

the same plane, but the corresponding finger-piece being in a different plane, and springs subject to the tension of which said sectors move.

109. In an adding-machine, the combination of means for listing the items, means for accumulating and printing the total thereof, a platen, a lever to carry said platen into engagement with said aforementioned means, and stops to limit the movement of said platen.

110. In an adding-machine, the combination of means for listing the items, means for accumulating and printing the totals thereof, and a platen roller operative therebetween which, when carried in one position, engages said listing means, and when carried in another position, engages said accumulating means.

111. In an adding-machine, the combination of a plurality of members each bearing listing type, a plurality of adding-wheels, an integral platen, and means to oscillate said platen to carry it into engagement with all of said type-bearing members or all of said adding-wheels.

112. In an adding-machine, the combination of a plurality of members each bearing listing-type, a plurality of adding-wheels, a platen suspended for arcual movement to engage all of said type-bearing members and all of said adding-wheels, and means to carry said platen into or out of such engagement.

113. In an adding-machine, the combination of listing means and registering means, both secured to a common member, accumulating means, and a platen which, when in one position engages said listing means and when in another position engages said accumulating means.

114. In an adding-machine, the combination of listing means and registering means, both secured to a common member, accumulating means actuated thereby, and a platen, which, when in one position engages said listing means and when in another position engages said accumulating means.

115. In an adding-machine, the combination of listing means and registering keys, both rotatable upon a common shaft, accumulating means, and a platen which when in one position engages said listing means and when in another position engages said accumulating means.

116. In an adding-machine, the combination of means for bearing and advancing the type which print the items, accumulating mechanism actuated by the type-bearing means, a platen, and means for rocking said platen into engagement with said item-printing mechanism and with said accumulating mechanism.

117. In an adding-machine, the combina-

tion of a plurality of sectors approximately circular in shape, means for rotating same, a plurality of adding-wheels, rack-bars actuated by the sectors thereby to actuate the adding-wheels, ratchets in connection with said adding-wheels, and teeth upon said rack-bars which teeth mesh with said ratchets, each rack-bar being provided with a cut-away portion to receive the appropriate adding-wheel.

118. In an adding-machine, the combination of type for listing the items, means for advancing said listing type, means for accumulating the totals, separate supporting means being provided for said listing means and for said accumulating means, said accumulating means being actuated by said listing type advancing means, and a platen independently actuated, said platen being brought into engagement at different times with the item printers and with the accumulating means.

119. In an adding-machine, the combination of means for listing the items, means for accumulating and printing the total thereof, a platen, a member supporting same, a pivot for said member, a lever, and means actuated by the lever for rotating said pivot, thereby to move the platen into engagement with said listing means or with said accumulating means.

120. In an adding-machine, the combination of means for listing the items, means for accumulating and printing the total thereof, a platen, a member supporting same, a pivot for said member, a lever, a gear actuated by said lever, and a gear upon said pivot, said first-mentioned gear meshing with and driving said second-mentioned gear, thereby to move the platen into engagement with said listing means or with said accumulating means.

121. In an adding-machine, the combination of rotating means carrying type for listing the items, rotatable keys for actuating said means, rotary mechanism for accumulating and printing the total of said items, and a platen, which, when in one position, engages said accumulating mechanism and in another position engages said printing mechanism, said second-mentioned mechanism being actuated by said first-mentioned mechanism.

122. In an adding-machine, the combination of means for listing the items, rotating keys for actuating same, means for accumulating and printing the total of said items, a platen which is brought into engagement at different times with said printing means and with said accumulating means, and means independent of said aforementioned means for actuating the platen.

123. In an adding-machine, the combination of means for listing the items, rotating



shaft supporting same, a plurality of adding-wheels, and a shaft supporting same, one of said shafts projecting through the casing but the other being entirely within the casing.

83. In an adding-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the total thereof, a platen normally retained between the two, and means for bringing said platen into engagement with said listing means or with said accumulating means.

84. In an adding-machine, the combination of sectors comprising a means for listing the items, adding-wheels, for accumulating and printing the total thereof, each sector and its corresponding adding-wheel being in the same plane, and a platen supported therebetween and rocking in said plane and engaging at will said listing means and said accumulating means, separate supporting means being provided for said listing means and for said adding means.

85. In an adding-machine, the combination of means for listing the items, means for accumulating and printing the total thereof, a platen roller supported therebetween, and means for bringing said roller into engagement with said listing means, and, also, with said accumulating means.

86. In an adding-machine, the combination of listing means, accumulating means, a platen suspended therebetween and having an arcual movement in a path intersecting said listing means and said accumulating means, means to carry said platen into engagement with said listing means and with said accumulating means, and means for rotating at will said platen while it is being so carried.

87. In an adding-machine, the combination of means for listing and printing the items, means for accumulating and printing the totals thereof, the type from which the items are printed facing approximately at right angles to the total-printing type, and means to bring a paper ribbon into engagement

the totals thereof, the type from which the items are printed facing approximately at right angles to the total-printing type, means for actuating simultaneously said list-printers and said total-printers, a platen, and means for bringing said platen into engagement with said list-printers and with said total-printers.

90. An adding-machine having a plurality of sectors, listing type thereupon, a socketed finger-piece secured to each sector at a point opposite the listing type, and downwardly-depending pawls adapted to seat in said sockets, thereby to lock the sectors in position.

91. An adding-machine having a plurality of sectors, listing type thereupon, a socketed finger-piece secured to each sector at a point opposite the listing type, pawls adapted to seat in said sockets, thereby to lock the sectors in position, springs to keep said pawls normally pressed against said finger-pieces, and a cross-rod to support said springs.

92. In an adding machine, the combination of listing means, accumulating mechanism actuated thereby, a platen suspended to have an arcual movement therebetween, and means for carrying said platen into engagement with said listing means and with said accumulating mechanism.

93. In an adding-machine, the combination of a plurality of rotatably-mounted type-bearing sectors, finger-pieces attached thereto by means of which said sectors are rotated, means for locking each sector in the position to which it may have been rotated, and means for releasing all the sectors in the series simultaneously, thereby permitting the return thereof.

94. An adding-machine having a plurality of sectors, listing means upon each sector, socketed finger-pieces secured to each sector, pawls adapted to seat in said sockets for locking said sectors in place, and means for simultaneously withdrawing all of said pawls.

95. In an adding-machine, the combination of means for listing the items, means alining therewith for accumulating and



# UNITED STATES PATENT OFFICE.

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## SNOW-PLOW AND GROOVE-CUTTER.

No. 929,318.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed March 8, 1909. Serial No. 481,946.

*To all whom it may concern:*

Be it known that I, SIMON D. MURPHY, citizen of the United States, residing at L'Anse, county of Baraga, State of Michigan, have invented a certain new and useful Improvement in Snow-Plows and Groove-Cutters, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to snow plows, and has for its object an improved snow plow, provided with a groove-cutting attachment for use in preparing roads for log sleds, or log sled runners. In preparing roads for drawing heavy loads of logs, the soft snow must be cleared away, or compacted, and the body or bed of the road made hard, either by the freezing of the water and snow that have been deposited naturally, or by freezing a deposit of water that has been spread upon the road for the purpose of giving it the hard icy surface. In either case, the surface of the road is smooth, and the log sled must be guided in some way to prevent it from sluing or skidding, and the object of this invention is a machine adapted to cut, either in the natural ice, or frozen water that has been mechanically spread over the road, a groove that will receive and guide the runner and prevent the sluing and skidding which has been mentioned. The plow which embodies the improvements that are designed to accomplish this end, is made with an especially heavy body, the runners of which are shod in order that they may themselves be drawn readily, but are provided with adjustable plain irons to cut out and form the groove mentioned.

In the drawings:—Figure 1, is a plan view of the plow. Fig. 2, is a side elevation. Fig. 3, is a cross section at the line *a—*a** of Fig. 1, looking from the front end of the sled. Fig. 4, is a detail view of the adjustable blade member.

1 and 2 indicate the heavy side pieces of the sled frame, which are joined at the front end by the cross brace 3, at the center if desired, by the brace 4, and at the rear by the intersecting brace pieces 5. The forward runner piece 6 is provided with a metallic armor 7. As seen particularly in Fig. 2, these forward runner members are com-

paratively short. Between the rear ends of the forward runners 6 and the forward ends of the rear runners 8, which are also armored as at 8<sup>a</sup>, extend the outwardly flaring terminals of the V-shaped plow member 9, whose central point is secured to the cross brace 3, and is also armored as at 9<sup>a</sup>. As shown particularly in Fig. 1, the outer ends of the members 9 project slightly beyond the side of the sled frame.

About midway of the sled and somewhat to the rear of the forward end of each runner member 8, a portion of the body of the runner piece is cut away for about half of its thickness, as shown particularly by the aperture 10 of Fig. 2. The rear or forwardly slanting edge of this apertured portion is armored by the adjustable blade member 11, which is slotted for the engagement of the screws 11<sup>a</sup> therethrough, and so that the degree of its projection beyond its edge of the wooden part of the runner piece may be regulated as desired, so that, if the track or groove, which is being cut by the metal runner 8<sup>a</sup>, is not of sufficient width, its breadth can be increased by dropping the cutting point of this member accordingly. Immediately to the rear of each of these apertured portions, is an outwardly projecting deflecting blade 12, by which the snow, initially finding its way into the aperture, is, as the sled passes along, and as it falls out therefrom, deflected and pushed upwardly so as to more or less coöperate with the hinged deflecting wings 13, which are held in their extreme outer position by the links 14, or may be folded in against the side of the sled if they are not needed.

Linked to the rear cross member 15 is the rudder member 16, whose armored forward end 17, when the rudder member as a whole is in approximately horizontal position, runs along the ground on a slightly lower plane than the armored edges of the side runners. Although capable of some right or left movement of its ends, with respect to its main point of linking to the cross members 15, the forward end of the rudder member, which is preferably much shorter than the rearward or handle end, has rising from it a guide rod 18, which slidably extends through the intersecting portion of the brace members 5, and which thus allows the upward or downward travel of the armored forward end of the rudder member, with respect to the sled frame, when the rear or handle



member is raised or lowered about the point of hinging to the cross members 15. When the handle end of the rudder member is raised, causing the lowering of the armored forward end, it results in raising the entire rear end of the sled just that much, and either causing it to clear the top of the coating of snow on the road entirely, or, if the snow is too deep for that purpose, to make a much shallower groove than the forward end. If at the same time the handle end of the rudder member is moved to the right or left, according to the direction in which it is desired to turn the sled, it can, because of the diminished mass or body at the rear end of the sled, which thus impinges against the snow bank, be turned with so much greater ease. If, on the other hand, the snow is so deep that the forward runners are used merely to effect the first breaking of the snow mass, and it is then desired that the groove cut in the road shall be broader than the armored part of the runners, the rear end of the sled is lowered, and the cutting members 11 adjusted accordingly, so that a track or groove of corresponding breadth is made. In this position, the deflector members and wing members force the snow far enough from the immediate vicinity of the grooves thus made, so that it does not fall in upon them after the sled is past.

What I claim is:—

1. A groove cutting sled, having in combination with a frame, a pair of forward runner members, a plow member fixed immediately in the rear thereof, a pair of rear runners, adjustable means appurtenant to

each whereby the breadth of the groove cut by said rear runners may be increased, and a rudder member whereby said rear runners may be raised to the degree desired with respect to the forward runners and whereby the direction of travel of the entire sled may be regulated, substantially as described.

2. In a groove cutting sled, in combination with a frame, forward and rear runners fixed thereto, a plow member fixed to the forward end of the frame, supplemental groove cutting members adjustably supported at the sides of the rear runners, deflector members adapted to cooperate therewith in clearing snow from the path of travel of the sled, and a rudder member whereby the sled may be steered and the rear end of the same elevated or lowered with respect to the forward end and to the surface over which the sled is traveling, substantially as described.

3. In a sled, in combination with a unitary frame piece, forward and rear runner members fixed thereto, adjustable groove cutting members supported by the rear runners, deflector members located in the rear thereof and a rudder member whereby the sled may be steered and whereby the elevation of the rear end thereof with respect to the forward end may be regulated, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

SIMON D. MURPHY.

Witnesses:

J. J. O'CONNOR,  
W. L. MASON.