L. B. NEIGHBOUR.

PORTABLE CONVEYER.

APPLICATION FILED OCT. 23, 1918.

1,353,841.

Patented Sept. 28, 1920.

3 SHEETS—SHEET 1.

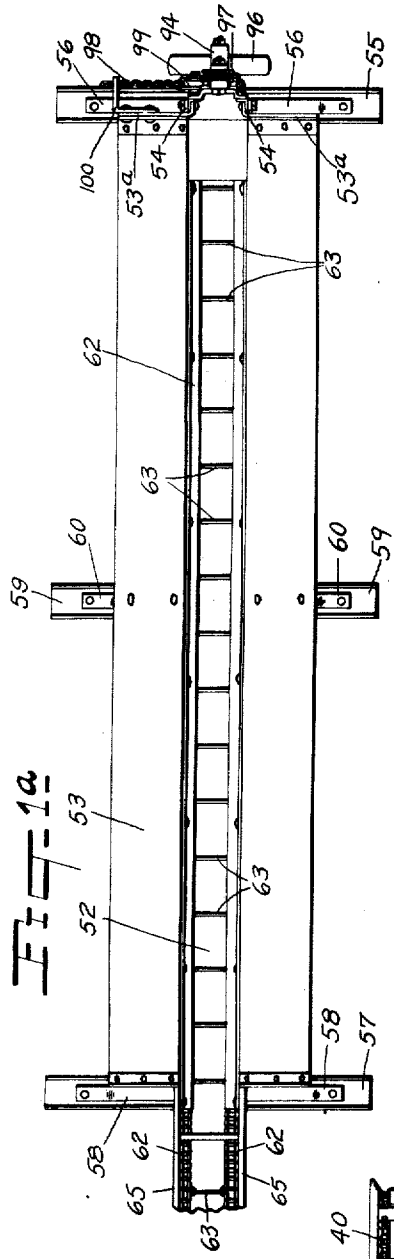


Fig. 1a.

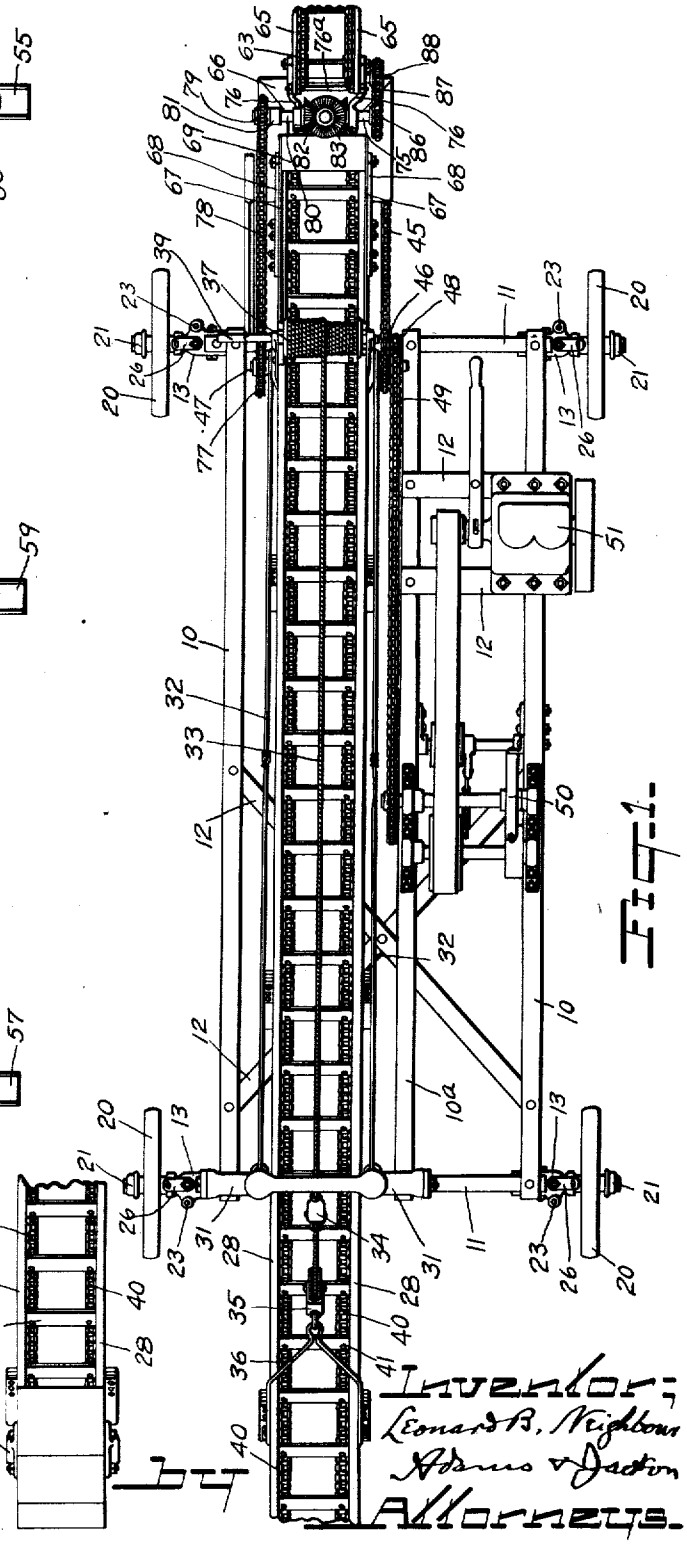


Fig. 1.

Fig. 1b.

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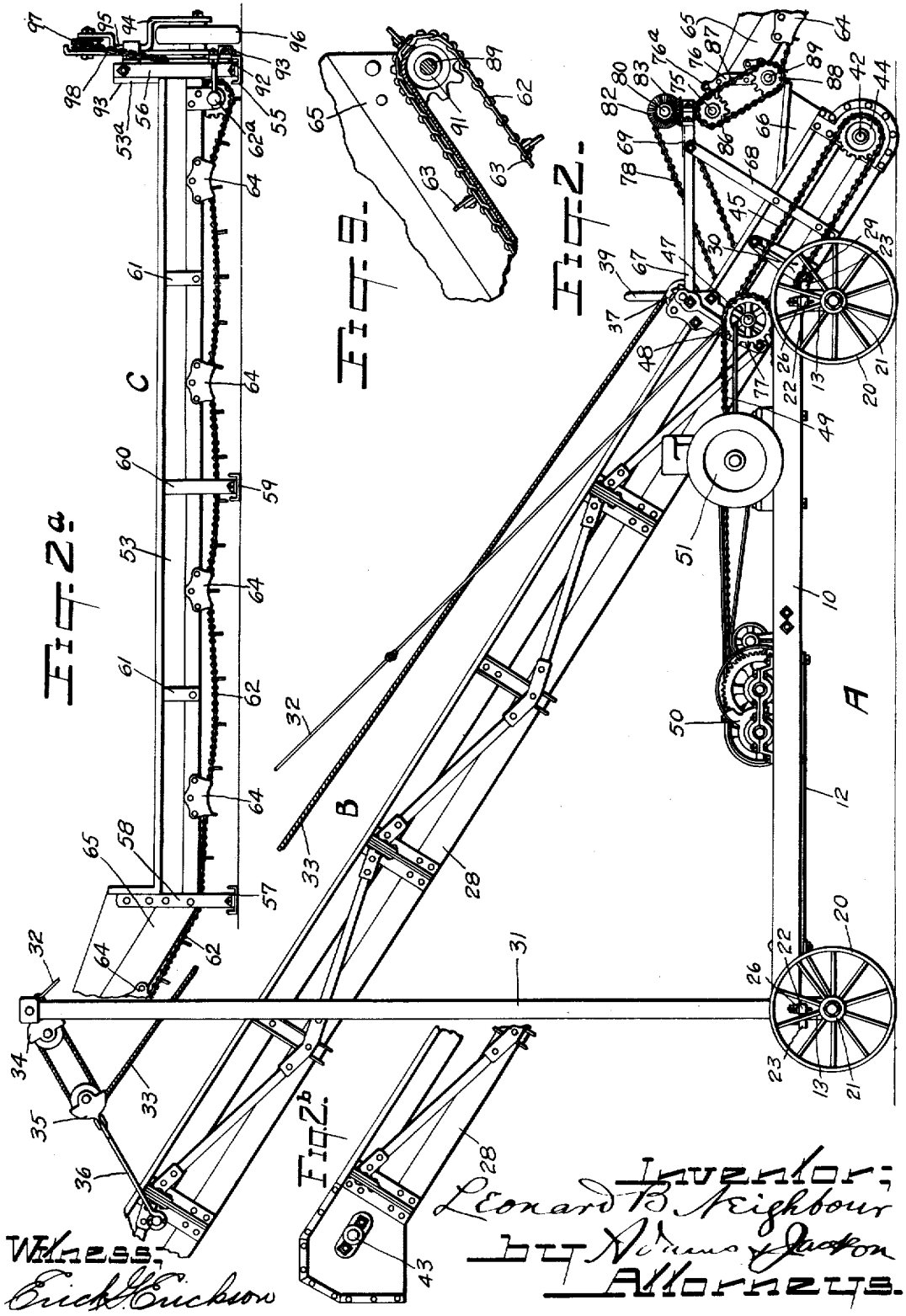
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

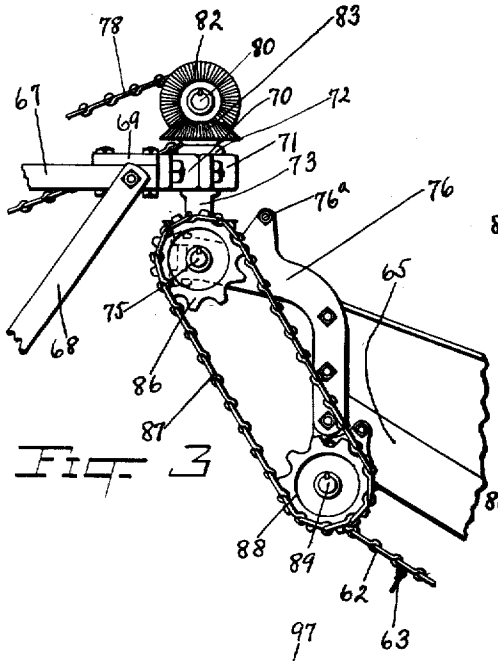


Fig. 3

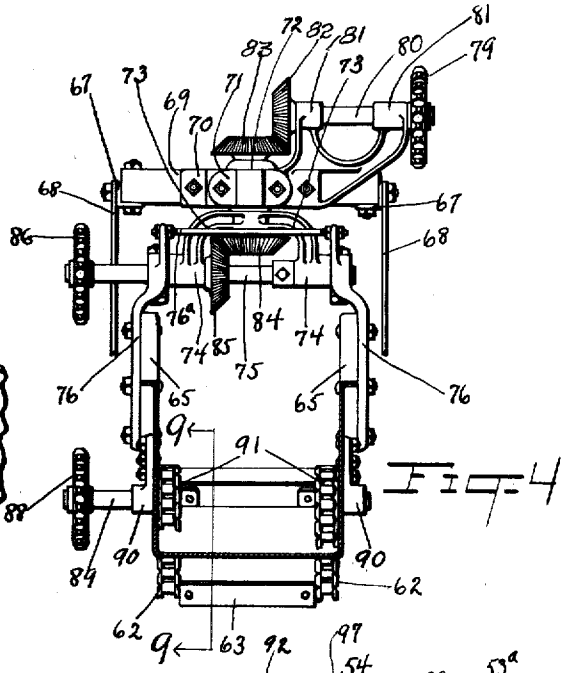


Fig. 4

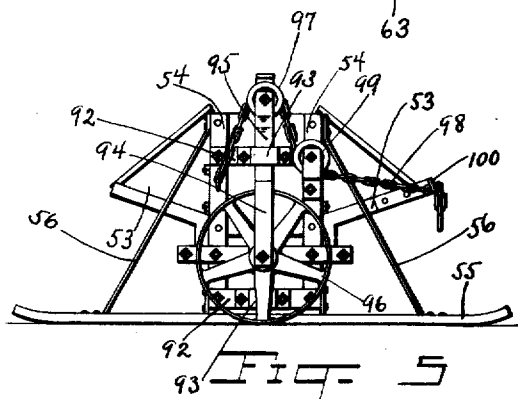


Fig. 5

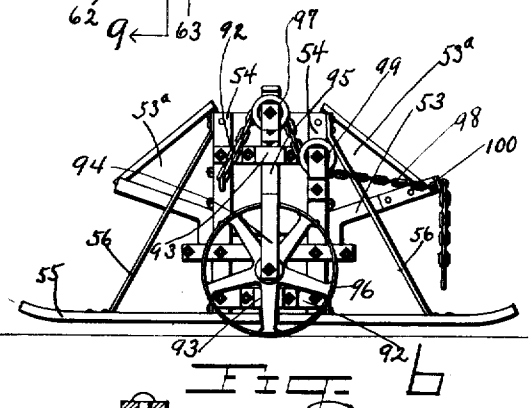


Fig. 6

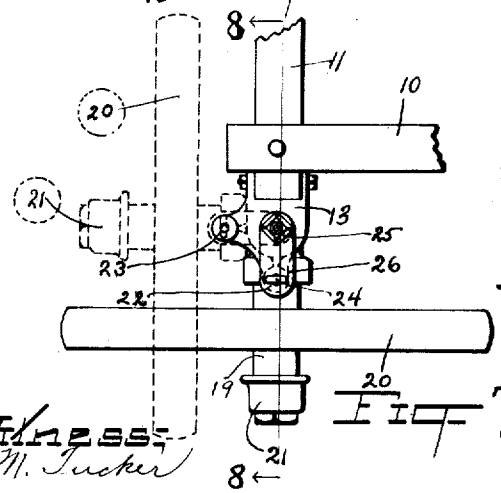


Fig. 7

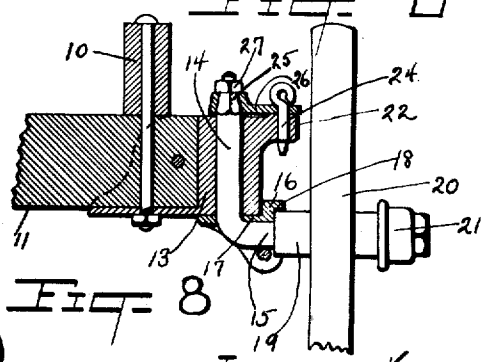


Fig. 8

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UNITED STATES PATENT OFFICE.

LEONARD B. NEIGHBOUR, OF EAST MOLINE, ILLINOIS, ASSIGNOR TO DEERE & COMPANY, OF MOLINE, ILLINOIS, A CORPORATION OF ILLINOIS.

PORTABLE CONVEYER.

1,353,841. Specification of Letters Patent. Patented Sept. 28, 1920.

Application filed October 23, 1918. Serial No. 259,360.

To all whom it may concern:

Be it known that I, LEONARD B. NEIGHBOUR, a citizen of the United States, and a resident of East Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Portable Conveyers, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in conveying apparatus that is particularly intended for use in connection with the handling of large quantities of sugar beets, although of course it is applicable to the handling of other articles that require to be moved under like or similar conditions. When sugar beets are hauled to a shipping station they are either loaded directly from the wagon into a car or stacked in long piles near the railroad track for subsequent loading into cars. My improved apparatus is adapted to be used for receiving the beets as they are dumped by the wagon and either transferring them to a car or to a pile upon the ground, or for transferring them from a pile into a car. When receiving the beets from a wagon the wagon will be raised at its forward end by some type of wagon-hoist located in close proximity to the elevating mechanism and the beets dumped from the wagon into a carrier that moves the beets onto the elevating mechanism. The wagon-hoist is preferably operated by power from the same source that supplies the power for operating the elevator, and it is one of the objects of my invention to so construct the carrier that is used to convey the beets to the elevator mechanism that, without disturbing its operative connection to such elevating mechanism, it may be readily turned to a very considerable angle to such elevating mechanism in order that a loaded wagon may be driven into proper position to be acted upon by the wagon-hoist, and thereafter swung back into substantial alinement with the elevating mechanism and in position to receive the beets as they are dumped from the wagon—the carrier referred to and the elevating mechanism connected therewith operating to transfer the beets during the time that the wagon-hoist is in operation. While, as stated, it is one of the objects of the invention to provide a construction that permits the easy and ready swing of the carrier so as to allow a wagon to be drawn into proper relation with the wagon-hoist, it is a further object of the invention to provide the device upon which such carrier is movably mounted with means that insure its immobility when it has been swung back into position for receiving the beets dumped from the wagon.

In many instances the beets are, as stated, stored in long piles alongside of a railroad track and from there transferred by mechanical conveyers to the cars. The beets are usually scooped from the end of such pile and it is desirable, of course, that the laborers be able to deposit the scooped-up beets upon the conveyer mechanism without having to walk to any extent toward such mechanism. It is one of the objects of my invention to not only make that member of the apparatus that supports the carrier referred to of very considerable length so that it will extend substantially from side to side of the pile of beets opposite the end of such pile, but to so construct the supports for the two principal members of the conveying mechanism, viz. the elevator and the carrier that conducts the beets thereto, that the apparatus as a whole can be moved along bodily to conform to the changing position of the end of the pile due to the shoveling away of the beets therefrom, and also provide means whereby the apparatus as a whole may be held fixedly in each of such adjusted positions. These various objects I accomplish by the devices and combinations of devices illustrated in the drawings and hereinafter particularly described. Those things which I believe to be new will be set forth in the claims.

In the drawings:—

Figures 1, 1^a, and 1^b taken together constitute a plan view of a portable conveyer mechanism embodying the invention, the part shown in Fig. 1^a being a continuation of the part in Fig. 1 at the right hand end of said Fig. 1, and Fig. 1^b being a continuation of the part in Fig. 1 at the left-hand end of said Fig. 1, the separation into these three parts being necessary for clearness of illustration owing to the size of the machine;

Figs. 2, 2^a and 2^b taken together consti-

tute a side elevation of the machine,—Fig. 2 representing that portion of the apparatus shown in Fig. 1, Fig. 2^a that portion that is shown in Fig. 1^a, and Fig. 2^b that portion that is shown in Fig. 1^b.

Fig. 3 is an enlarged detail, illustrating the pivotal connection between the elevator and the hopper and a portion of the power-transmitting means by which the endless carrier supported by the hopper is driven;

Fig. 4 is a section taken at line 4—4 of Fig. 3 and showing mostly in end elevation the mechanism in said Fig. 3;

Fig. 5 is an end elevation of the hopper, showing the supporting means at the outer end thereof;

Fig. 6 is a view similar to Fig. 5, but with the hopper raised so as to be supported by the wheel member of the supporting means;

Fig. 7 is a detail illustrating the manner in which each elevator truck wheel is mounted so that it may be adjusted to allow the elevator to move in either of two directions;

Fig. 8 is a section taken at line 8—8 of Fig. 7; and

Fig. 9 is a section taken at line 9—9 of Fig. 4.

The apparatus as a whole, as best indicated in Figs. 2, 2^a and 2^b, comprises three principal parts, to wit., an elevator truck A, an elevator mounted on said truck and indicated by B, and a hopper member indicated by C that has a swiveling connection with the lower end of the elevator. The truck member comprises a frame having side bars 10, an intermediate bar 10^a parallel to said side bars, transverse bars 11 at the front and rear ends, and diagonal bracing bars 12. The transverse bars 11 project beyond the side bars 10, and upon each projecting end is a bracket 13 (best shown in Figs. 7–8), and through each bracket is a vertical opening in which is journaled the vertical portion 14 of a wheel spindle 15. 16 indicates a washer mounted on the wheel spindle and having a plate portion 17, upon which the lower portion of the bracket 13 rests. This washer also has a curved lip 18 that overlies the hub 19 of a supporting wheel 20, and thus serves to exclude dirt from the wheel hub and axle. 21 indicates a hub cap on the horizontal portion of the spindle and overlying the outer end of the hub and holding the wheel in place. Each bracket 13 has at its upper end two outwardly extending lugs 22—23, said lugs being arranged substantially at right angles to each other, and each being provided with a hole therethrough adapted to receive a pin 24. The upper end portion of the vertical member of the wheel spindle is tapered, as indicated at 25, and such tapered portion is provided with flat faces, and upon such tapered and flattened end portion fits an arm 26 which is secured in place by a nut 27 screwed on to the threaded upper end of the spindle member 14. The arm 26 is provided near its outer end with a hole that will aline with the hole in each of the lugs 22—23 so that by means of the pin 24 the wheel may be locked in either of the two positions, indicated by full lines and dotted lines, respectively, in Fig. 7. When it is desired to move the truck in a forward direction, the wheels are positioned as indicated in full lines in Figs. 1, 2, 7, and 8, but when it is desired to move it laterally, the various pins 24 are to be removed and the wheels given a quarter-turn to bring them alongside of the end bars 11 of the frame, such swinging movement continuing until the hole in the end of each arm 26 comes into alinement with the hole in the adjacent lug 23, whereupon, by means of the pin 24, such plate and lug 23 will be locked together and thus hold the four wheels of the truck in position to allow such desired lateral movement.

The elevator that has been designated generally by the letter B comprises, in the construction shown, a frame having two side bars 28, which side bars are pivotally connected with the truck A near one end thereof such pivotal support, as shown, being afforded by brackets 29—30 at each side of the truck. Near its other end the truck is provided with two uprights 31 that are held in position by brace rods 32. The elevator frame is adjustably suspended from the uprights 31 by a cable 33 that runs over pulleys 34—35,—the pulley 34 being connected to the tops of the uprights, and the pulley 35 being connected with the elevator frame by a bail 36. The lower end of the cable is connected with a drum 37 that is supported in suitable brackets attached to the elevator frame near its lower end. The drum can be turned by a crank 39 to wind up or let out the cable for raising or lowering the elevator, and when the elevator is adjusted to any desired position the drum will be locked against rotation by a movable dog engaging ratchet teeth on the drum. The elevator frame carries an ordinary endless conveyer, the two link belts of which are indicated by 40, and the cross strips connecting such belts at intervals being indicated by 41. The conveyer runs over sprockets journaled in the boot and hood of the elevator respectively, the shaft for the sprockets in the boot being indicated by 42, and that for the sprockets in the hood by 43. The shaft 42 is rotated by means of a sprocket 44 mounted thereon outside of the boot, over which last-named sprocket passes a link 45 that also passes over another sprocket 46 mounted on a shaft 47 that extends through the elevator frame and is supported in suitable bearings secured to the sides of such frame. The shaft 47 is driven

by a sprocket 48 mounted thereon, a link belt 49 running over the sprocket 48 and over a sprocket carried by a speed jack, indicated at 50, the speed jack being belted to a suitable motor 51 mounted on the truck.

Referring now to that portion of the mechanism indicated generally by the letter C, and to which the beets are fed in the first instance for transference to the elevator means,—52—53 indicate a long hopper in which is mounted an endless carrier, by which beets placed in the hopper are moved toward and upon the elevator. The reference numeral 52 indicates the trough of the hopper, in which the carrier mentioned moves, and the reference numeral 53 indicates sloping or flaring side bars to direct the beets toward the central trough and upon the endless carrier movable in such trough. 53ª indicates the outer end wall of the hopper. The outer end of the hopper has connected to it a pair of uprights 54, (see Figs. 5-6) to the lower ends of which are secured a runner-like supporting member 55 that extends to a considerable distance at each side of the hopper and affords a firm ground-engaging support at that end. 56 indicates braces extending between the uprights 54 and the member 55. The inner end and middle portion of the hopper are supported by similar devices, the ground-engaging member and its braces at the inner end being indicated by 57—58, respectively, and the corresponding parts at the central portion being indicated by 59—60, respectively. 61 indicates braces for securing the flaring side bars 53 to the conveyer trough 52.

As stated, there is mounted in the trough of the hopper an endless carrier, the two link belt members of which are indicated by 62, and the cross pieces extending between such link belts being indicated by 63. The outer end of the carrier is supported by sprockets mounted on the shaft 62ª journaled in brackets secured near the outer end of the hopper, and at intervals are provided suitable fixed supports, indicated by 64, over which the return or lower member of the link belts pass to prevent sagging. The inner end of the hopper is inclined upwardly as indicated at 65, and the endless carrier runs therethrough and is similarly inclined—such inclination being to carry the beets up for delivery into the enlarged receptacle or hopper 66 at the lower portion of the elevator. The endless carrier in the hopper C is operated by power from the elevator as described hereinafter in connection with the pivotal means employed for attaching such hopper to the elevator.

The means by which the hopper C and elevator B are connected together comprises devices that permit the hopper C to be raised at its rear end relative to a supporting wheel that is located at such end, and also comprises means that permit such hopper to be moved on such supporting wheel to a position at substantially right angles to the elevator and its truck in order to permit the drawing of a wagon past the rear end of the elevator, as hereinbefore explained. Referring now to such swiveled connection of the parts B and C:—a support composed of angle bars 67 and braces 68, one of each at each side of the elevator, is connected with the lower end of the elevator and extends outwardly therefrom, and between the outer portions of the members that compose this support is secured a block 69, to which is bolted one-half of a socket casting 70, the other half of such socket casting being indicated at 71—the two socket members when bolted together forming a bearing in which is rotatably mounted a vertically disposed sleeve 72, from opposite sides of which project two downwardly-curved arms 73 which are preferably formed integral with the sleeve. Such arms in effect form a yoke, and at their outer ends are provided with alined horizontal bearings 74, through which a shaft 75 extends. 76 indicates two arms bolted to the inclined inner end portion 65 of the hopper, said arms at their upper ends being rotatably mounted upon the shaft 75. The arms 76 are preferably connected together by a bolt 76ª, as best shown in Fig. 4. By reason of these arms being journaled on the shaft 75, it is evident that the hopper C can be raised and lowered at its outer end as required, and, by reason of the swiveling of the sleeve 72 in its vertical bearing, it is obvious also that the hopper C as a whole can be turned out of alinement with the members A and B,—such turning being to the extent of ninety degrees if required.

As before stated, the endless carrier, located in the trough of the hopper, has connection with the same driving means that moves the endless conveyer mechanism of the elevator B. Referring to such means for driving the carrier in the hopper, 77 indicates a sprocket secured upon a projecting end of the shaft 47, as best shown in Fig. 1, over which sprocket runs a link belt 78 that also passes around a sprocket 79 secured upon the projecting end of a short shaft 80 (see Fig. 4) that is rotatable in bearings 81 which, as shown, are formed integral with the socket member 70. On the other end of the shaft 80 is secured a beveled gear 82 that meshes with a beveled gear 83 that is mounted on the upper end of a short shaft that extends through the sleeve 72. The lower end of this last-named shaft has secured to it a beveled gear 84 that meshes with another beveled gear 85 that is mounted on the shaft 75. Upon the projecting end of the shaft 75 is secured a sprocket 86 which, through a link belt 87 that passes around another sprocket 88 mounted on the

end of a shaft 89, turns said last-named shaft. 90 indicates the bearings for such shaft 89. Mounted upon the said shaft 89 are two sprockets 91, over which the link belt members 62 of the endless carrier in the hopper pass. From the foregoing description, it will be evident that the endless conveyer mechanism of the elevator and the similar mechanism of the hopper will be simultaneously driven, and that, therefore, there will be a continuous movement of beets through the hopper and through the elevator to the point of discharge from the upper end of the elevator.

With the parts in operative relation to each other, as indicated by Figs. 1, 1^a, 1^b and 2, 2^a, 2^b the weight of the hopper member C will be supported upon the several transversely-arranged runner-like supports 55, but when it is desired to swing the hopper member C to one side in order to permit of the passage of another wagon into position to have its front end raised by the wagon-hoist, as before explained, then it is advisable, owing to the length and weight of the member C, that a rolling support for such member should be provided in order that such turning or swinging movement may be more easily made. I find that it is sufficient to provide the outer end of the hopper member C with such a rolling support, provided that such outer end be raised to a slight extent with reference to such rolling support, and I have hereinbefore explained how the inner end of the member C is pivotally connected to the shaft 75 so that the outer end may be permitted the required upward movement. The rolling support at the outer end that I have referred to is shown as a wheel 96 carried opposite the end of the hopper C by means that permit a relative movement between the hopper and the wheel so that the weight of the hopper can be transferred to such wheel. The means for so securing the wheel, in the construction shown, comprises cross bars 92 extending between the end uprights 54, each of such bars carrying a clip 93 that forms a guide-way for a bar 95. 94 indicates a bracket connected to or formed with the bar 95 and having a vertical member that is parallel with the bar 95. Between such member of the bracket and the lower portion of the bar is journaled the supporting wheel referred to. The upper portion of the bar has journaled to it—and preferably in the same way that the wheel 96 is journaled in place—a pulley 97, over which extends a chain 98, one end of which is secured to one of the uprights 54. To the other upright is rotatably mounted another pulley 99, under which the chain passes. A hook 100 is secured on the end of one of the flaring sides of the hopper, with which hook a link of the chain 98 can engage. It is obvious that a pull on the free end of the chain will cause such a relative movement between the wheel and the hopper as to raise the outer end of the hopper so that its weight at that end comes wholly upon the wheel, and the parts can be retained in such position by properly securing the chain over the hook 100, and thereafter the hopper can be quickly and easily swung around to stand at substantially a right angle to the truck and elevator without in any wise disturbing the connections between said hopper and elevator. The hopper will also be so supported on its wheel that whenever the truck wheels 20 are swung around and locked in position at an angle of ninety degrees to the position shown in Figs. 1 and 2, the apparatus as a whole will have its various wheel supports so disposed as to enable such mechanism to be shifted laterally to accommodate itself to the decreased size of a pile from which the beets are being removed.

What I claim as my invention and desire to secure by Letters Patent, is:—

1. In an apparatus of the class described, the combination of a truck, an inclined conveyer mounted thereon, a hopper, a carrier in said hopper for conducting material to said conveyer, means for operating both said conveyer and carrier, wheeled supports at each end of said truck movable into positions opposite the ends of the truck for permitting lateral movement of the truck, and a rolling ground-engaging support connected with the hopper to permit the hopper to be moved laterally simultaneously with said truck and inclined conveyer without disturbing the connections of the said conveyer and carrier with their operating means, said hopper and support being relatively movable vertically to remove the weight of the hopper from the support.

2. In an apparatus of the class described, the combination of a truck, an inclined elevator-frame mounted thereon, a conveyer carried by said frame, a hopper having a jointed connection with the lower portion of said elevator-frame, a carrier in said hopper for conducting material to said conveyer, means for operating both said conveyer and carrier, wheeled supports at each end of said truck movable into positions opposite the ends of the truck for permitting lateral movement of the truck, and a rolling ground-engaging support connected with the hopper to permit the hopper to be moved laterally simultaneously with said truck and inclined conveyer without disturbing the connections of the said conveyer and carrier with their operating means, said hopper and support being relatively movable vertically to remove the weight of the hopper from the support.

3. In an apparatus of the class described, the combination of a truck, an inclined ele-

vator-frame mounted thereon, a conveyer carried by said frame, a hopper connected with said elevator-frame and being movable laterally and vertically relative thereto, a carrier in said hopper for conducting material to said conveyer, means common to both said conveyer and carrier for operating them, wheeled supports at each end of said truck adjustable into positions opposite the sides or ends of the truck so that the truck may be prevented from lateral movement or permitted lateral movement, and a rolling support connected with the hopper to permit the hopper to be moved laterally with said truck or be swung to one side independently, said hopper and support being relatively movable vertically to remove the weight of the hopper from the support.

4. In an apparatus of the class described, the combination of a truck, an inclined elevator-frame mounted thereon, a conveyer carried by said frame, a hopper connected with said elevator-frame and being movable laterally and vertically relative thereto, a carrier in said hopper for conducting material to said conveyer, means common to both said conveyer and carrier for operating them, wheeled supports at each end of said truck adjustable into positions opposite the sides or ends of the truck so that the truck may be prevented from lateral movement or permitted lateral movement, a ground-engaging support fixedly connected with said hopper for maintaining the hopper in substantial alinement with the truck, a rolling ground-engaging support also connected with the hopper and normally out of operative position when the hopper is in alinement with the truck, and means for forcing such rolling support into operative position so that the hopper may be moved laterally with the truck or be swung to one side independently.

5. In an apparatus of the class described, the combination of an elevator, a wheeled truck on which said elevator is mounted, the front and rear wheels thereof being movable into positions opposite the sides or ends of the truck frame, means for securing the wheels in either adjusted position, a hopper connected with the lower end of the elevator, means in said hopper for conveying material to the elevator, and supporting means for the hopper adapted to facilitate lateral movement of the hopper when said truck is moved laterally, said hopper and supporting means being relatively movable vertically to remove the weight of the hopper from said supporting means.

6. In an apparatus of the class described, the combination of an elevator, a wheeled truck on which said elevator is mounted, the front and rear wheels thereof being movable into positions opposite the sides or ends of the truck frame, means for securing the wheels in either adjusted position, a hopper connected with the lower end of the elevator, means in said hopper for conveying material to the elevator, two ground-engaging supporting means for the hopper, one of which is a rolling support, and means for causing a vertical movement of said hopper relative to its said rolling support, to remove the weight of the hopper from said rolling support.

7. In an apparatus of the class described, the combination of a truck, an inclined conveyer mounted thereon, a hopper, a carrier in said hopper for conducting material to said conveyer, means common to said conveyer and carrier for moving them simultaneously, a swivel connection between the said hopper and the frame of the conveyer for permitting independent lateral movement of the hopper, and a rolling ground-engaging support connected with the outer end of the hopper for facilitating such lateral movement, said hopper and support being relatively movable vertically to remove the weight of the hopper from the support.

8. In an apparatus of the class described, the combination of a truck, an inclined conveyer mounted thereon, a hopper, a carrier in said hopper for conducting material to said conveyer, means common to said conveyer and carrier for moving them simultaneously, a swivel connection between the said hopper and the frame of the conveyer for permitting independent lateral movement of the hopper, a rolling ground-engaging support connected with the outer end of the hopper for facilitating such lateral movement, and means for holding the outer end of said hopper raised relatively to said rolling support so as to be supported thereby.

9. In an apparatus of the class described, the combination of a truck, an inclined conveyer mounted thereon, a hopper, a carrier in said hopper for conducting material to said conveyer, means common to said conveyer and carrier for moving them simultaneously, connections between said hopper and the frame of said conveyer permitting independent vertical and lateral movements of the hopper without disturbing the engagement of said carrier and conveyer with their common driving means, and a rolling ground-engaging support connected with the outer end of the hopper for facilitating said independent lateral movement of the hopper, said hopper and support being relatively movable vertically to remove the weight of the hopper from the support.

10. In an apparatus of the class described, the combination of a truck, an inclined conveyer mounted thereon, a hopper, a carrier in said hopper for conducting material to

said conveyer, means common to said conveyer and carrier for moving them simultaneously, connections between said hopper and the frame of said conveyer permitting independent vertical and lateral movements of the hopper without disturbing the engagement of said carrier and conveyer with their common driving means, a rolling ground-engaging support connected with the outer end of the hopper for facilitating said independent lateral movement of the hopper, and means for holding the outer end of said hopper raised relatively to said rolling support so as to be supported thereby.

11. In an apparatus of the class described, the combination of a truck, an inclined conveyer mounted thereon, a hopper, a carrier in said hopper for conducting material to said conveyer, means common to said conveyer and carrier for moving them simultaneously, connections between said hopper and the frame of said conveyer permitting independent vertical and lateral movements of the hopper without disturbing the engagement of said carrier and conveyer with their common driving means, a rolling ground-engaging support for the hopper comprising a wheel slidingly connected with the outer end of the hopper, and means for raising said outer end of the hopper relatively to said wheel.

12. In an apparatus of the class described, the combination of a portable inclined conveyer, a hopper pivotally connected with the frame of said conveyer to permit independent lateral movement of the hopper, a carrier in said hopper for delivering material to said conveyer, ground-engaging supporting means for the hopper for holding it against movement when in substantial alinement with said conveyer, a rolling ground-engaging support normally out of supporting position, and means for causing a relative movement between said hopper and rolling support for bringing the latter into supporting position to facilitate the lateral turning of said hopper about its pivotal connection.

13. In an apparatus of the class described, the combination of a portable inclined conveyer, a hopper pivotally connected with the frame of said conveyer to permit independent lateral movement of the hopper, a carrier in said hopper for delivering material to said conveyer, ground-engaging supporting means for the hopper for holding it against movement when in substantial alinement with said conveyer, a vertical bar slidingly connected with the outer end portion of said hopper, a wheel journaled to the lower part of said bar, means connected with said hopper and said bar for causing a relative movement between said hopper and wheel to bring the latter into supporting position to facilitate the lateral turning of the hopper about its pivotal connection.

14. In an apparatus of the class described, the combination of a portable inclined conveyer, a hopper pivotally connected with the frame of said conveyer to permit independent lateral movement of the hopper, a carrier in said hopper for delivering material to said conveyer, ground-engaging supporting means for the hopper for holding it against movement when in substantial alinement with said conveyer, a vertical bar slidingly connected with the outer end portion of said hopper, a wheel rotatably affixed to the lower part of said bar, a pulley affixed to the upper part of the bar, and a flexible connection secured at one end to the hopper and passing over said pulley whereby the hopper and wheel may be moved relatively to each other to bring the wheel into supporting position to facilitate the lateral turning of the hopper about its said pivotal connection.

LEONARD B. NEIGHBOUR.