Jan. 8, 1935. S. SEVERSON 1,987,313

SNOW REMOVING DEVICE

Filed April 29, 1933 3 Sheets-Sheet 1

Fig. 1

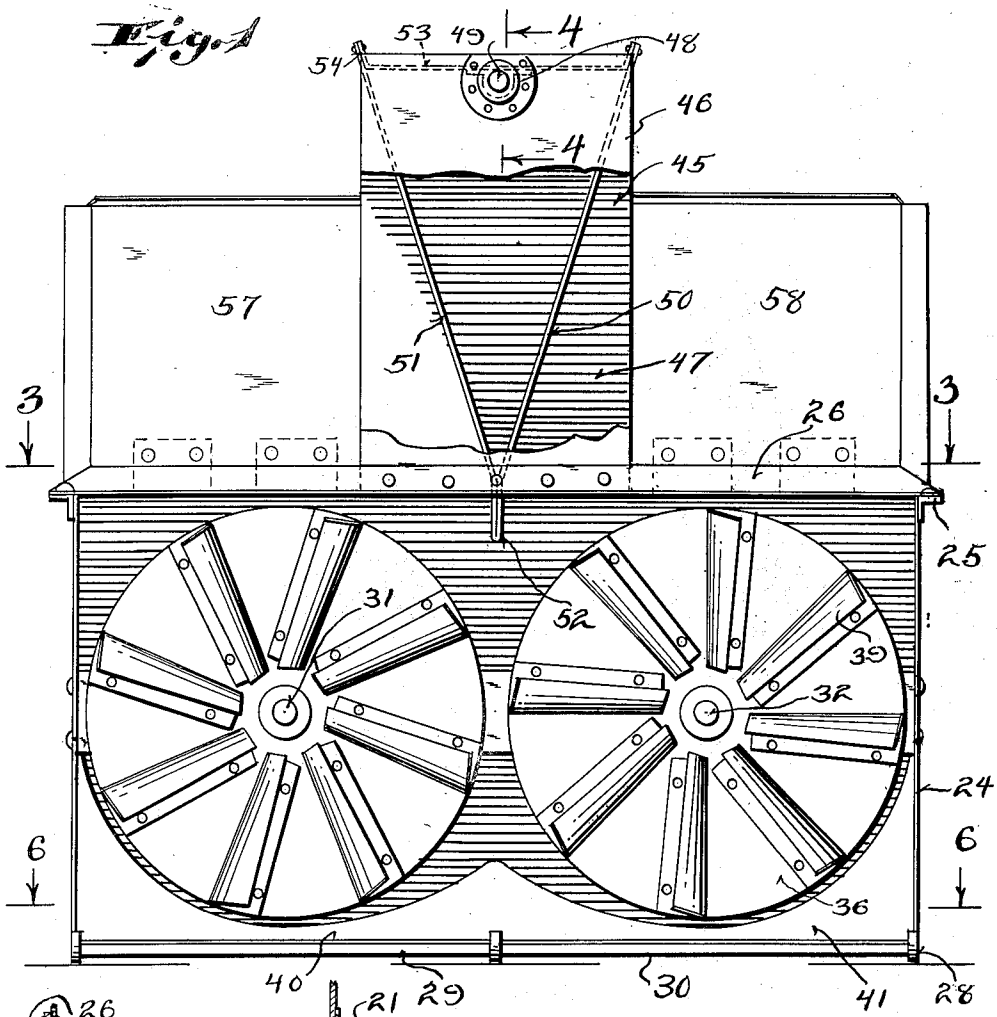
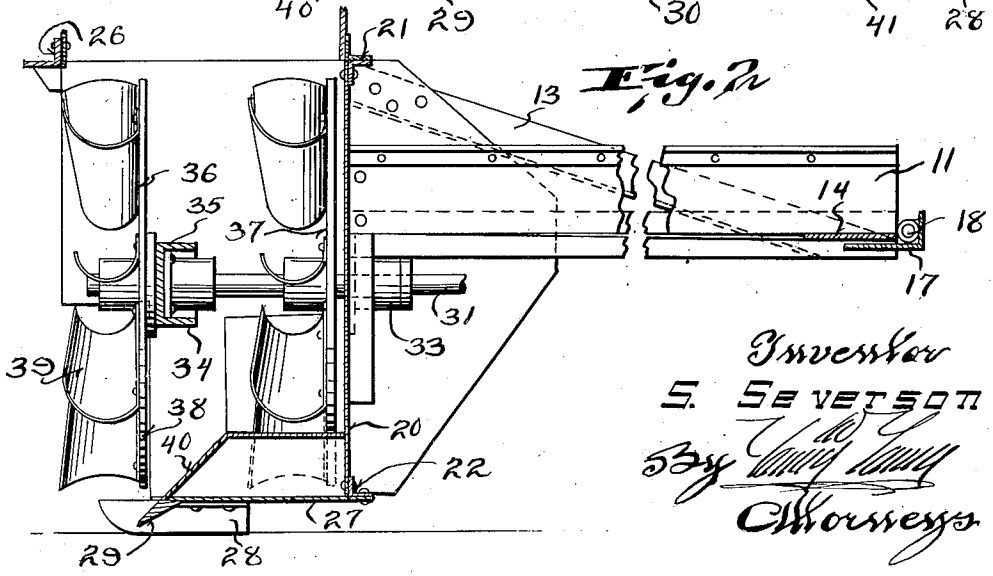


Fig. 2



Inventor
S. Severson
By
Attorneys

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Fig. 3.

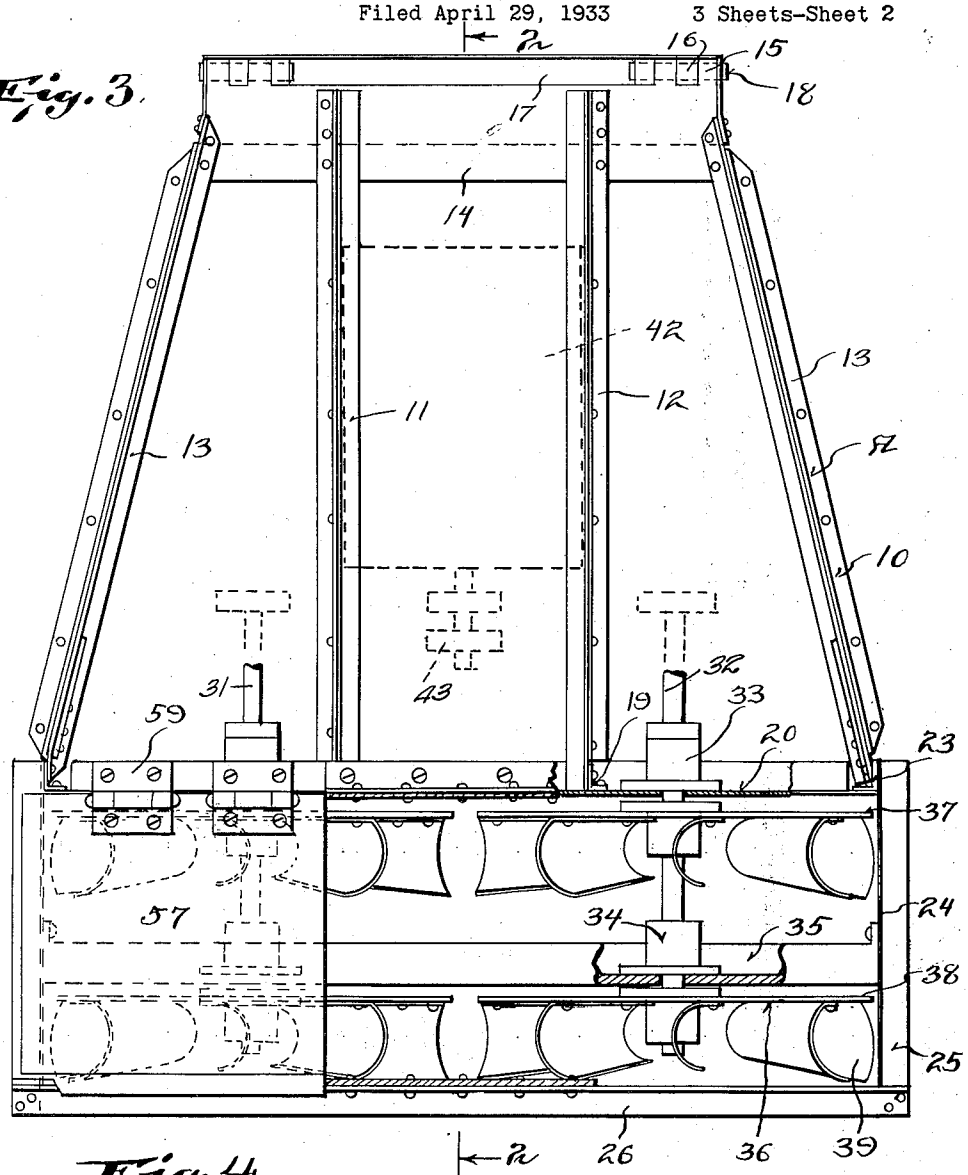
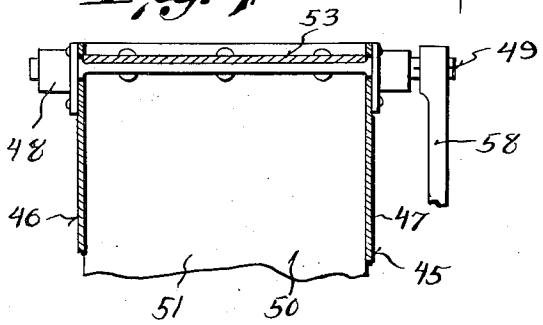


Fig. 4



Inventor
S. Severson
By
Attorneys

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Fig. 5

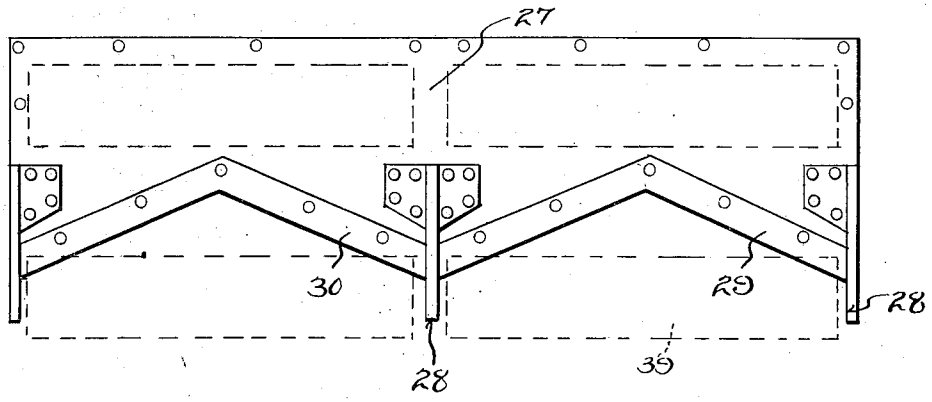


Fig. 6

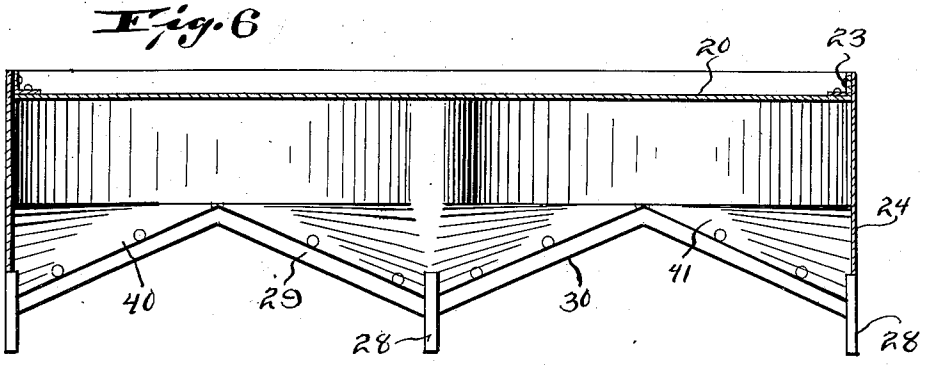
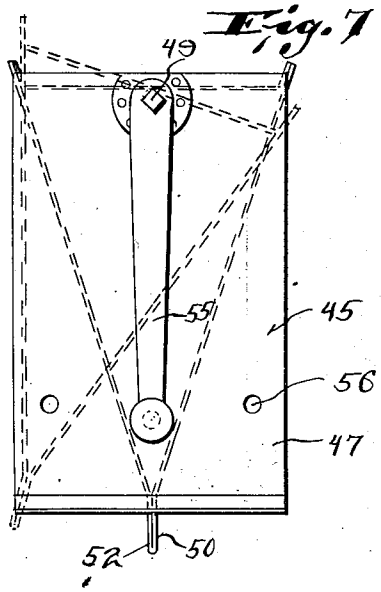


Fig. 7



Inventor
S. Severson
By Watts Young
Attorneys

Patented Jan. 8, 1935 1,987,313

UNITED STATES PATENT OFFICE

1,987,313

SNOW REMOVING DEVICE

Samuel Severson, Valders, Wis.

Application April 29, 1933, Serial No. 668,616

3 Claims. (Cl. 37—43)

This invention appertains to snow removing devices of the type particularly adapted for use on highways for keeping the same open to vehicular traffic during the winter season and is an improvement on my prior Patent 1,844,693, issued to me February 9, 1932.

In the mentioned patent, I disclosed the use of front and rear rotatable snow impellers for handling the snow and the present invention has for one of its primary objects the provision of novel means for arranging the cutting or scraper blades and the mold boards relative to the roadway and relative to the front and rear snow impellers, whereby the snow will be more efficiently handled and whereby easy movement of the device over the roadway is insured without undue drag on the impelling truck.

Another salient object of my invention is the provision of scraper blades and upwardly inclined mold boards disposed in rear of and below the front snow impeller wheels and in advance of the rear impeller wheels, the arrangement being such that the snow not acted on by the front impeller wheels will be delivered without crowding to the rear impeller wheels, the entire device being of such a character that the entire area of snow in front of the device is efficiently acted on and removed without any unnecessary shifting of any part of the snow.

A further important object of my invention is the provision of front and rear pairs of snow impeller wheels disposed on opposite sides of the longitudinal center of the machine with novel means arranged relative to said wheels for effectively directing the snow either to one side of the roadway or to the other side of the roadway, according to conditions encountered on the roadway, said device also permitting the snow to be thrown simultaneously on both sides of the road should conditions exist rendering such handling advisable.

A further object of my invention is the provision of a swinging gate or deflector mounted above and between the pairs of impeller wheels, the gate being movable to three different adjusted positions for permitting the throwing of the snow to either one side of the machine or the other, or the throwing of the snow simultaneously on both sides of the machine.

A further object of my invention is the provision of swinging covers arranged on opposite sides of the swinging gate or guide for cooperating with the gate to permit the throwing of the snow in the desired direction.

A still further object of my invention is to provide a novel snow removing device, which can be readily associated with the chassis of an automobile truck, said device having a power plant mounted directly thereon for driving the snow impeller wheels in the desired direction, the means of mounting the device on the truck allowing movement thereof relative to the roadway.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed and illustrated in the accompanying drawings, in which drawings:

Figure 1 is a front elevation of my improved snow removing machine with parts of the deflector or gate housing being shown broken away to illustrate the position of the deflector or gate, the covers on opposite sides of the housing being shown in their raised and elevated position.

Figure 2 is a longitudinal section through my improved snow removing machine taken on the line 2—2 of Figure 3 looking in the direction of the arrows.

Figure 3 is a horizontal section through my improved machine taken on the line 3—3 of Figure 1 looking in the direction of the arrows.

Figure 4 is a central vertical section through the deflector and housing taken substantially on the line 4—4 of Figure 1 looking in the direction of the arrows.

Figure 5 is a bottom plan view of the front portion of the machine illustrating the arrangement of the runners, scraper blades and mold boards, the impeller wheels being shown in dotted lines only.

Figure 6 is a horizontal section through the front of the machine taken on the line 6—6 of Figure 1 looking in the direction of the arrows.

Figure 7 is a rear elevation of the deflector or gate and its housing, said view illustrating one means of adjusting the position of said deflector or gate.

Referring to the drawings in detail, wherein similar reference characters designate the corresponding parts throughout the several views, the letter A generally indicates my improved snow removing machine, which comprises a supporting frame 10.

This frame 10 includes a pair of spaced parallel longitudinally extending beams 11 and 12, which are located on the opposite sides of the longitudinal center of the machine. Arranged on each side of the parallel beams 11 and 12 are side beams 13, which beams are arranged in diverging relation, as is clearly shown in Fig-

ure 3 of the drawings. All of these beams can be made from structural iron or steel and the rear ends thereof are securely fastened, such as by means of bolts, rivets or spot welding, to a transversely extending rear plate 14. This plate 14 has formed thereon or secured thereto hinge barrels 15 which mate with companion hinge barrels 16 carried by a transversely extending attaching plate 17. This attaching plate 17 is preferably of an L-shape in cross section for structural strength and is securely fastened to the chassis of the truck or tractor with which my device may be associated. Hinge pins 18 extend through the mating hinge barrels 15 and 16.

Securely bolted, riveted or otherwise connected to the forward ends of the beams 11, 12 and 13 are vertically extending angle supporting struts 19. These angle struts or standards 19 are in turn riveted or otherwise connected to the back plate 20 forming a part of the casing which constitutes the front end of my machine.

The upper and lower ends of the back plate 20 are preferably reinforced by upper and lower angle irons 21 and 22. This plate is further reinforced by vertically extending angle irons 23 which are disposed adjacent to the end edges of said plate 20. Thus, in effect, a complete reinforcing marginal frame is formed for this back plate. Rigidly secured to the ends of the back plate 20 and to the rearwardly extending flanges of the vertical angle irons 23 are forwardly extending side plates 24, which also constitute a part of the casing. The top edges of the side plates are in turn reinforced by forwardly extending angle bars 25 which can be securely fastened to the vertical angle bars 23. The forward ends of the angle bars 25 are connected by means of a front angle bar 26 which extends transversely of the longitudinal axis of the machine.

Rigidly connected with the bottom angle bar 22 and with the lower ends of the side walls 23 is a bottom plate 27 and it is to be noted that this bottom plate 27 terminates decidedly short of the front end of the casing, for a purpose which will be hereinafter more fully set forth. Suitable guide runners 28 are connected with the lower face of the casing so as to space the bottom wall 27 from the roadway.

Securely bolted to the front leading edge of the bottom wall 27 are the depending scraper blades 29 and 30. These scraper blades are arranged on opposite sides of the longitudinal center of the machine and are of a substantially V-shape in plan, as can be readily seen by referring to Figures 5 and 6 of the drawings and the front edge of the bottom wall 27 conforms to the configuration thereof.

The lower edges of the scraper blades 29 and 30 are preferably sharpened to facilitate the cutting of the snow and these blades terminate slightly short of the lower edges of the runners 28, so that the blades will not catch in obstructions in the roadway.

Arranged above the cutting blades 29 and 30 are longitudinally extending shafts 31 and 32. These shafts extend through the back plate 20 and are mounted in suitable bearings 33 carried thereby and in bearings 34 connected with a transversely extending channel beam 35, the ends of which are riveted or otherwise securely fastened to the side walls 24. As shown, these shafts are arranged directly above the apexes of the scraper blades 29 and 30 and have securely fastened thereto front and rear snow impeller wheels 36 and 37. These impeller wheels preferably consist of supporting discs 38 to the front faces of which are securely fastened radially extending curved buckets 39. The front impeller wheels 36 are disposed in advance of the cutting or scraper blades 29 and 30 for a purpose which will later appear, while the rear impeller wheels 37 are disposed in back of the scraper or cutter blades and adjacent to the rear wall 20.

In conjunction with the scraper blades 29 and 30, I utilize novel mold boards 40 and 41. These mold boards gradually incline rearwardly and upwardly toward the back plate 20 and are of an arcuate shape in front elevation, so as to conform to the outline of the rear impeller wheels 37.

By referring to Figure 2 of the drawings, it will be noted that the front impeller wheels 36 are located sufficiently in advance of the cutting blades and mold boards as to permit the free passage of the snow rearwardly into the casing, so as to be acted upon by the rear impeller wheels 37.

In actual practice, I prefer to mount a prime mover, such as an internal combustion engine, upon the frame 10 in rear of the casing. This internal combustion engine is shown in dotted lines in Figure 3 and is indicated by the reference character 42. As shown, the engine includes a drive crank shaft 43 and the shafts 31 and 32 are adapted to be driven in opposite directions from said crank shaft through the medium of any preferred driving mechanism.

The impeller wheels on the righthand side (by referring to Figure 1) rotate in a clockwise direction, while the impeller wheels on the left-hand side rotate in a counter-clockwise direction. Thus, the impeller wheels tend to throw the snow inwardly toward the center of the machine and out the sides thereof.

Arranged on top of the casing at the longitudinal center thereof is a housing 45 which can be made of sheet metal of the desired gauge. This housing embodies spaced front and rear plates 46 and 47 which are securely bolted respectively to the front angle iron 26 and the rear top angle iron 21. Thus, the housing 45 is disposed approximately between and above pairs of impeller wheels.

The upper edges of the front and rear plates 46 and 47 carry suitable bearings 48 in which is rockably mounted a shaft 49. This shaft 49 carries the deflector or gate 50 which is employed for guiding the snow out of the machine. The gate 50 is located between the front and rear plates 46 and 47 and may consist of converging side plates 51, the lower ends of which meet to define the dividing blade 52. If so desired, the side plates 51 and blade 52 can be made from an integral piece of metal. The upper diverging ends of the side plates 51 are connected by a top plate 53, the outer edges of which are bent to provide flanges 54, which are securely riveted or otherwise secured to said side plates. The top plate 53 at its longitudinal center is securely bolted to the rock shaft 49 and thus, swings therewith.

Any preferred means can be provided for swinging and holding the deflector or gate 50 in its desired position. By way of illustration, I have shown a depending lever 55 secured to the rear end of the rock shaft 49. The back plate 47 of the housing can be provided with intermediate and side openings 56 for receiving a latch carried by the lever, whereby the lever and the deflector or gate can be held either in a centrally disposed

position, as shown in full lines in Figures 1 and 7, or at one side or the other.

Operating in conjunction with the housing 45 and the deflector or gate 50 are cover plates 57 and 58 disposed on opposite sides of the said housing. These plates 57 and 58 are adapted to normally close the top end of the casing on opposite sides of the housing and above the impeller wheels. The rear edges of these cover plates 57 and 58 are connected by means of hinges 59 to the rear top angle iron 21. Thus, these cover plates can either be moved to an open or closed position and suitable means can be provided for holding the same in either one of their positions.

In use of my improved device, the same is attached to the tractor as previously described, which tractor is preferably of the type described in my patent previously mentioned; that is, that type of motor truck which is so constructed that the same can be driven backward or forward with the same facility, the same being provided with reversible driver's positions and controls.

As the machine is pushed forwardly over the roadway, the front impeller wheels 36 engage a certain part of the snow and the other part of the snow not engaged by said wheels is scraped up by the blades 29 and 30 and directed upwardly and rearwardly by means of the mold boards 40 and 41 to the rear impeller wheels. As stated, owing to the shape of the scraper blades and mold boards and the arrangement of the front impeller wheels forwardly thereof, the snow is permitted a free passage up the incline without crowding to the rear impeller wheels.

If the snow is to be directed on one side of the roadway only, say to the lefthand side, (by referring to Figure 1) the deflector or gate is moved to the right so as to partially overlie the impeller wheels on the righthand side. The cover 58 is moved to a closed position, while the cover 57 is moved to a raised position. Thus, the snow will be effectively thrown out from the lefthand side of the machine only.

Where the snow is to be directed out from the righthand side of the machine only, the cover 57 is lowered and the cover 58 is raised, and the gate of deflector 50 is shifted to the lefthand side. When it is desired to throw the snow on both sides of the road simultaneously, the covers 57 and 58 are each held in their raised positions and the deflector or gate 50 is disposed in a neutral position, as shown in Figure 1 of the drawings.

From the foregoing, it can be seen that I have provided novel means for effectively acting on an entire area of snow in front of the machine and have provided novel means for directing the throwing of the snow either to one side of the roadway or the other or on both sides of the roadway simultaneously.

As the snow is not crowded or shoved to one side of the roadway, but is picked up and thrown to the side by the impeller wheels, my machine is very easy to push over a roadway and can maintain a comparatively high rate of speed.

In other words, the construction gives the machine a capacity and speed of performance that cannot be obtained by the ordinary type of snow plow.

Changes in details may be made without departing from the spirit or the scope of my invention, but what I claim as new is:—

1. A snow removing device comprising a front casing, including a back wall and forwardly extending side walls, front and rear pairs of snow impeller wheels arranged within the casing on opposite sides of the center thereof for rotation in opposite directions, a housing carried by the upper wall of the casing and arranged between and above the pairs of impeller wheels including front and rear walls, a deflector gate rockably mounted between the front and rear walls of the housing including downwardly converging side walls and a connecting top wall, means for shifting and holding the gate either in a central position or at one side or the other side, and hinged cover plates for the top casing disposed on opposite sides of the housing movable either to a raised position or to a closed position independently of one another.

2. A snow removing machine comprising a frame including spaced parallel intermediate beams and forwardly diverging side beams, a rear plate rigidly connected to the rear ends of all of said beams, a hinged attaching plate connected to the first plate, a casing rigidly connected with the front ends of said beams, pairs of like front and rear impeller wheels carried by the casing and located on opposite sides of the center thereof, said pairs of wheels being rotatable in opposite directions, scraper blades carried by the casing and arranged between the front and rear impeller wheels of the pairs of impeller wheels, upwardly and rearwardly inclined mold boards disposed within the casing and leading from the scraper blades toward the rearmost impeller wheels, and means for deflecting the snow simultaneously from both sides of the machine or from one side of the machine or the other.

3. A snow removing machine comprising, a frame, a casing rigidly connected with the frame, pairs of like front and rear impeller wheels carried by the casing and located on opposite sides of the center thereof, said pairs of wheels being rotatable in opposite directions, scraper blades carried by the casing and arranged between the front and rear impeller wheels of the pairs of impeller wheels, and upwardly and rearwardly inclined mold boards disposed within the casing and leading from the scraper blades toward the rearmost impeller wheels.

SAMUEL SEVERSON.