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No. 861,534. PATENTED JULY 30, 1907.

W. PETERS.

ELEVATING APPARATUS.

APPLICATION FILED FEB. 9, 1906.

4 SHEETS—SHEET 1.

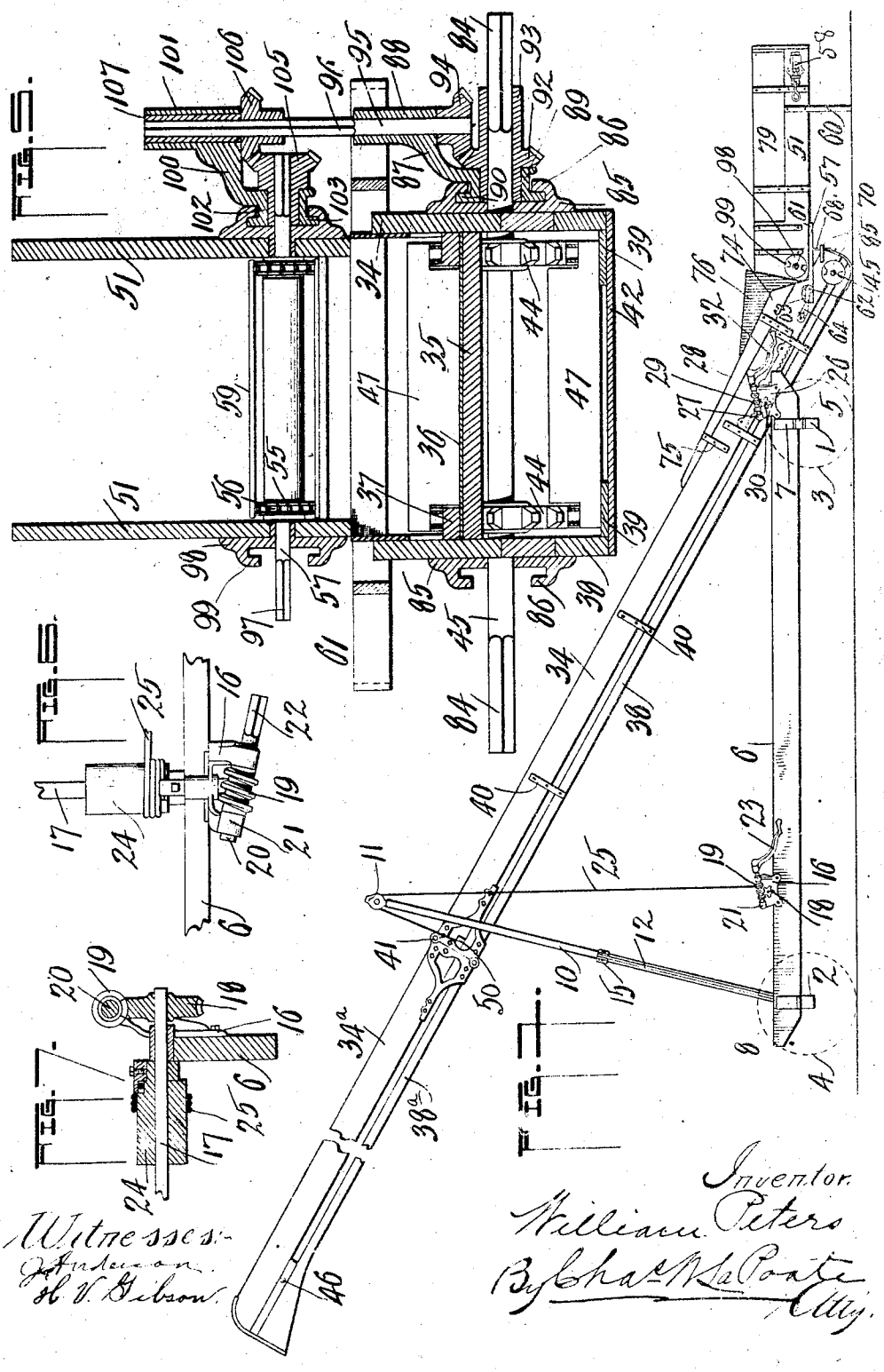


FIG. 5.

FIG. 6.

FIG. 7.

FIG. 1.

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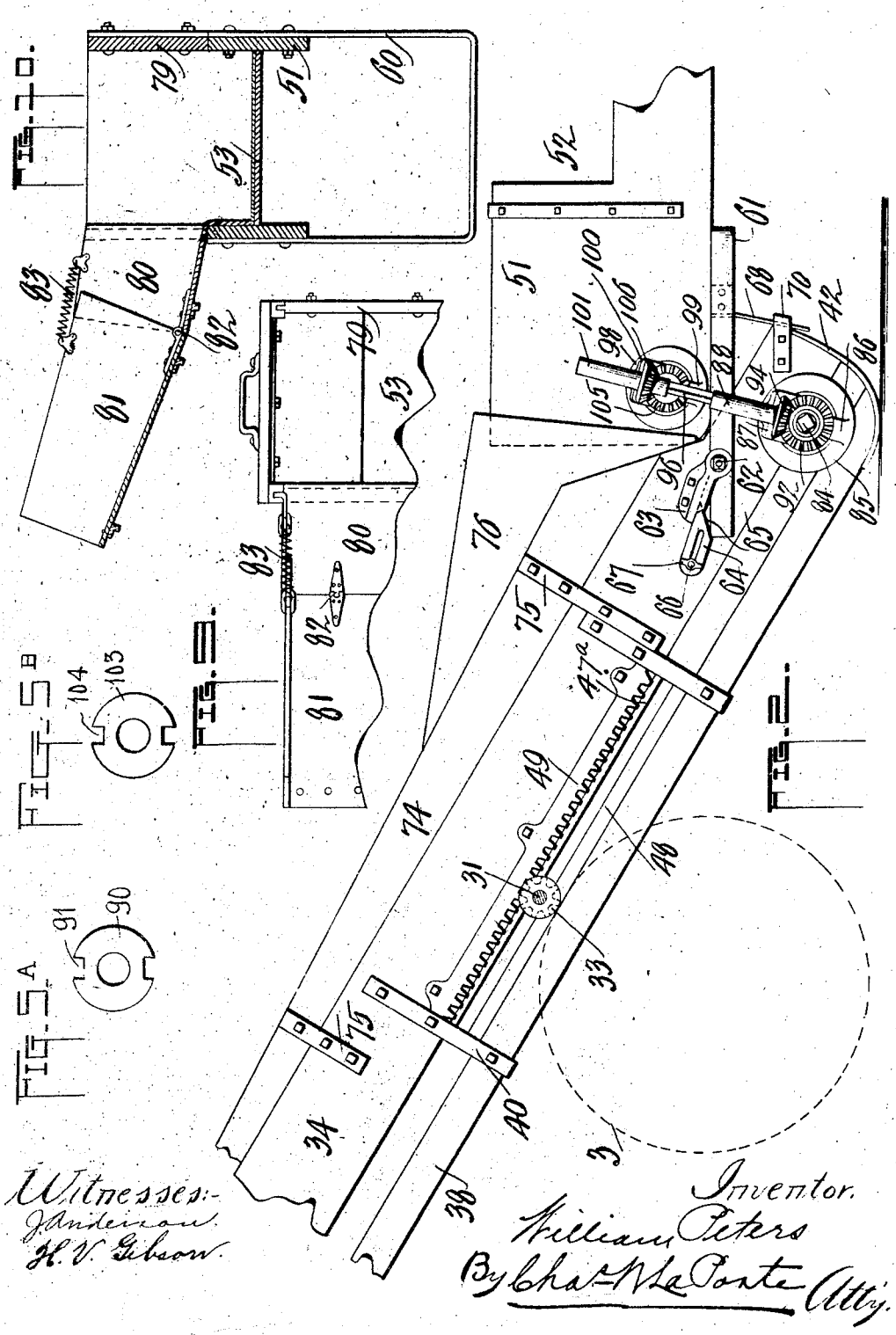
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4 SHEETS—SHEET 2.



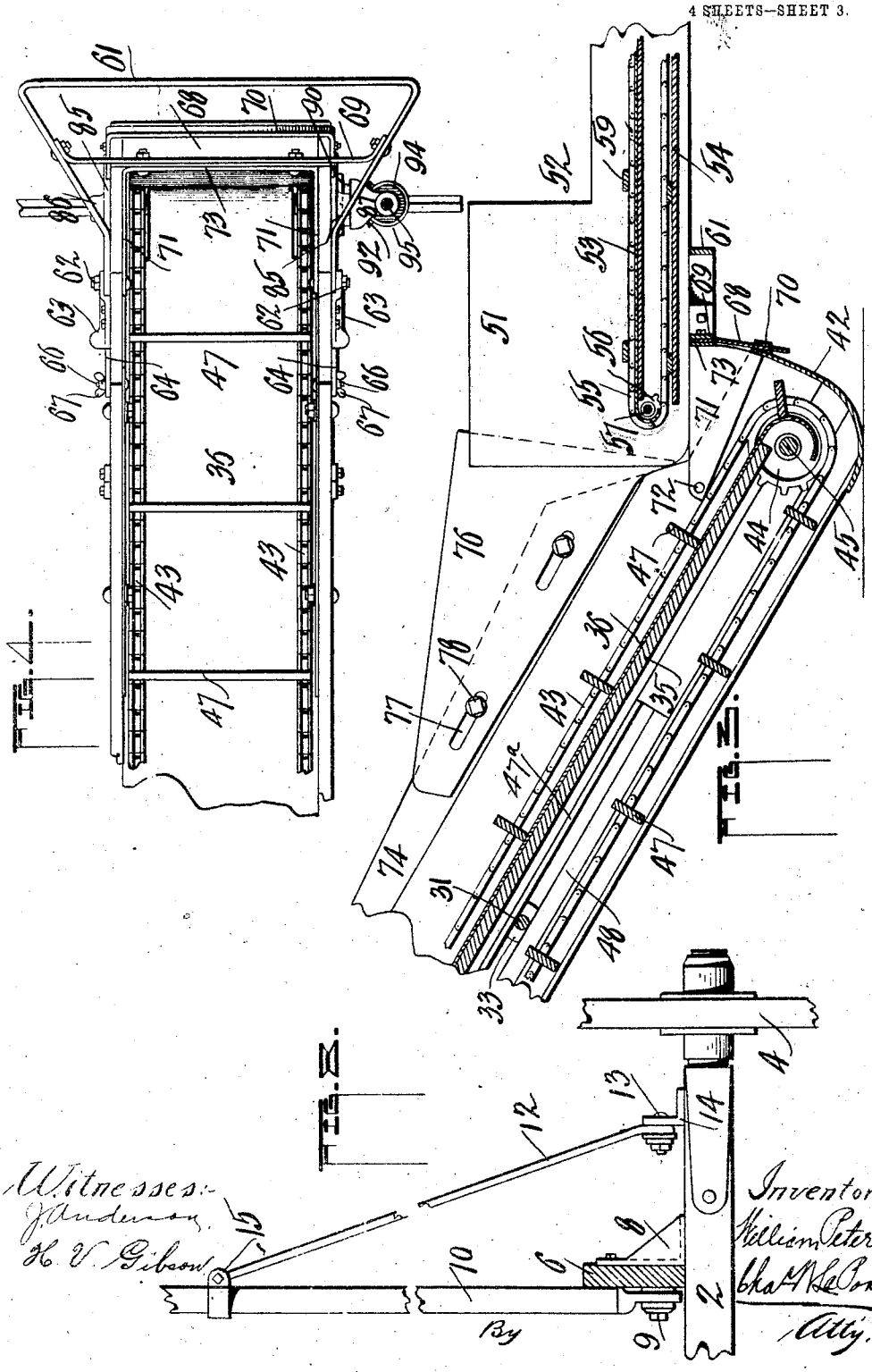
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4 SHEETS—SHEET 3.



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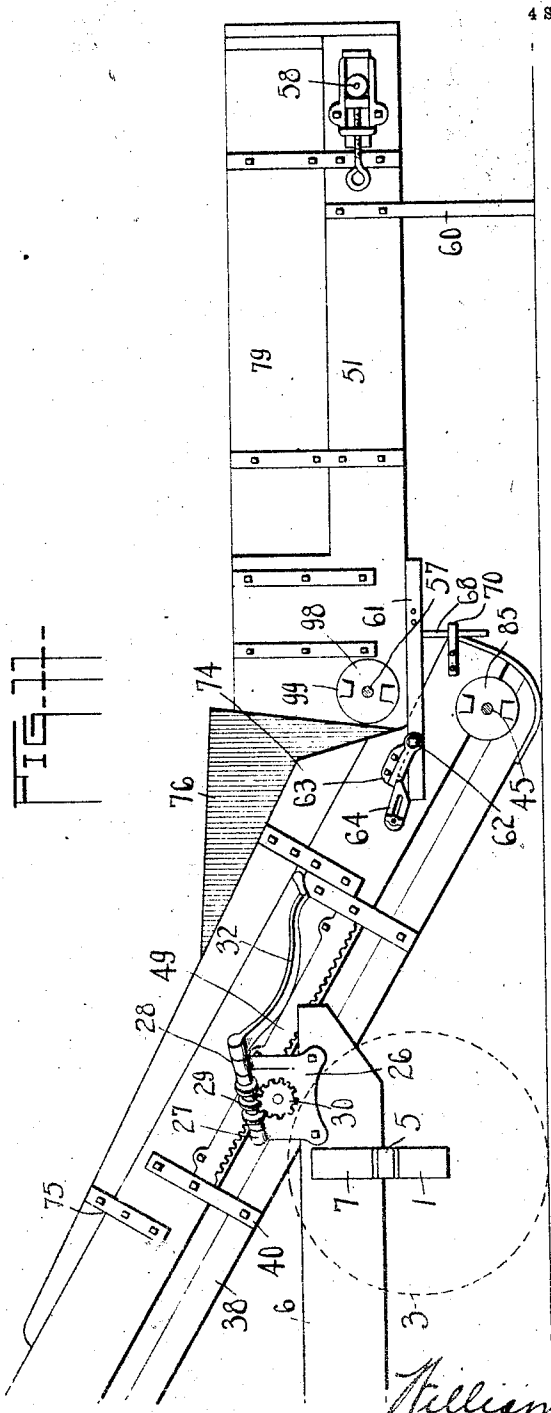
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APPLICATION FILED FEB. 9, 1906.

4 SHEETS—SHEET 4.

FIG. 11.



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UNITED STATES PATENT OFFICE.

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ELEVATING APPARATUS.

No. 861,534. Specification of Letters Patent. Patented July 30, 1907.

Application filed February 9, 1906. Serial No. 300,344.

To all whom it may concern:

Be it known that I, WILLIAM PETERS, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Elevating Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to certain new and useful improvements in elevating apparatus and relates particularly to a conveying mechanism with which it is adapted to connect a drag for receiving from a wagon or other suitable device material to be discharged into the lower end of the elevating means and elevated to a bin or other suitable receiving means.

One of the objects which I have in view is the supporting of the elevating means on a wheeled frame, and provided means at the forward end of said wheeled frame and in connection with said elevating means whereby the receiving end of the elevating means may be projected from and toward the end of the wheeled frame for the purpose of adjusting the position of the receiving end of said elevating means.

A further object of the present invention is combining an elevating means with a portable support and providing means at one end of said support and in connection with said elevating means for adjusting the position of the receiving end thereof; and also in the provision of means having a folding connection with the opposite end of said support for elevating the discharge end of said elevating means.

The invention has for its further object an elevating means adjustably connected at its receiving end with a portable support; folding means at the opposite end of said support for raising and lowering the discharge end of the elevating means; a receiving drag for conveying material into the receiving end of the elevating means, and in the provision of a rest for the inner end of said drag adjustably connected with the receiving end of the elevating means.

A further object of the invention is an elevating means, a drag for receiving and conveying material to the receiving end of the elevating means, driving connections between the receiving end of the elevating means and inner end of the conveying means of the drag, said driving connections adapted to have an interchangeable connection with the opposite sides of the elevating means and conveying means of the drag and also being such as to adapt the drag to have a horizontal swinging connection with said elevating means.

For a further and full description of the invention herein and the merits thereof, and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a greatly reduced side elevation of the portable support, the elevating means attached thereto and partly broken away, also showing the receiving drag in connection with the receiving end of the elevating means, but omitting the driving connections between the elevating means and the drag; Fig. 2 is an enlarged side elevation of the lower and receiving end of the elevating means and showing the inner end of the drag supported in connection therewith; also the gearing between said elevating means and drag; Fig. 3 is a view somewhat similar to Fig. 2, except that it is a longitudinal and vertical section through the said parts; Fig. 4 is a top plan view of the lower or receiving end of the elevating means; Fig. 5 is an enlarged vertical cross section of the lower or receiving end of the elevating means, the inner end of the drag and the driving connections between the elevating means and the drag; Fig. 5^a is a detail showing a face view of certain parts seen in Fig. 5; Fig. 5^b is a detail showing a face view of a part seen in Fig. 5, and similar to Fig. 5^a. Fig. 6 is an enlarged detail in plan of the mechanism carried on the portable support to effect the raising and lowering of the discharge end of the elevating means; Fig. 7 is a vertical sectional detail of the parts shown in Fig. 6; Fig. 8 is a detail elevation broken away and partly in section showing an end view of one of the axles of the portable support and the means for assisting in elevating or raising the discharge end of the elevating means and bracing the same when raised; Fig. 9 is an enlarged detail in plan of one end of the drag; and Fig. 10 is a vertical cross-section through that end of the drag shown in Fig. 9. Fig. 11 is an enlarged view of the lower right hand end of Fig. 1.

Like numerals of reference indicate corresponding parts throughout the figures.

In the drawings, referring particularly to the portable support, 1 and 2 denote front and rear axles carrying ground-wheels 3 and 4 upon the opposite ends thereof. The axle 1 has pivotally connected therewith by some suitable means the cross-head 5 and connected with the said cross-head 5 and the axle 1 are the longitudinal and parallel frame-parts or stringers 6 suitably spaced apart. There are also provided brackets 7 for rigidly connecting the frame-parts 6 to the cross-head 5 and brackets 8 for rigidly connecting the frame-part 6 to the axle 1. I have specified that the cross-head 5 has a pivotal connection with the axle 1, this is to adapt the easy turning of the portable support when it is being conveyed from place to place, although this connection has not been shown. Portable supports for this purpose are not entirely new and the arrangement such as I have described has been shown as well as used.

To the frames 6 and preferably at points above the axle 2 I have shown pivotally connected at 9 the lower ends of the uprights or supports 10 which at their upper ends have suitably connected therewith the sheave-wheels 11. These uprights or supports are adapted to raise and lower on their pivots 9, for purposes to be more fully explained, and as a means of bracing the uprights or supports 10 I have provided the brace-rods or reaches 12 which have a pivotal connection at 13 with brackets 14 secured to the axle 2 and at a suitable point on the uprights or supports 10 the reaches or brace-rods are connected therewith through suitable clamping devices 15.

At a suitable point on the frames 6 in advance of the axle 2 are secured brackets 16 in which is journaled and extends transversely across the portable support formed by the frames 6, a shaft or spindle 17. On one end of this shaft or spindle, see Figs. 1, 6 and 7 is carried a worm-wheel or pinion 18 which is in mesh with a worm 19 carried by a short shaft or spindle 20 journaled in bearings 21 attached to or forming a part of one of the brackets 16, and the outer end of the said shaft or spindle 20 is squared as at 22 to adapt the connection therewith of a crank or handle 23. To facilitate in operating the shaft or spindle 20 for imparting motion to the shaft or spindle 17 through the worm-wheel 18 and worm 19 in mesh therewith, on the shaft or spindle 17 and preferably adjacent to the frames 6 I have provided the drums 24 with which may be suitably connected the cables 25 which extend up and over the sheave-wheels 11 supported by the uprights 10 and the ends of the said cables are suitably connected with the elevating means in a manner to be described.

While the drawings disclose only one side of the portable support it is to be understood that the same is in duplicate, with the exception that I prefer to provide only one bracket 16 such as shown in Fig. 1 and the gearing in connection therewith. The shaft 17 carries a pair of the drums 24 and it is understood of course that the uprights or supports 10 and their connections with the frames 6 are in duplicate.

To the forward ends of the frames 6 of the portable support are connected brackets 26 in all respects similar to those indicated as 16, and the said brackets are provided with bearings 27 in which is journaled a short shaft or spindle 28 carrying a worm 29 in mesh with the worm-wheels 30 on a transverse shaft or spindle 31 journaled in the brackets 26. The bracket 26 attached to the opposite frames 6, which is not shown is preferably without the bearings 27 as it is not necessary or desirable to duplicate the gearing shown in connection therewith on that side of the support. The outer end of the shaft or spindle 28, while not here shown, is squared somewhat similar to that shown at 22 on the shaft 20, to adapt the connection therewith of a crank or handle 32 to facilitate in operating the shaft 31 to the worm and worm-wheel described and for purposes to be hereinafter more fully explained. On the shaft or spindle 31 is carried, preferably the flange pinions 33, of which there is a pair, although not shown, serving a purpose to be more fully explained.

The elevating means or conveyer to which reference has been made consists of the longitudinal and parallel spaced side frames 34 connected by the bottom 35 extending approximately the length thereof and said bottom has the sheet metal covering 36 and extending along and above the bottom and adjacent to the side frames 34 are the longitudinal cleats 37. Spaced a short distance below, extending parallel with each other and longitudinally with the side-frames 34 is shown the supplemental side frames 38 to which is secured the cleats 39; the latter projecting a short distance inwardly toward each other and extending longitudinally with and approximately of the length of the supplemental side frames 38. The side-frames 34 and 38 are connected and braced by the connecting straps indicated as 40 and arranged substantially as shown.

Pivotally attached to have a folding connection with the devices above described, which forms the lower section of the elevating means or conveyer is shown an upper section consisting of the side-frames 34^a and lower supplemental frames 38^a adapted to be connected with and braced by straps similar to those shown at 40, although none are shown in connection with the folding section. And while not shown, the folding section has a bottom similar to that shown at 36 and provided with cleats similar to that shown at 39. The upper and folding section just described is pivotally connected at 41 with the lower section and like devices of this character when transporting the machine from place to place or storing the same the upper and folding section may be folded back and upon the lower section.

The lower and forward end of the elevating means just described serves as the receiving end thereof and is closed by the shield or plate 42. Traveling through the two sections of the elevating means and serving as a conveyer or carrier adapted to receive and convey material from the lower receiving end to the upper discharge end thereof is shown the pair of endless chains or link-belts 43 which are adapted to travel over and along the cleats 37 attached to the bottom of the sections formed by the side-frames 34 and 34^a. These chains or link-belts are driven by the driving-sprockets 44 with which they engage carried by the transversely disposed driving-shaft 45 located in the lower and receiving end of said elevating means. The said chains or link-belts have the discharge end of the elevating means travel over sprocket-wheels, not shown, similar to those indicated as 44 and carried by the transversely disposed shaft 46. Connecting the chains or link-belts 43 at desired intervals are the flights 47, substantially as shown in the figures which, as they travel upwardly through and between the frames 34 and 34^a move along and over the bottom connecting the same and in their return movement the said flights travel along and above the cleats 39 secured to the supplemental frames 38 and 38^a, all of which it is believed is understood.

The shaft or spindle indicated as 31 above referred to is adapted to be carried transversely through the lower section of the elevating means. That is to say, the frame constituting the elevating means in which the carrier or conveyer consisting of the endless chain or belting is operated, is of less width than the width of the portable support between the side frames 6 and the lower end of the elevating means is so positioned that the shaft 31 is carried transversely through the same in the space between the side and supplemental

frames 34 and 38 and to prevent sagging of the said shaft and also play between the lower and upper edges of the frames 34 and 38 I insert the filling-plates 47ª and 48 as shown. Engaging and in mesh with the gear-wheels 33 on the shaft 31 are racks 49, preferably secured to the sides of the frames 34. These racks are arranged substantially as shown in the figures and may be of any suitable length. The provision of the wheels 33 and racks 49 is to adapt the adjustment of the lower and receiving end of the elevating means and the same provides a fulcrumed point for the elevating means on which the same may oscillate when being raised or lowered.

When placing the elevating means in a position to receive and elevate material, from a drag to be described or some other suitable means to a bin or other receptacle the discharge end of the elevating means is raised by the operator through the crank or handle 23 for operating the shaft 17 in the manner specified which will wrap the cable 25 about the drums 24 attached to the said shaft. These cables at their free ends are attached preferably at 50 to the upper end of the lower section of the elevating means formed by the frames 34 and 38. As the cables 25 are wrapped about the drums specified, the elevating means is elevated and at the same time the standards or uprights 10 are elevated, for supporting and staying the said elevating means, substantially as will be seen in Fig. 1 of the drawings. As the elevating means is raised it is oscillated on the pivot formed by the shaft 31 and the connection of the gears 33 with the racks 49. If in raising the elevating means the lower receiving end thereof does not assume the desired position or rest upon the ground in a position suitable to receive the drag to be referred to, the position of the receiving end of said elevating means may be adjusted from or toward the portable support through the crank 32 and the connections operated thereby for rotating the shaft 31. This mechanism not only governs the position of the receiving end of the elevating means on the ground but the operation and adjustment thereof will to some extent govern the height at which the discharge end of the elevating means will be raised, all of which it is believed will be understood.

The drag to which reference has been made is best seen in Figs. 1, 2, 3, 9 and 10. The same consists of the side frames 51 having the cut out portions 52 for a purpose to be described and the same are connected by the overlying bottom portions 53 and 54. Traveling longitudinally between the side frames 51 of the said drag is a pair of endless chains or belts 55 which travel above the bottoms 53 and 54 and are operated by the driving sprockets 56 carried by the drive-shaft 57. At the outer opposite end of the drag a shaft 58 is provided on which is carried sprockets, not shown, which are similar to those indicated as 56 around which the endless chains or belts 55 are directed. Connecting the chains or belts and located at desired intervals are the flights 59 which serve to convey material received by the drag and convey the same to the lower receiving end of the elevating means. When in operative position for receiving and conveying material to the elevating means the relative position of the drag and elevating means is substantially that seen in Figs. 1 2 and 3. The outer end of the drag is supported upon the rest or standard 60 and the inner end is adapted to rest or be supported on the adjustable frame 61. This frame consists of a strap pivotally connected at 62 to the side frames 34 of the elevating means and extends forwardly and outwardly, and then transversely across the forward end of the said elevating means. The straps of the frame 61 where they are pivoted to the elevating means, have a pivotal connection with brackets 63 fixedly attached to the opposite frames 34, constituting the forward section of the elevating means. For adjusting the position of the forward end of the frame 61 which is adapted to support or serve as a rest for the inner end of the drag I provide the slotted plate 64 having the beveled forward end 65 and pivotally and adjustably connected at 66 to one of the side-frames 34 through and by means of a stud or bolt passing through the said frame and engaged by means of the wing-nut 67 which locks the plate 64 in adjusted position. The operation and function of said adjustable plate 64 is best seen in Fig. 2 of the drawings. The adjustment of the frame 61 and the plate 64 is governed a good deal by the position of the lower end of the elevating means relative to the shaft 31. That is, if the lower and receiving end of the elevating means is moved farther from or closer to its portable support or the shaft 31, it will change the angle of the elevating means and thereby raise or lower the inner end of the frame 61, as it is desirable to support the inner end of the drag in a horizontal position and to do this the frame 61 must be adjusted in the adjustment of the lower end of the elevating means so as to place the outer end of said frame 61 in a position to sustain the inner end of the drag horizontally. For adjusting the position of the outer end of the frame 61, the wing-nut 67 is loosened and the plate 64 so projected as to cause the upper rear end of the frame 61 to engage with the beveled face 65 of the said beveled plate 64 and the upper edge of the plate caused to engage with the bracket 63. These parts are best seen in Fig. 2 and the operation thereof and function which they perform will be readily understood from an examination of this figure. In connection with the frame 61 is provided a shield 68 which forms an extension of the shield or plate 42 forming the closure for the lower end of the elevating means, so that as the material is discharged from the drag into the receiving end of the elevating means there will be no danger of the same crowding up and out of the end thereof. This shield 68 is secured to the cross-brace or support 69, best seen in Fig. 4 secured to the side straps of the frame 61 and the said shield has vertical movement up and down between the end plate or shield 42 and a strap 70 attached to the sides of the lower receiving end of the elevating means and projecting transversely across in front of the same, substantially as seen in Figs. 2 and 3. I have also provided in addition to the end shield 68 the side shields 71 which are pivotally connected at 72 to the inner faces of the side frames 34 of the elevating means and said shields are adapted to move up and down adjacent to the inner faces of said side-frames in the movement of the frame or support 61 and the shield 68. These side shields 71 have the transverse integral part 73 which is connected to the cross-piece 69, preferably by the same means which secures the shield 68 thereto. With the side shields in addition to the shield 68 there is absolute assurance that material deposited in the lower receiv-

ing end of the elevating means by the drag will not crowd out of the ends or side thereof.

I have provided in connection with the lower and receiving end of the elevating means side supports or attachments to serve as a receiving hopper in connection with said elevating means. This consists of the side-frames 74 of suitable length secured to the forward end of the frames 34 by the straps 35 and adjustably connected with the frames 74 are the hopper sides or plates 76. The adjustable connection between the hopper sides of the plate 76 and the frame 74 consists in slotting the plates 76 at 77 and securing the same by means of the bolts 78.

I have provided in connection with the sides 51 of the drag interchangeable parts consisting of a shield and a feeding-spout having a foldable section. It is adapted in connecting the drag with the elevating means to attach the same in a manner to be described therewith so that the drag may have horizontal movement. This provision is made so that as a wagon is driven up to the elevating means and its front end elevated to allow the material therein to be dumped into the drag, that the drag may be swung out of the way and then into position again. When it has assumed its position to receive the material from the wagon, substantially as seen in Fig. 1 the spout referred to as being attached to the drag is attached to that side of the drag to receive the material and the shield referred to is attached to the opposite side thereof to prevent the material from falling over the opposite side of the drag. The shield above referred to is indicated as 79 and has a dove-tail connection with either one of the sides 51 of the drag, as shown in Figs. 9 and 10 and co-incides with and closes the cut out portions in the said sides which are made particularly for this purpose. The feeding or receiving spout for the material dumped into the drag consists of the sections 80 and 81; the former is adapted to have a dove-tail connection with either one of the sides 51, at the cut out portions thereof which is also substantially seen in Figs. 9 and 10. The section 81 is an extension of the part 80 and pivoted thereto at 82, the same being yieldingly held in its relative position with the part 80 when unfolded by means of the springs 83 attached at their opposite ends to the sections 80 and 81 substantially as seen in Figs. 9 and 10. With the above construction, it will be seen that the shield 79 and the chute or spout consisting of the sections 80 and 81 are interchangeable from one side of the drag to the other to adapt the unloading of the material from the wagon into the said drag from either side.

The drag is of less width than the sections forming the elevating mechanism carried by the portable support and when the inner end thereof rests on the frame 61 the drag is in a position substantially as seen in Figs. 1, 2, 3 and 5 and it is adapted, by means to be described, to drive the carrier or conveyer of the drag from the driving shaft 45 which drives the carrier or conveyer of the elevating means. This driving mechanism also includes a swivel connection to adopt a horizontal swinging connection of the drag with the receiving end of the elevating means and is further adapted to have an interchangeable connection with opposite sides of the elevating means also the drag.

The driving-shaft of the carrier or conveyer of the main elevating means which has been referred to as 45, extends out a suitable distance on opposite sides of the frames 34 and has the squared ends 84. The extended ends of this shaft pass through the disks or plates 85 attached to the frames 34 and 38 as shown and are provided, preferably, with a pair of outwardly and inwardly projected lips or ears 86, between which and the body of the plate is provided a suitable space for a purpose to be described.

87 indicates a bracket provided with the elongated tubular bearing 88 and the short tubular bearing 89 provided with an outer flange 90 having oppositely disposed slots 91 therein corresponding approximately to the depth of the lips 86 formed on the plate 85. It is desired to have the bracket 87 detachably connected also interchangeably connected with the plates 85 and to connect the same in working position thereon to receive parts to be described, the slots 91 of the flange 90 of the bracket 87 are slipped over the lips 86 of the plate 85 and then turned into a working position which locks the bracket in connection with the plate 85 and while allowing the rotary motion in connection with the plate 85 the same is held in a substantially non-detachable relation until the bracket 87 has been turned so that the slots 91 of the flange 90 co-incide with the lips 86 to permit the same to be detached therefrom.

92 denotes a beveled gear-wheel having a hub portion which has a bearing in the short tubular bearing of the bracket 87 and is further provided with an extended hub portion 93, squared for a portion of its length to adapt the same to have a fixed connection with the squared ends of the shaft 84. Intermeshing with the beveled gear 92 is a bevel gear 94 carried on the lower end of a shaft 95 which passes up through and has bearing in the elongated tubular bearing 88 of the bracket 87, this shaft has an elongated squared extension indicated as 96 serving a purpose to be described.

The driving shaft 57 of the conveying means in the drag is extended beyond the opposite ends thereof and has the squared ends 97, the said shaft being somewhat similar to that shown as the driving-shaft 45. The extended ends of the shaft 57 passes through the disks or plates 98 attached to the side frames 51 of the drag and are provided, preferably, with the pair of outwardly and inwardly projected lips or ears 99, between which and the body of the plate is provided a suitable space for a purpose to be described.

100 denotes a bracket which is similar to the bracket 87 and the same is provided with the elongated tubular bearing 101 and the short tubular bearing 102 provided with an outer flange 103 having oppositely disposed slots 104 therein corresponding approximately to the depth of the lips 99 formed on the plate 98. It is desired to have the bracket 100 detachably and interchangeably connected with the plates 98 and to connect the same in working position thereon to receive parts to be described, the slots 104 of the flange 103 of the bracket 100 are slipped over the lips 99 of the plate 98 and then turned into a working position as shown in the figures which locks the bracket 100 in connection with the plate 98 and while allowing rotary motion in connection with the said plate the same is held in a substantially non-detachable relation until the bracket 100 has been turned so that the slots 104 of the flange 103 co-incide with the lips 99 to permit the same to be detached therefrom.

105 denotes a beveled gear wheel having a hub portion which has a bearing in the short tubular bearing 102 of the bracket 100, which is squared internally approximately its length to adapt the same to have a fixed connection with the squared ends of the shaft 57. Intermeshing with the beveled gear 105 is a beveled gear 106, which, when the same is in operative connection with the driving-shaft 45 of the elevating means and the beveled gear 105 is carried on the upper squared extension 96 of the shaft 95; this squared portion of the shaft 95 has a suitable bearing in the tubular bearing 101 of the bracket 100 through the provision of an elongated sleeve 107 loosely carried by the bracket 100, in the manner seen in Fig. 5 which has a squared opening extending through the same to correspond to the squared portion of the shaft 95.

With the provision of the brackets 87 and 100 together with the plates attached to the elevating means and the drag and also the gearing specified it will be seen that the same may have an interchangeable connection with one side or the other of the elevating means and the drag and that suitable power connections may be made with the squared extensions 84 of the drive-shaft 45, as by means of a tumbling-shaft, not shown, from a horse-power or by other suitable power connections. The further advantage of the driving connections between the shaft 45 of the elevating means and the shaft 57 of the drag is, that the drag may have a swingable connection with the elevating means. That is to say, the drag may have a horizontal swinging movement in connection with the shaft 95 which serves as a pivotal point about which the drag may be swung, all of w' ch it is believed will be understood. And further, the drag may be easily attached to or disconnected from the elevating means and the power connections thereof by lifting the inner end of the drag and disconnecting the bracket 100 its gear 106 and sleeve 107 from the squared end of the shaft 95. A still further advantage of a drive of this character interposed between the elevating means and the drag is that the driving shaft 95 may be disposed at suitable angles and not necessarily limited to a vertical position between the shaft 45 and the shaft 57, which is fairly well illustrated in Fig. 2 wherein the shaft 95 is disposed in a slightly inclined position.

It is to be noted that in elevating or raising the discharge end of the elevating means through the operation of the drum shaft 17 for wrapping the cable 25 thereon, that as the elevating means is raised the uprights 10 are also raised, and when the shaft 17 is operated to unwind the cables 25 therefrom as the elevating means is lowered the uprights also automatically lower, the speed at which they drop being controlled by the cables which pass over the sheave wheels as shown.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent of the United States, is:—

1. In an apparatus of the class described, the combination of a portable support, an elevating body containing a carrier driven from its lower end, a pair of rack-bars connected with the lower end of said body and extending a short distance along the same, a shaft extending through the elevating body supporting pinions in mesh with said racks, journal supports on one end of said portable support, uprights extending up from the opposite end of said portable support, and mechanism in connection with said uprights for raising and lowering the outer end of said elevating body.

2. In an apparatus of the class described, the combination of a portable support, an elevating body containing a carrier driven from its lower end, a pair of rack-bars connected with the lower end of said body and extending a short distance along the same, a shaft extending through the elevating body, pinions on said shaft in mesh with said rack serving as a fulcrum point on which the lower end of the elevating body may be swung and for moving said body lengthwise, means for supporting said shaft on one end of said portable support, uprights extending up from the opposite end of said portable support, and mechanism in connection with said uprights for raising and lowering the outer end of said elevating body.

3. In an apparatus of the class specified, the combination of a portable support, elevating means adjustably connected by means of a rack and pinion with said support, a drag, and driving connections between the lower and receiving end of the elevating means and drag, said connections having an interchangeable connection with the opposite sides of the elevating means and drag.

4. In an apparatus of the class specified, the combination of a portable support, elevating means adjustably connected by means of a rack and pinion with said support, a drag, driving mechanism between the elevating means and drag and adapted to have an interchangeable connection with opposite sides thereof, said driving mechanism containing means for swingably connecting the drag to the elevating means.

5. In an apparatus of the class described, the combination of a portable support, an elevating body containing a carrier driven from its lower end, a pair of rack-bars connected with the lower end of said body, and extending a short distance along the same, a shaft extending through the elevating body, pinions on said shaft in mesh with said rack bar serving as a fulcrum point on which the lower end of the elevating body may be swung and for moving said body lengthwise, means for supporting said shaft on one end of said portable support, a pair of uprights pivotally connected at their lower ends with the opposite end of said portable support, and cables in connection with the outer ends of said uprights for raising and lowering the outer end of said elevating body.

6. In an apparatus of the class specified, the combination of elevating means comprising folding sections, a driving shaft in the lower receiving end thereof, a drag, driving mechanism connecting said shaft with the drag and adapted to have an interchangeable connection with the opposite sides of the driving-shaft and drag, said mechanism containing means for swingably connecting the drag to the elevating means.

7. In an apparatus of the class specified, the combination of elevating means, means for raising and lowering the discharge end thereof, a driving shaft in the lower receiving end thereof, a drag, driving mechanism connecting said shaft with the drag and adapted to have an interchangeable connection with the opposite sides of the driving shaft and drag, said mechanism containing means for swingably connecting the drag to the elevating means.

8. In an apparatus of the class described, the combination of a portable support, an elevating body containing a carrier driven from its lower end, a pair of rack-bars connected with the lower end of said body and extending a short distance along the same, a shaft extending through the elevating body supporting pinions in mesh with said racks, journal supports on one end of said portable support, uprights extending up from the opposite ends of said portable support, cables in connection with the outer ends of said uprights and said elevating body for raising and lowering the latter, means for operating said cables, and a drag swingably connected with the receiving end of said elevating body.

9. In an apparatus of the class described, the combination of a portable support, an elevating body containing a carrier driven from its lower end, a pair of rack bars connected with the lower end of said body and extending a short distance along the same, a shaft extending through the elevating body supporting pinions in mesh with said

racks, journal supports on one end of said portable support, uprights extending up from the opposite end of said portable support, cables in connection with the outer ends of said uprights and said elevating body for raising and lowering the latter, means for operating said cables, a drag, power connections between the elevating body and drag, said connections containing means for swingably attaching the drag to said elevating body.

10. In an apparatus of the class described, the combination of an elevating body, consisting of folding sections and containing a carrier, uprights and power means in connection with said uprights and said elevating body for raising and lowering the same, racks and pinions to facilitate in moving said elevating body lengthwise, a drag, driving connections between the drag and carrier of the elevating body, a rest extending from said elevating body for the inner end of the drag, and means for adjusting the said rest to support said drag as the angle of the elevating body is changed.

11. In an apparatus of the class specified, the combination of an elevating body, a drag, driving connections between drag and elevating body, and a strap attached to and extending across the elevating body to serve as a rest for the drag.

12. In an apparatus of the class specified, the combination of an elevating body, a drag, driving connections between drag and elevating body, a strap attached to and extending across the elevating body to serve as a rest for the drag, and means for changing the angularity of said strap.

13. In an apparatus of the class specified, the combination of an elevating body, a drag, driving connections between drag and elevating body, a strap pivotally connected to the opposite sides of said elevating body and serving as a rest for the drag, and means in connection with the elevating body for changing and fixing the angularity of the strap.

14. In an apparatus of the class specified, the combination of an elevating body, a drag, driving connections between drag and elevating body, brackets attached to the sides of the elevating body, a strap serving as a rest for the drag having its ends pivotally connected to said brackets, and means operating in connection with one of said straps for changing and fixing the angularity of said strap.

15. In an apparatus of the class specified, the combination of elevating means, comprising a support and an endless carrier therein, a driving shaft for the said carrier, a drag comprising a support and an endless carrier, driving connections between the driving shaft of the elevating means and carrier of the drag, said driving connections adapted to have an interchangeable connection with the opposite ends of said driving shaft and the drag, and a support for the inner end of the drag adjustably connected with said elevating means.

16. In an apparatus of the class specified, the combination of a portable support, an elevating body, racks and pinions for moving said body lengthwise, means for raising and lowering the outer end of said body, a drag, a strap pivotally attached to the elevating body and serving as a rest for the drag, and a plate pivotally attached to the support and coöperating with said strap for changing the angularity of said strap.

17. In an apparatus of the class specified, the combination of elevating means, a drive shaft therefor, a drag, driving mechanism between the elevating means and drag, the same adapted to have an interchangeable connection with the opposite ends of the said shaft, a support for the drag pivotally attached to the elevating means, and means attached to said elevating means for adjusting the position of said support.

18. In an apparatus of the class specified, the combination of a portable support, elevating means adjustably mounted at one end upon said support, a drive shaft in the lower receiving end of said elevating means, a drag, driving connections between the shaft and drag, a support for the drag pivotally attached to the elevating means, and means attached to said elevating means for adjusting the position of said support.

19. In an apparatus of the class specified, the combination of a portable support, elevating means adjustably mounted at one end upon said support by means of a rack and pinion, a drive shaft in the lower receiving end thereof, a drag, driving connections between the shaft and drag, a support for the drag pivotally attached to the elevating means, and means attached to said elevating means for adjusting the position of said support.

20. In an apparatus of the class described, the combination of a wheeled support, an elevator mounted on said support, mechanism connecting the receiving end of the elevator with the forward end of said support that the elevator may be movable lengthwise on said support for the purpose of placing the receiving end of the elevator on the ground, and means connected with the rear end of said support and the outer portion of said elevator for raising and lowering the same on a fulcrum formed by the mechanism for moving the same lengthwise.

21. In an apparatus of the class specified, the combination of a support, elevating means adapted to be raised and lowered on said support, a shaft journaled on the support and passing transversely through the elevating means, racks attached to and extending longitudinally of the elevating means and worm and worm-wheel gearing in connection with said shaft and racks for adjusting the position of the elevating means on the support.

22. In an apparatus of the class described, the combination of a wheeled support, an elevator mounted on said support, connections between the lower end of the elevator and the forward end of the support, which said connections form a fulcrum on which the elevator may be raised or lowered, means for raising and lowering the elevator, and mechanism for operating the connections aforesaid, for advancing or withdrawing the lower end of the elevator.

23. In an apparatus of the class described, the combination of a wheeled support, an elevator mounted on said support, mechanism connecting the receiving end of the elevator with the forward end of said support to adapt the moving of the receiving end of the elevator in advance of its support and in proximity to the ground to connect therewith a drag, a drag swingably connected with the receiving end of the elevator, and means for raising and lowering the outer end of said elevator on a fulcrum formed by the mechanism for moving the said elevator.

24. In an apparatus of the class specified, the combination of elevating means, a drive-shaft connected with the lower end of the same and having oppositely extended portions therefrom, a drag, driving mechanism interchangeably connected with the opposite ends of the drive-shaft, and driving connections between said driving mechanism and the drag adapted to have an interchangeable connection with the drag and an adjustable and detachable relation with said driving mechanism.

25. In an apparatus of the class specified, the combination with elevating means, of a drive-shaft projected therethrough upon opposite sides, a bracket adapted to have an interchangeable connection with the opposite ends of said shaft, gearing in connection with the shaft and having a bearing in said bracket, a drag, a drive-shaft therefor, a bracket adapted to have an interchangeable connection with the opposite ends of said last mentioned shaft and having a bearing in the bracket, and driving connections between the gearing of said first mentioned shaft and said last mentioned gearing.

26. In an apparatus of the class specified, the combination with conveying means, a drive-shaft therefor projecting from without opposite sides thereof, plates attached to said conveying means through which said shaft is carried, a bracket adapted to have a detachable and interchangeable connection with the plates upon the opposite sides of said conveying means, a gear-wheel having a bearing in said bracket and adapted to be revolubly connected with the driving-shaft, a second gear in mesh with the aforementioned gear, and a shaft journaled in said bracket for carrying said last mentioned gear.

27. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, means connecting the lower

end of said elevator with the forward ends of the stringers of said support comprising gearing which forms a fulcrum on which the elevator may be raised and lowered, and adapted to be manually actuated for moving said elevator bodily, a support for the outer end of the elevator, and means for raising and lowering the outer end of the elevator.

28. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, gearing attached to the lower end of said elevator, gearing supported on the forward end of one of said stringers, connections between the gearing of the stringers and the elevator, which forms a fulcrum on which the elevator may be raised and lowered means for manually actuating the gearing on the stringers for moving the elevator bodily, a support for the outer end of the elevator, and means for raising and lowering the outer end of said elevator.

29. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, means connecting the lower end of said elevator with the forward ends of the stringers of said support comprising gearing which forms a fulcrum on which the elevator may be raised and lowered, and adapted to be manually actuated for moving said elevator bodily, uprights connected with the rear end of said support and extending alongside of said elevator, and means in connection with the stringers, the elevator and uprights adapted to be manually actuated for raising and lowering the outer end of the elevator.

30. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, gearing attached to the lower end of said elevator, gearing supported on the forward ends of one of said stringers, connections between gearing of the stringers and the elevator, which forms a fulcrum on which the elevator may be raised and lowered means for manually actuating the gearing on the stringers for moving the elevator bodily, uprights connected with the rear end of said support and extending alongside of said elevator, and means in connection with the stringers, the elevator and uprights adapted to be manually actuated for raising and lowering the outer end of the elevator.

31. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, means connecting the lower end of the said elevator with the forward ends of the stringers of said support, comprising gearing which forms a fulcrum on which the elevator may be raised and lowered, and adapted to be manually actuated for moving the said elevator bodily, uprights pivotally connected with the rear end of said support having their outer ends extended alongside of said elevator, power devices supported by said stringers, connections between the power devices and elevator and passing over the outer ends of said uprights, and means for actuating said power devices for raising and lowering the outer end of the elevator and simultaneously oscillating said uprights on their pivots.

32. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, gearing attached to the lower end of said elevator, gearing supported on the forward ends of one of said stringers, connections between gearing of the stringers and the elevator, which forms a fulcrum on which the elevator may be raised and lowered means for manually actuating the gearing on the stringers for moving the elevator bodily, uprights pivotally connected with the rear end of said support having their outer ends extended alongside of said elevator, power devices supported by said stringers, connections between the power devices and elevator and passing over the outer ends of said uprights, and means for actuating said power devices for raising and lowering the outer end of the elevator and simultaneously oscillating said uprights on their pivots.

33. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, means connecting the lower end of said elevator with the forward ends of the stringers of said support comprising gearing which forms a fulcrum on which the elevator may be raised and lowered, and adapted to be manually actuated for moving said elevator bodily, uprights pivotally connected at their lower ends with the rear end of the stringers, brace-bars pivotally connected with the rear axle at their lower ends and at their opposite ends connected with said uprights, power devices supported by said stringers, connections between power devices and elevator and passing over the outer ends of said uprights, and means for actuating said power devices for raising and lowering the outer ends of the elevator and simultaneously oscillating the said uprights on their pivots.

34. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, gearing attached to the lower end of said elevator, gearing supported on the forward ends of one of said stringers, connections between gearing of the stringers and the elevator, means for manually actuating the gearing on the stringers for moving the elevator bodily, uprights pivotally connected at their lower ends with the rear end of the stringers, brace-bars pivotally connected with the rear axle at their lower ends and at their opposite ends connected with said uprights, power devices supported by said stringers, connections between power devices and elevator and passing over the outer ends of said uprights, and means for actuating said power devices for raising and lowering the outer ends of the elevator and simultaneously oscillating the said uprights on their pivots.

35. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers, connected front and rear with said axles, an elevator, means connecting the lower end of said elevator with the forward ends of the stringers of said support comprising gearing which forms a fulcrum on which the elevator may be raised and lowered, and adapted to be manually actuated for moving the said elevator bodily, uprights supported from the rear end of said support, a transverse shaft journaled in bearings supported by said stringers, cables connected with said shaft and elevator and passing over the outer ends of said uprights, and gearing for actuating the said shaft for winding and unwinding said cable and thereby raising and lowering the said elevator.

36. In an apparatus of the class described, the combination of a portable support, comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, gearing attached to the lower end of said elevator, gearing supported on the forward ends of one of said stringers, connections between gearing of the stringers and the elevator, which forms a fulcrum on which the elevator may be raised and lowered means for manually actuating the gearing on the stringers for moving the elevator bodily, uprights supported from the rear end of said support, a transverse shaft journaled in bearings supported by said stringers, cables connected with said shaft and elevator and passing over the outer ends of said uprights, and gearing for actuating the said shaft for winding and unwinding said cable and thereby raising and lowering the said elevator.

37. In an apparatus of the class described, the combination of a support, comprising rear and front axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator, comprising hinged sections and having a receiving boot at its lower end, means for mounting the lower end of the elevator on the forward ends of the stringers and between the same, comprising a shaft revolubly mounted on said stringers, and gearing connecting said shaft with said elevator, means for actuating the said shaft and thereby bodily moving said elevator, and

means connected with said support for raising and lowering the outer end of said elevator.

38. In an apparatus of the class described, the combination of a support comprising front and rear axles, a pair of parallel spaced stringers connected front and rear with said axles, an elevator having a receiving boot at its lower end, means for mounting the lower end of the elevator on the forward ends of the stringers and between the same, comprising longitudinal rack-bars attached to said elevator, a shaft mounted on the forward ends of said stringers, gearing on said shaft in mesh with said racks, means for actuating said shaft to move the elevator lengthwise for adjusting the boot end of said elevator with respect to the ground, and means connected with said support for raising and lowering the outer end of said elevator.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM PETERS.

Witnesses:
CHAS. W. LA PORTE,
ROBT. N. MCCORMICK.