

(No Model.)

2 Sheets—Sheet 1.

C. JOHNSON.
SNOW PLOW FOR WAGON ROADS.

No. 590,989.

Patented Oct. 5, 1897.

Fig. 1.

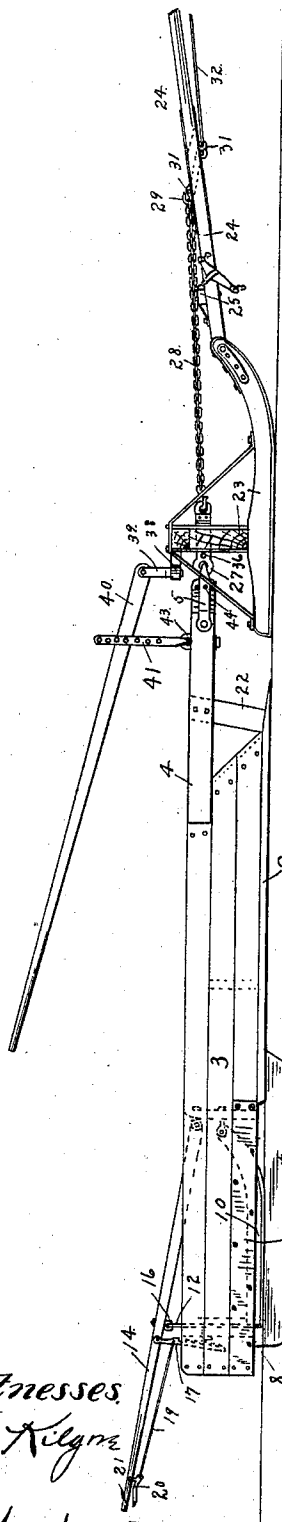


Fig. 2.

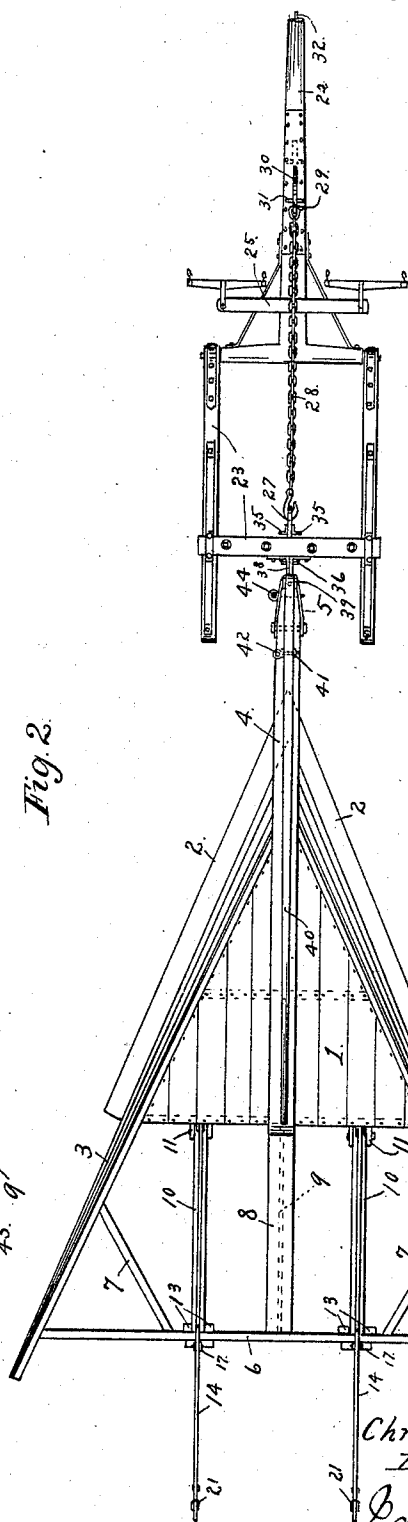
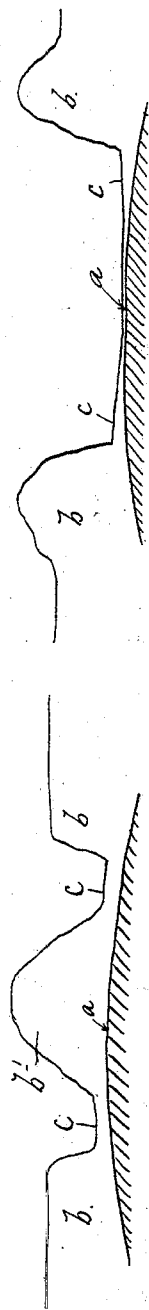


Fig. 9.

Fig. 10.



Witnesses
C. F. Kilgus
R. D. Merchant.

Inventor:
Christian Johnson
By his Attorney
Jas. F. Williamson

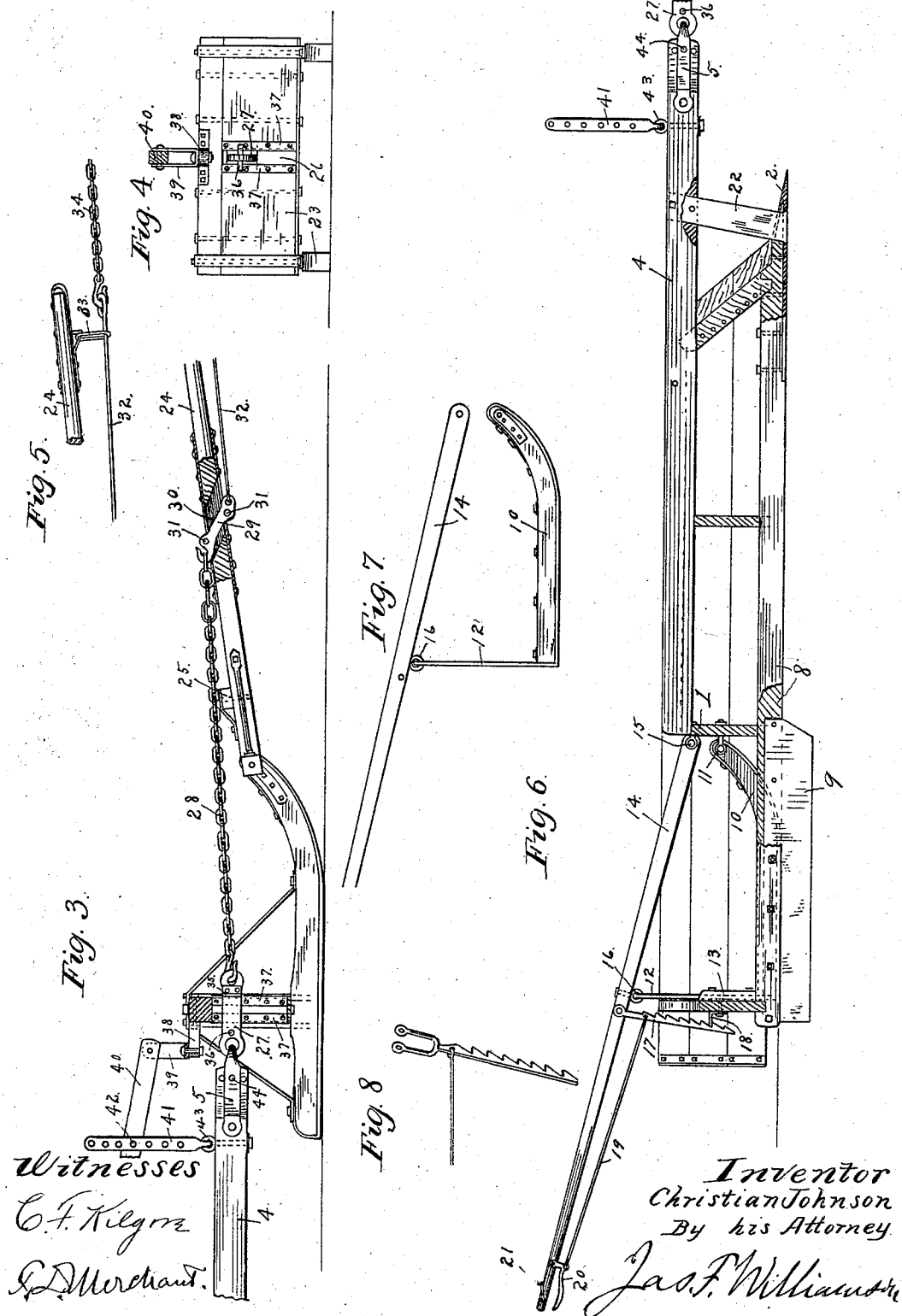
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

CHRISTIAN JOHNSON, OF WARWICK, MINNESOTA.

SNOW-PLOW FOR WAGON-ROADS.

SPECIFICATION forming part of Letters Patent No. 590,989, dated October 5, 1897.

Application filed April 6, 1897. Serial No. 630,991. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN JOHNSON, a citizen of the United States, residing at Warwick, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Snow-Plows for Wagon-Roads; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an efficient snow-plow for clearing country-roads from snow and ice, especially in the spring of the year before the break up.

In the northern and northwestern countries the snow seldom melts off during the winter season, but continues to accumulate until the break up in the spring. As a result the snow often reaches a level of three or four feet and the country-roads wear down in the sled and horse trails and pile up in the middle of the road. This body of snow and ice in the middle of the road packs hard and is difficult to remove. When the thaw begins at the break up in the spring, the draft-animals and the vehicles will sink through the snow and ice and the roads become impassable.

The object of my invention is to provide a plow which may be used to cut out the ridges from the center of the road and throw the snow and ice on opposite sides of the roadway, so as to put the road in condition for use.

To these ends my invention consists of the novel devices and combinations of devices, which will be hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein, like notations referring to like parts throughout the several views—

Figure 1 is a side elevation, and Fig. 2 is a plan view, of my improved plow. Fig. 3 is a vertical central section through the leading or forward sled and a part of the plow, some parts being broken away. Fig. 4 is a rear end view of the leader sled shown in Fig. 3 with some parts removed and the lever shown in vertical section. Fig. 5 is a detail showing the forward end of the draft-pole and portions of the draft devices to which the leaders or draft-teams forward of the pole team are

hitched. Fig. 6 is a central vertical section through the body of the plow with some parts broken away and others removed. Fig. 7 is a detail showing one of the rear sled-runners detached and the relation of the same to the hand-lever by which the plow is raised or lowered on the runner, and Fig. 8 is a detail showing the ratchet-pawl carried by one of said hand-levers. Fig. 9 is a view in diagram lines, showing a cross-section of a road as it would appear before the plow was used thereon; and Fig. 10 is a similar view showing a cross-section of the road as the same would appear after the plow had been used to clear the same.

In the diagram views Figs. 9 and 10, *a* represents the ground-line, *b b'* represent the snow and ice, and *c* represents the horse and sled trail.

As the snow and ice accumulate the roadway under the ordinary usage tends to assume the shape shown in Fig. 9, and the problem is to remove the central or ridge part *b'*. Hence the plow must be of some suitable design which can be held to its work without sheering sidewise and be pulled by draft-animals walking in the trails or ruts *c*. The only limit to the height of the accumulating ridge *b'* is the amount of clearance between the sleds or other vehicles which travel the road. The bottom of the road will also gradually rise under the accumulating snow and ice, so as to raise the level of the sled and horse trail *c*. Hence when the accumulating snow and ice begin to soften preliminary to the break up in the spring both the draft-animals and the vehicle sink through the snow and ice and the roads become almost or entirely impassable. As before stated, my plow was designed to meet these conditions, and after the use of the plow the road will appear as in Fig. 10.

The body portion 1 of the plow is of angular form and is made up of any suitable material which will afford the requisite strength and rigidity. To the said plow-body 1 is fixed a steel share 2 of corresponding angular form. To the body 1 are also fixed suitable mold-boards 3, which extend rearward beyond the body portion 1 of the plow, as best shown in Fig. 2. The plow is provided with a suitable beam 4, which extends forward beyond the

share 2 and is provided with a clevis 5 for the draft attachment, as will presently be noted.

The moldboards 3 are spaced apart at their rear ends by a suitable cross bar or beam 6 and diagonal braces 7 in the corners between the moldboards and said cross-bar 6. The body of the plow is also provided with a bottom center beam 8, which extends rearward beyond the body portion 1 and is made fast to the cross bar or plate 6 at its rear end. To this bottom beam 8 is fixed a suitable metallic center board or rudder 9, which projects downward a suitable distance below the beam 8 and is knife-edged and preferably beveled at its forward end. A pair of sled-runners 10 are pivoted at their forward ends to the rear end of the body portion 1 of the plow between the moldboards 3 and the bottom center sill 8. This pivotal connection may be made in any suitable way, but is shown as effected by eyebolt-clevises 11. The shoe-irons of the sled-runners 10 are provided with vertical extensions 12 at their rear ends which work between suitable guide-irons 13, fixed to the cross bar or plate 6, as best shown in Figs. 2 and 6.

A pair of strong hand-levers 14 are pivoted to the body of the plow at their forward ends at points preferably directly over the forward ends of the sled-runners, as shown at 15. These hand-levers 14 are pivotally connected to the extensions 12 of the shoe-irons of the sled-runners 10 by eyebolts 16 or other suitable means. The said levers 14 also carry ratchet-pawls 17, which are pivoted to said levers at their upper ends, as best shown in Fig. 6. The teeth of these ratchet-pawls 17 are adapted to engage with cooperating angle-irons 18, secured to the rear face of the cross bar or plate 6. The said ratchet-pawls 17 are connected by rods 19 to a finger-lever 20, pivoted to the rear end portions of the levers 14 and adapted to be gripped in the hand like an ordinary pawl-lever finger-pull. By the finger-lever 20 and the rod 19 the ratchet-pawls 17 may be released from the angle-irons 18 at will. The levers 14 are shown as provided with rings 21 for engaging over the finger-levers 20 for holding the pawls 17 in their released positions whenever so desired.

The described relation between the body of the plow, the sled-runners 10, and the hand-levers 14 permit the rear end of the plow to be raised or lowered on the said runners under the action of said levers 14 and to be held in any desired adjustment with respect to said runners by the ratchet-pawls 17 in cooperation with the angle-irons 18.

At its forward end the plow is provided with a suitable knife-edged cutter 22, shown as extending from the share to the beam and secured to both.

The leading sled 23 is substantially like the forward member of an ordinary pair of bobsleds and is provided with a suitable draft-pole 24, with draft appliances 25 for the pole team. The bunker of the leading sled 23 is

provided with a vertical slot or passage 26, through which works a draft-iron 27. At its rear end the draft-iron 27 connects with the clevis 5 of the plow, and at its forward end the said draft-iron 27 connects with a draft-chain or other flexible connection 28. The chain 28 connects with the draft-iron 29, which works like a cross-head in a suitable slot or guideway 30, provided in the pole 24. As shown, the draft-iron 29 is provided with top and bottom lateral pins or studs 31, which work against face-plates which take the wearing action. The pins or studs 31 are of course of the proper length to prevent the draft-iron from being pulled through the slot 30 in either direction. The lower and forward end of the draft-iron 29 is shown as connecting with a draft-rod 32, which extends forward through a guide-ring 33, depending from the outer end of the pole 24. To the outer or forward end of the draft-rod 32 is applied the draft-chain 34, to which the leaders are hitched.

The draft-iron 27 is provided with angle-iron stops 35 at its forward end, which limit the movement of the leader sled 23 on the said draft-iron 27, and after the draft-iron 27 is passed through the bunker-slot 26 a suitable pin 36 is applied to the rear end of the same, which serves to limit the forward movement of said draft-iron 27 in respect to the leader sled 23. The bunker of the sled 23 is provided with wearing-irons 37 on opposite sides of the slot 26, which take the wear and tear from the draft-iron 27.

To the bunker of the sled 23 is attached a suitable bracket 38, having mounted therein a swiveled fork 39. To the swiveled fork 39 is pivoted the forward end of a long hand-lever 40. This lever 40 extends rearward over the body portion 1 of the plow and is adapted to be manipulated by a workman riding on the plow. The said lever 40 extends between the perforated prongs of a fork 41 and is adapted to be secured thereto in any desired adjustment by a suitable pin 42. The fork 41 is pivoted to the plow-beam at its lower end by an eyebolt 43 or other suitable device.

Operation: The operation of the machine may be briefly stated as follows: A suitable number of draft-animals must be applied, according to the conditions of the road which it is intended to clear. In virtue of the relations of the draft attachments it will be seen that the leaders or teams in advance of the pole team can pull directly through the leader sled 23 and onto the forward end of the plow-beam. The draft-iron 27, which extends through the bunker of the leader sled 23, has only a limited play therein, and the draft-iron or cross-head 29, which works in the guide-slot 30 of the pole, has a larger range of motion, and hence under the pull from the leaders the strain never falls on the pole 24. If the pole team should be slack, the leaders would simply pull the leading sled 23 by the pin 36 coming in contact with the bunker thereof. The draft from the pole team is applied to the

plow by the bunker coming in contact with the stop-irons 35 on the forward end of the draft-iron 27. The dip of the plow at the forward end may be varied by throwing the clevis 5 up or down on the end of the plow-beam and securing the same at any desired pitch by the pin 44. The rear end of the plow is then set to the desired level by manipulating the hand-levers 14 and the ratchet pawls 17. One of the workmen then mounts the plow, so as to be able to manipulate the hand-lever 40. It is obvious that by pressing down on the hand-lever 40 the workman on the plow can keep the forward end of the share down to the proper dip for holding the same to its work. In a similar way one or more workmen following directly behind the plow can manipulate the hand-levers 14 to adjust the rear end of the plow to any desired height in respect to the rear pair of sled-runners 10. The metallic center board or rudder 9 will engage with the snow and ice below the plowshare-level and thereby hold the plow to its proper direct line of action and avoid the sheering of the same sidewise under the excessive and unequal strains which fall thereon. The cutter 22 at the forward end of the plow separates the snow and ice which is to follow the respective moldboards 3. Hence under the forward motion of the plow the ice and snow will be severed at the front and be thrown off by the plow in opposite directions to the opposite sides of the roadway. By successive cuts in this manner the roadway can be entirely cleared and the appearance of the same be changed, for example, from that shown in the diagram view Fig. 9 to that shown in diagram view Fig. 10. The depth of the cut or slice to be taken at a single traverse of the plow will of course be determined by the character of the material.

By actual usage I have demonstrated that a plow constructed as herein described can be made to clear a road in which the snow and ice has been packed very hard. The convenience and value of the device for use on country-roads preliminary to the break up will be appreciated by all persons who have had occasion to travel over such roads at that season of the year.

It should have been noted that the moldboards 3 rearward of the share should be faced with suitable metallic wearing-surfaces 45.

It will be understood that some of the details of the construction could be varied without departing from my invention.

It should also have been noted that in virtue of the peculiar arrangement of the draft connections for the leader teams there is no downpull on the necks of the pole team under the pulling strain applied by the leader team.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a leading sled and

a snow-plow, of draft connections applied to connect the plow and the sled and to afford a limited travel of either independent of the other, for most advantageously distributing the pull from the several teams of draft-animals, substantially as described.

2. The combination with a snow-plow, of a leading sled having the ordinary pole and draft devices for the pole team, and draft devices for the leader teams applied to the plow-beam and mounted to work with a limited movement through the bunker and pole of the leading sled, substantially as and for the purposes set forth.

3. The combination with a snow-plow of triangular form, having moldboards extended rearward and outward beyond the body of the plow, of rear runners pivoted to the body of the plow inward of the moldboards, and hand-levers fulcrumed on said runners and applied to the plow, for adjusting the rear end of the same, in respect to said runners, substantially as described.

4. The combination with the plow of triangular form and the leading sled to which the plow is pivotally connected, of the rear runners pivoted to the body of the plow, inward of the moldboards, and provided with upturned extensions, at their rear ends, which work between guides on a cross-bar of the plow, and hand-levers fulcrumed on said vertical extensions from the runners and having their forward ends pivoted to the plow, and latching devices for locking the levers to the plow for holding the rear end of the same in any desired adjustment, in respect to said runners, substantially as described.

5. The combination with the snow-plow of triangular form having moldboards extended rearward and outward beyond the body of the plow, of the sled-runners 10 pivoted to the body of the plow at their forward ends, and having the vertical extensions 12 at the rear ends, working between guides on the plow, the hand-levers 14 pivoted to the plow at their forward ends, and fulcrumed to said extensions 12 of the runners, the ratchet-pawl 17, for coöperation with the latch-irons 18 on the plow, the rods 19 and the finger-pull 20, all arranged, for coöperation, substantially as described.

6. The combination with the leading sled, of the snow-plow pivotally connected thereto, the hand-lever 40 fulcrumed to said sled and connected to the beam of the plow, substantially as and for the purposes set forth.

7. The combination with the leading sled, of the snow-plow pivotally connected to said sled, the lever-fork 39 swiveled to said sled, the hand-lever 40 pivoted to the fork 39 and connected by the pin 42 to the fork 41, rising from and pivoted to the plow-beam 4, substantially as and for the purposes set forth.

8. The combination with the leading sled and the plow, of the clevis 5 angularly adjustable on the plow-beam 4, and the draft-iron 27 working through a slot in the sled-

bunker, with freedom for a limited longitudinal motion therein, and the draft connections for the leader teams connected to the draft-iron 27 and including as part thereof
5 the draft-iron 29 working through a slot 30 of the pole 24, with freedom for a greater longitudinal or sliding motion therein than is permitted to the draft-iron 27 in the bunker-slot, substantially as and for the purposes set
10 forth.

9. The combination with a snow-plow of tri-

angular form, of a downwardly-extended center board or rudder fixed longitudinally and centrally to the plow-frame, for preventing the plow from sheering, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHRISTIAN JOHNSON.

Witnesses:

JAS. F. WILLIAMSON,
B. B. NELSON.