(No Model.) 3 Sheets—Sheet 1.

T. SCHEFFLER.

SNOW PLOW.

No. 421,841. Patented Feb. 18, 1890.

Fig. 1.

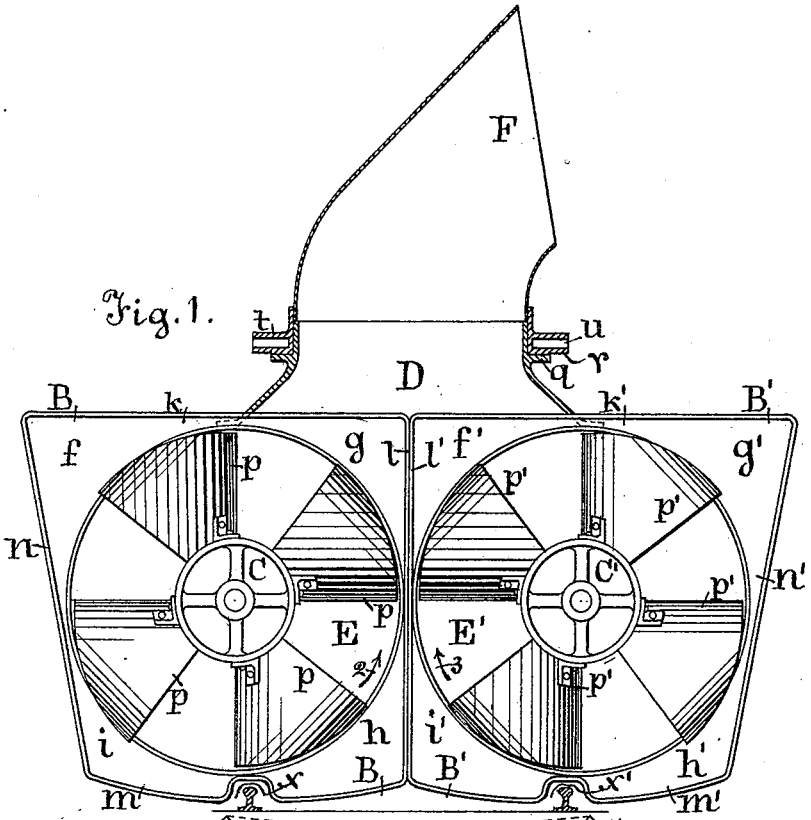
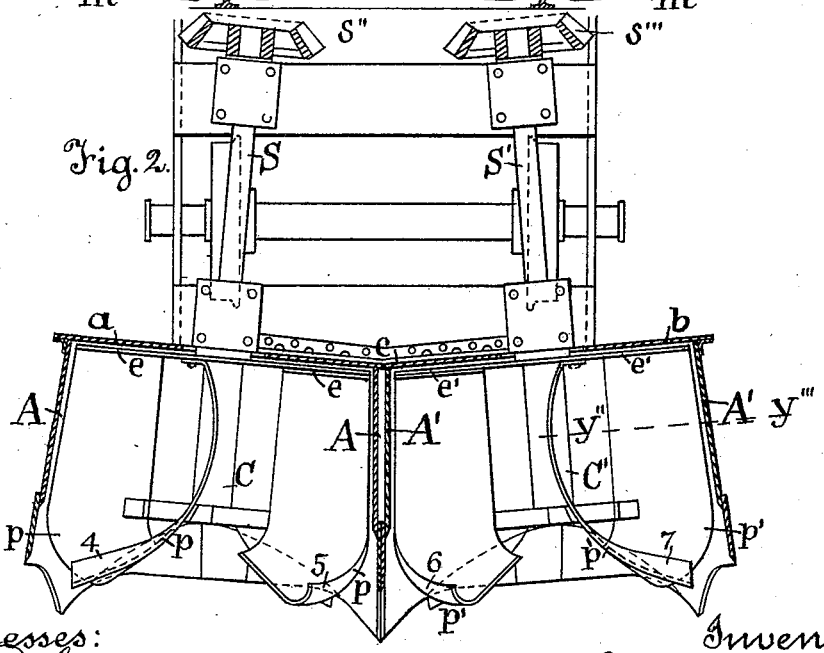


Fig. 2.



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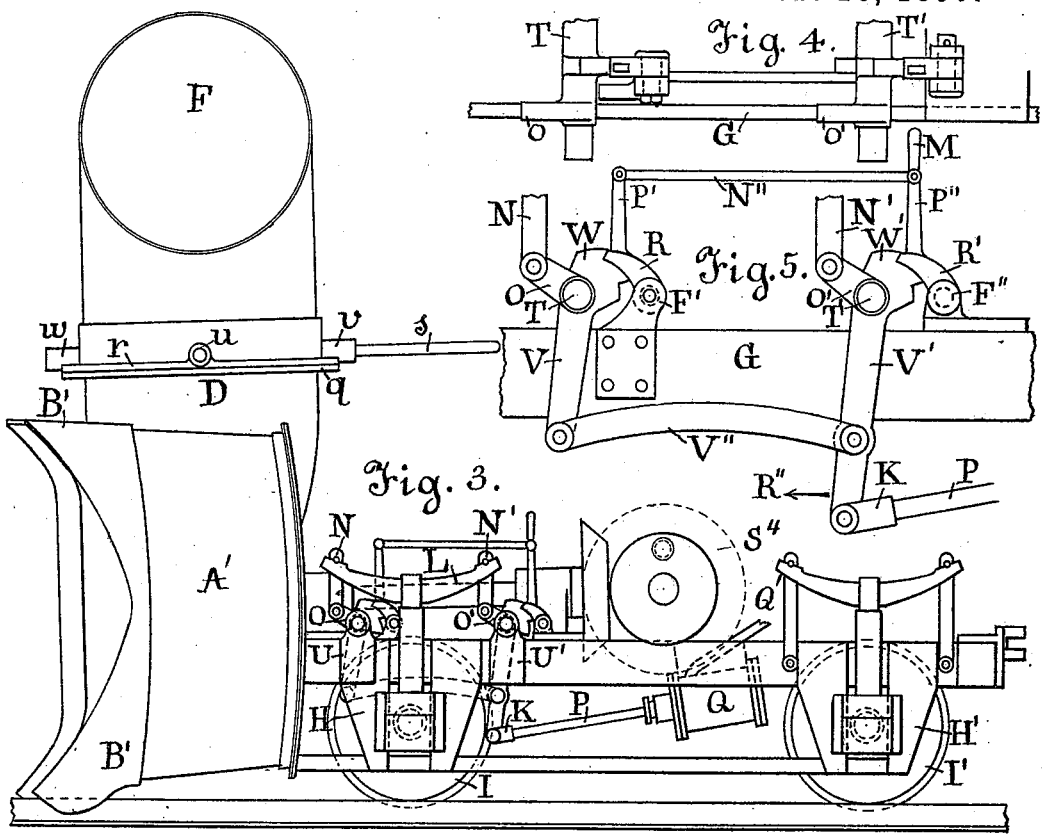

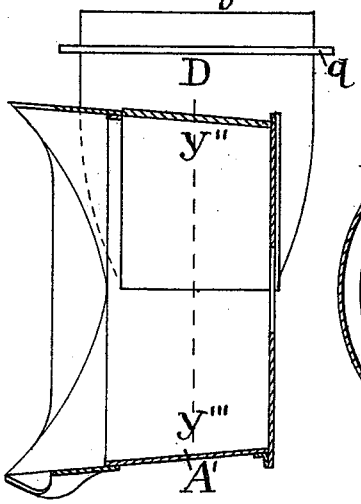

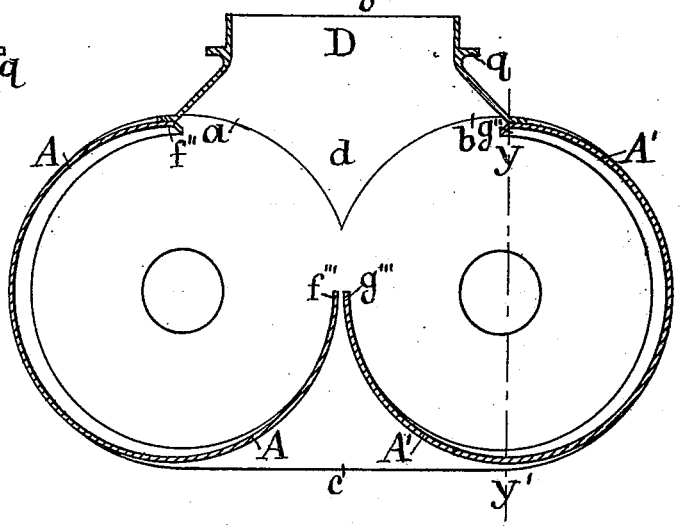

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(No Model.) 3 Sheets—Sheet 3.

T. SCHEFFLER.

SNOW PLOW.

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Fig. 8.

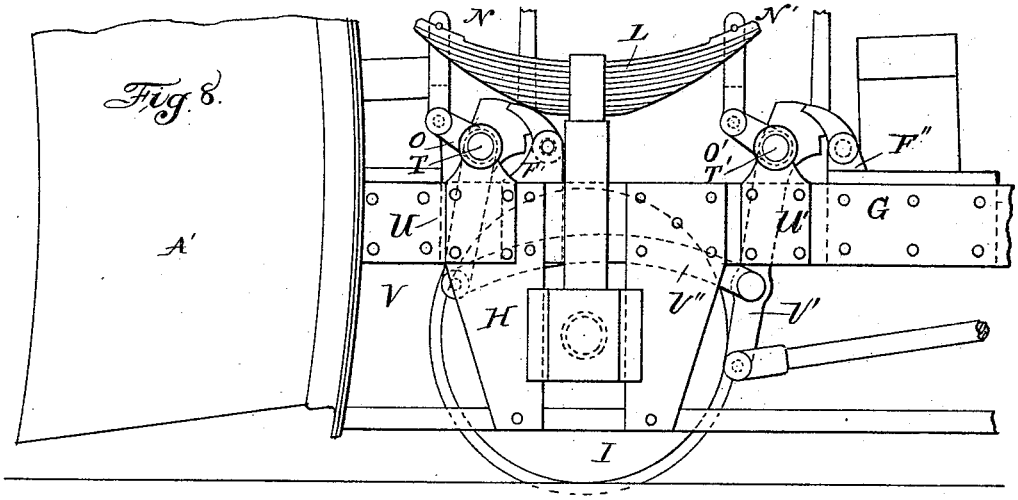
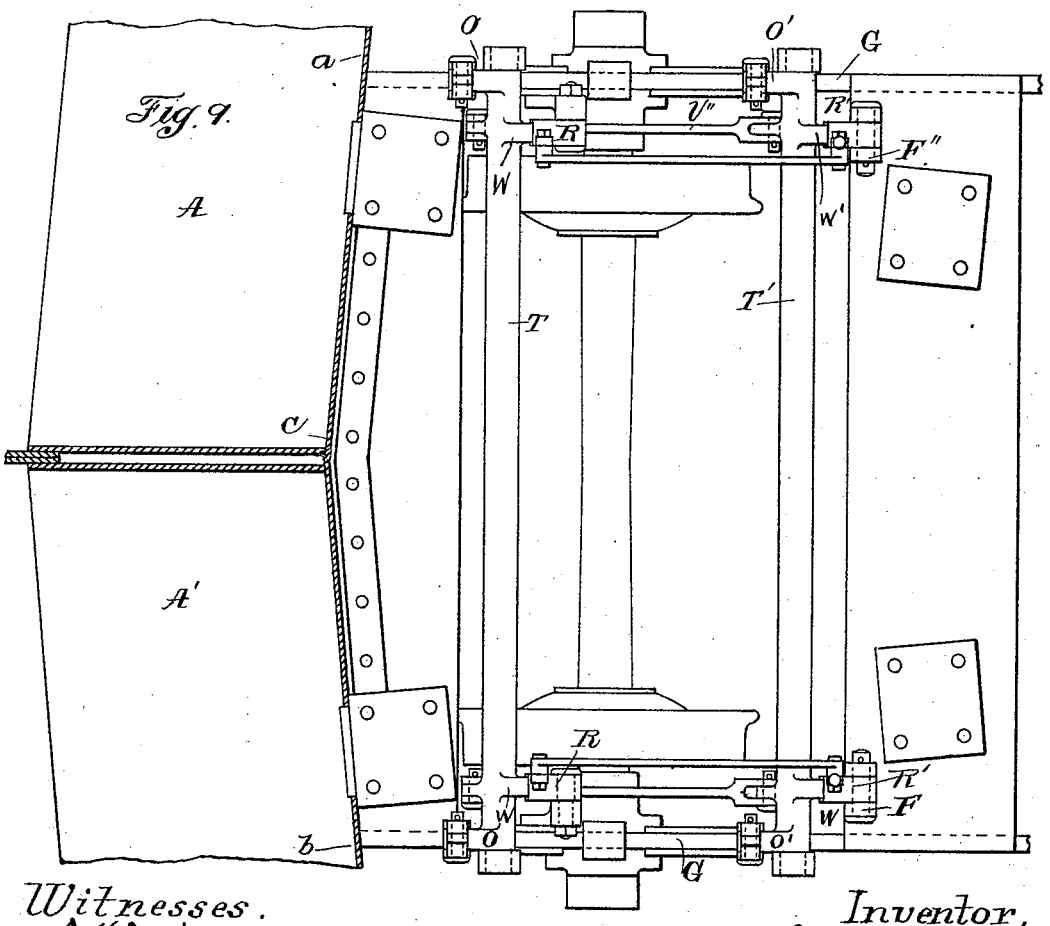


Fig. 9.



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UNITED STATES PATENT OFFICE.

THEODORE SCHEFFLER, OF PATERSON, NEW JERSEY.

SNOW-PLOW.

SPECIFICATION forming part of Letters Patent No. 421,841, dated February 18, 1890.

Application filed April 16, 1889. Serial No. 307,490. (No model.)

To all whom it may concern:

Be it known that I, THEODORE SCHEFFLER, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented a certain new and useful Improvement in Snow-Plows, of which the following is a specification.

My invention relates to that class of snow-plows in which a series of shovels revolve in a case from an aperture in which they throw the snow by centrifugal force; and it consists in the devices and combinations of devices hereinafter set forth, and pointed out in the claims.

Figure 1 is a front elevation and partial section of my improved snow-plow. Fig. 2 is a transverse section and partial plan view. Fig. 3 is a side elevation. Fig. 4 is a plan view of a portion of the frame. Fig. 5 is a side elevation of a portion of said frame. Fig. 6 is a transverse vertical section of the casing for the rotary shovels, and Fig. 7 is a longitudinal vertical section on the line $y\ y'$ of Fig. 6. Fig. 8 is a side elevation of the forward end of the snow-plow drawn on a somewhat larger scale than the same parts in Fig. 3; and Fig. 9 is a top plan view thereof, partially in section.

In the drawings, A A′ represent the two compartments of a casing or shell, each compartment in vertical cross-section being circular, as shown in Fig. 6, and having the upper portion of the adjacent edges of the circle cut away, as shown from the points f'' f''' of the compartment A and g'' g''' of the compartment A′, so that the two compartments will be in communication at their upper adjacent portions. In longitudinal section each of these compartments is in the form of a frustum of a cone, as shown for the compartment A′ in Fig. 7. Upon top of these compartments is secured in any convenient manner an uptake D, which coincides at its bottom with the cut-away portion at f'' and g'' and inclines inward and upward from those points and terminates in a circular portion, upon which is located a circular stack F.

The compartments A A′ are held together at the back by the back plate $a\ b\ c$. In each of the compartments is located a rotary shovel formed by a center hub C and a series of blades $p\ p\ p\ p$, united to a back plate e, for the compartment A, and a similar hub C′, series of shovels $p'\ p'\ p'\ p'$, and back plate e' for the compartment A′, each of the blades being suitably secured at their inner ends to the back plates and near their outer ends suitably supported on said central hub. Each of these blades is preferably of the curvature shown in Fig. 2, where it will be seen that, commencing at a point at the back plate, they first curve away from the side of the casing and then gradually approach it until they are quite close to it near their outer ends. Preferably these plates are formed so that the centers of their arcs lie at the center line of the uptake D. The dotted lines y^2 y^3 in Figs. 2 and 7 show the center point of the arc and of the uptake D. The object of thus curving the plates is so that they will assume in rotating such a position as to act as cutters and to feed the snow toward their centers and to the middle of the uptake. The outer ends of the plates are formed with a curved or turned-over portion (designated 4, 5, 6, 7 in Fig. 2) to further effect the delivery of the snow to their centers and to the middle of the uptake.

Surrounding the compartments A A′ at their front ends are hoods B B′, one hood for each compartment and each hood being substantially in the form of a trapezoid, the hoods having perpendicular adjacent sides $l\ l'$, and each hood having a horizontal top k and k', an inclined side $n\ n'$, and a bottom $m\ m'$, the latter slightly curving from the bottom of the inclined side to the bottom of the perpendicular side, and each having a recess formed in it for the rails. These hoods are secured to the compartments which they surround in any suitable manner at their rear ends, and at their front ends are cut away in the manner shown in Figs. 3 and 7, so as to provide at each corner of the hood an advanced pointed portion $f\ g\ h\ i$ for the hood B and $f'\ g'\ h'\ i'$ for the hood B′.

It will be seen that by the shape given to the hood the snow to be removed will be met by the advanced portions $f\ g\ h\ i$ and $f'\ g'\ h'\ i'$, which will serve to break up and disintegrate the snow, and that the inclined sides $n\ n'$ will leave the bank of snow on either side of the track inclining away from the track, whereby danger of the snow remaining at the

side of the track falling in upon the track is greatly lessened; also, that the formation of the bottom of the hood, so as to permit it to descend below the head of the rail, enables the snow to be taken up very completely from the track. The hoods clearing a greater space than that occupied by the casing of the shovels permits the snow-plow to pass easily around the curves. The conic form given the compartments of the casing, having the larger section of the cone outward, further aids the accomplishment of this.

Each series of rotary blades is rotated in an opposite direction to the other series, so that the tendency will be for the blades to throw the snow into the same aperture. Over the aperture through which the snow is to be ejected on the flange *q* of the uptake-pipe D is located a stack F, the mouth of which is approximately perpendicular to the ground. This stack F is mounted on the flange *q*, so as to be capable of rotation thereon, and has a flange, *r*, which rests on the flange *q*, which is provided with a series of sockets *t u v w*, into either of which a hand-bar *s* may be inserted for the purpose of rotating the stack to bring its mouth into different positions, so as to throw the snow in different directions, as found convenient. It will be seen that when the mouth of the stack faces directly across the track the snow will be thus thrown straight away from the track at right angles thereto; but when the mouth of the stack is turned so as to be nearly parallel with the track the snow will be thrown almost along the line of the track. Thus by providing a rotatable stack with its mouth substantially perpendicular to the ground is provided a means for regulating the distance from the track to which the snow is to be thrown. The rotation of the shovels is accomplished by means of the shafts S S′, having on their ends the beveled gears S^2 S^3, which are driven through the medium of bevel-wheels S^4, preferably from a steam-cylinder on the plow, receiving steam preferably from the locomotive-boiler.

By reason of the casing of the plow descending below the heads of the rails it becomes necessary at switches and crossings to raise the plow structure to clear the same. I provide a mechanism for lifting the whole front end of the plow.

The whole machine is mounted on a frame G, preferably of iron, from which depend the pedestals H H′, which serve as guides for the axle-boxes, the springs interposed between the axle-boxes and the frame serving to allow the frame sufficient play up and down when going over rough places on the road.

The axle-boxes of the wheels I I′ are connected to the springs L in the manner shown, and to the spring-hangers N N′ of the front spring are attached the arms O O′, and to these latter are secured the shafts T T′, supported in the bearings U U′ on the frame G. These shafts T T′ are provided at each end with levers V V′, which are connected together by the link V″.

To the shafts T T′ are also attached the segment-shaped ratchet-pieces W W′, with the teeth of which the pawls R R′, which have their fulcrums on the lugs F′ F″ of the frame, engage. The lever V′ is longer than the lever V, and is at the lower end attached to a knuckle-joint K, connecting with the piston-rod P of the steam-cylinder Q.

The weight of the machine exerts through the spring-links N N and shafts T T′ a force in the direction of the arrow R^2 in Fig. 5, which is taken up by the ratchet and pawl, thereby keeping the machine in position. The drawings show the machine in its lowest position and the piston-rod P out its entire length. When steam is admitted in the front end of the cylinder, the piston will be forced in and, acting in the opposite direction to the weight of the machine, the levers V V′ will be drawn backward, thus raising the whole machine up as the lower ends of the hangers N N′ are acting as fulcrums.

When the machine is raised sufficiently high, steam is exhausted, and the pawls, having engaged with another tooth of the ratchet, hold the machine in position again. To lower the machine again, steam will be admitted to the front end of the cylinder to back out the pawls, and when they are free of the ratchet they will be removed altogether therefrom by means of the handle M, connected with the pawls through the rod N^2 and P′ P^2, as shown in Fig. 5, when the machine will descend and the pawls may be dropped into position again.

While I prefer to use a pair of rotary shovels in connection with the remainder of my apparatus, yet I do not mean to limit myself to such use, as it is obvious that a single shovel might be used to advantage in connection with the other parts or some of them, and the hood might be dispensed with and its functions performed by the casings for the shovels.

What I claim is—

1. In a snow-plow, the combination of a pair of rotary shovels revolving in opposite directions, and a single outlet through which the snow is ejected, substantially as set forth.

2. In a snow-plow, the combination of a pair of rotary shovels revolving in opposite directions, a single outlet through which the snow is ejected, and an uptake, substantially as set forth.

3. In a snow-plow, the combination of a pair of rotary shovels revolving in opposite directions, a single outlet through which the snow is ejected, an uptake, and a stack having its mouth substantially perpendicular to the ground, substantially as set forth.

4. In a snow-plow, the combination of a snow-shovel, a hood descending below the heads of the rails, and means for elevating said hood, substantially as set forth.

5. In a snow-plow, the combination of two snow-shovels, each shovel rotating in an op-

posite direction to the other, a compartment for each of said shovels to rotate in, and an outlet communicating with both compartments, substantially as specified.

6. In a snow-plow, the combination of two snow-shovels, each shovel rotating in an opposite direction to the other, a compartment for each of said shovels, and an uptake communicating with both compartments, substantially as set forth.

7. In a snow-plow, the combination of two snow-shovels, each shovel rotating in an opposite direction to the other, a compartment for each of said shovels, an uptake communicating with both of said compartments, and a stack for said uptake, substantially as specified.

8. In a snow-plow, the combination of two snow-shovels, each shovel rotating in an opposite direction to the other, a compartment for each of said shovels, an uptake communicating with both of said compartments, and a stack for said uptake, having its mouth substantially perpendicular to the ground, substantially as specified.

9. In a snow-plow, the combination of two snow-shovels, each shovel rotating in an opposite direction to the other, a compartment for each of said shovels, an uptake communicating with both of said compartments, a stack for said uptake, having its mouth substantially perpendicular to the ground, and means for rotating said stack about said uptake to change the position of its mouth, substantially as specified.

10. In a snow-plow, a rotary shovel comprising a center hub, a back plate, and a series of curved blades attached to said hub and back plate and having a turned-over outer portion, substantially as set forth.

11. In a snow-plow, the combination of a rotary shovel and an outlet for the snow, said shovel having a series of curved blades with the center of their arc coinciding with the horizontal center line of the outlet, substantially as set forth.

12. In a snow-plow, the combination, with a casing and its shovels, of a hood extending on each side of the rail to near the ground, and means for elevating said parts above the rail, substantially as specified.

This specification signed and witnessed this 8th day of April, 1889.

THEODORE SCHEFFLER.

Witnesses:
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HENRY A. CLARK.