Nov. 24, 1925. 1,562,929

A. TROVATON

POTATO HANDLING DEVICE

Filed May 9, 1923 3 Sheets-Sheet 1

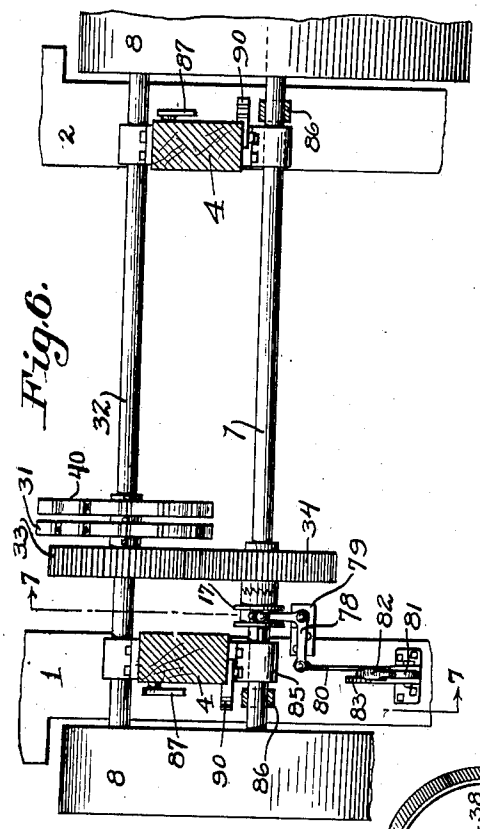


Fig. 6.

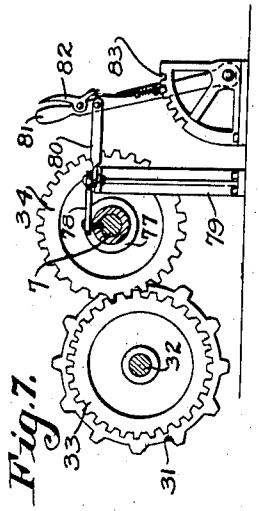


Fig. 7.

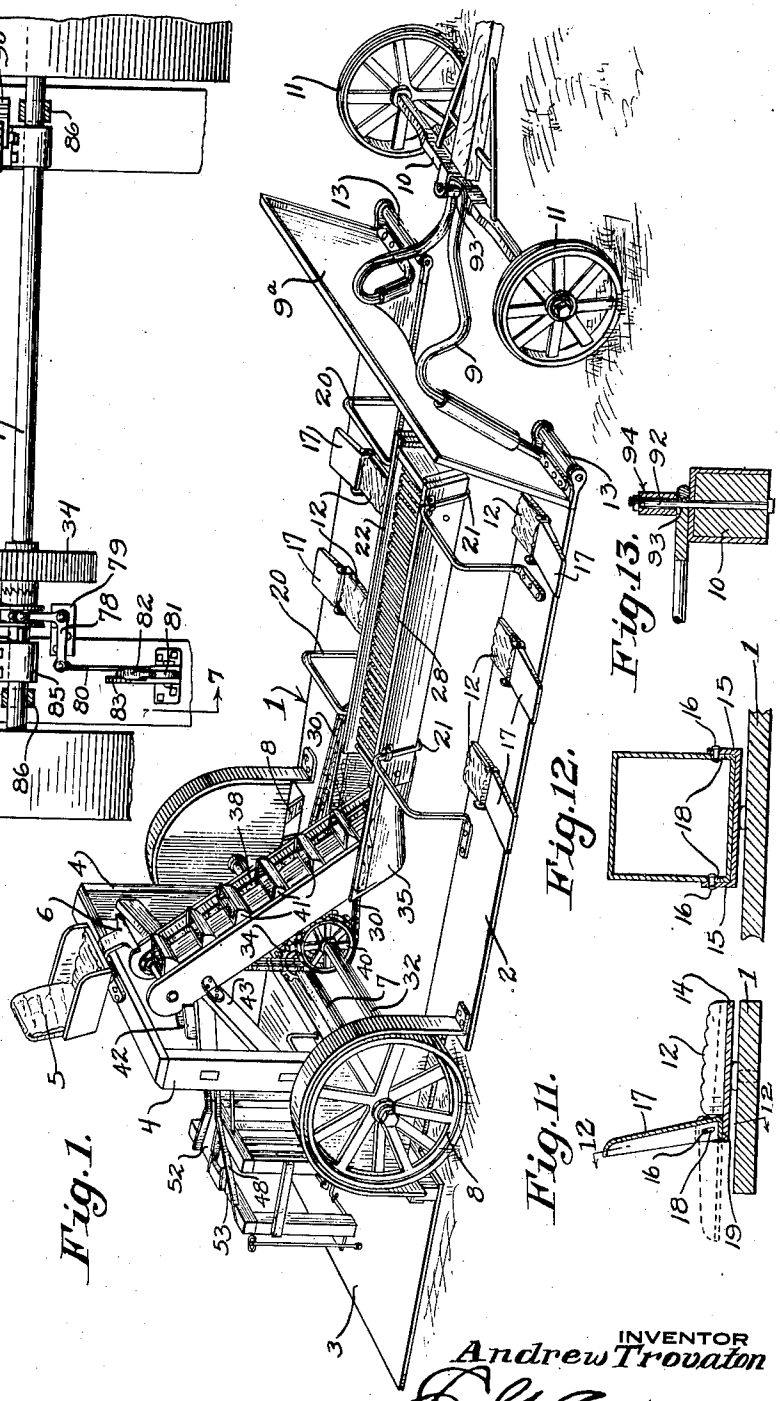


Fig. 1.

Fig. 12.

Fig. 11.

Fig. 13.

WITNESSES

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POTATO HANDLING DEVICE

Filed May 9, 1923 3 Sheets-Sheet 2

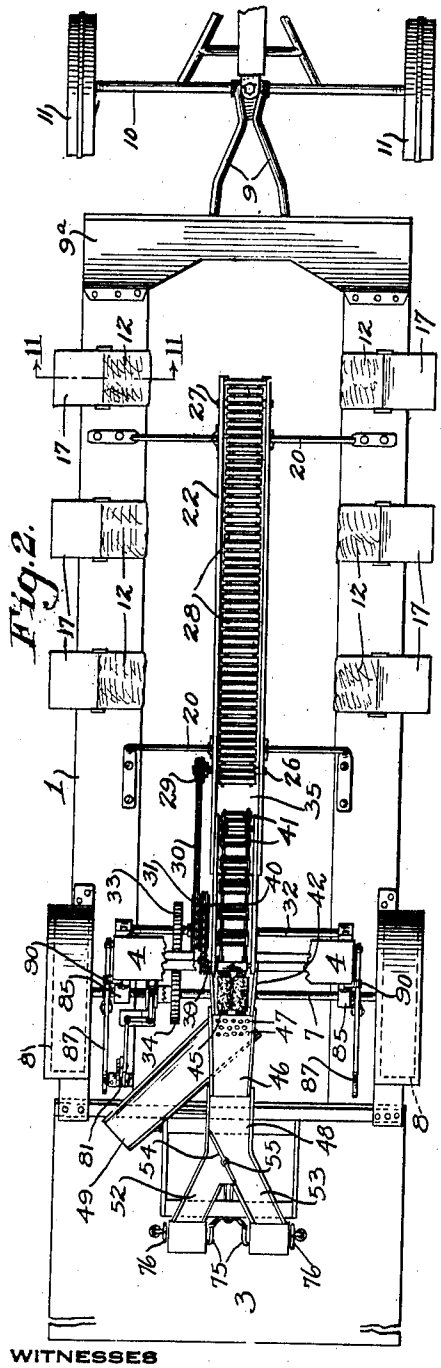


Fig. 2.

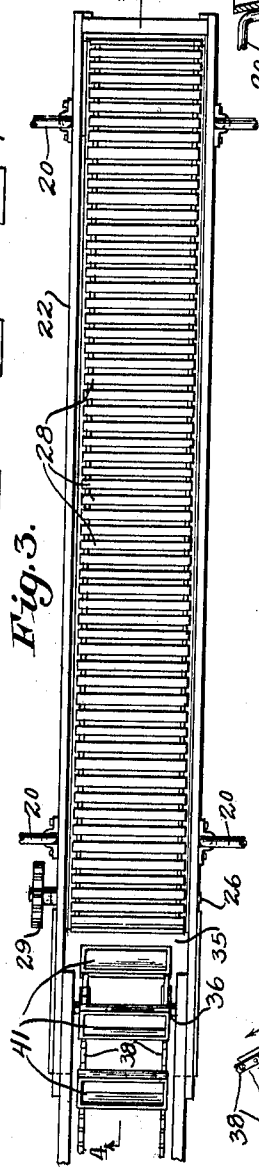


Fig. 3.

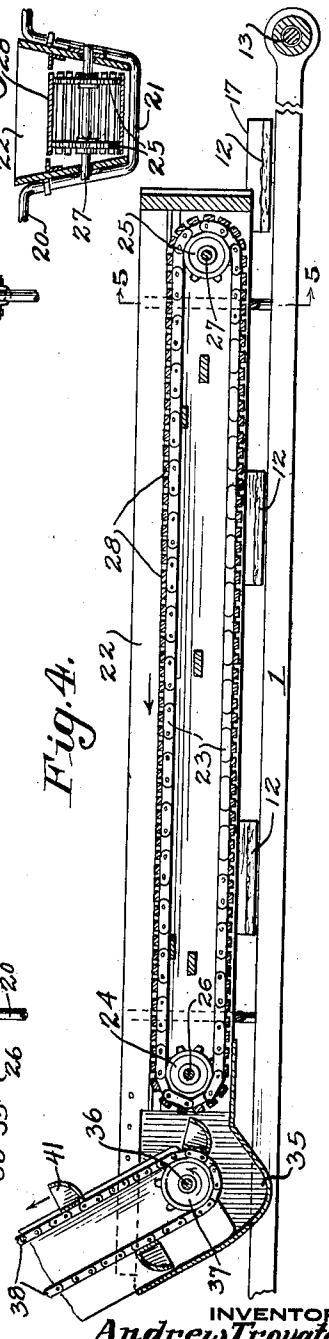


Fig. 4.

Fig. 5.

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POTATO HANDLING DEVICE

Filed May 9, 1923 3 Sheets-Sheet 3

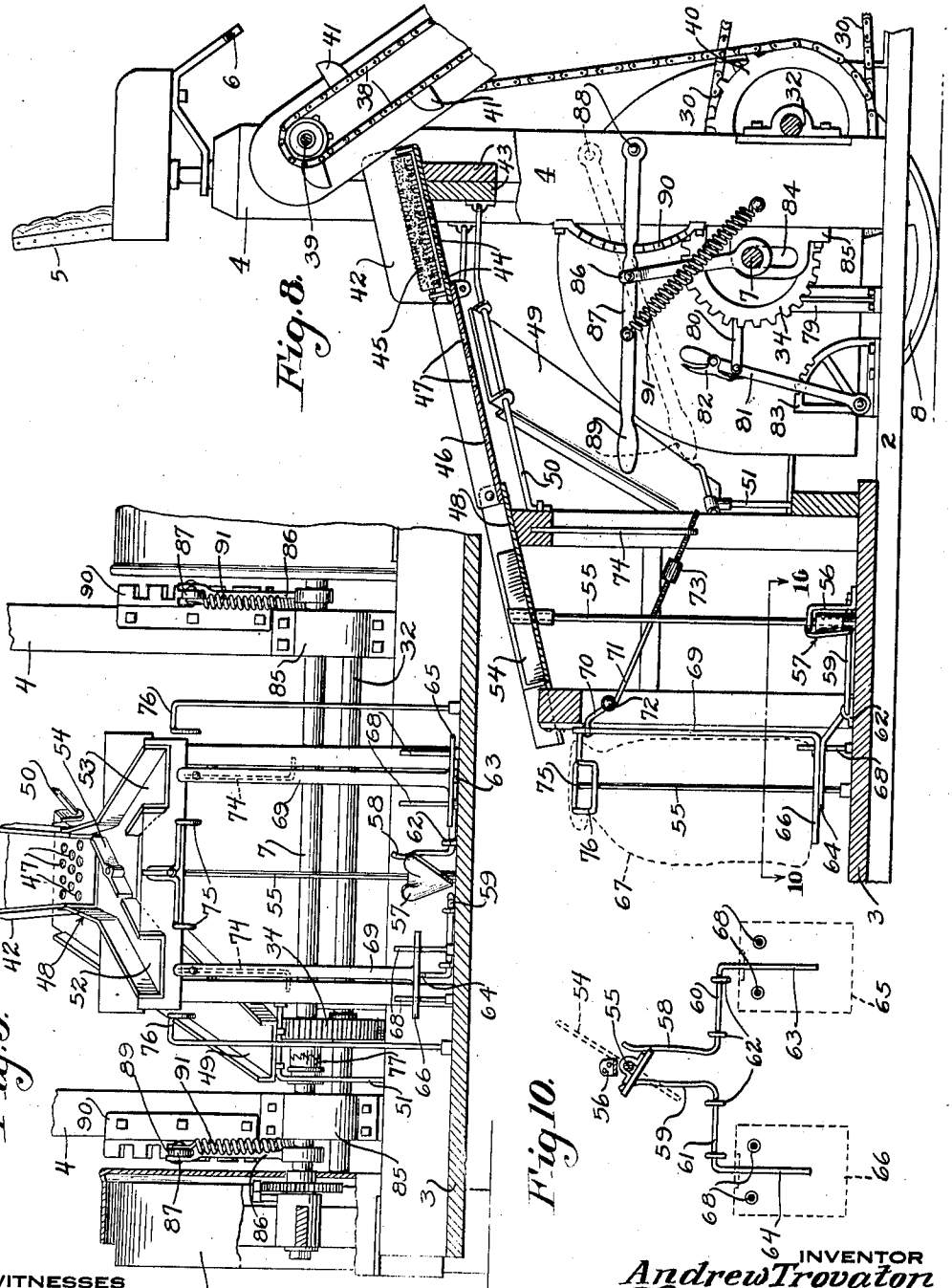


Fig. 8.

Fig. 9.

Fig. 10.

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1,562,929

UNITED STATES PATENT OFFICE.

ANDREW TROVATON, OF THIEF RIVER FALLS, MINNESOTA.

POTATO-HANDLING DEVICE.

Application filed May 9, 1923. Serial No. 637,760.

To all whom it may concern:

Be it known that I, ANDREW TROVATON, a citizen of the United States, residing at Thief River Falls, in the county of Pennington and State of Minnesota, have invented new and useful Improvements in Potato-Handling Devices, of which the following is a specification.

This invention relates to a potato handling device which is adapted to travel through the field, and to facilitate the work of picking up, sorting and bagging potatoes or the like.

The general object of the invention is to provide a vehicle adapted to straddle a row and to support a number of persons in a convenient position for picking up the potatoes as the vehicle travels slowly over the field, and which may also be provided with automatic means for conveying, cleaning, sorting, bagging and weighing the potatoes.

In the machines which have heretofore been used for digging and gathering potatoes automatically, it is impossible to provide efficient means for separating the stones and rubbish from the potatoes, and moreover when the potatoes are transferred directly from the digging apparatus to the bags without having a chance to dry, a great deal of wet earth adheres thereto and the moisture has a tendency to cause rotting. In the use of the present invention, however, the potatoes, after being dug, are permitted to remain on the ground long enough to become thoroughly dry and are then picked up by persons carried on the vehicle and manually delivered to the mechanism which performs the various functions referred to above.

In carrying out my invention, the frame of the vehicle includes side platforms for supporting the pickers, and a rear platform for supporting the bags being filled and a person for attending to the same. All of the platforms are carried close to the ground while the device is in use, but may be raised vertically when passing from one field to another, or for other reasons. The potatoes, as they are picked, are thrown onto a conveyer and transferred thereby to an elevator which delivers them to suitable cleaning and sorting devices, after which the marketable potatoes are delivered into bags supported by automatic weighing mechanism.

The details of construction of the invention and the operation thereof will be best understood from the following detailed description, taken in connection with the accompanying drawings, which illustrate the invention in its preferred form.

In the drawings:—

Fig. 1 is a perspective view of the invention.

Fig. 2 is a plan view thereof with parts broken away.

Fig. 3 is a detail plan view of the conveyer and elevator on an enlarged scale.

Fig. 4 is a longitudinal section on the line 4—4 of Fig. 3.

Fig. 5 is a transverse section on the line 5—5 of Fig. 4.

Fig. 6 is a transverse sectional view of a portion of the invention showing the main driving gear and clutch.

Fig. 7 is a detail sectional view substantially on the line 7—7 of Fig. 6.

Fig. 8 is a vertical longitudinal section through the rear portion of the invention.

Fig. 9 is a rear elevation of the invention with parts shown in section.

Fig. 10 is a detail sectional view on the line 10—10 of Fig. 8.

Fig. 11 is a detail sectional view on the line 11—11 of Fig. 2.

Fig. 12 is a detail sectional view on the line 12—12 of Fig. 11.

Fig. 13 is a detail view of the connection between the frame and the front axle.

The device which comprises my invention includes a main frame having side platforms 1 and 2 adapted to straddle a row of potatoes to be picked, and a rear platform 3 on which an attendant may stand for taking care of the bags of potatoes as they become filled. The frame also includes a transverse upright portion 4 on which may be provided a suitable seat 5 and foot rest 6 for the driver of the vehicle. The entire frame is supported for vertical adjustment, by means hereinafter described, upon the rear axle 7 and rear wheels 8, and at the front end, is supported by a forwardly-extending yoke 9 from the front axle 10 and front wheels 11. A dust guard 9ª may be attached to the yoke 9.

The platforms 1 and 2, which during the operation of the invention are carried close to the ground, are each provided with a number of pads 12, on which the knees of

the pickers may rest while picking up the potatoes as the machine passes slowly over the ground. The forward ends of the platforms 1 and 2 are preferably provided with rollers 13, so that they may easily ride over clods of earth or trash. The pads 12 are contained within frames 14 which have upstanding flanges 15 at their outer corners, provided with pivot pins 16 to which extension members 17 are connected through the medium of elongated slots 18. During the operation of picking, the extension members 17 normally lie flat upon the respective platforms 1 and 2, but when going to and from the field, the members 17 may be raised as shown in full lines in Fig. 11, to provide backs for the pads 12, which may now be used as seats. The lower edge of each back 17 is flat, as seen at 19 in Fig. 11, whereby the back is suitably held in upright position, but may be easily lowered by lifting the same upwardly until the pins 16 engage the lower ends of the slots 18.

The platforms 1 and 2 are suitably braced by cross bars 20, each of which is formed centrally with a downwardly-bent portion 21 forming a saddle within which a conveyer trough 22 is held. A conveyer, preferably of the endless type, is mounted to travel rearwardly within the trough 22, and comprises a pair of sprocket chains 23 mounted upon sprocket wheels 24 and 25 carried by shafts 26 and 27 journaled within the conveyer trough. The sprocket chains 23 carry a series of transverse slats 28 which are spaced apart sufficiently to permit the dirt to sift through the same and be discharged through the open bottom of the trough 22 onto the ground. The rear shaft 26 of the conveyer is provided with a drive sprocket wheel 29 connected by a sprocket chain 30 and sprocket wheel 31 to a countershaft 32 which is operatively connected by a spur gear 33 to the main driving gear 34 on the rear axle 7.

The rear end of the conveyer trough 22 is provided with a hopper 35, within which is journaled the lower shaft 36 of the elevator. This shaft carries sprocket wheels 37 over which pass the sprocket chains 38 of the elevator, the upper portions of said chains passing over similar sprocket wheels on a shaft 39 driven by sprocket gearing 40 from the countershaft 32. The elevator is provided with buckets 41 or other suitable elevating devices secured to certain links of the chains 38 and adapted to receive the potatoes delivered from the conveyer slats 28 and elevate the same to the cleaning and sorting mechanism which will now be described.

Beneath the upper end of the elevator, as best seen in Fig. 8, is a hopper 42 supported on a cross bar 43 of the upright portion 4 of the frame and having perforations 44 in its bottom. Mounted within the hopper 42 are idle inclined rollers 45 spaced apart and having stiff bristle or wire brushes thereon which remove from the potatoes any dirt which may still adhere thereto, the dirt being discharged through the perforations 44. The potatoes pass from the rollers 45 onto the sorter 46 which is provided with a series of openings 47 in its bottom larger than the perforations 44, and permitting the small potatoes to pass therethrough while the potatoes of marketable size pass on into the chute 48.

It will be understood that the sorter 46 may be constructed in any suitable manner to grade the potatoes into as many different sizes as may be desired. As shown herein, the small potatoes pass through the openings 47 onto a chute 49 which is pivotally mounted at its upper end on a rod or shaft 50 suitably supported beneath the sorter, and the lower end of the chute 49 is supported on a suitable rest 51 near one side of the platform 3, where a suitable receptacle may be provided for receiving the small potatoes.

The chute 48, into which the marketable potatoes are delivered, is divided at its lower end into branches 52 and 53 into which the potatoes are delivered alternately by means of a switch 54. This switch is secured to the upper end of a vertical shaft 55 which extends from the chute 48 downwardly and is journaled at its lower end in a bracket 56 secured to the forward part of the platform 3. A cam 57 in the shape of a triangle or heart is secured to the lower end of the shaft 55 and extends rearwardly therefrom, the sides of the cam being in the vertical planes of movement of arms 58 and 59, which extend forwardly from rock shafts 60 and 61, journaled in bearings 62 on the floor of the platform 3. The opposite ends of the rock shafts 60 and 61 extend upwardly and rearwardly, as shown at 63 and 64, and support bag platforms 65 and 66.

Each of the bag platforms 65 and 66 is substantially horizontal and adapted to support a bag 67, as shown in Fig. 8. The bag platforms are guided for vertical movement by pins 68, and at their forward sides are connected with upright arms 69, the upper ends of which are pivoted to the short arms 70 of levers or scale beams 71 which are pivoted at 72, and provided on their longer forwardly-extending ends with adjustable counterweights 73. Suitable stop members 74 are provided to limit the downward movement of the forwardly-extending arms of the levers 71, and the counterweights 73 may be adjusted to permit the bags to be filled with any desired quantity of potatoes before the scale beams will be overbalanced and the bag platforms 65 and 66 settle upon the platform 3. Suitable bag supports 75 and 76

are provided for holding the mouths of the bags open in position to receive the potatoes as they are discharged from the branches 52 and 53 of the chute.

When one of the bags has received a sufficient quantity of potatoes to overbalance the counterweight 73, the forward end 58 or 59 of the respective rock shaft 60 or 61 is raised to engage the inclined surface of the cam 57 and to rock the shaft 55 and operate the switch 54, thus shifting the stream of potatoes into the other branch of the chute.

It will be understood that as the machine is passing over the field, the rear axle 7 is continuously driven by the rear wheels 8 and the conveyer and elevator mechanism are normally driven through the medium of gears 33 and 34. In turning corners, however, it is desirable to disconnect this mechanism, and for this purpose, I have provided a clutch collar 77, Figs. 6 and 7, which is slidably keyed to the axle 7 and operable by means of a bell crank 78 into or out of engagement with the driving gear 34, the latter being freely rotatable on the shaft 7 when the clutch is disengaged. The bell crank 78 is mounted for rocking movement on a bracket 79 supported on the platform 1, and is connected by a link 80 to a hand lever 81 within reach of the operator on the platform 3, the lever being provided with a thumb latch 82 cooperating with a suitable segment 83 to lock the lever and clutch in the desired position.

The main frame of the machine, including the platforms 1, 2 and 3, is preferably mounted for vertical adjustment with respect to the rear axle 7, so that the same may be raised when passing from one field to another to provide ample clearance from the ground. To this end, the axle 7 is mounted in vertically elongated slots 84 formed in brackets 85 which are secured to some part of the main frame, as the vertical transverse frame portion 4. Journaled on the axle 7, adjacent each of the brackets 85, is a link 86 which extends upwardly from the axle and the upper end of which forms a fulcrum on which a lever 87 is intermediately pivoted. The forward end of this lever is pivoted at 88 to the frame member 4, while the opposite end of the lever extends rearwardly and is provided with a handle 89. The lever is engageable with a quadrant 90 for locking the frame in its adjusted position. A strong spring 91 connects the lever 87 to the frame at a point considerably below the pivotal connection 88. It will be seen, therefore, that by depression of the rear end of the lever 87, the front end thereof will be raised about the upper end of the link 86 as a fulcrum, thus raising the entire machine frame on the axle 7, while the tension of spring 91 has a tendency to overcome the weight of the frame and facilitate its adjustment.

Provision is also made for vertically adjusting the front end of the vehicle body with respect to the front axle. For this purpose the king bolt 92 which receives the eye 93 formed in the forward end of the yoke 9 is provided with a spacing sleeve 94 which may be placed above or below the eye 93. Any number of these spacing sleeves may be used to provide the adjustment desired.

By the use of my invention, as above described, the entire process of picking up, sorting and weighing the potatoes is accomplished by a continuous operation. The pickers being supported by the platform are left with both hands free so that their entire attention and energy may be directed to the picking up of the potatoes. No time will be lost in moving the baskets or in emptying the same and the work of picking may be carried on much more rapidly and with less expense. The method employed is more practical than using a machine which digs the potatoes, and automatically gathers and bags the same while still wet along with stones and clods which cannot be distinguished by machinery from the potatoes.

The combination of the cleaning, sorting and weighing devices eliminates the necessity of emptying the potatoes first into sacks and then emptying the sacks into the sorter, as has heretofore been done. The sacks of potatoes will all be of uniform weight and thus the expense of re-weighing to obtain the correct amount in each bag is eliminated. If desired however the potatoes may be delivered directly from the elevator into a wagon travelling alongside and transported to the warehouse for sorting.

While I have shown and described the structural details of one form in which the invention may be embodied, it will be understood that this is merely illustrative, and that many modifications may be made therein as long as no material departure is made from the salient features of the invention, as set forth in the claims. Obviously, the device may also be used in gathering other kinds of vegetables.

What is claimed is:—

1. In a potato handling device, a wheeled vehicle having side platforms located close to the ground and adapted to straddle a row, said platforms being provided with padded members on which the pickers may kneel, each padded member having an outward extension which is adjustable to upright position to form a back when the padded member is used as a seat, a substantially horizontal conveyer supported midway between the platforms and spaced therefrom, and means for handling vegetables as they are delivered from the conveyer.

2. In a potato handling device, a wheeled vehicle having side platforms located close

to the ground and adapted to straddle a row, a rear platform adapted to support a receptacle, a longitudinal conveyer disposed midway between the side platforms and operable by the forward movement of the vehicle for receiving the potatoes as they are picked and conveying them rearwardly, transverse brace bars connecting the side platforms and having intermediate downwardly bent portions forming saddles in which said conveyer is supported, padded members supported on the side platforms on which the pickers may kneel, each padded member having an outward extension which is adjustable to upright position to form a back when the padded member is used as a seat, and means for receiving the potatoes from the conveyer and delivering them to a receptacle on the rear platform.

3. In a potato handling device, a wheeled vehicle including front and rear wheel supported axles, a frame supported by said axles and having longitudinally extending spaced side platforms for supporting the pickers, a substantially horizontal conveyer disposed longitudinally between the platforms, transverse brace bars connecting the platforms and constituting means for supporting said conveyer, means carried by said frame for receiving the potatoes from the conveyer and cleaning and sorting them, and means for raising and lowering either end of said frame, independently of the other end.

4. In a potato handling device, a wheeled vehicle having side platforms adapted to straddle a row for supporting pickers, a rear platform for supporting a receptacle, a conveyer extending longitudinally between the side platforms for receiving the potatoes as they are picked, said conveyer being operable by the forward travel of the vehicle, a chute having two branches at its discharge end terminating above the rear platform, means for transferring the potatoes from the conveyer to the chute, a switch operable to direct the potatoes into one or the other of said branches, and means for automatically shifting the switch, said shifting means being operated by the weight of the potatoes delivered from either of said chutes to a receptacle carried by the rear platform.

5. In a potato handling device, a wheeled vehicle having longitudinal spaced platforms located close to the ground and adapted to straddle a row for supporting the pickers, a rear platform connecting the rear ends of the side platforms and adapted to support bags for receiving potatoes, a conveyer extending longitudinally between the side platforms and supported thereby for receiving the potatoes as they are picked, revolubly mounted brushes for cleaning the potatoes, means for receiving the potatoes from the conveyer and directing them into contact with the brushes, and means for subsequently sorting the potatoes and delivering them to said bags.

6. In a potato handling device, a wheeled vehicle having a longitudinal conveyer mounted centrally thereof, means for supporting pickers close to the ground on each side of the conveyer, revolubly mounted brushes for cleaning the potatoes, means for receiving the potatoes from the conveyer and directing them into contact with the brushes, and means for subsequently sorting and bagging the potatoes.

7. In a potato handling device, a wheeled vehicle, a conveyer mounted thereon adapted to receive potatoes as they are picked, said conveyer being operated by the forward travel of the vehicle, a chute having two branches at its discharge end, means for transferring the potatoes from the conveyer to the chute, a switch operable to direct the potatoes into one or the other of said branches, and means for automatically shifting the switch, said shifting means being operated by the weight of the potatoes delivered.

8. In a potato handling device, a wheeled vehicle, means on the vehicle adapted to receive potatoes as they are picked and to convey them rearwardly and upwardly, a chute having two branches at its discharge end, means for transferring the potatoes from the conveyer to the chute, a switch operable to direct the potatoes into one or the other of said branches, means for automatically shifting the switch after a predetermined quantity of potatoes has been delivered, said shifting means being operated by the weight of the potatoes, and adjustable means for varying the weight required to operate the shifting means.

9. In a potato handling device, a wheeled vehicle, means for receiving potatoes as they are picked and conveying them rearwardly and upwardly, a chute having two branches at its discharge end, means for transferring the potatoes from the conveyer and elevator to the chute, a vertical rock shaft having a switch secured to its upper end operable by the rocking of the shaft to direct the potatoes into one or the other of said branches, a cam secured to the lower end of the rock shaft, a vertically-movable platform beneath the mouth of each branch for supporting a bag or other receptacle, a counterbalance for each platform normally maintaining it in its uppermost position but adapted to be overbalanced by a predetermined weight of potatoes, and means operable by the platform in descending to engage said cam to rock the rock shaft and shift said switch.

10. In a potato handling device, a wheeled vehicle, a chute supported on the vehicle and having two branches at its discharge end,

means for receiving potatoes as they are picked and delivering the same to the upper end of the chute, a switch operable to direct the potatoes into one or the other of said branches, a vertical rock shaft to the upper end of which the switch is secured, a cam secured to the lower end of the rock shaft, a vertically movable platform beneath the mouth of each chute for supporting a bag or other receptacle, an intermediately fulcrumed scale beam for each platform having a connection at one side of its fulcrum to its respective platform, and an adjustable counterbalance at the other side of its fulcrum, a pair of horizontal rock shafts each having an arm in contact with the under side of one of the platforms, and a second arm movable when the shaft is rocked into contact with said cam, said shaft being normally held by gravity out of contact with the cam but actuated by the descent of the platform to engage the cam and rock the vertical shaft to shift said switch.

11. In a potato handling device, a wheeled vehicle including a main frame having front and rear axles, said frame having vertical slots in which the rear axle is mounted, a link journaled on the axle adjacent each slot, a lever fulcrumed to the upper end of the link and operable to raise or lower the main frame with respect to the rear axle.

12. In a potato handling device, a wheel-supported axle, a main frame having substantially vertical slots in which the axle is mounted, a lever adjacent each slot having one end pivoted to the frame and having a movable fulcrum supported by the axle, said lever being operable to raise and lower the frame with respect to the axle, and means for locking the lever to support the frame in the desired position of adjustment.

13. In a potato handling device, a wheel-supported axle, a main frame having substantially vertical slots in which the axle is mounted, a lever adjacent each slot having one end pivoted to the frame, a link journaled to the axle underneath each lever, said lever being intermediately fulcrumed on the upper end of the link, a spring connecting each lever to the frame and partially counterbalancing the weight of the latter to assist in raising the frame, and means for locking the lever to hold the frame in the desired position of adjustment.

14. In a potato handling device, a wheeled vehicle including front and rear wheel-supported axles, a main frame supported by said axle and having longitudinally-extending spaced side platforms for supporting the pickers, a conveyer supported by and between the platforms, means carried by the main frame for receiving the potatoes from the conveyer, cleaning and sorting them, and means for adjusting either end of the main frame vertically, independently of the other end.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

ANDREW TROVATON.