J. A. KITE.

BEET HARVESTER.

APPLICATION FILED JULY 10, 1914.

1,192,644.

Patented July 25, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

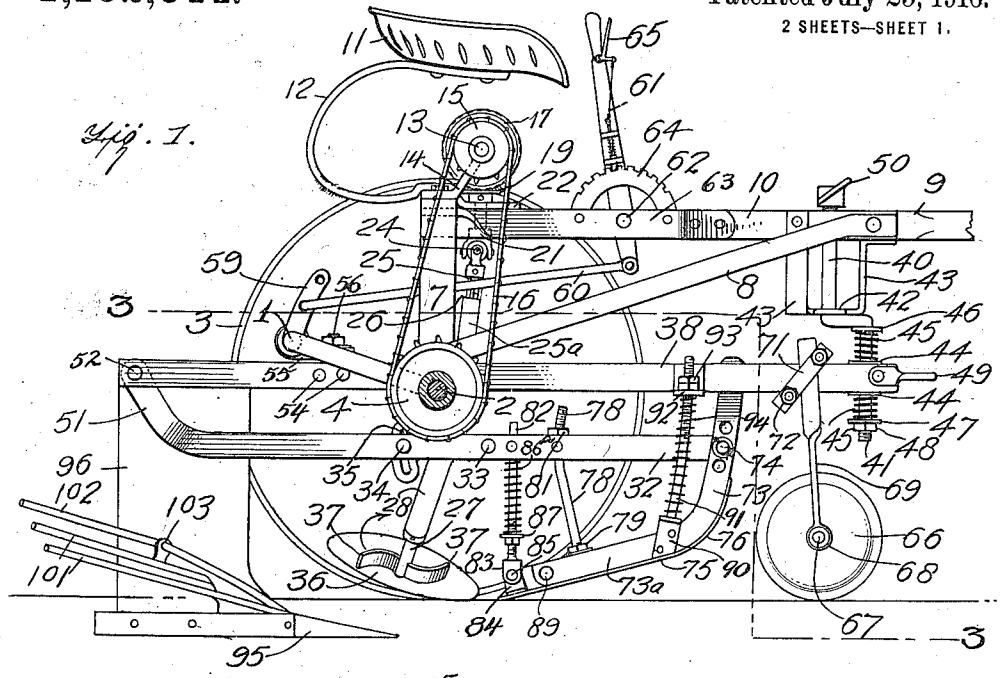
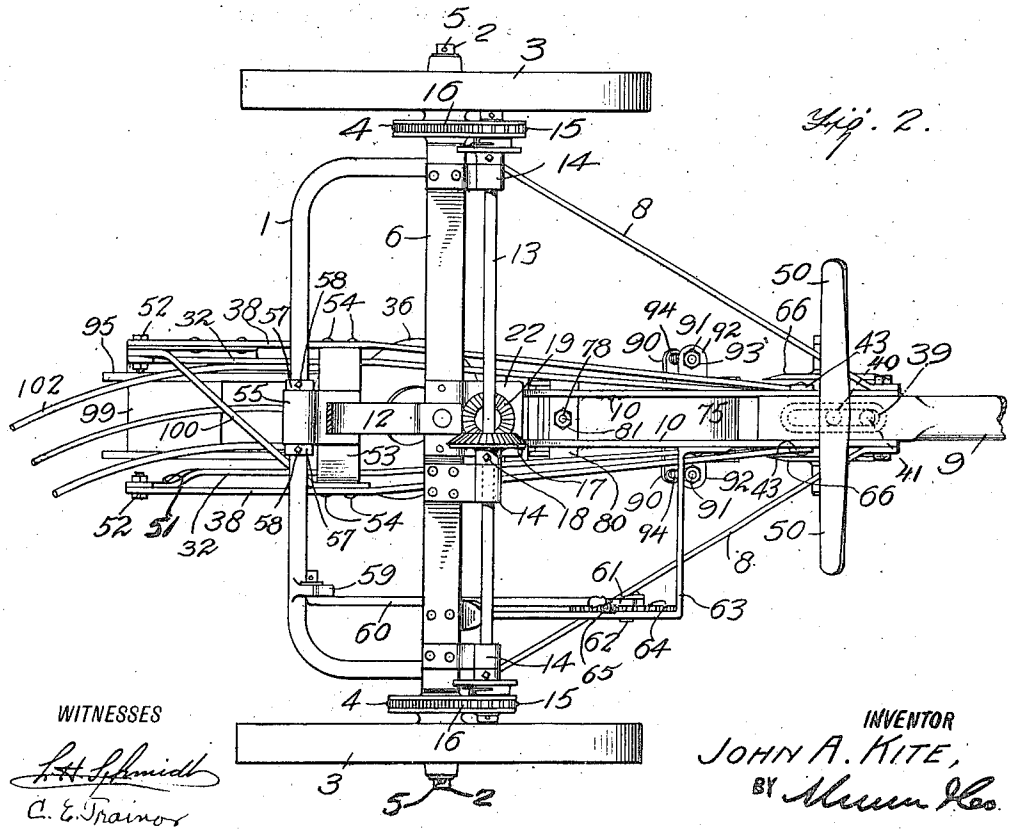


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

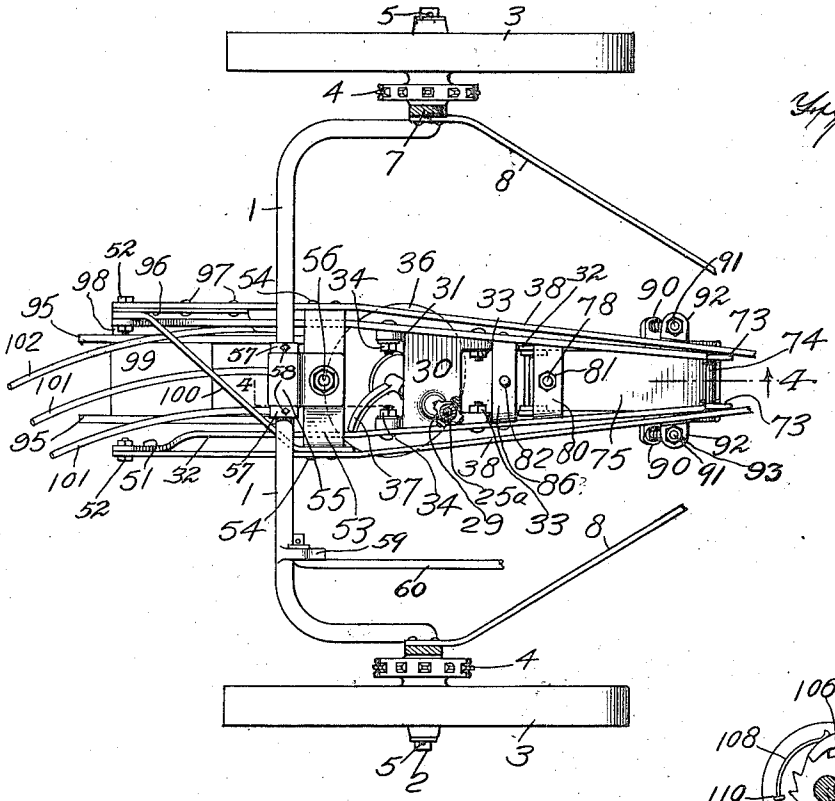


Fig. 7.

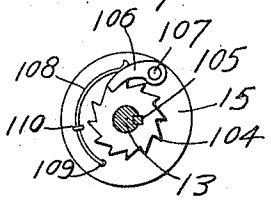


Fig. 4.

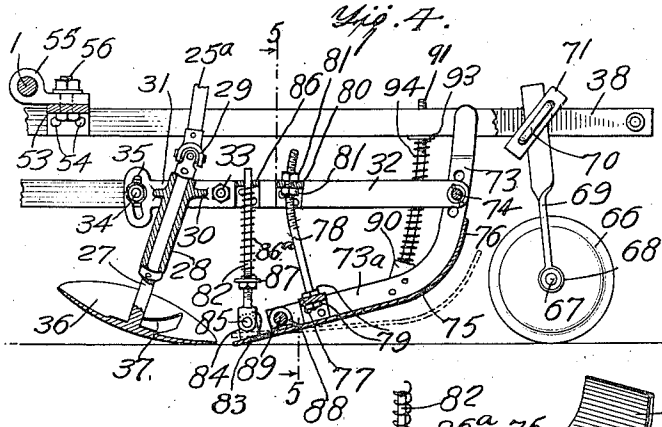


Fig. 5.

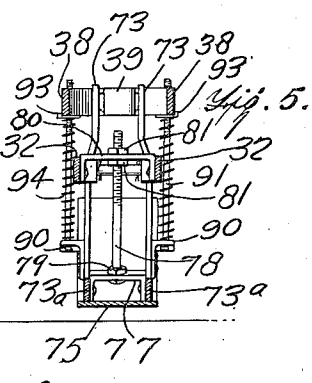
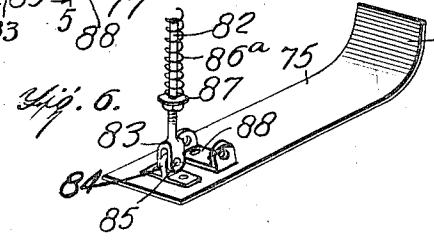


Fig. 6.



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BEET-HARVESTER.

1,192,644. Specification of Letters Patent. Patented July 25, 1916.

Application filed July 10, 1914. Serial No. 850,158.

To all whom it may concern:

Be it known that I, JOHN A. KITE, a citizen of the United States, and a resident of Las Animas, in the county of Bent and State of Colorado, have made certain new and useful Improvements in Beet-Harvesters, of which the following is a specification.

My invention is an improvement in beet harvesters, and has for its object to provide a device of the character specified, wherein a main wheel supported frame is provided and an auxiliary frame mounted to yield upwardly with respect to the main frame, the auxiliary frame carrying means for removing the dirt from the beets, means for crowning the beets, means for guiding the crowning mechanism to insure the crowning of the beets at the proper point, and means for digging the beets.

In the drawings: Figure 1 is a side view of the improved harvester, Fig. 2 is a top plan view, Fig. 3 is a section taken on the line 3—3 of Fig. 1, Fig. 4 is a section on the line 4—4 of Fig. 3 looking in the direction of the arrow adjacent to the line, Fig. 5 is a section on the line 5—5 of Fig. 4 looking in the direction of the arrows adjacent to the line, Fig. 6 is a perspective view of the guide for guiding the crowning mechanism, and Fig. 7 is a detail section of the connection between the sprocket wheels and the operating shaft.

The present embodiment of the invention comprises an axle consisting of a body 1 and alined laterally offset spindles 2, on which are journaled wheels 3, each having a sprocket wheel 4 secured thereto at its inner side. The wheels are held in place by cotter pins 5, and a substantially U-shaped plate consisting of a body 6 and depending arms 7 is connected with the axle.

The arms 7 of the plate are journaled on the spindles at the inner side of the sprocket wheels 4, and inclined braces 8 are connected with the arms near their lower ends, and the said braces extend forwardly and upwardly to a connection with the opposite sides of the rear end of a tongue 9. Plates 10 are secured at their front ends to the opposite sides of the tongue, and the said plates extend rearwardly to a connection with the body of the plate 6—7, and at the center of the said body. A seat 11 is connected to the center of the body 6 of the plate 6—7, by means of a resilient seat plate 12.

A shaft 13 is journaled in bearing brackets 14 secured to the body of the plate 6—7 and extending forwardly and upwardly therefrom, and a sprocket wheel 15 is secured to each end of the shaft, the sprocket wheels being in register with the wheels 4 on the spindles. A sprocket chain 16 connects each wheel 15 with the adjacent wheel 4, and a bevel gear wheel 17 is secured to the shaft 13 intermediate its ends, by means of a set screw 18.

The bevel gear wheel 17 meshes with a bevel gear wheel 19 on the upper end of a flexible shaft consisting of a series of sections. The bevel gear wheel 19 is secured to the upper end of a stub shaft 21. The stub shaft is journaled between the plates 10 before mentioned, in a bearing plate 22 secured to the upper edges of the plates 10 and to the body of the plate 6—7, and at its lower end the stub shaft is connected by a universal joint 24 to the inner member of a telescoping shaft, consisting of the inner and outer members 25 and 25^a.

The members 25 and 25^a are feathered together as indicated at 26, and the lower end of the outer section 25^a is connected by a universal joint 29 to the upper end of a shaft 27 journaled in a bearing sleeve 28 adjustably mounted in a manner to be presently described. The bearing sleeve 28 is integral with a bearing plate 30, provided at each end with an extension 31. The extensions 31 lap upon the inner faces of the members of a pair of plates 32, mounted in a manner to be presently described, and are adjustably connected thereto by means of bolts 33 and 34.

Each extension 31 is provided at its front end with an opening through which and a registering opening in the adjacent plate 32 a bolt 33 is passed. At the rear end each extension is provided with an arc-shaped slot 35, and a bolt 34 is passed through each slot and a registering opening in the adjacent plate 32. It will be evident that by loosening the nuts of the bolts 33 and 34, the bearing sleeve 28 may be adjusted.

A concavo-convex disk 36 is rigid with the

lower end of the shaft 27, the said disk being arranged with its concave face upwardly. Curved vanes 37 are connected with the upper face of the disk 36, the said vanes extending in opposite directions and being similarly curved. The plates 32 before mentioned constitute a common support for the crowning means, namely, the disk 36 and the guide for determining the point at which the beets are to be crowned, to be later described, and the said common support is connected with an auxiliary frame to be described. The said frame comprises plates 38 which are connected at their forward ends by a loop-shaped or oblong guide 39. The guide 39 is spaced with its longitudinal center half way between the plates 38, and with its long axis longitudinal to the plates.

A rod comprising laterally offset portions 40 and 41 is provided for connecting the front end of the auxiliary frame to the main frame. The portion 40 of the rod passes upwardly through the tongue while the portion 41 passes downwardly through the guide 39. The portion 40 of the rod is journaled in the tongue and in a bearing plate 42 held below the tongue by means of three arms 43 connected to the tongue. Washers 44 are arranged on the portion 41 of the rod above and below the guide 39, and a coil spring 45 encircles the rod at the outer side of each washer. The upper end of the uppermost spring 45 bears against a washer 46 which encircles the portion 41 of the rod at its upper end, while the lower spring 45 bears at its lower end against a washer 47, held in place by a nut 48 threaded on to the said portion 41. The front end of the auxiliary frame is thus yieldingly mounted to move either upwardly or downwardly.

A clevis 49 is connected with the front end of the auxiliary frame, that is with the front ends of the plates 38. Arms 50 extend in opposite directions and laterally with respect to the machine from the upper end of the portion 40 of the rod 40—41, and above the tongue, and the said arms are curved upwardly at their outer ends to form foot plates for engagement by the feet of the driver in the seat 11. By pressing on the arms with his feet, the driver may swing the rod 40—41, to move the front end of the auxiliary frame laterally in either direction.

The plates 38 diverge outwardly from their front ends to near their centers, and then extend parallel, as shown in Figs. 2 and 3. Each of the plates 32 before mentioned has an upward and outwardly extending extension 51 at its rear end, and the free end of each extension 51 is connected to the rear end of the adjacent plate 38, by means of a bolt and nut 52. Intermediate their ends the plates 38 are connected by a cross plate 53. The body of the plate extends transversely between the plates 38, and the ends of the plate are bent downward and lapped upon the inner faces of the plates 38, and are secured thereto by bolts or rivets 54.

A bearing sleeve 55 is secured to the body 53 of the plate by means of a bolt and nut 56, and the said sleeve engages the body 1 of the axle, at its center. Collars 57 are arranged on the body of the axle at each side of the bearing sleeve, and each collar is held in place by a set screw 58. The body of the axle is provided with an arc-shaped upstanding arm 59, and the arm has a series of openings for engagement by an angular lug on the rear end of a link 60. The front end of the link is pivoted to the lower end of a lever 61, which is pivoted near its lower end, as indicated at 62, to an angle bracket 63, connected with the body of the plate 6—7, and with the adjacent plate 10. A toothed sector 64 is also secured to the angle bracket, and the lever has spring operated latch mechanism 65 for engaging the teeth of the sector to hold the lever in adjusted position. It will be obvious that when the lever is released from the sector and is moved, the body 1 of the axle may be raised or lowered, with respect to the spindles, to raise or lower the rear end of the auxiliary frame.

A cutting disk 66 is arranged at each side of the auxiliary frame at the front thereof, each disk having a journal pin 67 which is held in a bearing 68 on the lower end of a bar or standard 69. The upper end of each bar or standard is held to the adjacent plate 38, by means of a U-shaped clip 70. The arms of each clip are passed through openings in the ends of a plate 71, and astride of the upper end of the bar 69 and the adjacent plate 38, and through openings in the ends of another plate 71 arranged on the outer face of the plate 38. The arms are then engaged by nuts 72. It will be evident that by loosening the nuts the cutting disks may be adjusted vertically, and longitudinally of the auxiliary frame.

An angle plate consisting of portions 73 and 73ª is connected to the front end of each of the plates 32. The portions 73—73ª are arranged at an obtuse angle with respect to each other, and the portion 73 is provided with a series of openings intermediate its ends. One of these openings is adapted to register with an opening in the front end of the adjacent bar 32, and a pin 74 is passed through the registering openings and pivotally connects the plate 32 to the portion 73 of the angle plate. The portions 73—73ª of the angle plates do not join each other abruptly, but gradually merge into each other, and the plate 75 shown in Fig. 6 is arranged on the under edges of the angle plates. It will be noticed that the front end of the plate 75 is curved upwardly, as indicated at 76 to fit the convex edges of the angle plates, and the free edge of this

portion 76 extends well up on the portions 73 of the angle plate. The rear ends of the portions 73ª of the angle plates are rigidly connected by a U-shaped clip 77, and one end of a rod 78 is passed through a central opening in the body of the clip, and nuts 79 are threaded on to the rod above and below the body of the clip. The upper end of the rod passes through a U-shaped clip 80 that connects the plates 32 near their front ends.

The upper end of the rod 78 is curved, as shown in Fig. 4, and lock nuts 81 are threaded on to the rod above and below the clip. A second rod 82 is connected with the plate 75 at its rear end, the rod 82 having a fork 83 at its lower end. The arms of the fork extend on opposite sides of a perforated lug 84 which extends upwardly from the upper face of the plate 75 at its rear end, and a pin 85 is passed through the arms and the lugs to pivotally connect the rod to the plate. The upper end of the rod extends through an opening in a U-shaped clip 86 that connects the plates 32 in the rear of the clip 80.

A coil spring 86ª encircles the rod between the clip 86 and a stop 87 adjustable on the rod. The stop 87 is in the form of a nut and washer, the nut being threaded on to the rod. A U-shaped clip 88 is secured to the upper face of the plate 75 near its rear end, and the arms of the clip have openings which are adapted to register with openings in the rear ends of the portions 73ª of the angle bars 73—73ª, and a pin 89 is passed through the registering openings to connect the rear end of the plate 75 pivotally to the angle bars.

An angle bracket 90 is connected to the portion 73ª of each of the angle plates 73—73ª, near its connection with the portion 73, and each angle bracket has an opening through which is passed one end of a rod 91. Each rod 91 is headed below the angle bracket, and the upper end of each rod passes through a perforated lug 92 on the adjacent plate 38. Nuts 93 are threaded on to the rod above the lug, and a coil spring 94 encircles each rod between the lugs 90 and 92. The entire mechanism comprising the angle plates 73—73ª and the plate 75—76 is thus yieldingly mounted, being normally pressed downward by the springs 86ª and 94. The front end of the plate 75—76 may also swing downward with respect to the angle plates, as indicated in dotted lines in Fig. 4, but the spring 86ª immediately returns the plate to original position, as soon as the pressure on the same is relaxed. The angle bars 73—73ª may be adjusted with respect to the plates 32, swinging on the pivot pin 74, by means of the rods 78.

The rear end of the plate 75 is just in front of the front edge of the disk 36, and the disks 66 which are arranged parallel and in register are just in front of the portion 76 of the plate 75—76. The disk 36 is the crowning mechanism for crowning the beets, and a plow for lifting the beets is arranged behind the crowning mechanism. This plow comprises two points 95 arranged in spaced parallel relation, and supported by a plate 96 which is connected at its upper end, as indicated at 97, to one of the plates 38. At its lower end the plate 96 is bent laterally, as indicated at 98, and is connected to one of the plows 95. The other plow 95 is connected to the first-named plow by means of a plate 99 which is arranged between the plows and connected to both of them. A brace 100 is arranged diagonally of the plates 38 at the plow, and a deflecting rod 101 is connected to each plow. A second rod 102 is connected with the plate 96, and all of the rods curve rearwardly and laterally away from the supporting plate 96 for the plows.

A bearing lug 103 is provided for holding the rod 102 in proper position. Each of the sprocket wheels 15 is loose on the shaft 13, and is connected to the shaft by pawl and ratchet mechanism shown in Fig. 7. Adjacent to each wheel 15 a ratchet wheel 104 is keyed to the shaft 13, as indicated at 105, and a pawl 106 is pivoted to the adjacent face of each sprocket wheel, as indicated at 107. The free end of each pawl engages the adjacent ratchet wheel, and is held in engagement therewith by a spring 108. One end of the spring engages the pawl, and the other end is received in an opening 109 in the face of the ratchet wheel. Intermediate its ends the spring passes through an eye 110 on its sprocket wheel. So long as the wheels 3 are moving forwardly the shaft 13 will be carried therewith, but the wheels 3 may move freely rearwardly without affecting the wheels 15, the pawls slipping idly over the ratchet wheels.

In operation, with the parts adjusted to the proper depth the machine is drawn through the field in any desired manner. As the machine moves along, the cutting disks 66 cut the ground on each side of the row, and also cut all the superfluous top and the weeds. As the machine moves farther the plate 75—76 engages the beets and the plate will be lifted by the beets, if they extend above the ground. The plate is in fact a guide for determining the point at which the edge of the disk 36 will engage the beets to crown the same. If for instance a beet is of larger size and higher above the ground, as the plate 75 passes over the beets the entire front end of the auxiliary frame will be lifted, also lifting the cutting disk 36. Thus practically the same amount of crown will be cut from each beet. After they have been crowned, the plows 95 which run be-

neath the surface of the ground will engage opposite sides of the beets and will gradually lift them from the ground, the rods 101 and 102 moving the beets to one side of the row.

The vanes 37 on the disk move the tops to one side, so that they do not collect in the concave surface of the disk. By means of the lever 61 the auxiliary frame may be lifted into inoperative position, so that neither the cutting nor digging elements will engage the ground, thus saving wear and tear on the machine during transportation. By means of the arms 50 the driver may swing the front end of the auxiliary frame to cause it to follow the irregular course of the plants in the row. When the wheels 3 are turning rearwardly, the wheels 15 will not be affected.

The above described elements, namely, the axle, the U-shaped plate 6—7, the tongue and connected parts constitute a main frame, while the plates 38 form, as before stated, an auxiliary frame. This auxiliary frame supports the crowning mechanism and the guide, the guide being connected to a support for the same which in turn is yieldingly connected to the common support or auxiliary frame.

I claim:

1. In a beet harvester, a main frame, an auxiliary frame connected to the main frame and mounted to yield with respect to the said main frame, crowning mechanism for the beets, said mechanism comprising a disk, means for supporting the disk for rotation on an approximately vertical axis, a guide for determining the point at which the beets will be crowned arranged in front of the crowning mechanism and adapted to move over and in contact with the tops of the beets, a support for the guide yieldingly connected with the auxiliary frame, a pivotal connection between the support and the guide, and a yielding connection between the guide and the auxiliary frame for permitting the guide a limited movement with respect to its support.

2. In a beet harvester, a supporting frame, crowning mechanism for the beets, a guide for determining the point at which the beets will be crowned arranged in front of the crowning mechanism, a common support for the crowning mechanism and the guide, said support connected to the frame and mounted to yield with respect to the frame.

3. In a beet harvester, comprising a main frame, an auxiliary frame, topping and crowning mechanism for topping and crowning the beets, a guide for determining the point at which the beets will be topped and crowned, arranged in front of the crowning mechanism, a common support for the guide and the crowning mechanism, a yielding connection between the said common support and the auxiliary frame for permitting the support to yield upwardly, and a yielding connection between the guide and the common support.

4. In a beet harvester, comprising a main frame, an auxiliary frame, topping and crowning mechanism for topping and crowning the beets, a guide for determining the point at which the beets will be topped and crowned arranged in front of the crowning mechanism, a common support for the guide and the crowning mechanism, a yielding connection between the said common support and the auxiliary frame for permitting the support to yield upwardly, said guide comprising an approximately horizontal plate adapted to ride over the beets and having its front end curved upwardly, a hinge connection between the plate and the common support intermediate the ends of the plate, and near the rear end thereof, said rear end being mounted to yield upwardly, and resilient means normally pressing the said end downward.

5. In a beet harvester, comprising a main frame, an auxiliary frame, topping and crowning mechanism for topping and crowning the beets, a guide for determining the point at which the beets will be topped and crowned arranged in front of the crowning mechanism, a common support for the guide and crowning mechanism, a yielding connection between the said common support and the auxiliary frame for permitting the support to yield upwardly, said crowning mechanism comprising a disk, means for supporting the disk for rotation on an approximately vertical axis, a connection between the said supporting means and the common support for permitting the inclination of the axis of rotation of the disk to be varied, and oppositely arranged approximately radial deflecting vanes for the beet tops on the upper face of the disk.

6. In a beet harvester, comprising a main frame, an auxiliary frame, topping and crowning mechanism for topping and crowning the beets, a guide for determining the point at which the beets will be topped and crowned arranged in front of the crowning mechanism, a common support for the guide and the crowning mechanism, a yielding connection between the said common support and the auxiliary frame for permitting the support to yield upwardly, said crowning mechanism comprising a disk, means for supporting the disk for rotation on an approximately vertical axis, a connection between the said supporting means and the common support for permitting the inclination of the axis of rotation of the disk to be varied.

7. In a beet harvester, a frame, crowning mechanism supported by the frame, a guide for determining the point at which the beets

will be crowned, said guide comprising a support, a common support for the guide support and the crowning mechanism connected to the frame, said common support being yieldingly connected to the frame to move upward with respect thereto, the guide comprising a plate hinged intermediate its ends to the guide support and normally inclining upward toward its front end, and a spring arranged between the rear end of the guide and the common support and normally holding the front end of the guide elevated.

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