truck T by any suitable means attached to the housing 1 in which is mounted the motor M for operating the device. Mounted upon the front of the housing 1 is the circular rotor housing 2 provided with the tangential discharge throat 3. Disposed over the upper half of the front of the housing 2 is the shield 4 and disposed about the lower open half of the front of the housing 2 is the concave scoop 5, and disposed on each side of the scoop 5 are the outer cutting blades 6.

Keyed upon the driving shaft 7 of the motor M, which extends into the housing 2, is the rotor hub 8 provided at its forward end with a spider 9 having six spokes 10, peripheral notches 11 aligned with the spokes 10 and a flange 12 adjacent its periphery. The hub 8 is provided at its rear end with a radial flange 13. Mounted upon the hub 8, there are six rotor scoops 14. As these scoops 14 are identical in construction and mounting, a description of one will suffice. The scoop 14 has two inwardly extending shanks 15 and 16 bolted to the spider 9 and the flange 13 respectively. The inner edge 17 of the scoop 14 between the shanks 15 and 16 is received in one of the slots 11 of the spider 9 and abuts the flange 12. Three brace rods 18 extend from the back surface of the scoop 14 to the spider 9. The rear edge 19 of the scoop 14 extends outwardly at right angles to the hub 8, the outer semi-circular edge 20 of the scoop 14 extends forwardly considerably beyond the forward end of the hub 8, and the forward straight edge 21 of the scoop 14 slants sharply rearwardly to the forward end of the hub 8. Thus it will be seen that by the novel design of the scoop 14, I have provided a rotor with forwardly projecting scoops, to facilitate the action of the rotor in handling the loose snow supplied to it, and discharging it through the throat 3.

Suitably mounted in the throat 3 is the rotatable discharge spout 22 which is provided with circumferential rack 23 and co-acting pinion 24 with hand-wheel 25 for adjusting the

spout 22, and latch 26 for locking same in adjusted position.

Suitably pivoted on brackets 27 on the sides of the housing 1 are the casings 28 extending forwardly between the outer edges of the shield 4 and the outer cutting blades 6. Rotatably mounted in the outer ends of these casings 28 is the drum 29, thereby disposed across the front of the device. This drum 29 is provided upon its periphery with a plurality of curved hooks 30 each terminating in a sharp tooth 31. I prefer to arrange these hooks 30 in longitudinal rows upon the drum, in staggered formation (see Figs. 2 and 3). The drum 29 is provided at each end with a sprocket wheel within one of the casings 28, connected by a chain with a sprocket wheel at the rear end of the casing 28 mounted on the shaft 32 journaled on the brackets 27, and driven by any suitable driving means, such as a chain 33 driven by beveled gears 34 and 35 from the drive shaft 7 of the motor M.

The casing 28, upon the side of the device upon which is mounted the hand-wheel 25 for the discharge spout 22, has a segmental rack 36 with co-acting pinion 37 on shaft 38 journaled in bracket 39 from the housing 1, and having a hand-wheel 40 for adjusting the drum 29 vertically, and latch 41 for locking same in adjusted positions.

From the foregoing description of the details of construction of my device, its use and operation will be obvious. By manipulation of the hand-wheel 40, the drum 29 may be adjusted at such an height that when rotated the hooks 30 will eat into the upper portion of the snow bank. The latch 41 may be utilized to maintain the drum 29 in such position until its operation is begun. My device then is pressed forward by the truck T. Power from the motor M is applied to the drum 29, and, the latch 41 being released, the drum 29 descending by gravity, the hooks 30 eating into the snow bank will disintegrate the bank, throwing the loosened snow rearwardly into the scoop 5, as the cutting blades 6 advance into the snow bank. The scoops 14 of the rotor receiving the loose snow under the shield 4 from the scoop 5 throw it violently upwardly through the discharge throat 3 and the spout 22 which may be adjusted to deliver the stream of discharged snow as desired.

It is to be particularly noted (see Fig. 1) that scoops 14 are projected forwardly from the hub 8 of the rotor toward the scoop 5 so as to facilitate their loading.

Having described my invention, what I claim is:

1. In an apparatus for snow removal, the combination of a housing; a rotatable shaft in said housing; a hub on said shaft having a radial flange and a spider; and a plurality of scoops mounted on said hub, each scoop having two shanks one of which is mounted on said flange and the other on said spider.

2. In an apparatus for snow removal, the combination of a main frame; two arms pivoted to said frame on its sides respectively; a scarifying drum rotatably mounted at the forward ends of said arms; a segmental rack on one of said arms; a stub shaft journaled on said frame; a pinion on said shaft meshing with said rack; and a hand-wheel on said shaft.

3. In an apparatus for snow removal, the combination of a main frame; two arms pivoted to said frame on its sides respectively; a scarifying drum rotatably mounted at the forward ends of said arms; a segmental rack on one of said arms; a stub shaft journaled on said frame; a pinion on said shaft meshing with said rack; a hand-wheel on said shaft; and a latch on said frame coacting with said pinion to prevent rotation of said pinion when in its locking position.

4. In an apparatus for snow removal, the combination of a main frame; two casings pivoted on said frame on its sides respectively; a scarifying drum journaled in said casings; a motor on said frame; a shaft on said frame driven by said motor; a sprocket-wheel on said shaft in each casing; a sprocket-wheel on each end of the drum in each casing; a chain connecting the wheels in each casing; a segmental rack on one of said casings; a stub shaft journaled on said frame; a pinion on said shaft meshing with said rack; and a hand-wheel on said shaft.

5. In an apparatus for snow removal, the combination of a main frame; two casings pivoted on said frame on its sides respectively; a scarifying drum journaled in said casings; a motor on said frame; a shaft on said frame driven by said motor; a sprocket-wheel on said shaft in each casing; a sprocket-wheel on each end of the drum in each casing; a chain connecting the wheels in each casing; a segmental rack on one of said casings; a stubshaft journaled on said frame; a pinion on said shaft meshing with said rack; a hand-wheel on said shaft; and a latch on said frame coacting with said pinion to prevent rotation of said pinion when in its locking position.

6. In an apparatus for snow removal, the combination of a main frame; a prime mover mounted on said frame; a scarifying drum pivotally mounted on said frame, so as to extend across the front of the apparatus; driving means from the prime mover to the drum for rotating the drum; elevating means for raising the drum; locking means for holding the drum in raised position; a concave scoop disposed behind the drum, having an arcuate horizontal cutting edge and a semi-circular inner discharge opening; a vertical shield above said scoop discharge opening; a rotor disposed behind said shield and scoop opening, so that its upper half is covered by said shield and its lower half is surrounded by the scoop; a shaft on said prime mover on which said rotor is mounted; a circular housing about said rotor having a tangential throat; a rotatable discharge spout in said throat; and means for rotating said spout.

7. In an apparatus for snow removal, the combination of a main frame; a prime mover mounted on said frame; a scarifying drum mounted on said frame; driving means from the prime mover to the drum for rotating the drum; a concave scoop disposed behind the drum, having an arcuate horizontal cutting edge and a semi-circular inner discharge opening; a rotor disposed behind said scoop opening so that its lower half is surrounded by the scoop; a shaft on said prime mover on which said rotor is mounted; a circular housing about said rotor having a tangential throat; a rotatable discharge spout in said throat; and means for rotating said spout.

ADOLPH M. JESWINE.