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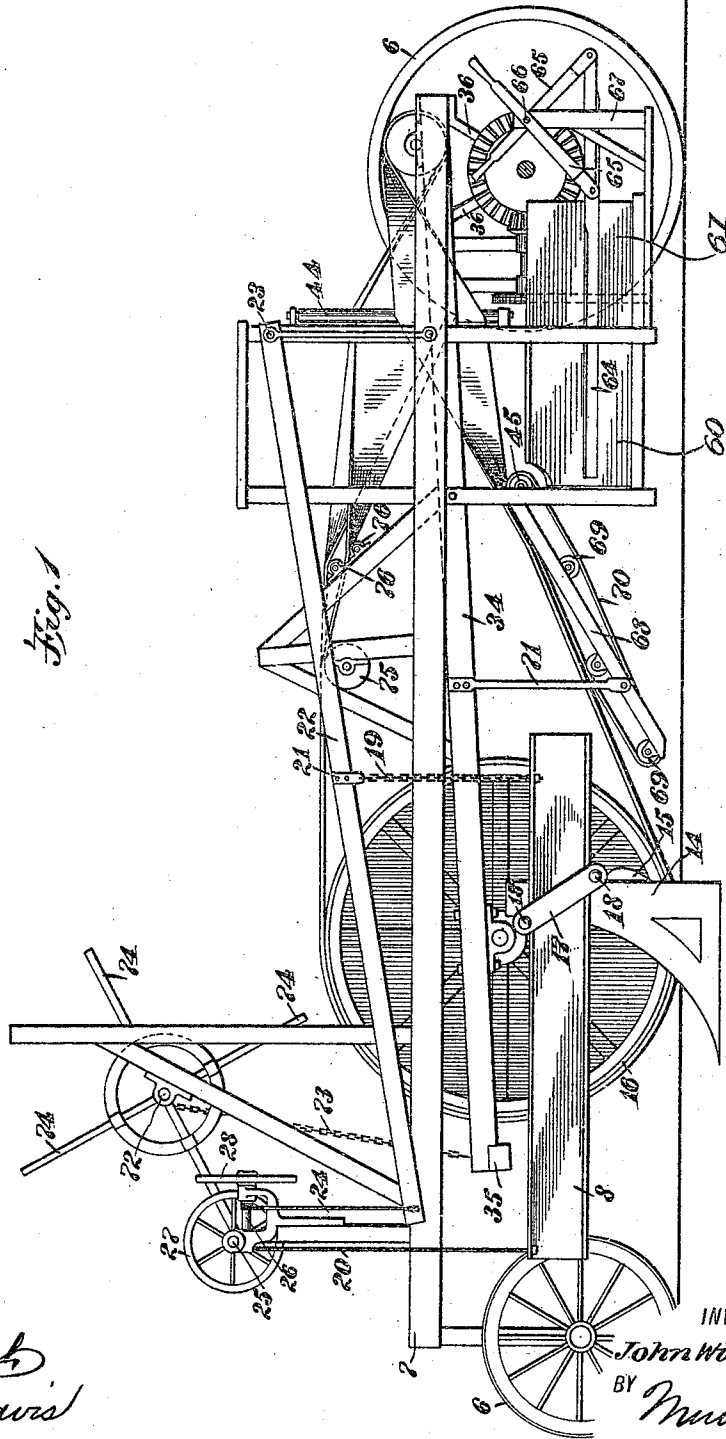
GRADER.

APPLICATION FILED MAY 20, 1909.

950,272.

Patented Feb. 22, 1910.

4 SHEETS—SHEET 1.



WITNESSES
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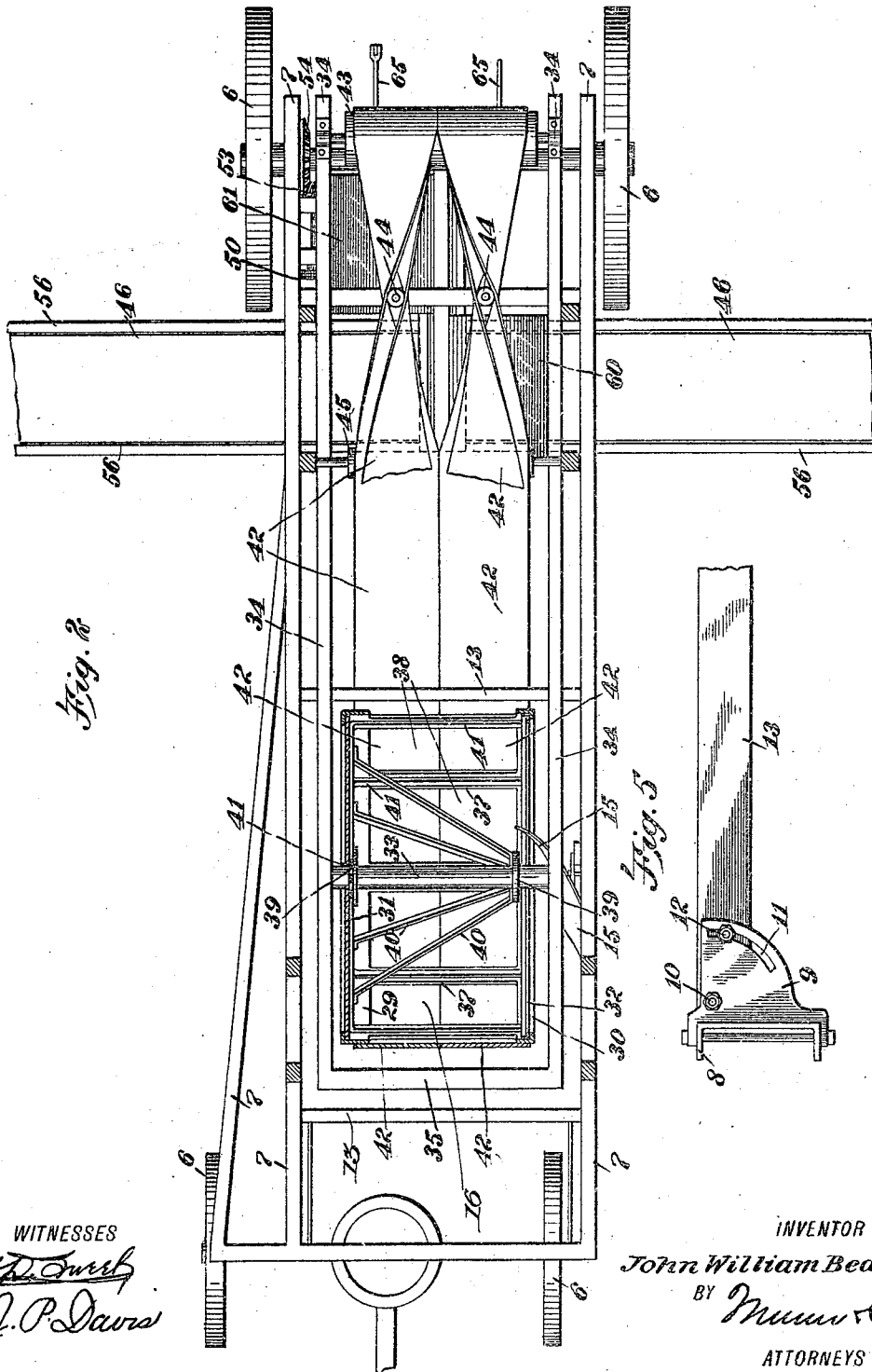
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

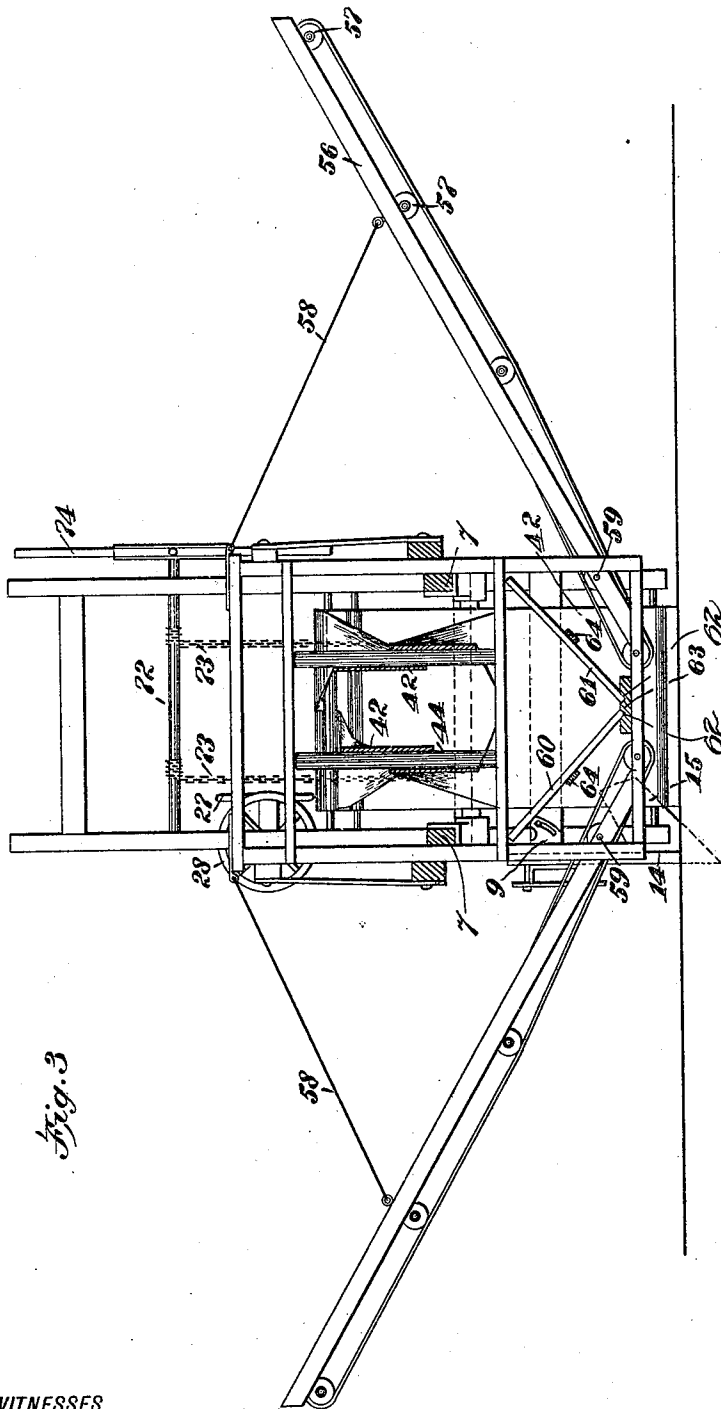


Fig. 3

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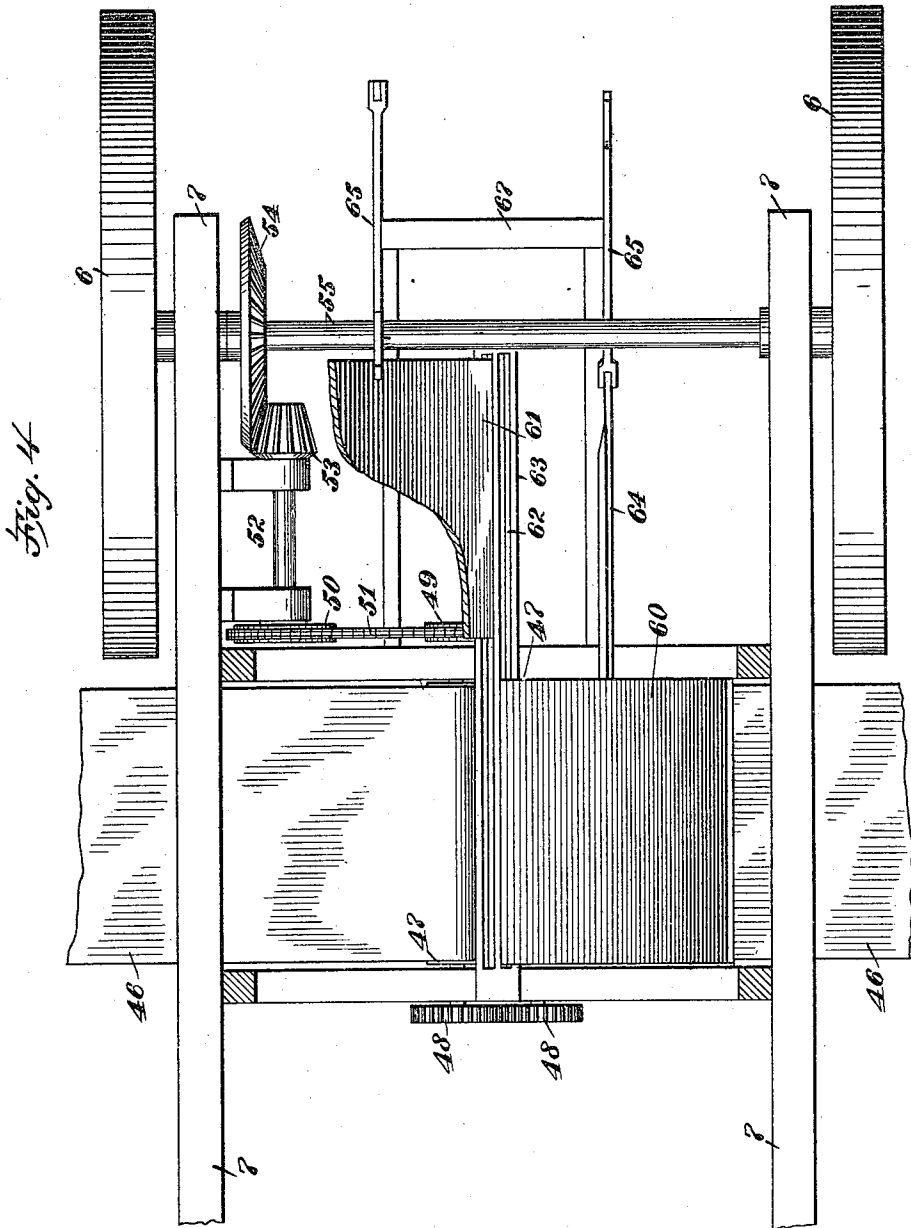
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GRADER.

950,272.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN WILLIAM BEASLEY, a citizen of the United States, and resident of Modesto, in the county of Stanislaus and State of California, have invented a certain new and useful Grader, of which the following is a full, clear, and exact description.

The principal objects which the present invention has in view are: to provide a mechanism whereby the earth is plowed and delivered to an elevator and distributor; to provide a continuously acting mechanism for delivering the plowed dirt at each side of the machine alternately so that the same may be distributed or received in a conveyer for removal, said delivery being manually controlled; to provide a receiving drum adapted to guide the delivery belts and to form a driving member therefor and to deliver the dirt from the interior of the said drum upon the said belts; and to provide the desired manually-operated controls for the operating mechanism.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings wherein like characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a machine built in accordance with the present invention; Fig. 2 is a plan view of the machine partly in section, the driving wheel for the conveyer belts being shown as cut away, and the standing rigging on the main beams of the vehicle being removed; Fig. 3 is a rear end elevation of the machine, showing the side conveyers in position; Fig. 4 is a detail view in plan of the rear end of the machine, to show the disposition of the conveyer belts and the driving mechanism therefor and the fenders for selecting the delivery thereon; and Fig. 5 is a detail view in rear elevation, of the swivel brackets for connecting the plow beam to the carrying frame therefor.

The various groups of cooperating instrumentalities are mounted upon vehicle wheels 6, suitably mounted to carry the frame of which the beams 7 are the main beams. The beams 7 are suitably arranged with cross beams or ties adapted to maintain the beams 7 parallel and so disposed as not to interfere with the operation of the mechanism of the machine. The machine is adapted to be drawn by a horse team. The front wheels 6 are suitably mounted on an axle which

swings on a king bolt or fifth wheel of suitable construction. Suspended from the frame is a channel beam 8 which acts as a plow beam, and in this specification I will so designate the beam 8. Said beam is suitably mounted in a bracket 9 (see Fig. 5), pivoted at 10 and provided with a quadrant slot 11, through which is passed a bolt 12, having a suitable nut in thread engagement therewith, and adapted to clamp the bracket 9 rigidly to a cross beam 13. It will be understood that there is such a beam 13 at both ends of the beam 8, and that on the opposite side of the machine, a beam corresponding to the beam 8, but rigidly set, is joined to the said beams 13, 13, making a rigid square frame.

The plow is provided with a standard 14, forming a landside, or adapted to have a landside secured thereto. Upon the standard is mounted a mold board 15 of any desired shape or size; that preferred by me is of the long wing type. The wing of this mold board 15 is adapted to extend within an open ended wheel 16, in such manner as to deliver the furrow, when turned, within the interior of the said wheel. The standard 14 is rigidly secured to the beam 8 by a strap 17, bolted by means of bolts 18 extending past the beam 8 and the standard 14, and secured to a strap corresponding to the strap 17, on the opposite side of the standard 14. This method of joining a plow standard to a plow beam, is efficient and readily adapted to adjustment. By means of the pivoted brackets 9, the set of the plow may be changed by inclining the beams 8 and the standard 14 connected therewith, to or from the vertical.

The plow beam 8 is suspended in operative position by a chain 19 and a cable 20, said chain and cable being connected at the rear and front of the said beam respectively. The chain 19 is fixedly attached by a clip 21 to a suspension bar 22 which is pivotally mounted on the standing rigging at 23, the forward end of the suspension bar being suspended by a cable 24. The cable 20 is wound upon a drum or shaft 25, while the cable 24 is wound upon a drum or shaft 26. The shaft 25 is provided with a hand wheel 27, and the shaft 26 is provided with a hand wheel 28. By the manipulation of the hand wheels 27 and 28, the depth and dip of the plow may be regulated.

It will be understood that the shafts or

drums 25 and 26 and the wheels 27 and 28 have any suitable form of detent for holding the shafts and wheels in their adjusted position. By winding the cables 20 and 24 upon the shafts or drums 25 and 26, the frame, of which the plow beam 8 is a member, may be raised until the plow is held out of contact with the ground.

As above stated, the plow delivers the dirt from the mold board 15 to the interior of the wheel or drum 16. This wheel is constructed as an open or spider frame, and consists primarily of rings 29 and 30, the ring 29 being provided with a solid side plate 31, while the ring 30 is supported by a circular internal flange 32.

The wheel 16 is supported upon an axle 33 which is mounted in bearings in the side members 34 of the suspension frame, which are joined at the front by the cross beam 35, and pivotally mounted in bearings set in the rear axle of the vehicle, and formed by brackets 36. The wheel 16 is cross-braced by wide straps 37 so disposed as to form openings 38 through which the dirt is passed to the conveyer belts.

Hubs 39 are disposed substantially as shown in Fig. 2 of the drawings, and consist of flanges adapted to receive the ends of braces 40, and the spokes 41. The spokes 41, 41 are bent and turned across the rim of the wheel under the straps 37 to reinforce the same. The braces 40 are extended from the hub, disposed at the open side of the wheel and connected to the plate 31 forming the closed side of the wheel. There is no interference on the part of the structure to the introduction of the dirt from the mold board 15. The straps 37 are placed at intervals sufficiently close to form substantially a continuous tread for the wheel 16 when the same is carrying, and is bridged across by conveyer belts 42. The conveyer belts 42 are formed of heavy leather or canvas belting, and on the outside, are suitably reinforced and protected so as to stand the abrasion of running in contact with the ground, as they do, when rolling with the drum 16. The inner surface may be formed as shown in the drawings as smooth or uninterrupted, or said surface may be battened, or provided with conveyer cleats, all being suitably disposed to fall within the openings 38. Two of said belts are used by me and they are threaded around the wheel 16 and extended to the rear of the vehicle, where they are passed over a drum 43, having been twisted intermediate the wheel and drum by the vertical rollers 44. The outward and inward reaches of the belts pass at opposite sides of the vertical rollers 44. The belts 42 are passed from the wheel 16 in the first instance over a horizontal roller 45, and it is between the roller 45 and the drum 43 that the belts 42, 42 are twisted as

shown in Fig. 2 of the drawings. By means of this twist of the belts they are caused to dump the load carried on their surface up to this point.

Extended laterally from the median line of the vehicle, outward to any suitable distance, are conveyers 46, which converge below the opening formed by the twist of the belts 42, and are driven by drums 47 at the lower end thereof. The drums 47 are connected through equal gears 48, the one of which is mounted upon a shaft extending through the drum 47 and provided at the other end with a sprocket wheel 49, which is connected to a sprocket wheel 50 by means of a sprocket chain 51. The sprocket wheel 50 is fixedly mounted upon a shaft 52 which is provided with a bevel gear 53 mounted in toothed engagement with a large bevel 54, fixedly mounted upon the axle 55 of the traction wheels 6 at the rear of the vehicle. By means of this driving mechanism just described, as the vehicle is caused to progress, the conveyer belts are driven in timed relation with the travel of the vehicle. If the operation of the machine is for the purpose of scattering the dirt as plowed, the dirt is permitted to drop over the ends of the one or the other of the lateral conveyers, but if it is the desire to transport the dirt to a distant point, it is then arranged that a cart or wagon shall be driven alongside the machine, in such position that the end of the carrier extends over the body of the cart or wagon, to receive the dirt as delivered therefrom. There is no limitation to the length of the conveyers 46.

It will be understood that the conveyers 46 are constructed as belts from any suitable material, and are supported in frames 56, which are provided with a plurality of rollers 57. The frames 56 are suspended by cables 58 which are suitably anchored to the standing rigging of the machine. When passing to and from the field of operation, the conveyers are drawn close to the vehicle, to as nearly a vertical position as the structure will allow. The frame is pivoted at 59 to permit this vertical swing thereof. As above mentioned, it is desired to shift the feed of the dirt from the one to the other of the said lateral conveyers 46. This is accomplished by the interposition of fenders 60 and 61, one of which is inclined in such manner as to press the dirt to the conveyers facing one side of the vehicle, while the other is inclined in the opposite direction. Hence, if one is drawn into position in line with the dump of the belts 42, the dirt will be carried by one of the conveyers 46, while by the interposition of the oppositely-inclined fender, the dirt will be carried to the opposite conveyer 46. The fenders are mounted in grooves 62 formed in a runboard 63, and are connected by means of strap

rods 64 to levers 65 pivotally mounted at 66 on a standard 67. The levers 65 are manually operated, therefore, under the control of the operator. With a construction as thus described, if two wagons are hauling the dirt as delivered by this machine, and the one on the one side be filled, and the empty wagon on the other side having drawn into position under the raised end of the opposite conveyer 46, the operator reverses the levers 65, changing the fender 60 for the fender 61, and immediately changing the direction of the delivery of the dirt by the conveyers 46. The filled wagon now moves off, while the empty wagon continues to move with the machine, receiving its load. When, in course of time, the second wagon is loaded, and a third has drawn into position under the opposite conveyer, the operation just described is reversed, and the delivery of the dirt is now to the opposite side of the machine.

The drum 45 is mounted in the upper end of side bars 68, carrying rollers 69 which, together with the roller 45 form carriers for a belt 70. The lower roller 69 is located close to the point where the belts 42 leave the wheel 16 when carrying the load of dirt. The belt 70 is a continuous or unbroken belt, and supports the two belts 42, to prevent their spreading under the load of dirt. It is after leaving the roller 45 that the belts 42 are twisted to dump their load. The side bars 68 are suspended from the side members 34 by tie rods 71, 71.

As mentioned, the wheel 16 rolls over the ground and is thereby propelled. The frame in which the wheel is mounted is connected by means of the cross beam 35 to a windlass 72 by means of a chain 73. The windlass is provided with extended handles 74. By winding the chain 73 upon the windlass 72 the suspended frame formed by the side members 34 and the cross beam 35, is raised. By raising the suspended frame, the wheel 16 is raised out of contact with the ground, and thereby ceases to operate. The windlass 72 is mounted upon a frame of any suitable character and shape, such as shown in Fig. 1 of the drawings.

The belts 42 on their return or overhead reach, are guided by idler rollers 75 and 76, suitably mounted in journals upon framing, raised on the side members 34 of the suspended frame carrying the wheel 16 and the various belts.

With a machine thus constructed, the operation is as follows: While being driven to the field of action, the plow beam and plow are raised out of contact with the ground, by operating the hand wheels 27 and 28 to wind up the cables 20 and 24. The wheel 16 is raised out of contact with the ground by winding the windlass 72 together with the chain 73; in this position of the operating

members the vehicle is moved to the field of operation. Having been placed in line, the wheels 27 and 28 are reversed to lower the plow beam 8 and the plow standard 14, so that when the vehicle is drawn forward, the plow will enter the ground. The windlass 72 is then unwound to permit the wheel 16 to track upon the ground, and the conveyers 46 are released from the vertical position, and allowed to extend laterally as shown in Fig. 3 of the drawings. In this position, the team is started causing the plow to enter the ground, turning the furrow inside of the wheel 16 and upon the inner surface of the belts 42, to be immediately carried thereby over the supporting belt 70 and roller 45 to be dumped between the roller 45 and the vertical rollers 44, on to the one or other of the fenders 60 or 61 to be thereby delivered to the conveyer 46 according to the selection of the fender. The operation continues as described, the only alteration transpiring being that the delivery from the conveyer 46 on the one side, is changed to a delivery to the conveyer 46 on the other side.

It will be observed that as the vehicle is mounted upon four wheels, these wheels constitute a guide for the depth of the operation of the plow standard 14.

If, in the course of operation, it is desired to give the plow a greater depth of action, this is accomplished by releasing the suspending cables 20 and 24. If it is desired to give the plow more dip, this is accomplished by releasing the cable 20 and tightening the cable 24.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A grader, comprising a plow having a lateral delivery, a conveyer belt guidably mounted to receive the dirt from said plow and extended to the rear of the same, guide rollers for said belt, adapted to twist the same to dump the load at predetermined stations, laterally extended conveyer belts mounted to travel on frames extended from the sides of the said grader, and adapted to receive the dirt from the first mentioned conveyer under the twist of the same, and a driving mechanism for moving the said conveyers.

2. A grader, comprising a plow having a lateral delivery, a conveyer belt mounted upon a drum, the head whereof is open to receive the dirt from the said plow, said belt being guidably mounted to carry the dirt from said drum to the rear of said plow, guides for said belt, adapted to twist the same to dump the load at the delivery station, laterally-extended conveyer belts mounted to travel on frames extended from the sides of the said grader and adapted to receive the dirt from the first-mentioned conveyer under the twist of the same, and a

driving mechanism for moving the said conveyers.

3. A grader, comprising a plow having a lateral delivery, a drum rotatably mounted on the frame of the grader and located to receive the dirt from the said plow, said drum being provided with peripheral openings to deliver the said dirt, a plurality of belts mounted upon said drum and extended therefrom to the rear of the grader, rollers adapted to carry said belts and to depress the one side of each to dump their load at a certain station, laterally extended conveyer belts mounted to travel on frames extended from the sides of the said grader, and adapted to receive the dirt from the belts passing around the said drum, and a suitable driving mechanism for moving the said conveyers.

4. A grader, comprising a plow having a lateral delivery, a drum rotatably mounted on the frame of the grader, and adapted to track on the surface of the ground beside the said plow to receive the dirt therefrom, said drum being provided with peripheral openings to deliver the said dirt, a plurality of belts mounted upon said drum and extended therefrom to the rear of the grader, rollers adapted to carry the said belts and to twist the same to dump the load from the carrying side, a platform extended under the said belts from the said drum to the point of twist in the said belt, laterally extended conveyer belts mounted to travel on frames extended from the sides of the said grader, and adapted to receive the dirt from the belts passing around the said drum, and a driving mechanism for moving the said conveyers.

5. A grader, comprising a plow having a lateral delivery, a drum adapted to roll on the ground beside the said plow and adapted to receive the dirt therefrom, said drum having peripheral openings to deliver the said dirt, a plurality of belts mounted upon said drum in contact with the ground and adapted to receive the dirt from the said plow through the said peripheral openings, said belts being extended to the rear of said grader and adapted to carry the said dirt from said drum, rollers adapted to carry the said belts and to twist the same to dump the dirt at a predetermined point, an inclined delivery board adapted to receive the said dirt as delivered by the said belts and to guide the same laterally, laterally extended

conveyer belts mounted to travel on frames extended from the sides of the said grader and adapted to receive the dirt from the said delivery board, and a driving mechanism connected with the traction mechanism of the grader for moving the said conveyers.

6. A grader, comprising a plow having a lateral delivery, a drum adapted to roll on the ground beside the said plow and adapted to receive the dirt therefrom, said drum having peripheral openings to deliver the said dirt, a plurality of belts mounted upon said drum in contact with the ground and adapted to receive the dirt from the said plow through the said peripheral openings, said belts being extended to the rear of said grader and adapted to carry the said dirt from said drum, rollers adapted to carry the said belts and to twist the same to dump the dirt at a predetermined point, a plurality of inclined delivery boards adapted to be interposed in the path of the dirt as delivered from said belts, to move the said dirt to the one or other side of the grader, laterally extended conveyer belts mounted to travel on frames extended from the sides of said grader and adapted to receive the dirt from the said delivery boards, and a driving mechanism connected with the traction mechanism of the grader for moving the said conveyers.

7. A grader comprising a plow having a lateral delivery, a drum rotatably mounted on the frame of the grader and adapted to track on the surface of the ground beside the said plow to receive the dirt therefrom, said drum being provided with peripheral openings to deliver the said dirt, a plurality of belts mounted upon said drum and extended therefrom to the rear of the grader, rollers adapted to carry the said belts and to twist the same to dump the load from the carrying side, a platform extended under the said belts from the said drum to the point of twist in the said belt, a mechanism for raising the said plow from contact with the ground, and a mechanism for raising the said drum from the ground.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN WILLIAM BEASLEY.

Witnesses:

L. J. MADDEN,
F. S. KELLEY.