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S. NETTLESHIP.
PEA HARVESTER.

APPLICATION FILED NOV. 30, 1904.

4 SHEETS—SHEET 1.

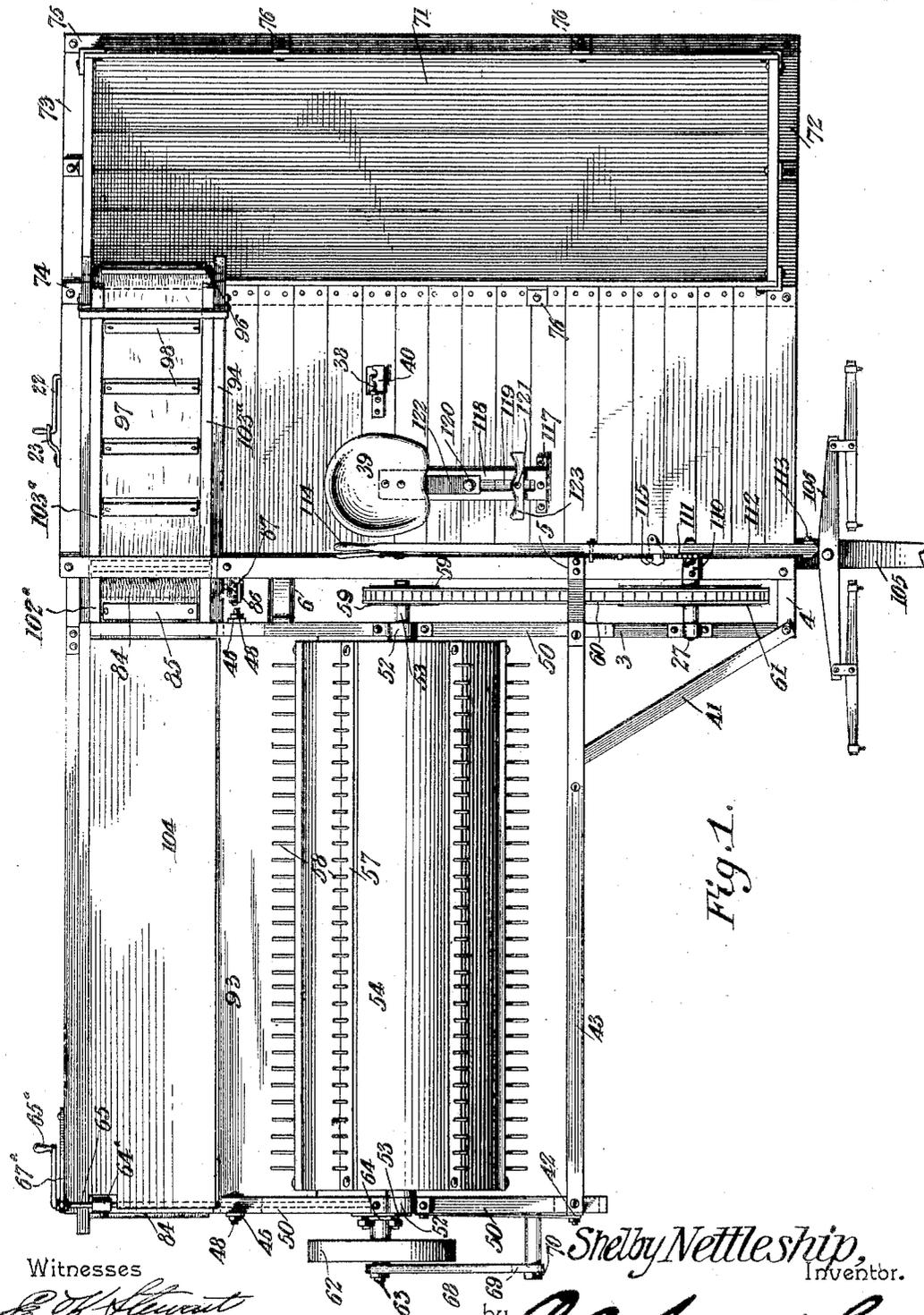


Fig. 1.

Witnesses

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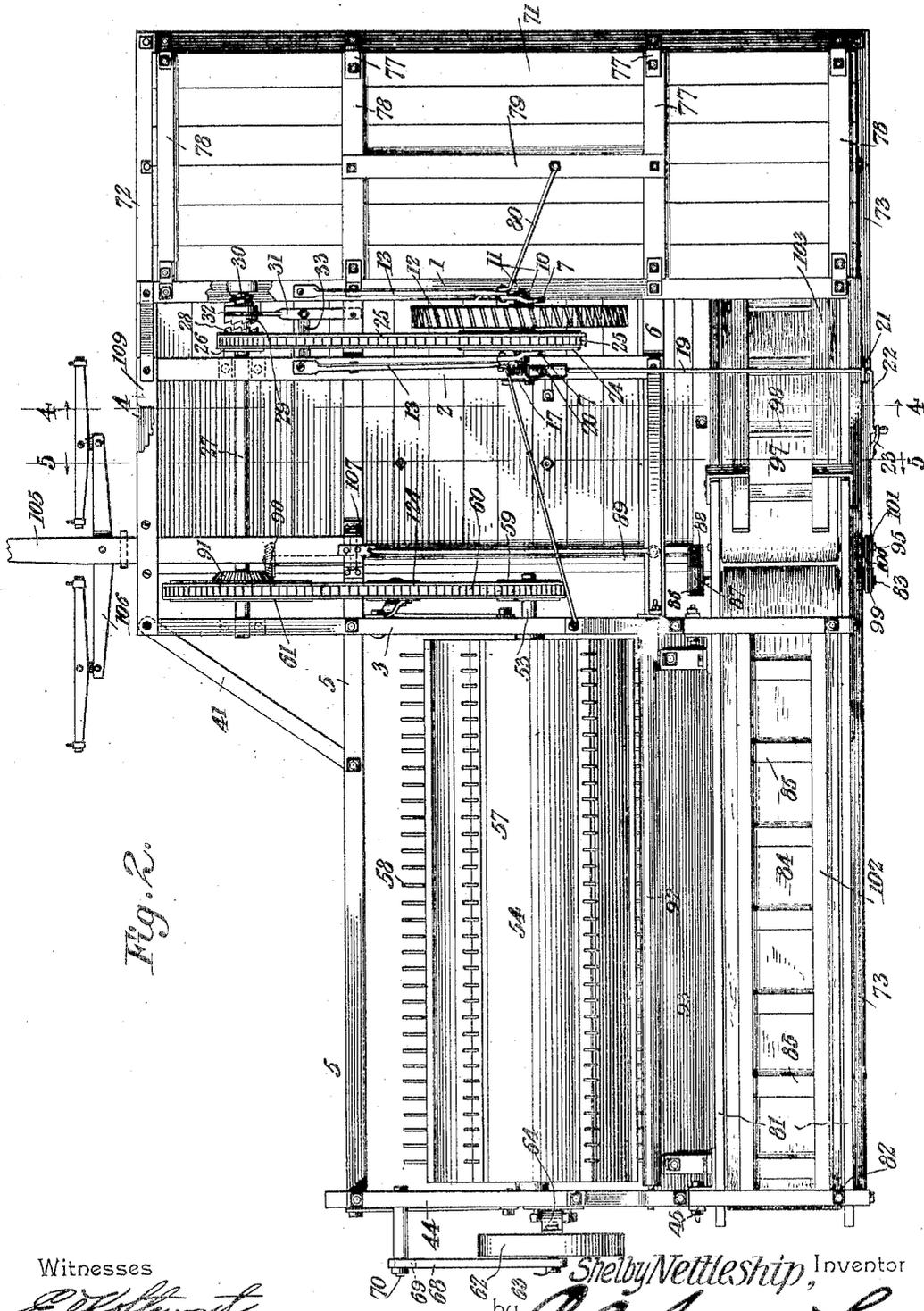


Fig. 2.

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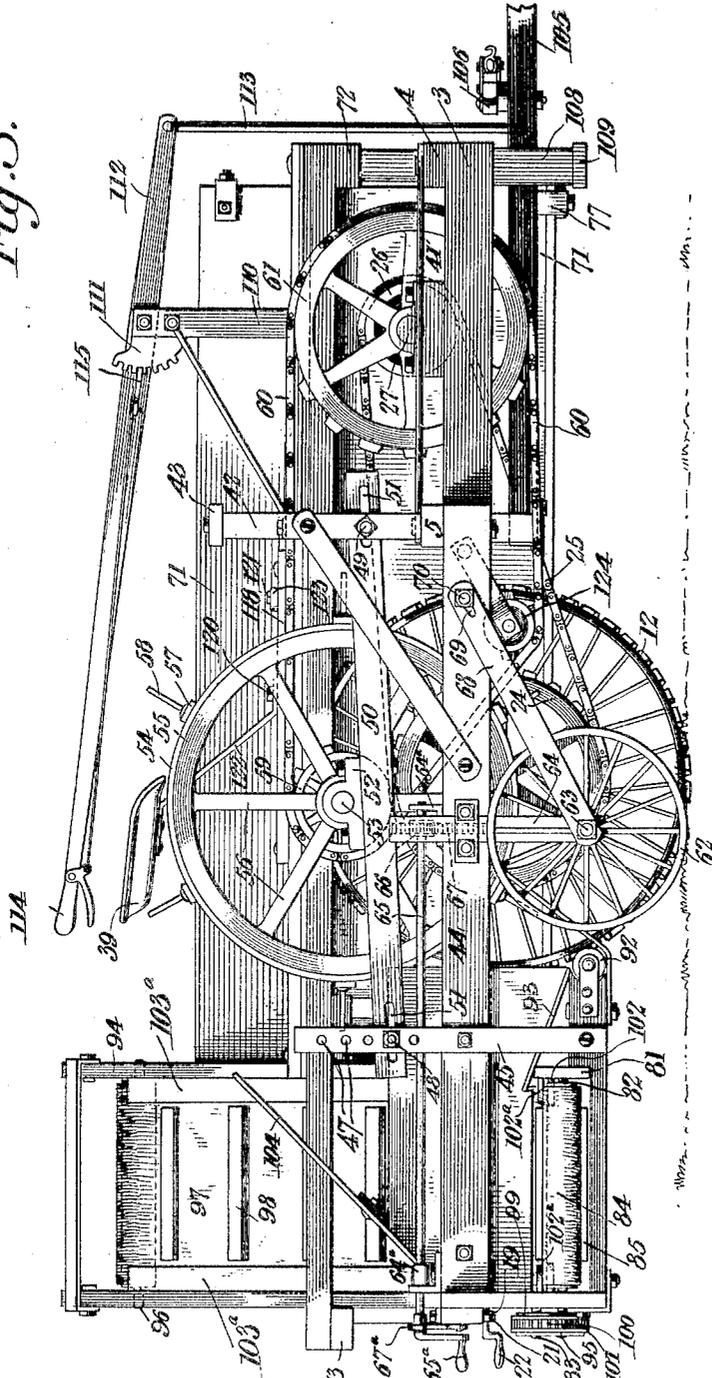
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Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 4.

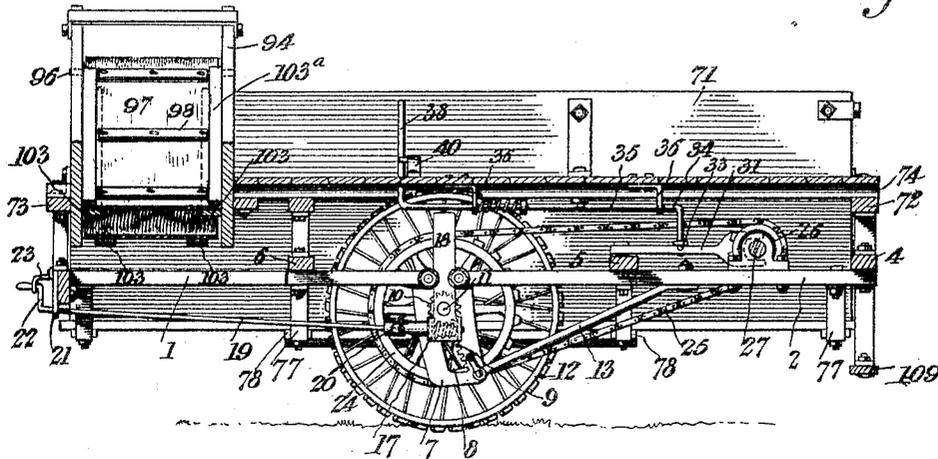


Fig. 5.

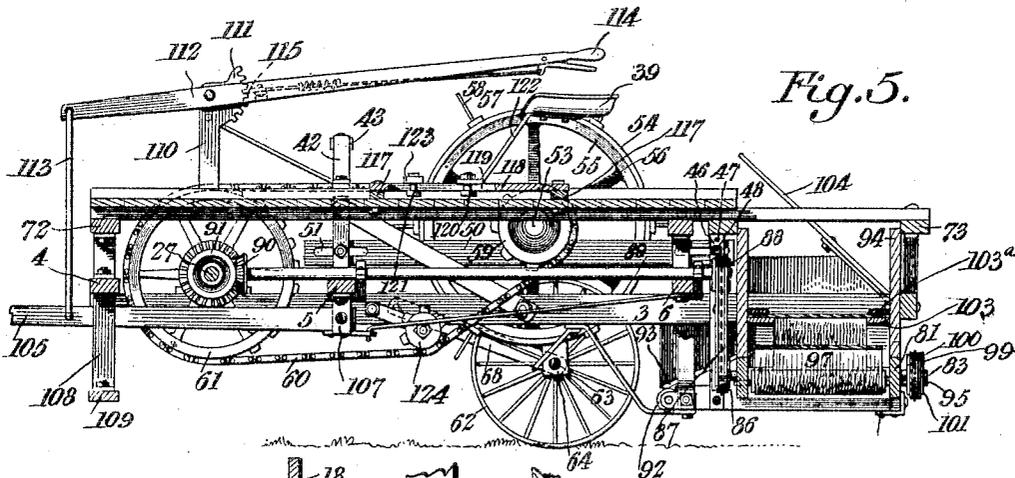
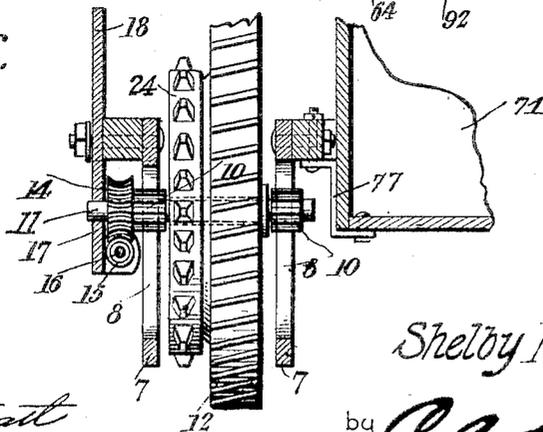


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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PEA-HARVESTER.

No. 797,142.

Specification of Letters Patent.

Patented Aug. 15, 1905.

Application filed November 30, 1904. Serial No. 234,953.

To all whom it may concern:

Be it known that I, SHELBY NETTLESHIP, a citizen of the United States, residing at Fayetteville, in the county of Washington and State of Arkansas, have invented a new and useful Pea-Harvester, of which the following is a specification.

This invention relates to pea-harvesters, and particularly to that class of pea-harvesters which strip the pods from the vines, leaving the latter standing in the field.

The invention has for its object to simplify and improve the construction and operation of a machine of this class; and with these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of embodiment of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that the right is reserved to any changes, alterations, and modifications to which recourse may be had within the scope of the invention and without departing from the spirit or sacrificing the efficiency of the same.

In said drawings, Figure 1 is a top plan view of a machine constructed in accordance with the principles of the invention. Fig. 2 is a bottom plan view of the same. Fig. 3 is a side elevation, enlarged, of the machine as seen from the grain side. Fig. 4 is a vertical longitudinal sectional view taken on the plane indicated on the line 4 4 in Fig. 2. Fig. 5 is a vertical longitudinal sectional view taken on the plane indicated on the line 5 5 in Fig. 2. Fig. 6 is a transverse sectional detail view taken through parts of the machine in front of the bull-wheel and showing in elevation said bull-wheel and related parts.

Corresponding parts in the several figures are indicated by like characters of reference.

The main frame of the machine includes longitudinal frame-beams 1, 2, and 3 and transverse frame-beams 4, 5, and 6, supported thereon and bolted to or otherwise suitably connected therewith. Secured to the inner

sides or opposing faces of the longitudinal beams 1 2 are a pair of brackets 7, having segmental slots 8, provided with teeth 9, engaging pinions 10, which are mounted upon the shaft or axle 11, carrying the bull-wheel 12, which is the main supporting and traction wheel of the machine and from which motive power for the various operating parts is derived. The brackets 7 are supported and reinforced by means of braces 13, connecting the lower ends of said brackets with the longitudinal frame-beams 1 and 2, respectively. The shaft or axle 11 in addition to the pinions 10 carries a worm-gear 14, meshing with a worm 15 upon a short shaft 16, which is journaled in a bracket 17 at the lower end of a suitably-supported slide 18, which also has a bearing for the axle 11. The slide 18 is supported upon the frame-piece 2.

19 designates a shaft one end of which is connected by a universal joint 20 with the shaft 16. The rear end of the shaft 19 is supported in a bracket 21, suitably connected with the rear part of the frame, and it terminates in a crank 22, by means of which it may be conveniently manipulated. Means, such as a supporting-hook 23, is provided to engage the crank 22, and thereby to secure the shaft 19 against reverse rotation.

It will be seen that by manipulating the crank 22 to rotate the shaft 19 the worm 15 will engage the worm-gear 14, thus rotating the axle 11, upon which said worm-gear is fixed, and causing the pinions 10 to engage the segment-racks 9, and thus raising or lowering the frame of the machine, according to the direction of rotation. The slide 18, it will be observed, moves up and down with the axle, hence the necessity for the universal joint 20, which connects the shaft 19 with the shaft 16. The shaft 19 will also be free to move in its bearing 21 in the direction of its length in order that it may accommodate itself to various positions assumed by the operating parts.

Connected with the bull-wheel 12 or with the axle upon which said bull-wheel is mounted is a sprocket-wheel 24, from which motion is transmitted by a chain 25 to a sprocket-wheel 26 upon a counter-shaft 27, suitably supported upon the frame of the machine. The sprocket-wheel 26 is loose upon the shaft 27, and it carries a clutch member 28, adapted to engage a clutch member 29, which latter is

rotatable with but longitudinally slidable upon the shaft 27, a suitably-disposed spring 30 serving to urge the clutch member 29 into engagement with the clutch member 28, thus locking the latter upon the shaft 27. A suitably-supported bifurcated lever 31, which engages a groove 32 in the clutch member 29, is connected, by means of a link 33, with a crank 34, depending from a rock-shaft 35, which latter is suitably supported in bearings 36 upon the under side of the deck or platform of the machine. The opposite end of said rock-shaft 35 has a crank or handle 38, whereby it may be conveniently manipulated by the driver, whose seat 39 is supported upon the deck or platform adjacent to said crank. A notched brace or quadrant 40 is provided to engage the crank 38, and thereby to retain said crank in adjusted position. By this mechanism it will be seen that the driver by simply manipulating the crank 38 may operate the clutch mechanism so as to throw the machine into or out of gear by either locking the sprocket-wheel 26 upon or disconnecting it from the counter-shaft 27, which latter may be designated as the "main" driving-shaft.

The frame-bar 5 is extended laterally in the direction of the grain side of the machine, as will be best seen in Fig. 2 of the drawings, and it is connected, by means of an obliquely-disposed brace 41, with the end of the frame-bar 4 at the front end of the machine. Upright brackets 42 upon the frame-bar 5 serve to support a cross-bar 43, which is disposed above and parallel to the frame-bar 5. 44 is an outer frame-bar which is connected at its front end with the under side of the extremity of the cross-bar 5. The outer frame-bar 44 and the longitudinal frame-beam 3 are provided near their rear ends with vertically-disposed straps or brackets (designated, respectively, 45 and 46) having holes or apertures 47 for the passage of adjusting-bolts 48. Similar adjusting-bolts 49 extend through the straps or brackets 42 upon the cross-bar 5, which support the cross-bar or cap-beam 43. The adjusting-bolts 48 and 49 support a pair of bars 50, provided at the front and rear ends thereof with slots 51, whereby longitudinal adjustment of said bars may be had, vertical adjustment of said bars being effected at the rear ends thereof by means of the adjusting-bolts 48, which may be adjusted, as described, in the apertures 47 of the straps or brackets 45 and 46. It will be seen that by tightening the nuts upon the adjusting-bolts 48 and 49 the bars 50 may be clamped and secured in various positions to which by means of the adjusting-bolts and the slots 51 in said bars they may be adjusted.

The bars 50 are provided upon their upper sides with boxes 52, affording bearings for a shaft 53, carrying a drum or cylinder 54, which may be constructed of any suitable material, the heads or ends of which, 55, have been shown as

being provided with spokes 56. The drum or cylinder 54 is provided with a plurality of longitudinal strips 57, carrying radially-extending teeth or pickers 58. The shaft 53 carries a sprocket-wheel 59, which is connected, by means of a chain 60, with a sprocket-wheel 61 upon the counter-shaft 27, from which motion is transmitted to the picker-cylinder.

The outer or grain end of the machine is supported by means of a grain-wheel 62, mounted upon a spindle or axle 63, which is connected with the lower end of a slide 64, connected adjustably with the outer frame-bar 44. The latter is provided with bearings 64^a for a shaft 65, having at one end a pinion 66, meshing with teeth 67 upon the slide 64, which latter, together with the grain-wheel mounted thereon, may be adjusted vertically by rotating the shaft 65, which for this purpose is provided at its rear end with a crank or handle 66^a, means, such as a crank-engaging hook 67^a being provided for the purpose of preventing reverse rotation of the shaft. The lower end of the slide 64 is connected with the frame-bar 44 by means of a pivoted brace 68, provided with a slot 69, engaging the bolt 70, whereby it is connected with the frame-bar, said brace being for the purpose of preventing vibration of the wheel-carrying slide.

It will be observed that the frame of the machine includes a number of braces, straps, and reinforcements, to which no specific reference has been made, such parts being freely used wherever it shall be deemed necessary to reinforce and strengthen the framework, which latter by preference is made very light. The framework of the machine also includes supporting means for a box or receptacle 71 and for carriers whereby the peas when picked or stripped from the vines are conveyed into said receptacle.

Two of the transverse frame-bars of the machine (designated, respectively, 72 and 73) are extended laterally in a direction opposite to the grain side of the machine, and upon these cross-bars are supported a pair of longitudinal bars 74 and 75. Straps or brackets 76 and 77, bolted to the upper and lower sides of the rectangular frame formed by the bars 72, 73, 74, and 75, serve to support the box or receptacle 71, which is provided on its under side with transverse cleats 78, supported by the brackets 77. Two of the cleats 78 are connected by a stay 79, the latter being connected, by means of a brace 80, with the lower end of one of the brackets 77 at the point where the latter is connected with the brace 13. The box or receptacle is preferably constructed of light material, so as not to add unnecessarily to the weight of the machine. At the same time it is thoroughly reinforced, so as to be capable of sustaining any weight of material that may be placed therein.

The frame of the machine supports a short

distance in rear of the stripping-cylinder a casing 81, at the ends of which are provided bearings for a pair of roller-carrying shafts 82 and 83, which cooperate to support an endless carrier 84, preferably constructed of textile or other suitable flexible material and equipped with transverse slats or flights 85. The shaft 83, which is located at the inner end of the carrier, is provided with a sprocket-wheel 86, connected by a chain 87 with a sprocket-wheel 88 upon the rear end of a shaft 89, the front end of which carries a bevel-pinion 90, meshing with a bevel-gear 91 upon the counter-shaft 27, from which motion is transmitted to the carrier 84. The latter, it will be observed, is located transversely to the body of the machine, and in front of the carrier trough or casing and parallel thereto is disposed a roller 92, which extends the entire length of said carrier. This roller is supported in suitable bearings connected with the frame of the machine, and it is disposed below and slightly in rear of the stripping-cylinder, so as to be out of the path of the teeth of the latter. 93 designates a suitably-supported upwardly and rearwardly inclined guide, the front edge of which is disposed slightly above, so as to be out of contact with the roller 92, and the rear edge of which is supported upon the front of the casing 81, in which the carrier 84 is located, the rear edge of said guide being extended over the carrier, so as to deposit upon the latter the material passing thereover. The roller 92 is mounted loosely in its bearing and is not positively driven.

94 is a suitably-supported casing provided with bearings for shafts 95 96, the former being at the lower and the latter at the upper end of said casing, which is supported in an inclined position and in longitudinal alinement with the carrier-casing 82. The shafts 95 and 96 are provided with rollers carrying an apron 97, provided with slats 98, constituting an elevator which receives material from the carrier 84 and discharges the said material into the receptacle 71. The carrier 97 is driven from the carrier 84 by means of a sprocket-wheel 99 upon the shaft 83 and a chain 100, connecting said sprocket-wheel with a sprocket-wheel 101 upon the shaft 95. Cleats 102 and 103, supported longitudinally under the leads of the carriers 84 and 97, respectively, prevent the lower leads of said carriers from sagging, and thereby becoming entangled with vines and the like. Similar cleats 102^a and 103^a are similarly disposed above the edges of the upper leads of said carriers to prevent the material moved by said carriers from working through and becoming lost or tangled between the upper and lower leads. The rear side of the carrier-casing 81 supports an upwardly and forwardly inclined deflector 104, whereby pods stripped from the vines with more or less violence by the action

of the stripping-cylinder will be deflected upon the carrier.

The tongue 105 of the machine, to which draft is attached by means of a whiffletree or equalizer 106 of ordinary construction, is pivotally mounted between brackets 107, depending from the cross-bar 5 of the frame. Said tongue is also guided vertically between brackets 108, depending from the cross-bar 4 and supporting a cross-bar 109, which limits the downward movement of the tongue. Rising from the deck or platform of the machine is an upright 110, carrying a segment rack or quadrant 111, concentrically with which is pivoted an adjusting-lever 112, the front end of which at a distance from the fulcrum thereof is connected with the tongue 105 by means of a link 113. The lever 112 is extended rearwardly within convenient reach of the driver to form a handle 114, whereby it may be manipulated, and said lever is provided with a spring-actuated dog or catch 115 of ordinary construction, engaging the rack-segment 111 for the purpose of retaining the lever 112 and the tongue 105 in adjusted position. This mechanism is provided for the obvious purpose of enabling the front end of the machine to be tilted to various positions, it being evident that it is the frame of the machine which is actually adjusted with relation to the tongue.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains. When the machine progresses over the field, it is supported and balanced upon the bull-wheel and the grain-wheel, both of which are so mounted as to admit of the vertical adjustment of the entire frame, the greater portion of the weight of which is obviously supported upon the bull-wheel, which latter is also the traction or power wheel and which by the weight of the machine is held in contact with and caused to grip the ground with a degree of tenacity which will prevent it from slipping or sliding inactively over the ground. From the bull-wheel or traction-wheel motion is transmitted in the manner herein described to the stripping-cylinder, which is rotated at a considerable speed, and also to the carriers, whereby material is conveyed into the receptacle. The forward side of the stripping-cylinder moves in a downward direction, and the vines operated upon will thus be beaten down and stripped longitudinally of the pods, which latter will be thrown violently in a rearward direction against the deflector 104, from which they rebound upon the carrier 84. The stripping action of the cylinder is much facilitated by the presence of the roller 92, under which the stripped vines will pass out of the range of the cylinder, while the pods will be guided

over the inclined guide 93, over which such pods as are not stripped from the vines with sufficient violence to cause them to be thrown against the deflector 104 will pass onto the carrier 84. From the carrier 84 the pods will pass onto the carrier 97, whereby they are conveyed into the receptacle 71.

It will be seen that the bars 50, upon which the stripping-cylinder is supported, are capable of being adjusted longitudinally, as well as vertically, thereby enabling the stripping-cylinder to be adjusted for operation in whichever position shall be considered most advantageous according to the condition of the crop that is to be operated upon. This adjustment will obviously be attended to prior to the commencement of operations.

The tilt of the machine may be adjusted by the driver while the machine is in operation by means of the adjusting-lever 112. It may here be stated that the driver's seat 39 is preferably connected adjustably with the frame of the machine in order that the weight of the driver may be utilized for balancing the latter. To this end there is supported upon the deck or platform of the machine a pair of transverse cleats 117, supporting a longitudinal bar 118, having a slot 119, in which a pair of clamping-bolts 120 and 121 are longitudinally adjustable, the bolt 120 passing through the seat-supporting spring 122, while the bolt 121 serves to secure a foot-rest 123 adjustably in position.

When the bars 50, supporting the stripping-cylinder, are adjusted to place said cylinder in a forward direction, the chain 60, by which said cylinder is driven, is apt to become loose. For the purpose of tightening said chain a tightening-sprocket 124 is provided, said tightening-sprocket being plainly seen in Figs. 3 and 5 of the drawings. While this improved machine has been designated and described as a pea-harvester, its use is not necessarily limited to the harvesting of peas inasmuch as the machine embodying the principles of the invention may be successfully used for harvesting other crops. In order to adapt the machine particularly for the harvesting of other crops than peas, it might become necessary or desirable to modify certain parts thereof—such as, for instance, the size, shape, and disposition of the stripping-teeth; but such modifications would be wholly within the scope of the invention.

Having thus described the invention, what is claimed is—

1. In a machine of the class described, a ground-engaging bull-wheel, a frame mainly supported upon and vertically adjustable with relation to said bull-wheel, a stripping-cylinder journaled upon the frame and provided with radially-extending teeth, means for transmitting motion from the bull-wheel to the stripping-cylinder, a carrier disposed in rear of the stripping-cylinder, and a vine-engaging

roller disposed between and beneath the stripping-cylinder and the carrier.

2. In a machine of the class described, a frame, a stripping-cylinder and bars adjustable longitudinally and vertically in the frame and affording bearings for the shaft of the stripping-cylinder.

3. In a machine of the class described, a bull-wheel and a grain-wheel, a frame supported by and vertically adjustable with relation to said wheels, a pair of slotted bars longitudinally and vertically adjustable in the frame, a shaft journaled upon said bars, a stripping-cylinder upon said shaft, and means for transmitting motion to said shaft from the bull-wheel.

4. In a machine of the class described, a suitably-constructed frame, a stripping-cylinder mounted for rotation in said frame and provided with radially-extending teeth, a carrier disposed transversely in rear of the stripping-cylinder, a vine-engaging roller disposed between and beneath the stripping-cylinder and the carrier, and an inclined guide supported upon the carrier-frame with its front edge slightly above and free from contact with the vine-engaging roller.

5. In a machine of the class described, a stripping-cylinder having radially-extending teeth in combination with a vine-engaging roller supported behind and beneath said stripping-cylinder.

6. In a machine of the class described, the combination with a stripping device, of a vine-engaging roller supported behind and beneath said stripping device.

7. The combination with a rotary vine-stripper, of a transversely-disposed carrier, and a vine-engaging roller disposed between and beneath said stripper and carrier.

8. The combination with a vine-stripping device supported for rotation, a carrier, a roller disposed between and beneath said stripping device and carrier, and an inclined guide extending from said roller to said carrier.

9. In a machine of the class described, a stripping-cylinder mounted for rotation and having radially-extending teeth, in combination with a vine-engaging roller supported for rotation beneath and behind the stripping-cylinder, and means for positively driving the latter.

10. In a machine of the class described, a stripping-cylinder mounted for rotation, a carrier-casing in rear of said cylinder, an endless carrier in said casing, a vine-engaging roller supported for rotation between and beneath the stripping-cylinder and the carrier-casing, an inclined guide supported upon the carrier-casing and having its front edge supported above and free from contact with the vine-engaging roller, and an upwardly and forwardly inclined deflector supported upon the rear part of the carrier-casing.

11. In a machine of the class described, a frame, uprights or brackets rising from said frame, adjusting-bolts connected with said brackets, longitudinally-slotted supporting-bars mounted upon said adjusting-bolts, and a stripping-cylinder supported for rotation upon said bars.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SHELBY NETTLESHIP.

Witnesses:

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