E. C. WINCHESTER.

MACHINE FOR TOPPING BEETS.

APPLICATION FILED MAR. 27, 1913.

1,074,827. Patented Oct. 7, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

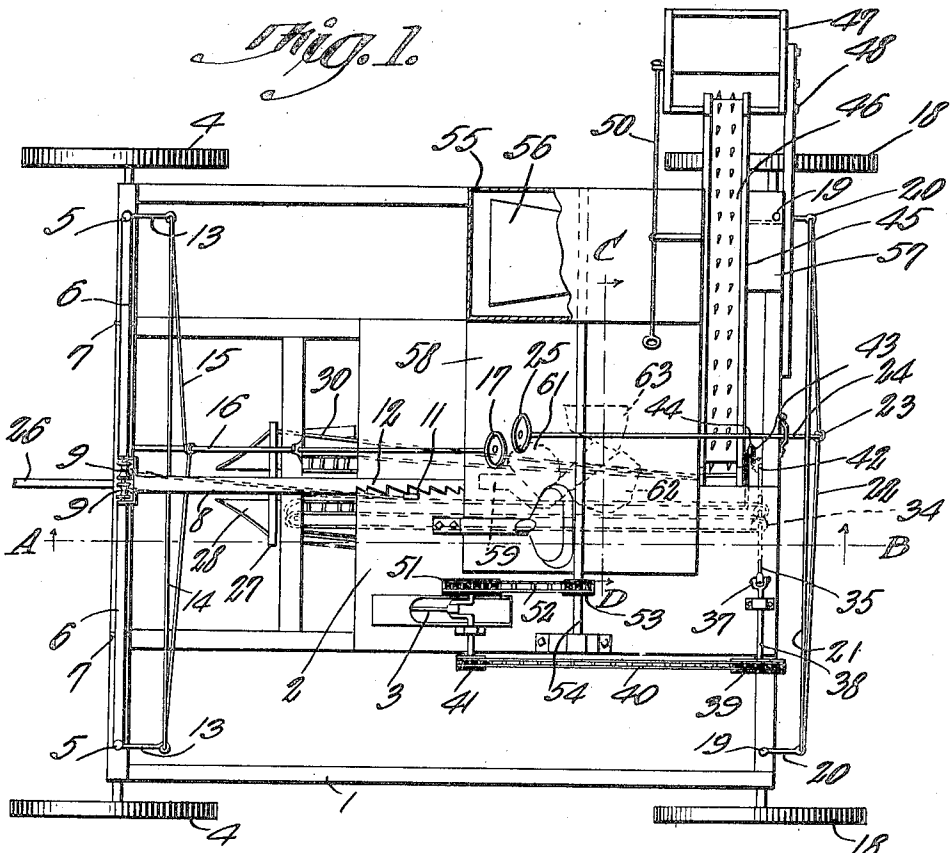
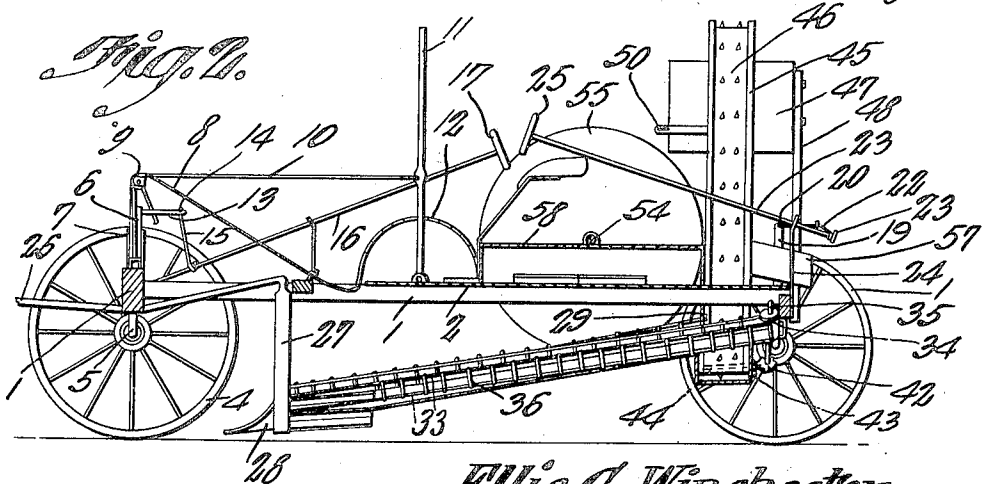


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

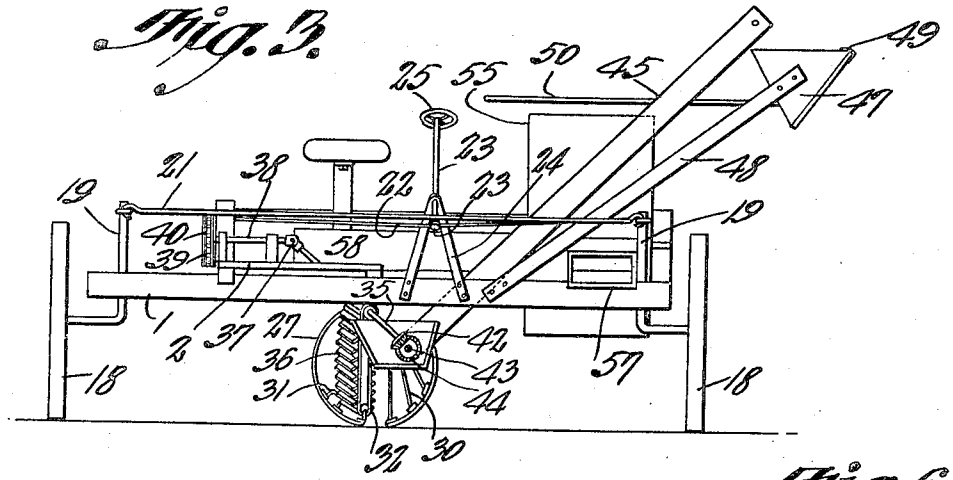


Fig. 6.

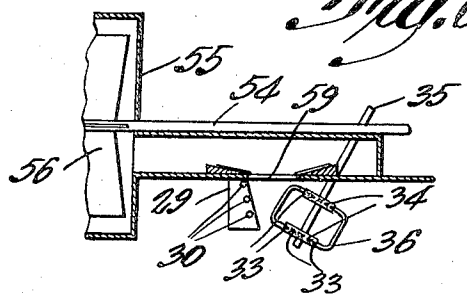


Fig. 5.

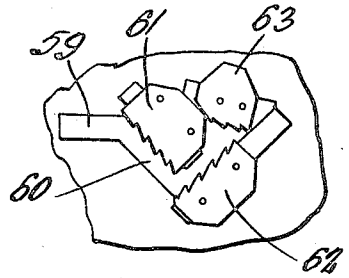
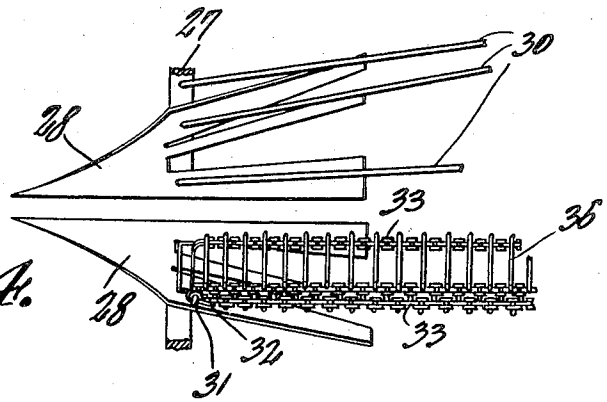


Fig. 4.



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UNITED STATES PATENT OFFICE.

ELLIS C. WINCHESTER, OF BILLINGS, MONTANA.

MACHINE FOR TOPPING BEETS.

1,074,827. Specification of Letters Patent. Patented Oct. 7, 1913.

Application filed March 27, 1913. Serial No. 757,222.

To all whom it may concern:

Be it known that I, ELLIS C. WINCHESTER, a citizen of the United States, residing at Billings, in the county of Yellowstone and State of Montana, have invented a new and useful Machine for Topping Beets, of which the following is a specification.

This invention relates to machines for topping beets, one of its objects being to provide pneumatic means for lifting the tops of the beets into position to be engaged by cutters whereby the tops are removed during the movement of the beets from the digger to the delivering elevator.

A further object is to provide a suction element which not only serves to set up a current for the purpose of lifting the tops into position to be acted on by the cutters but also acts to discharge the severed tops from the machine.

A further object is to provide improved means for conveying the beets to the topping mechanism, said conveyer being so constructed as to cause the beets to roll while being conveyed to and while passing the cutters, thus to insure the proper positioning of all of the tops so that they will be carried by the air currents into position to be cut.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a plan view of the machine, parts being broken away. Fig. 2 is a section on line A—B Fig. 1. Fig. 3 is a rear elevation. Fig. 4 is a plan view of the digger and the adjacent portion of the conveyer. Fig. 5 is a plan view of the cutting blades. Fig. 6 is a section on line C—D Fig. 1, showing the position of the cutting blades relative to the conveyer thereunder.

Referring to the figures by characters of reference 1 designates a wheel supported frame adapted to be propelled by any suitable power and mounted on this frame is a platform 2 on which a motor 3 is arranged.

The front or steering wheels 4 of the machine are provided with upwardly extending spindles 5 which are mounted to slide upwardly and downwardly within the front end of the frame, each spindle being engaged by the outer end of a lifting lever 6 mounted on the front end of the frame and extending transversely thereof, said lever being fulcrumed at a point between its ends, as indicated at 7. A bracket 8 is mounted on the front portion of the machine and carries a guide spool 9 over which extend cables 10 or the like. These cables are connected to the inner ends of the levers 6 and extend upwardly from said ends over the spool 9 and thence rearwardly to a lever 11 which is fulcrumed on the platform 2 and is provided with any suitable means, such as a toothed segment 12, for holding it in any position to which it may be moved. Thus it will be seen that by pulling the lever 11 rearwardly, the flexible cables 10 will pull upwardly on the inner ends of levers 6, thus causing the outer ends of the levers to bear downwardly on the spindles 5 and cause the front end of the frame 1 to be elevated.

Each spindle 5 is provided with a radially extending arm 13, the two arms being connected by a cross bar 14 so that the spindles will be caused to operate together. Actuating cables, chains or the like, indicated at 15, are connected to the arms 13 and extend up to and are wrapped about a steering post 16 extending upwardly and rearwardly upon the front portion of the machine, this post being designed to be rotated in any suitable manner, as by means of a hand wheel 17 or the like. The rear supporting wheels 18 of the machine are also provided with upwardly extending spindles 19 adapted to rotate within the rear end portion of the frame 1, these spindles being provided with radially extending arms 20 connected by a bar 21 whereby the two spindles will be caused to rotate together. Cables, chains, or other suitable flexible connections indicated at 22 are secured to the arms 20 and also to a spool 23 secured to one end of an upwardly and forwardly inclined post 24 having a handle wheel 25 or the like whereby it can be rotated conveniently. Thus it will be seen that by manipulating the wheels 17 and 25 the machine can be quickly steered in any desired direction.

A draft bar 26 extends through the front

end of the frame 1 at the center thereof and terminates, at its rear end, in a downwardly extending yoke 27, the two arms of the yoke being bowed so as to define almost a complete circle. Secured to the lower end of each arm of the yoke is a plow 28 constituting means for digging the beets. A short bracket 29 extends downwardly from the rear portion of the machine and is connected to one of the arms of the yoke by means of guide rods 30 which diverge forwardly from the bracket 29 to one of the arms of the yoke 27. These guide rods are so spaced as to permit dirt to fall freely between them without, however, permitting the beets to pass therebetween. Mounted on the other arm of the yoke 27 is a bracket 31 on which spaced sprockets 32 are journaled. Each of these sprockets engages an endless chain 33 and the two chains are extended upwardly and rearwardly along parallel lines and engage sprockets 34 secured to a shaft 35 which is inclined downwardly and laterally toward the longitudinal center of the machine and extends upwardly through the platform 2. Shaft 35 is parallel with the axis of the sprockets 32 and thus it will be seen that the upper and lower flights of the chains 33 will occupy planes inclined downwardly toward the lower guide rods 30. In other words the chains and the guide rods form a substantially trough shaped structure which is inclined upwardly and rearwardly from the plows to a point close to but under the rear portion of the platform 2. The two chains 33 are connected by transversely arranged bail-shaped cleats or brackets 36.

The upper end of shaft 35 is connected by a universal joint 37 to a transverse shaft 38 having a sprocket 39 thereon which receives motion, through a chain 40, from a sprocket 41 driven by the motor 3. The lower end of shaft 35 has a gear 42 which meshes with a gear 43 secured to a shaft 44 extending transversely within the lower end of an upwardly and laterally inclined elevator casing 45. Mounted on the shaft and extending longitudinally within the casing is an elevator 46 the upper end of which is adapted to discharge into a hopper 47 supported, as by means of standards 48, beyond one side of the frame 1. The bottom of the hopper 47 is hingedly mounted, as indicated at 49 and a rod 50 may be connected to this hinged bottom so that, by manipulating the rod, the bottom can be moved to open or closed position. In this manner the contents of the hopper can be dumped whenever desired.

The motor 3 drives a sprocket 51 which transmits motion, through a chain 52, to a sprocket 53 secured on a transverse shaft 54. This shaft extends into a drum 55 and secured to the shaft so as to rotate freely in the drum is a fan 56. The drum has a tangential outlet spout 57 at the rear thereof and from which material is adapted to be discharged onto the ground or into any suitable receptacle provided therefor. One side of the drum 55 has an air trunk 58 opening thereinto, this trunk being extended transversely over a portion of the platform 2 and formed in the bottom of the trunk and directly over the rear portion of the trough formed by the rods 30 and the chains 33 is an opening 59 in the form of an elongated slot the back portion of which is enlarged, as shown at 60. Secured upon the bottom of the trunk so as to extend over the enlarged portion 60 of the opening are cutting blades 61, 62 and 63. The blade 61 is extended diagonally across the front end portion of the enlarged portion 60 of the opening and substantially at right angles to the blade 62 which is extended diagonally across the rear of said enlarged portion the third blade 63 being arranged with its cutting edge substantially longitudinally of the opening and back of blade 61 and to one side of the blade 62. Thus a tortuous or zigzag passage is formed between the blades and the walls of the opening 59 and its enlarged portion 60.

In using the apparatus the motor 3 will drive the shafts 38 and 54 through the mechanism provided therefor so that the chains 33 will thus be actuated, elevator 46 will be driven, and fan 56 will be revolved. The fan will create a suction upwardly into its trunk 58 through the opening 59—60. By means of the chains or cables 10 the front end portion of the frame 1 can be caused to move upwardly or downwardly on the spindles 5, thus raising or lowering the plows 28 so as to cause them to dig to any desired depth. As the machine moves forward these plows will dig up the beets and said beets will be deposited on the front end portions of the rods 30 and of the chains 33. The bails or cleats on the chains will engage the beets and drag them upwardly along the rods 30, these rods, by reason of their frictional engagement with the beets, causing the beets to roll as they are moved upwardly. Thus the dirt will be quickly loosened from the beets and will be discharged between the chains and between the rods. Furthermore the tops of the beets will be held extended upwardly. As each beet is brought into position under the opening 59, the air currents rushing through the opening and into the trunk 58 will be sufficiently strong to suck the tops upwardly into the opening 59. As the beets continue to move rearwardly the tops will be carried along the tortuous passage formed by the blades and said tops will thus be slid along the cutting edges of the blades and severed by the time the beets have completely passed the opening. The

tops, when severed, will be sucked by the fan into the drum 55 and then discharged through the outlet spout 57. The beets, after passing the opening 59—60 are discharged into the bottom end of the elevator casing where they are engaged by the elevator 46 and conveyed upwardly to the hopper 47. After a desired number of beets have accumulated within the hopper, the hinged bottom of the hopper can be opened and the beets thus discharged into any suitable receptacle provided therefor.

Importance is attached to the fact that the rods 30 and the chains 33 together with the bails 36 connecting the chains coöperate not only to separate the beets from the dirt but also to roll the beets while they are passing the opening 59—60. Thus all of the tops are brought into contact with the blades 61, 62 and 63 and the accurate and complete severing of the tops is therefore insured.

What is claimed is:—

1. In a machine for topping beets, the combination with a cutting element, and means for conveying beets past said element, of pneumatic means for holding the tops of the beets against the cutting element to sever the tops during the movement of the beets past the element.

2. In a machine of the class described, the combination with a cutting element, and means for conveying beets past said element, of suction means for positioning the tops of the beets upon said cutting element and holding them in such position during the movement of the beets past the element.

3. In a beet topper the combination with severing means and means for conveying beets past the severing means, of pneumatic means for holding the tops of the beets against the severing means during the movement of the beets.

4. In a beet topper the combination with severing means and means for conveying beets past and close to the severing means, of pneumatic means for holding the tops against the severing means during such movement of the beets and for discharging the tops when severed.

5. In a beet topping machine the combination with beet conveying means, of severing devices disposed along a tortuous opening, and close to the conveying means, and pneumatic means for sucking the beet tops into the opening and holding them upon the severing means during the movement of the beets with the conveyer.

6. In a beet topper the combination with a conveyer, of severing devices disposed along a tortuous opening adjacent the conveyer, and pneumatic means for sucking the tops of the beets into the opening and against the severing devices during the movement of the beets with the conveyer, and for discharging the severed tops from the machine.

7. A beet topping machine including a structure having an opening therein, a severing device adjacent the opening, means for conveying beets past the opening, and pneumatic means for sucking the tops of beets into the opening and against the severing device during the movement of the beets past the opening.

8. In a beet topping machine the combination with a structure having an opening therein, of severing devices disposed along the opening and coöperating with walls of the opening to form a tortuous passage, means for conveying beets past the opening, and pneumatic means for sucking the tops of the beets into the opening and for holding them against said severing devices during the movement of the beets past the opening.

9. In a beet topping machine the combination with a structure having an opening therein, of severing devices disposed adjacent the opening, means for conveying beets past the opening, and pneumatic means for sucking the tops of the beets into the opening and holding them against the severing devices until the tops are removed during the movement of the beets past the opening, said pneumatic means constituting means for discharging the severed tops from the machine.

10. A machine for topping beets including a structure having an opening therein, a severing device adjacent the opening, means extending past and close to the opening for conveying and rolling beets past the opening, and means for sucking the tops of the beets through the opening and holding them against the severing device during such movement of the beets.

11. A machine for topping beets including a structure having an opening therein, coöperating means extending past the opening for conveying beets and for rolling them, and pneumatic means for sucking the tops of the beets through the opening, holding the tops of the beets against the severing device during the movement of the beets past the opening, and discharging the severed tops from the machine.

12. In a machine for topping beets the combination with coöperating fixed and movable elements for conveying and rolling beets, of a structure having an opening adjacent the path of movement of the beets, a severing device adjacent the opening, and pneumatic means for sucking the tops of the beets into the opening and holding them against the severing device while the beets are being rolled and conveyed.

13. In a machine for topping beets the combination with a structure having an opening therein, of a severing device adja-

cent the opening, coöperating fixed and movable means for conveying beets past the opening and rolling them during such movement, pneumatic means for sucking the tops of the beets into the opening and for holding them against the severing device during such movement of the beets and for discharging the severed tops from the machine, and means for engaging and elevating the tops.

14. In a machine of the class described, the combination with digging means, of downwardly converging fixed and movable elements constituting means for conveying beets from the digging means and rolling them while being conveyed, a structure having an opening adjacent the path of movement of the beets, a severing device adjacent the opening, and pneumatic means for directing the tops into the opening and holding them against the severing device during the movement of the beets past the opening.

15. In a machine of the class described, the combination with digging means, of downwardly converging fixed and movable elements constituting means for conveying beets from the digging means and rolling them while being conveyed, a structure having an opening adjacent the path of movement of the beets, a severing device adjacent the opening, and pneumatic means for directing the tops into the opening and holding them against the severing device during the movement of the beets past the opening, said pneumatic means also constituting means for discharging the severed tops from the machine.

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

ELLIS C. WINCHESTER.

Witnesses:

NATE P. WILSON,

G. M. FLETCHER.