Feb. 4, 1930. R. ROBERTSON 1,746,167

SNOWPLOW

Filed May 7, 1927 4 Sheets-Sheet 1

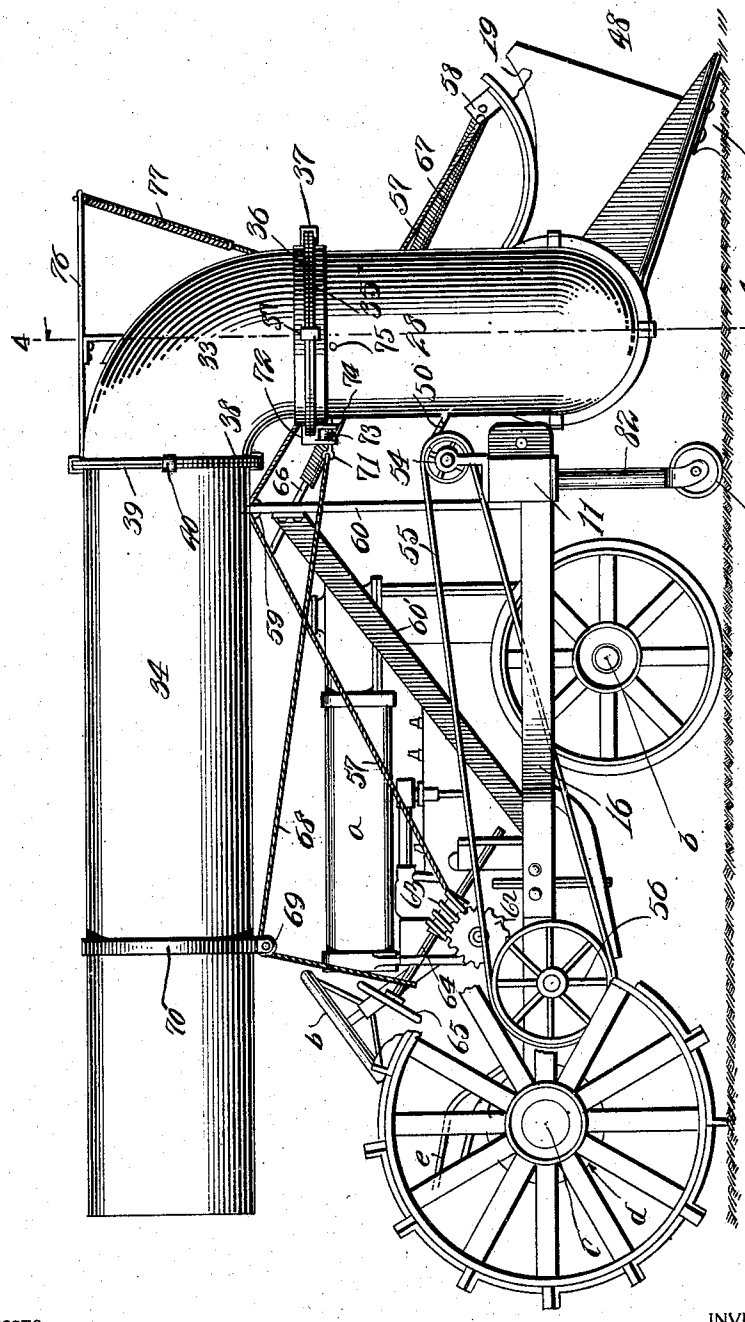


Fig. 1.

WITNESSES

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SNOWPLOW

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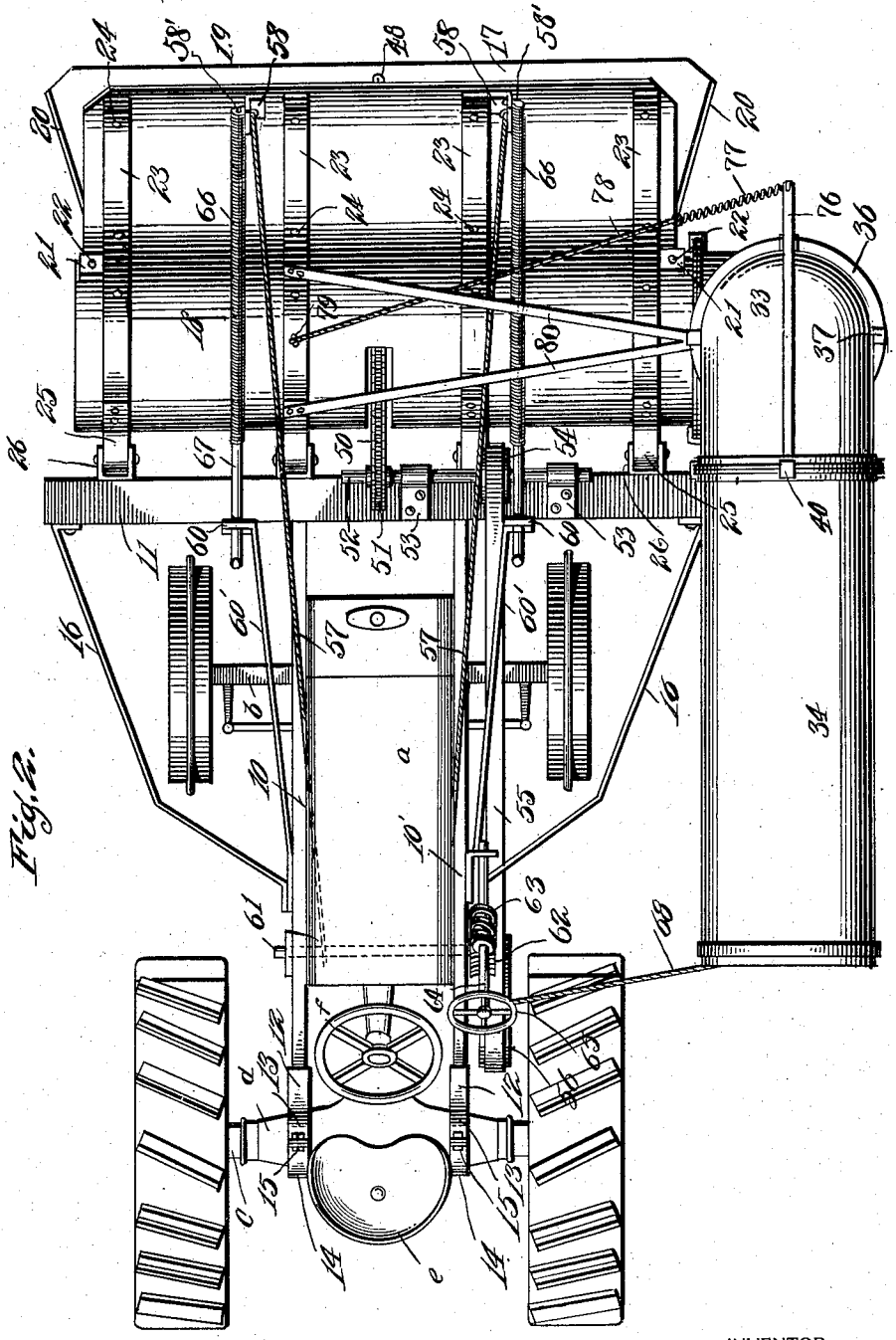


Fig. 2.

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SNOWPLOW

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Fig. 3.

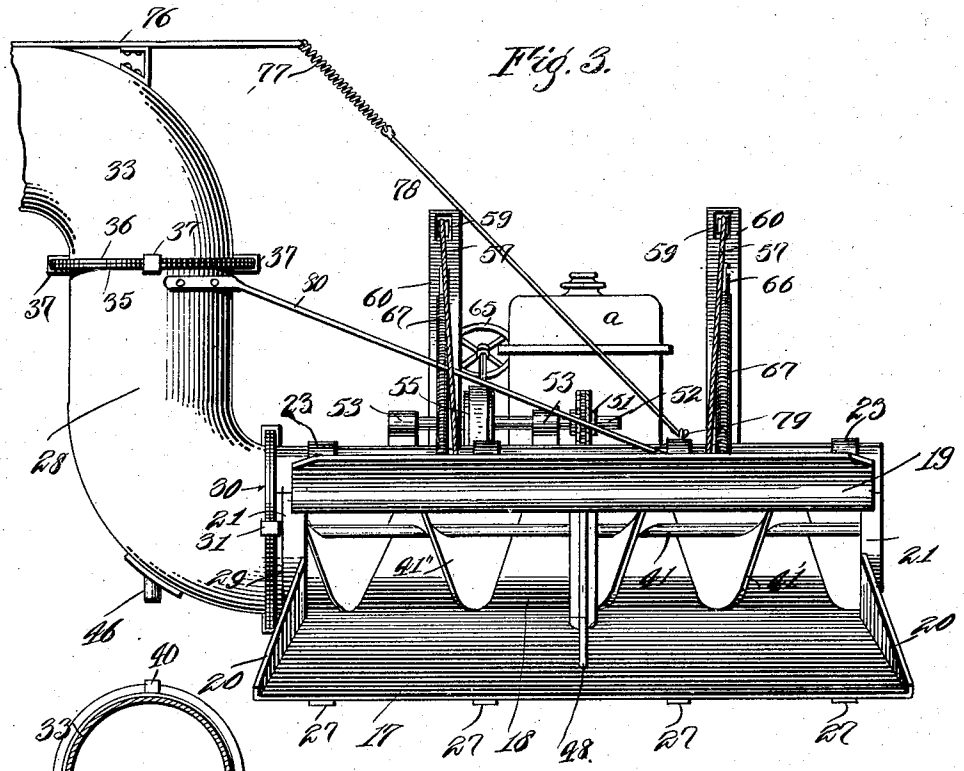
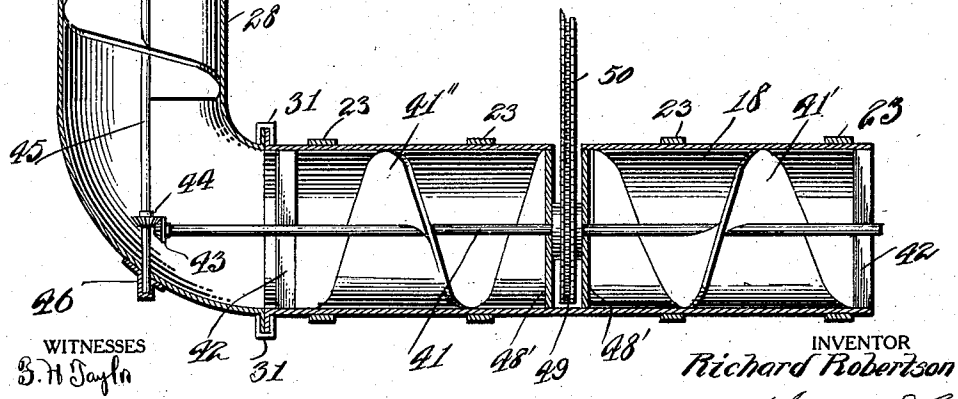


Fig. 4.



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Feb. 4, 1930. R. ROBERTSON 1,746,167

SNOWPLOW

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Fig. 6

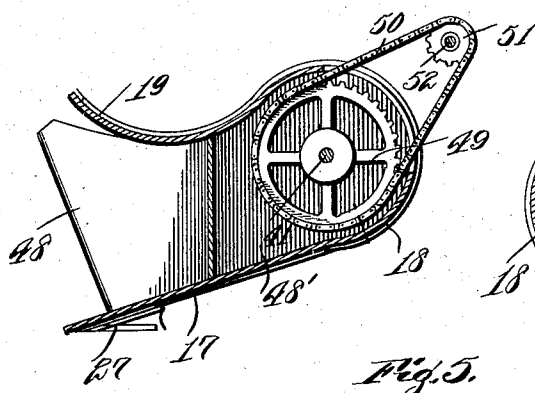


Fig. 9.

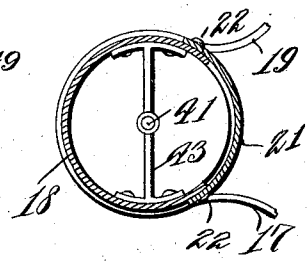


Fig. 5.

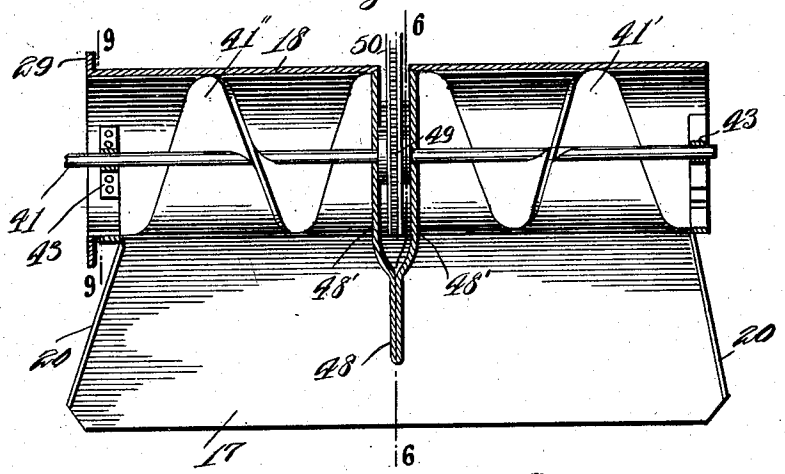


Fig. 7.

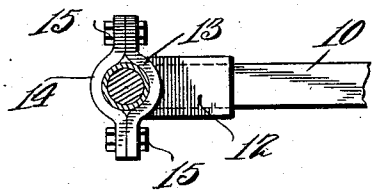
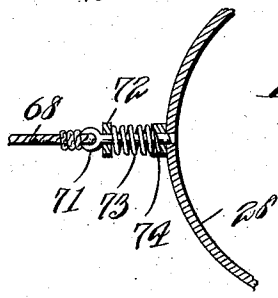


Fig. 8.



WITNESSES

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Patented Feb. 4, 1930 1,746,167

UNITED STATES PATENT OFFICE

RICHARD ROBERTSON, OF SALINA, KANSAS

SNOWPLOW

Application filed May 7, 1927. Serial No. 189,714.

The invention relates to improvements in snow plows generally, and more particularly to a type of the same adapted for use in connection with traction engines and the like.

Among the numerous objects and advantages of the invention, the same provides for a snow plow attachment for farm tractors and the like, such as the Fordson type of the same, without in any way modifying the structure of the latter for the purpose; suitable and effective mechanical refinement of mounting and connections whereby to facilitate the attachment of the snow plow in position on a tractor; efficient means of control, within convenient reach of the operator of the tractor whereby the necessary parts of the snow plow may be easily and readily rendered operative and inoperative as the occasion may require or demand throughout a snow removing operation; effective means for delivering gathered snow at either one side or the other of the plow or at both sides of the same as may be desired or necessary; comparatively simple and efficient means for gathering the snow and conveying it to the said discharge means; means, controlled by the operator from his seated position on the tractor, for moving said delivery means from positions of side delivery of the gathered snow, to positions directly rearwardly of the tractor and parallel to the sides thereof, for the purpose of clearing the roadway to passing traffic at one or both sides of the machine; and automatic means for returning the delivery or discharge means to positions of side delivery upon the release of the control means by the operator.

With the foregoing and other important objects and advantages in view, as will be hereinafter more readily understood, the invention resides in the certain new and useful features of the construction and arrangement of parts as will be hereinafter more fully described, set forth in the appended claims and illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of a conventional form of structure showing a practical application of the invention thereto,

Figure 2 is a top plan view of the same,

Figure 3 is a front elevation,

Figure 4 is a vertical transverse section taken on the line 4—4 of Figure 1,

Figure 5 is a horizontal section through the head or shovel of the snow plow attachment,

Figure 6 is a vertical section taken on the line 6—6 of Figure 5,

Figure 7 is a side elevation of the detached draft connection used for coupling the snow shovel draft frame to the rear or power axle or axle housing, both the said axle and housing being shown in cross section,

Figure 8 is an enlarged sectional detail showing the latching device for securing the snow discharge means spout in either of the operative or inoperative positions, and

Figure 9 is a section taken on line 9—9 of Figure 5.

Referring to the drawings wherein similar characters of reference designate corresponding parts throughout the several views therein, *a* indicates generally the power plant of a tractor, preferably a Fordson type of tractor as shown, *b*, the front wheeled axle, *c* the rear or driving wheeled axle, *d* the housing inclosing an intermediate portion of the rear axle *c*, *e* the operator's seat located directly in rear of the power plant *a* and *f* the steering wheel disposed directly in rear of the power plant *a*, all of the usual construction arrangement of these units or parts.

Referring particularly to Figures 1, 2 and 7, and to effectively coupling the snow plow attachment to the tractor, a draft frame is provided and the same consists of side bars 10 and 10′, arranged at opposite sides of the power plant *a* with their front ends projecting for a distance beyond the forward axle *d*, in overlying relation thereto, and the front end of the power plant *a*, and connecting the cross bar or draft beam 11. The draft bars 10 and 10′ extending along the opposite sides of the power plant *a* and having their rear ends terminating adjacent to and in line with the rear axle housing *d*, each of the rear ends of bars 10 and 10′ are engaged in a sleeve portion 12 of a part 13, of a split clamp engaged over the complemental end portions of the axle *d*, and are connected to the other or detachable part 14 of the split clamp by means

of the bolts 15. To strengthen the oppositely projecting ends of the draft bar 11, suitable brace members 16 are connected to the extended outer ends thereof and extend rearwardly to points of connection with the side bars 10 and 10'. If necessary, and as shown, these braces 16 are to be bent to a shape sufficient to clear the ground wheels of the front axle *b* of the tractor.

Referring now and generally to all the several figures of the drawings, the snow plow proper consists essentially of a sheet metal head or shovel formed to provide a rearwardly and upwardly inclined blade portion 17, which merges into a substantially cylindrical portion 18 forming a housing for a side delivery conveyor mechanism will be hereinafter fully described. The upper wall of the cylindrical housing curves first in a forwardly and downwardly direction and then merges into a forwardly and upwardly directed inclined or curved portion 19 which portion 19 overlies a major portion of the blade 17 and out of conjunction therewith to direct the snow as it is gathered into the housing 18. The returning edge of the blade 17 is longer than the cylindrical housing 18, and has its opposite side edges up-turned to form end walls or flanges 20, converging rearwardly and merging into the adjacent wall portions of the housing 18, as a further means for directing the gathered snow from the plate 17 and into the latter. This head or shovel is preferably formed from a single sheet of metal, and the upper and lower wall portions and of the cylindrical housing 18 are connected together by short strap members 21 being secured to the adjacent wall portions, at the opposite ends of the cylindrical housing portion 18, as by being riveted, as at 22, thereto. The head or shovel is to be strengthened by means of a desired number of metal straps or bars 23, being riveted as at 24 to the outer side of the same, the outer of which bars or straps 23 being disposed immediately adjacent the opposite side edges, of the head or shovel and the inner of the same in equi-distantly spaced relation by these outer bars or straps. The plow head or shovel thus provided is hingedly connected to the draft bar or beam 11 of the draft frame by means of hinge members or straps 25, fastened to reinforcing bars or straps 23, engaged in the complemental hinge members or eyes 26 bolted or otherwise fastened to the draft bar or beam 11. It is desired that the returning edge of the shovel 17 be supported slightly above a road surface, when operated, to avoid undue wear and tear on the same, and to this end, suitable shoes 27 are provided for the purpose and are secured in position beneath the edge of the blade 17 and preferably to the ends of the several reinforcing bands or straps 23.

For conveying the gathered snow to either one side or the other of the plow head or shovel, after the snow has been received within the cylindrical portion of the housing 18 thereon, for effecting the discharge of the snow side-ways from the same, the cylindrical housing 18 opens, at one or both of its ends, into a vertically disposed discharge spout L 28, the adjacent ends of the housing 18 and the L 28 being provided with complemental flanges 29 and 30 respectively, secured together by means of suitable fastening means 31, whereby snow will readily pass from the housing 18 to and through the L 28. Mounted on the upper end of the spout L 28 is another spout L 33 which, in turn, has its upper horizontally disposed open end connected to one end of a straight length or section of spout 34. The L 33 is mounted on the upper end of the L 28 for turning movements, whereby the discharge spout 34 may be directed outwardly at right angles to the path of travel of the plow, when discharging snow from the same, or rearwardly, into parallel relation with respect to the adjacent side of the tractor or plow head, when inoperative. To facilitate the turning of the upper L 33, on the lower L 28, a form of turntable is provided and the same consists of an outturned flange 35 secured at the edge of the upper end of the L 28 to seat thereon, an outturned flange 36 carried at the lower end of the spout L 33 suitable U-shaped clips 37 being fitted over both flanges 35 and 36 to maintain the same in operative relation, and these clips are secured to the upper flange 36 in equi-distantly spaced relation around the same. The straight spout section 34 is secured at one end to the upper end of the L 33, by means of the flanges 38 and 39, carried by the abutted ends of the L 33 and the spout 34 respectively, and these flanges are secured together by means of metal clips 40 engaged over the same and suitably bolted in position for the purpose.

As conveying means, for delivering the gathered snow from the cylindrical housing 18, of the plow head or shovel, a screw conveyor or impeller is mounted within the cylindrical housing 18 and has its shaft 41 journalled in bearings 42 formed with cross bars disposed diametrically of the opposite open ends of the housing 18. The free end of the shaft 41 is projected into the lower end of the spout L 28 and carries thereon a bevelled gear 43 arranged in mesh with a complemental bevelled gear 44 carried on the lower end portion of a screw impeller shaft 45 rising vertically within the upwardly directed portion of the spout L 28, the lower end of the impeller shaft 45 being journalled in a bearing 46 carried by the lower wall portion of the L 28 and its upper end in a bearing formed in a cross bar 47 secured diametrically of the upper open end of the L 28.

To permit of the discharge of gathered

snow from the opposite sides of the plow head or shovel, it is to be understood that the arrangement of the lower and upper spout L's 28 and 33 and the straight spout section 34, together with the impeller shaft 45 in the lower L 28, will be duplicated at the opposite side of the plow head or shovel, and that the impeller shaft 41 in the cylindrical housing 18 will be geared to the vertically disposed impeller shaft 45 by means of a second set of meshed bevelled gears 43 and 44 for the purpose. In this instance, the impeller shaft 41 will have right and left hand screw sections 41′ and 41″, and the medial portion of the shaft 41, between the screw sections 41′ and 41″ will be journalled in the wall portion 48′ of the partition 48 disposed vertically of the plow head or shovel to divide the latter into two snow receiving compartments. This partition 48 is preferably formed of a length of heavy sheet metal folded in half and disposed to have its folded end projecting outwardly from the cylindrical housing 18 to direct the gathered snow to either side of the same and into the path of the screw sections 41′ and 41″, while its inner wall portions 48′ are spaced apart to house between the same a sprocket wheel 49 mounted on the intermediate portion of the impeller shaft 41 through the medium of which sprocket wheel 49 power is to be applied to the impeller shaft from the power plant *a* of the structure.

Power is to be transmitted to the sprocket wheel 49 by means of a sprocket chain 50, passing through a suitably slotted opening in the rear wall of the cylindrical housing 18 from a smaller sprocket wheel 51 carried at the inner end of a shaft 52 journalled in bearings 53, and secured on the cross bar or beam 11 of the draft frame. The shaft 52 is driven by means of a pulley 54, keyed to the same, and is coupled by a belt 55 leading to and engaging a pulley 56 which, in turn, is driven direct from the power plant of the structure.

Suitable devices and mechanism for controlling the power head and the delivery spout whereby the same are to be moved to and from operative positions, are provided and each is to be operated from a position convenient to the position of the operator on the tractor. One of these mechanisms is adapted to effect the raising and lowering of the plow head or shovel from and to snow gathering position, and consists of a pair of cables 57, connected at their forward ends to suitable eyes or fastenings 58 secured in properly spaced relation inwardly of the returning edge of the upper and forwardly curved portion 19 of the plow head or shovel and having their rearwardly directed portions passing over pulleys 59, carried on the upper ends of standards 60 rising from the draft bar or beam 11 of the draft frame. The rear ends of the cables 59 are fastened to a winding shaft 61 journalled transversely of the tractor. For imparting turning movements to the winding shaft 61, a worm wheel 62 is mounted on the end of the same and is disposed in mesh with a worm 63 carried on an operating shaft 64, journalled in proper position on the tractor. A hand wheel 65 is mounted on the upper end of the operating shaft 64 which, when turned in one direction operates the transverse shaft 61 through the meshing worm gears 62 and 63, to effect the winding of the cables 67 around the shaft 61 to cause the plow head or shovel to swing upwardly on its hinged connections 25 and 26 and out of contact with the road surface as is desirable when the plow head is being transported from one point of use to another. By turning the end wheel 65 in a reversed direction, the cables 57 will be permitted to unwind from the shaft 61, and the plow head or shovel to lower to operative position with its supported shoes 27 in contact with the road surface. In the raising movement of the plow head or shovel, a pair of coil springs 66 are placed under compression on associated rod members 67 whereby, when the hand wheel 65 is manipulated in a direction for the unwinding of the cables 57 from the transverse winding shaft 61, the springs 66 expand and act to accelerate the initial lowering movement of the plow head or shovel to operative position. The springs 66 are engaged on the rods 67 which have their outer ends pivoted in suitable eye members 58′ on the upper side of the plow head, alongside the eyes 58 and their inner ends slidably engaged through openings formed in the upper ends of the standard 60, for the purpose.

To effect the moving of the discharge spout 34 to and from side discharge position, a cable 68 leads from a position convenient to the operator of the tractor and passes over a pulley 69 supported on the lower side of the spout section 34 from a reinforcing band 70, secured thereon rearwardly of the transverse center of the same and from thence to a latch bolt 71 which it connects for simultaneous actuation thereof with the initial pull on the cable for the moving of the discharge spout from its side discharge position to its rearwardly directed travelling position. The latch bolt 71 is mounted in a bracket 72 carried at the lower side of one of the clips 37, and is normally under tension of a spring 73 to maintain it in latching connection with one of its two complemental keeper openings 74 and 75 formed in the upper end of the stationary spout L 28 corresponding to the positions of inoperativeness and operativeness respectively of the movable spout sections 33 and 34. To effect the automatic return of the discharge spout to position of side discharge, an arm 76 is secured at the center of the upper side of the spout L 33

in line with the spout section 34 and has connected to the free end of the same, one end of a coil spring 77, the other end of the spring being in turn connected to one end of a cable 78 which leads to and connects at its other end an eye or other suitable device 79 secured in one of the intermediate reinforcing bands or straps of the plow head or shovel. Now, with the spout 34 disposed in rearward or inoperative travelling position as shown in Figures 1 and 2, and it is desired to move the same to the position of side discharge, the operator grasps the cable 68 and pulls on the same, which pulling action releases the latch bolt 71 from its engagement with the keeper opening 74 when the spring 77 immediately begins to contract and exerts a pull on the arm 76 so that the spout 34 and its L section 33 is quickly turned outward to such position. As soon as the spout 34 begins its turning movement to side discharge position, the operator may release his grip on the cable 68, when the latch bolt 71 will be snapped by the spring 73 into keeper engaging position. Now, when the position of side discharge of the spout 34 is reached, the latch member 71 will automatically engage the keeper 75, and lock the spout against further or accidental movement. To turn the spout 34 back to its rearward position, the operator grasps the cable 68 and pulls the same to release the latch bolt 71 from the keeper 75, and continues to pull steadily on the cable until the rearward turning movement of the spout 34 is completed, when by ceasing the pulling effort on the cable 68, the latch bolt 71 is snapped again into engagement with the keeper 74 under the action of the spring 73.

To effectively brace the delivery spout, in its entirety a brace member 80 is employed for the purpose, and the same is secured at one end to the upper end of the lower spout L 28 just below the turntable flanges 35 and 36 and its other end to one of the intermediate reinforcing bands or straps 23 on the plow head. To support the forward end of the draft frame and to remove its weight from the front steering axle *b* of the tractor, suitable ground castors or the like 81 are provided. the same being journalled in the lower ends of spindles 82 depending from the opposite ends of the cross bar or draft beam 11 of the frame, any suitable means being employed to secure the upper ends of the spindles 82 securely in the opposite ends of the bar or beam 11.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention or its scope as claimed.

Having thus fully described the invention what is claimed is:

1. In combination with a tractor, a snow plow carried at the forward end of the tractor, means adapted to discharge gathered snow side-ways from said plow, means for actuating said snow discharge means to a rearwardly directed inoperative travelling position, means for securing said snow discharge means in either operative or inoperative position and means for returning said snow discharge means to its side delivery operative position upon the release of said securing means.

2. In combination with a tractor, a snow plow carried at the forward end of the tractor and arranged for vertical swinging movements to and from operative position, means actuated by the operator of the tractor for raising and lowering said plow, means adapted to discharge gathered snow sideways from said plow, means for actuating said plow discharge means to a rearwardly directed inoperative travelling position, means for securing said snow discharge means in either operative or inoperative position, and means for automatically returning said snow discharge means to its operative position upon the release of said securing means.

3. In combination with a tractor, a draft frame carried by the tractor, a snow plow hingedly connected to the forward end of said draft frame, means operative from the tractor for raising and lowering said plow from and to its position of operation, means carried by said snow plow and adapted to discharge gathered snow side-ways therefrom, means carried by said plow for conveying gathered snow to said discharge means, means for actuating the said snow discharge means to a rearwardly directed inoperative travelling position, means for securing said snow discharge means in either operative or inoperative position, and means for returning said snow discharge means to its operative position upon its release of said securing means.

4. A snow plow attachment for tractors having a front axle and a rear driving axle comprising a frame overlying the front axle of the tractor and having draft connections with the rear axle only thereof, a snow gathering shovel having vertically hinging connections with the front edge of said frame, means for discharging gathered snow sideways of said shovel, means carried by the shovel for conveying gathered snow to said discharging means, means controlled by the operator of the tractor for raising said shovel when not in use, means for moving said snow discharging means to a rearwardly directed inoperative travelling position, automatic means for returning said snow discharging means to its normally operative position upon the release of said last mentioned means, and latching means for securing said snow dis-

charging means in either operative or inoperative position.

5. A snow plow attachment for tractors having a front axle and a rear driving axle, comprising a draft frame engaged over the power plant of the tractor, draft connections carried at the rear end of said frame and engaging the rear axle only of the tractor, a snow gathering shovel having vertically hinged connections with the front end of said frame, means for discharging gathered snow sideways of said shovel, means carried by the shovel for conveying gathered snow to the said discharging means, means controlled by the operator of the tractor for raising said shovel when not in use, means for securing said snow discharge means in either operative or inoperative position, means also controlled by the operator of the tractor for simultaneously releasing said securing means and moving said snow discharging means to a rearwardly directed position when not in use, and means for automatically returning said snow discharging means to its normally operative position upon the release of said securing means for the purpose.

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