Feb. 17, 1925. 1,526,740

J. L. BURGWARDT

SNOWPLOW

Filed May 5, 1921 2 Sheets-Sheet 1

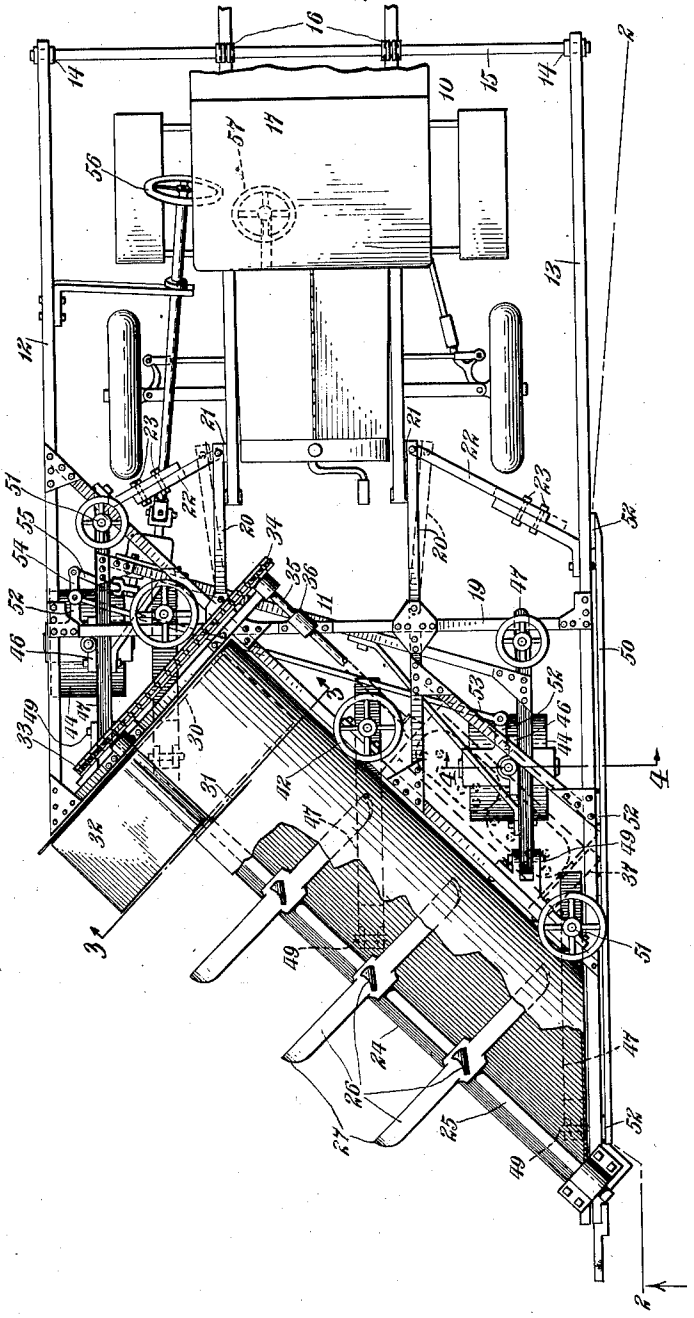


Fig. 1.

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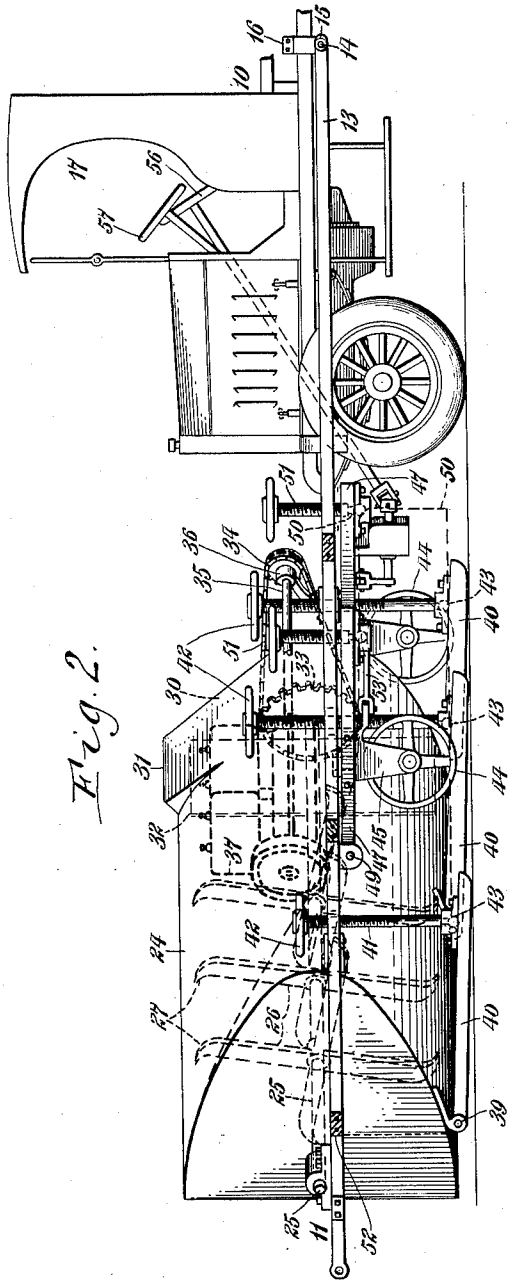


Fig. 2.

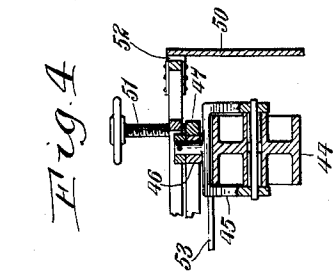


Fig. 4

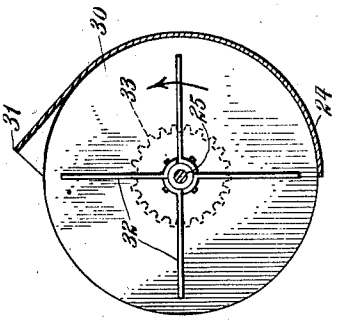


Fig. 3.

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Patented Feb. 17, 1925. 1,526,740

UNITED STATES PATENT OFFICE.

JOHN L. BURGWARDT, OF HAMBURG, NEW YORK.

SNOWPLOW.

Application filed May 5, 1921. Serial No. 466,901.

To all whom it may concern:

Be it known that I, JOHN L. BURGWARDT, a citizen of the United States, residing in Hamburg, in the county of Erie and State of New York, have invented new and useful Improvements in Snowplows, of which the following is a specification.

This invention relates to a snow plow attachment for trucks and tractors, whereby the snow may be scooped up from the streets and thrown off to one side and out of the way.

The object of the invention is to provide a snow plow attachment which may be applied to any suitable vehicle and which will function expeditiously and properly even though the snow is of considerable depth and firmly packed or glazed over.

In the accompanying drawings: Figure 1 is a top plan of the complete invention showing also the front portion of a typical truck to which it is adapted to be attached. Figure 2 is a side elevation of the same taken on line 2—2, Fig. 1. Figure 3 is a vertical diagonal section taken through the blower on line 3—3, Fig. 1. Figure 4 is a detail vertical section through the axis of one of the supporting wheels and taken on line 4—4, Fig. 1.

Similar characters of reference refer to like parts throughout the several views.

This improved snow plow is adapted to be attached to the forward end of any suitable truck, tractor or other suitable available vehicle 10 and pushed ahead of the same so as to pick or scoop up the snow and discharge the same to one side of the roadway. The main frame 11 of the snow plow comprises a pair of horizontal longitudinal side bars 12 and 13 whose rear ends are pivoted at 14 to a horizontal cross bar 15 suitably secured by clamps 16 to the chassis of the vehicle 10 preferably at a point just back of the usual chauffeur's compartment 17. A transverse frame beam 19 is secured at opposite ends to said longitudinal side bars 12 and 13, and pivoted thereto at their forward ends, are a pair of horizontal, longitudinal tie bars 20, the rear ends of which are adapted to be suitably secured at 21 to the chassis of the vehicle 10. To laterally brace or stiffen these tie bars 20, a pair of adjustable stiffening braces 22 are provided, the inner end of each of the same being pivoted to the rear end of its companion tie bar 20. The adjustment of said stiffening braces 22 results from the fact that each of the same consists of a pair of overlapping bars adjustably secured together by suitable clamping bolts 23, so that in fitting the snow plow to any particular vehicle, it is merely necessary to loosen these clamping bolts 23, then secure the rear ends of the tie bars 20 to the vehicle chassis, and then tighten the said clamping bolts in position.

Arranged diagonally at the forward end of the main frame 11 of the snow plow, is a semi-cylindrical scoop 24 whose lower edge is disposed a short distance above the roadway over which the snow plow is pushed. Journaled on said main frame 11 and disposed coaxially and longitudinally with respect to the axis of said semi-cylindrical scoop is a power shaft 25. To the forward outer end of this shaft are secured a number of disintegrator spiders 26 whose blades are arranged diagonally similarly to an ordinary boat propeller, their outer ends, in addition being bent or curved to form pick teeth 27 which project on a radial plane and in a circumferential direction. These pick teeth move downwardly (at the extreme forward end of the snow plow) and thus serve to split or break up any large compacted masses of snow, glazed ice, etc. After being broken up the snow is scooped up into the aforesaid scoop 24 and is caused to move laterally by reason of two forces, the one caused by the obliquity of the said scoop, the other caused by the obliquity of the blades of the disintegrator spiders 26, which cause the snow to be propelled parallel to the power shaft 25 similarly to an ordinary air fan. The rear outer end of said scoop forms a blower chamber 30, the upper cylindrical portion thereof being preferably bent upwardly at 31 as best shown in Figs. 2 and 3. Within the said blower chamber is arranged a plurality of radially extending blower blades 32 whose inner ends are suitably secured to the power shaft 25. These blower blades serve to take the snow which is travelling longitudinally of the scoop, and centrifugally blow the same up and out of the blower chamber 30 and laterally out away from the snow plow to one side of the road way. The rotation of the power shaft may be effected in any suitable way. For instance a suitable large sprocket wheel 33, may be secured to the extreme rear outer end of the said power shaft 25, the same engaging with a suitable chain belt 34 whose

opposite end or turn engages with a smaller sprocket wheel mounted on a propeller shaft 35. The latter is journaled at 36 to the main frame 11 of the snow plow and is suitably driven by an internal combustion motor 37 (shown by dotted lines in Figs. 1 and 2.)

Pivoted at 39 to the lower face of the scoop 24 are a plurality (for instance three) of tiltable snow runners 40, which are adapted to support the weight of the snow plow whenever the surface of the roadway is sufficiently and evenly snow-packed to warrant their use. This optional use of each of said snow runners is independently obtained by the use of a depressing screw 41 whose upper end is provided with a suitable hand wheel 42 for manually rotating the same, while the intermediate part of said screw (below the hand wheel) is engaged by a suitable, female-threaded hole arranged in the main frame 11 of the snow plow whereby a raising or lowering of said screw is effected by the rotation of the said hand wheel 42. The lower end of each of said depressing screws is provided with a ball and socket joint 43 (shown by dotted lines Fig. 2) with the rear end of its companion pivoted snow runner 40. There is sufficient lost motion or play in each of these ball and socket joints 43 (and also in the screw thread connections between the depressing screws 41 and the main frame 11) so that no binding of the different working parts occurs as the snow-runners 40 are moved up or down.

When desired, the said snow runners may be elevated clear of the roadway and the snow plow supported instead by a plurality (preferably a pair) of rollers or wheels 44 which are suitably pivoted or journaled in companion bifurcated forks or wheel yokes 45. Each of these forks is rotatably mounted (on a substantially vertical axis) in a suitable bearing block 46 which is suitably secured to the intermediate part of a rock lever 47 whose forward end is pivoted at 49 to the main frame 11 of the snow plow while its rear part is provided with a ball and socket joint 50 engaging with the lower end of a wheel-depressing screw 51. Each of these screws is provided with a suitable hand wheel at its upper part for manually turning the same, while its intermediate part is in threaded engagement with a suitable female threaded screw hole formed in the main frame 11 of the plow. Thus by rotating either of the hand wheels in one direction or the other, its companion wheel 44 is either raised or depressed correspondingly. The wheel yokes 45 have their upper portions extending rearwardly to form integral steering arms 52 which are pivoted to the opposite ends of the usual horizontal, transverse steering link 53. The steering arm of one of these wheel yokes 45 extends some distance back of this steering link to form an extension steering arm 54, the rear end of which is pivoted to a short steering link 55 which is suitably manipulated through various interconnections with a supplemental steering wheel 56. The latter is journaled on the main snow plow frame 11 and not on the frame vehicle 10, so that no complicated interconnecting links are required. At the same time this supplemental steering wheel 56 is in juxtaposition to the regular steering wheel 57 of the vehicle 10, so that the chauffeur can conveniently operate both of said steering wheels from his seat. For the purpose of packing the one adjacent snow bank and preventing the same from caving in under the one side of the snow plow and interfering with the working parts thereof, a suitable metal apron 50 is employed (see Figs. 1 and 4 and dotted lines of Fig. 2) the same being arranged vertically and longitudinally on the outer side of the frame bar 13 of the snow plow and suitably secured thereto by blocks 52. It is obvious that the snow bank on the other side of the snow plow is so packed, by the obliquity of the movement of the snow that a similar metal apron may be dispensed with on that side of the machine.

The general operation of the snow plow is as follows:

In applying the same to some available vehicle 10, the cross bar 15 is clamped to the latter by means of clamps 16. Then the clamping bolts 23 are slackened and the rear ends of the tie bars 20 secured to the chassis of the vehicle and the clamping bolts 23 again tightened. If the condition of the roadway or a portion thereof either warrants or demands their use, one or more of the snow runners 40 may be depressed by turning the hand wheels 42 and the snow plow supported slidably in this manner. If, however, the snow is wet and slushy or if most of the roadway has been worn bare of snow, or if for any other reason the snow runners are not suitable then the wheel depressing screws 51 may be suitably operated by their respective hand wheels so as to depress the wheels 44 and support the weight of the snow plow in this manner, the snow runners being elevated in such a case. A further combination of these supporting members is however sometimes desirable. For instance, when clearing the snow from a roadway having a street railway, it is sometimes desirable to depress the one wheel 44 (toward the street car tracks) considerably more than its companion, thus supporting the one side of the snow plow on a wheel. The opposite side of the snow plow which is traveling through the snow bank at the curb, may be supported by the snow runners 40 on that side of the snow plow. In such a case

there is no harm in actually having the wheel 44, on the side toward the curb, actually extending below the snow runners and disposed transversely in line with the companion wheel 44. But if the snow runners 40 on the curb side of the snow plow are somewhat depressed they will carry the whole load even about the said wheel 44 on that side. In such a case the one side of the snow plow is supported on one or two snow runners while the opposite side is supported by the one wheel 44, and the guiding of the snow plow may be effected by manipulating the auxiliary snow plow steering wheel 56, inasmuch as the said one wheel 44 is travelling on the bare roadway.

The snow and other material is scooped back into the scoop 24, this action being facilitated by the pick points 27 which break up the glazed surface of the snow and the hard compacted lumps. The blades of the disintegrator spiders 26 propel the snow laterally and rearwardly parallel to the axis of the scoop, this action being facilitated by the diagonal arrangement of said scoop. When the snow enters the extreme rear outer end of the scoop, it passes into a blower or centrifugal chamber 30, from whence it is discharged upwardly and laterally of the snow plow by the blower blades 32.

I claim as my invention:

1. A snow plow comprising a wheeled truck, a scoop mounted on the front end of the truck and at an angle to the direction of movement of the same and having its front or advancing end arranged on one side of the truck and its rear or trailing end arranged on the other side of the truck and having its front side open to form an inlet for the snow into the scoop, a rotary conveyer arranged within the scoop at the same angle and operating to propel the snow entering the same from the front to the rear end of the scoop, a blower chamber having an axial inlet communicating with the rear end of the scoop to receive the snow therefrom and having a peripheral outlet, rotary blower blades rotatable in the blower chamber and adapted to discharge the snow from the blower chamber through the outlet thereof to one side of the path of the truck, a diagonal shaft upon which said conveyer and blades are mounted, and a driving mechanism connected with the rear end of said shaft.

2. A snow plow comprising a wheel truck having a frame, a scoop arranged in front of the truck, a conveyer arranged in the scoop, and means for mounting the scoop on the truck comprising front frame members which carry the scoop, inner rear longitudinal bars which are pivoted at their front ends to said front frame members to swing horizontally and connected at their rear ends to opposite sides of the front part of said truck, outer longitudinal bars connected at their front ends with said front frame members and connected at their rear ends with the rear parts of said truck, and transverse brace bars each connecting the rear end of one of said inner longitudinal bars with the adjacent part of the companion outer longitudinal bar and capable of longitudinal adjustment.

JOHN L. BURGWARDT.