

Oct. 15, 1929.

F. D. COPPOCK

1,732,083

STACKER

Filed July 8, 1927

6 Sheets-Sheet 1

Fig. 1.

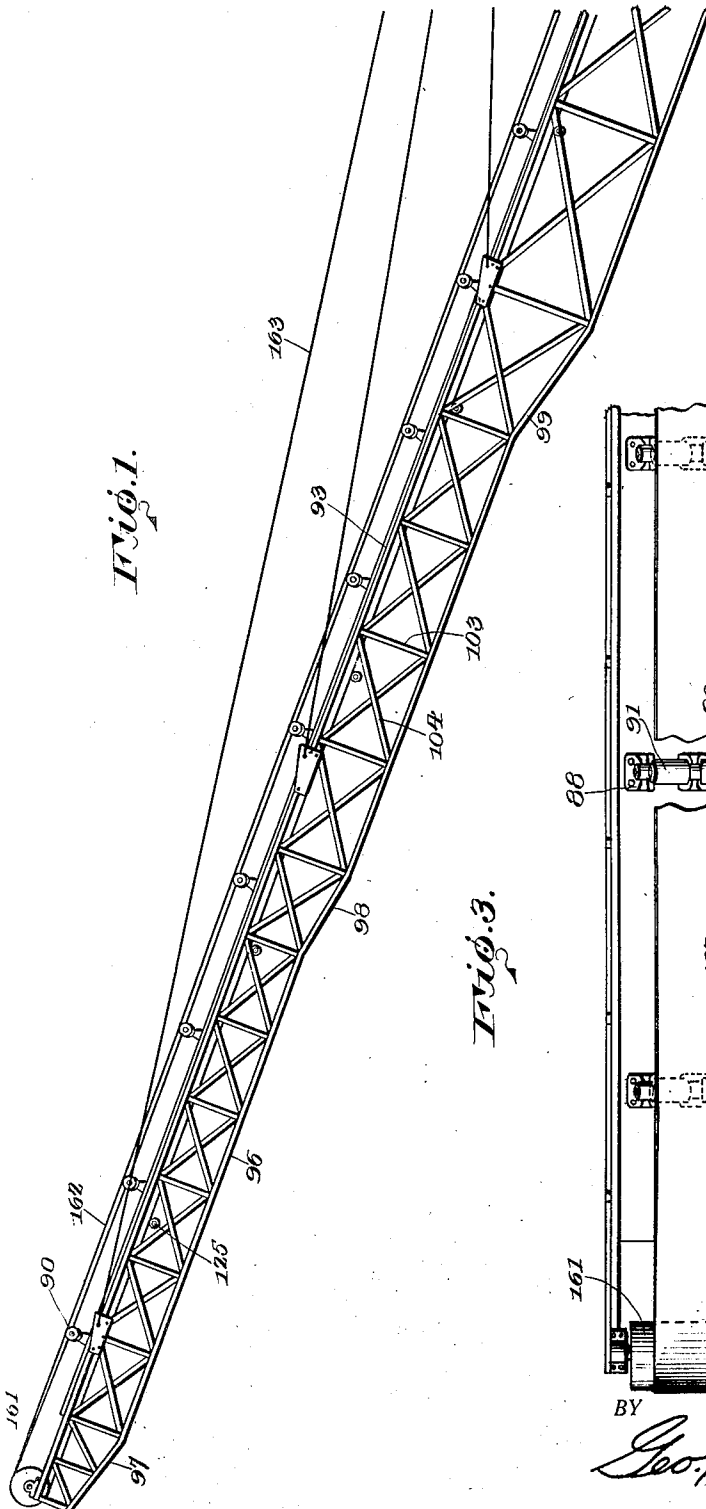
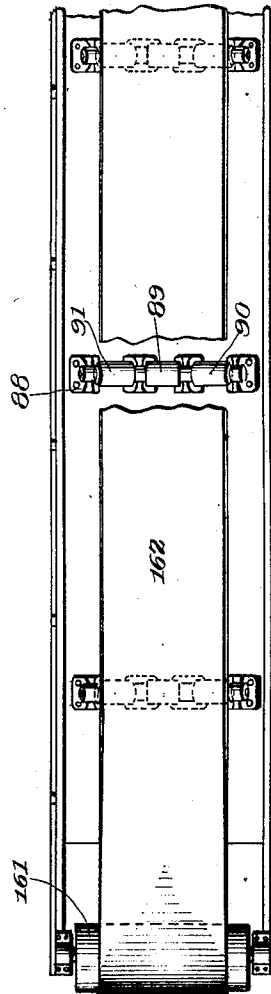


Fig. 3.



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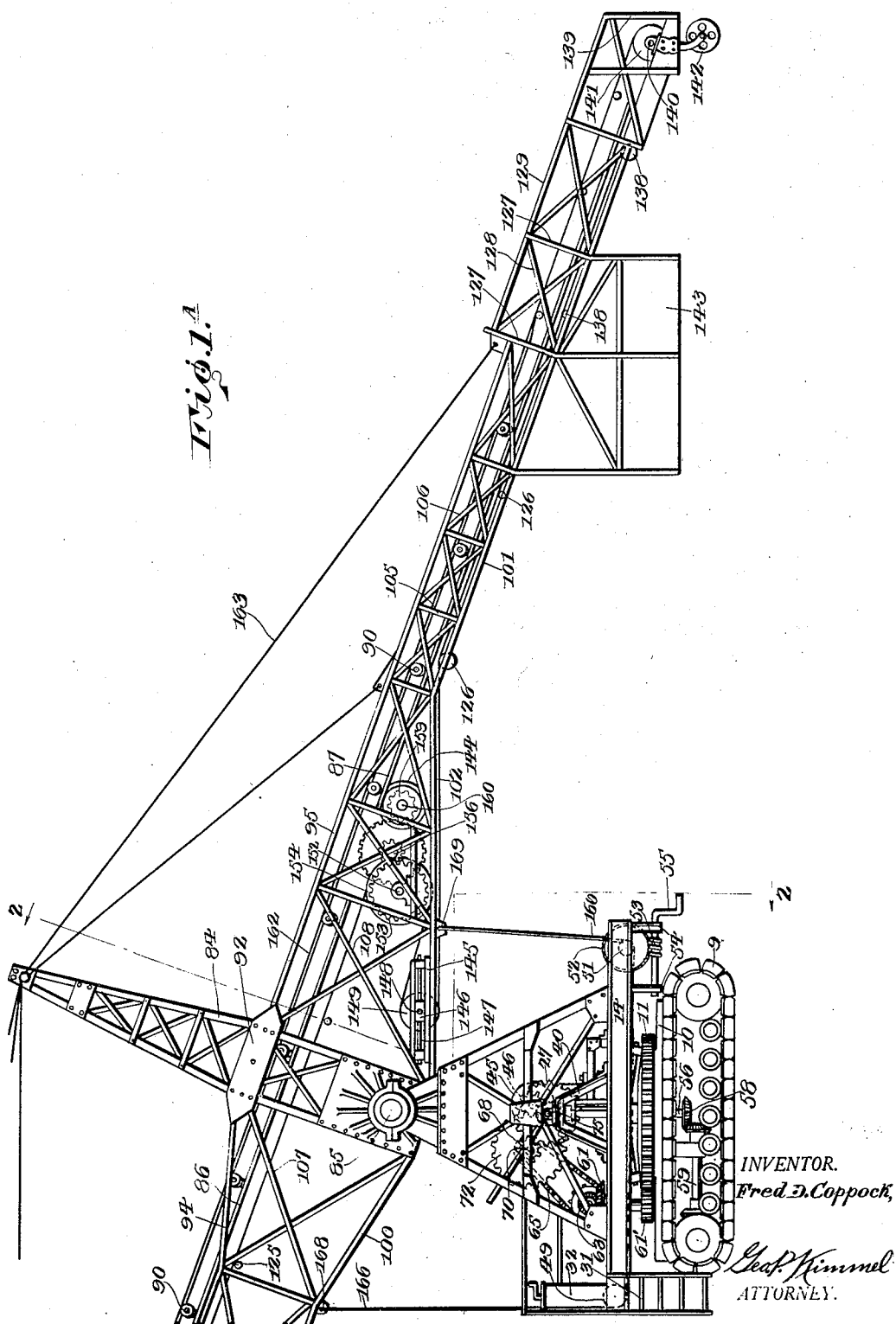
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6 Sheets-Sheet 3

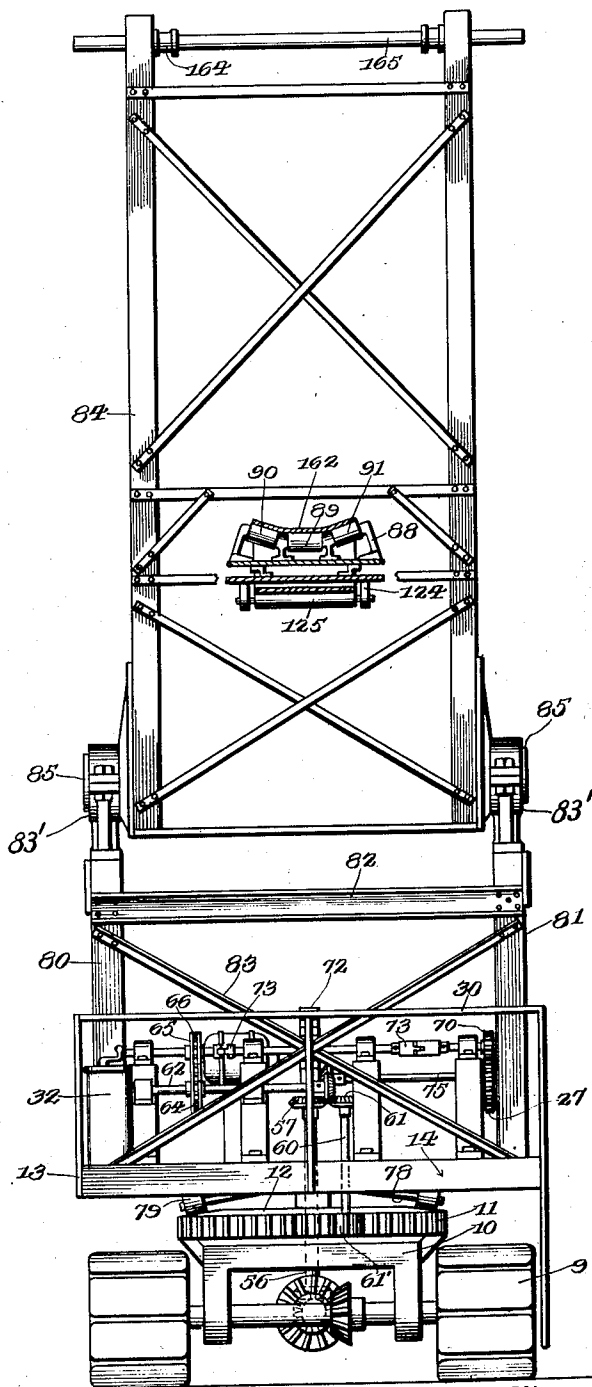


Fig. 2.

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Fig. 4.

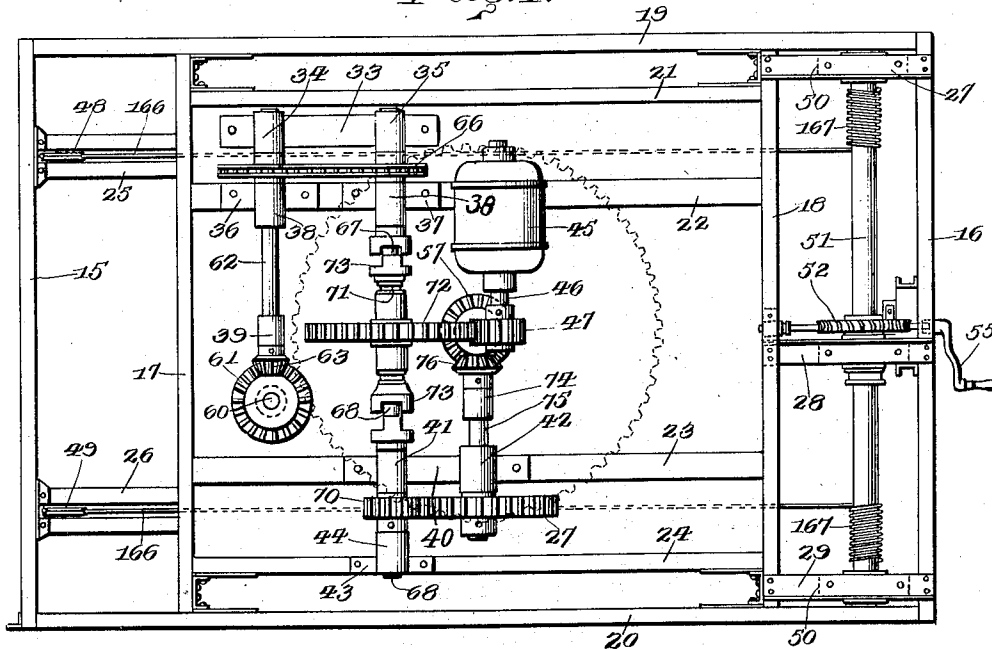
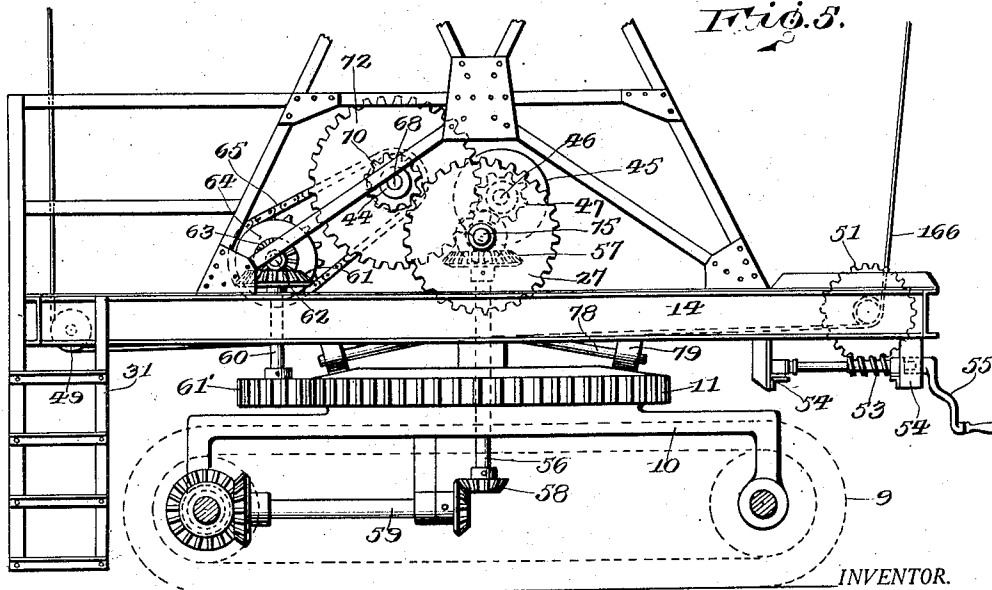


Fig. 5.



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Fig. 6.

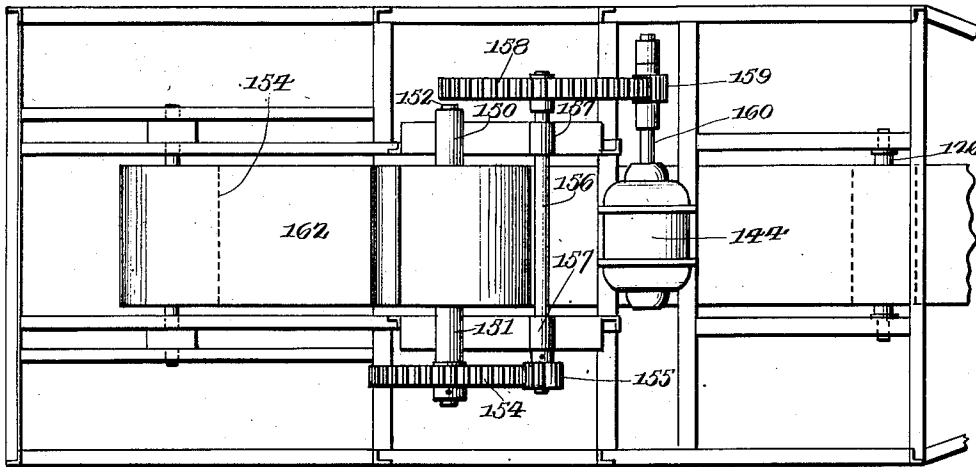


Fig. 7.

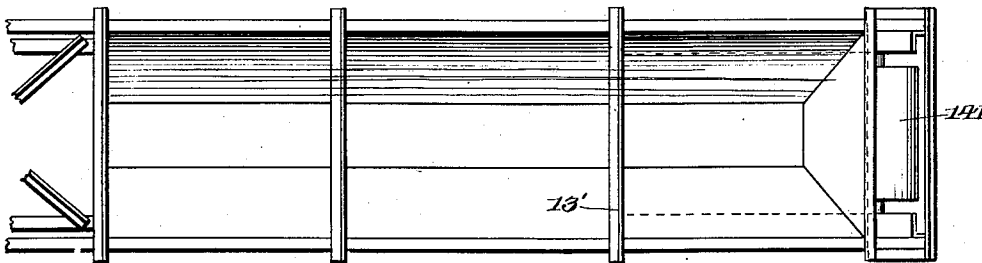


Fig. 8.

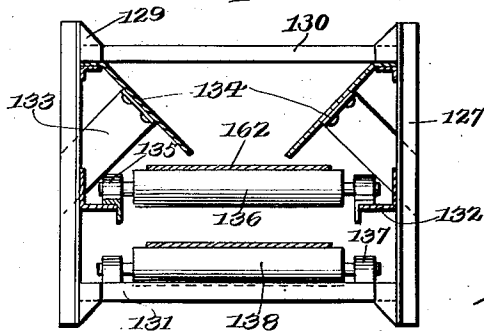
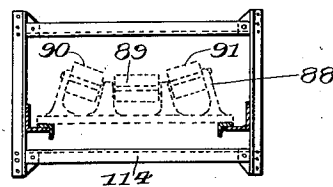


Fig. 14.



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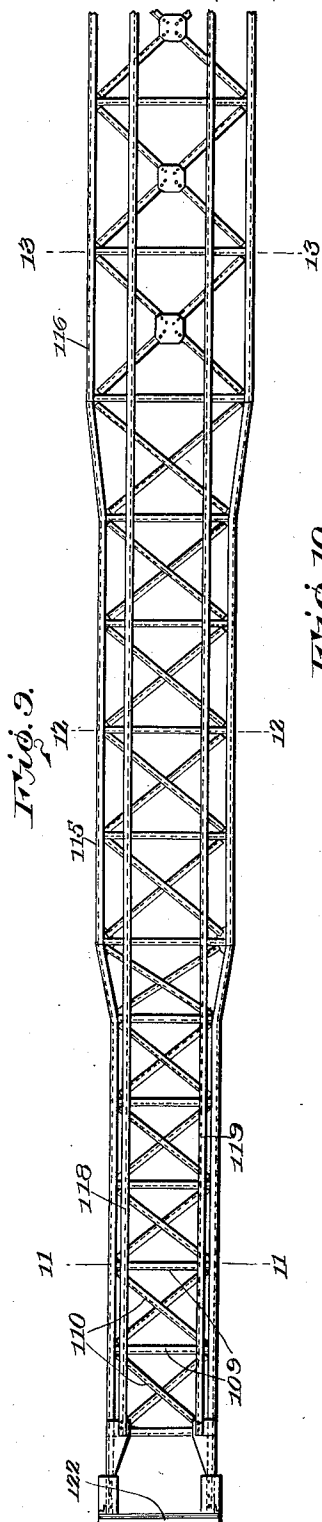
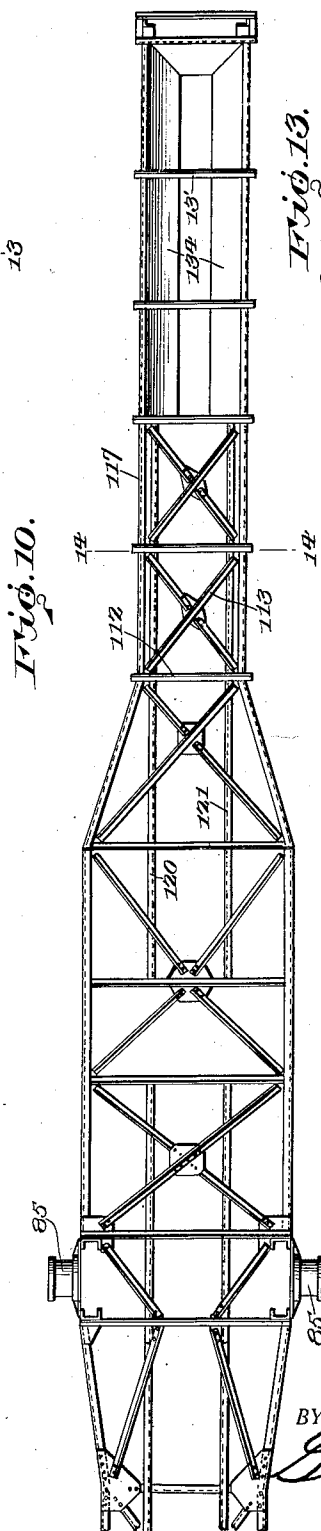
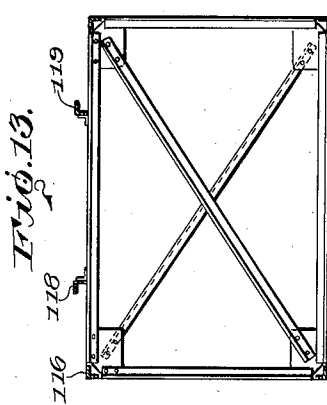
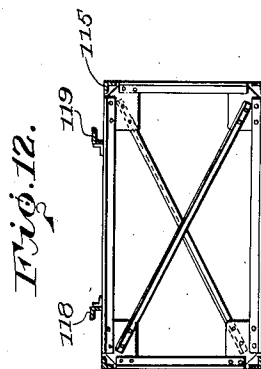
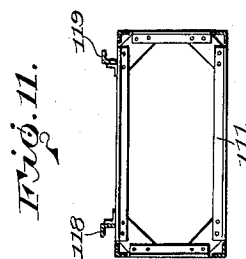
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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

FRED DOUGLAS COPPOCK, OF GREENVILLE, OHIO

STACKER

Application filed July 8, 1927. Serial No. 204,294.

This invention relates to an adjustable, mobile stacker and has for its object to provide, in a manner as hereinafter set forth, a device of such class including a motor driven traction carriage including traction elements of the endless, flexible track laying type for transporting the stacker from point to point when desired, and further including a stacker element capable of being rotated in a horizontal plane without changing the position of the carriage, and further with the stacker element tiltably mounted, intermediate its ends, so that the loading or unloading points thereof can be raised or lowered to accommodate rolling ground or other conditions demanding such flexibility.

Further objects of the invention are to provide, in a manner as hereinafter set forth, an adjustable, mobile stacker which is comparatively simple in its construction and arrangement, strong, durable, thoroughly efficient in its use, conveniently operated and adjusted, readily assembled, and comparatively inexpensive to set up.

With the foregoing and other objects in view the invention consists in the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

Figures 1 and 1^a when taken together illustrate in side elevation, an adjustable, portable stacker in accordance with this invention.

Figure 2 is a section on line 2—2 Figure 1. Figure 3 is a fragmentary view in plan of the stacker element.

Figure 4 is a top plan view illustrating the driving mechanism for the carriage and the adjusting means for the stacker element.

Figure 5 is a fragmentary view in side elevation illustrating the lower portion of the stacker.

Figure 6 is a fragmentary view in top plan

illustrating the operating means for the conveyor and the take up device for the latter.

Figure 7 is a fragmentary view in top plan showing the receiving hopper.

Figure 8 is a cross sectional detail through the receiving hopper.

Figures 9 and 10 when taken together illustrate the beam of the picker element in top plan.

Figure 11 is a section on line 11—11 Figure 9.

Figure 12 is a section on line 12—12 Figure 9.

Figure 13 is a section on line 13—13 Figure 7.

Figure 14 is a section on line 14—14 Figure 10.

The stacker includes a motor driven traction carriage 9 of that character having traction elements of the endless, flexible, track type. The carriage 9 has as a part thereof a support 10 carrying a horizontally disposed gear wheel 11 which constitutes a turn table and a track for that portion of the structure arranged thereover. The said portion of the structure, which is arranged over the gear wheel 11, is pivotally connected with the carriage and can be, when occasion requires, bodily swung horizontally about its pivot. The marginal portion of the upper face of the gear 11 is beveled, as at 12, to provide a track.

Positioned upon the gear 11, as well as being pivotally connected therewith, is a deck referred to generally by the reference character 14 and which consists of a frame comprising end bars 15, 16, transverse brace bars 17, 18 spaced a substantial distance from the end bars 15, 16, respectively, side bars 19, 20 to which the transverse bars 17, 18 are connected, spaced longitudinally extending brace bars 21, 22, 23 and 24 which are secured and arranged between the bars 17, 18 and with the bars 21, 24 spaced from the bars 19, 20, pairs of brace members 25, 26 arranged between and secured to the bars 15, 17 and with the brace members of each pair arranged in spaced relation, and connecting members arranged in spaced relation, indicated at 27, 28 and 29 and which are secured to the bars 16, 18. The deck 14 is provided with a railing 30

and depending steps 31 leading thereto. Mounted on the deck 14 is an electric controller 32. The frame carries suitable flooring.

5 Secured upon the deck 14 in any suitable manner is a standard 33 provided at its top with a pair of spaced guides 34, 35. Secured to the bar 22 is a pair of spaced standards 36, 37, provided with bearings 38, 39', respectively. Carried by the deck 14 is a bearing 39. Secured to the bar 23 is a standard 40 provided with bearings 41, 42. Secured to the bar 24 is a standard 43 provided with a bearing 44. Supported by the deck 14 is an electric motor 45 having suitable circuit connections with the controller 32. The shaft of the motor 45 is indicated at 46 and it carries a sprocket pinion 47. Supported by the pair of brace members 25 is a pulley 48 and supported by the brace members 26 is a pulley 49. The pulleys 48 and 39 are arranged between the brace members 25, 26, respectively. Depending from the connecting members 27, 28 and 29, are bearings 50 for a winding shaft 51, carrying a worm gear 52 which is driven from a worm shaft 53 journaled in hangers 54 and provided at its outer end with a handle member 55. The hangers 54 are secured to and depend from the deck 14.

30 Supported from the deck 14, by any suitable means is a vertically disposed shaft 56 which extends into the carriage 9 and carries at its upper end a bevel gear 57 and at its lower end a bevel pinion 58 which coacts with the driving connection 59 for the carriage. Supported by the deck 14 is a vertically disposed shaft 60 carrying at its upper end a bevel pinion 61 and at its lower end a cog gear 61' which meshes with the gear 11. Journaled in the bearings 34, 38 and 39 is a shaft 62, provided at its inner end with a beveled pinion 63 which meshes with the bevel gear 61. The shaft 62 between the bearings 34 and 38 carries a sprocket gear 64 driven from a sprocket chain 65 which is operated by a sprocket pinion 66 carried by a shaft 67 journaled in the bearings 35, 40. Journaled in the bearings 41, 44 is a shaft 68, arranged in alignment with the shaft 67 and which carries a sprocket pinion 70. Arranged in alignment with the shafts 67, 68 and suitably supported from the deck 14, is a shaft 71 provided with a large gear wheel 72. Arranged between the shafts 67 and 71 is a clutch 73 provided for the driving of the shaft 67 from the shaft 71 and arranged between the shafts 60, 71 is a clutch 73 for the purpose of driving the shaft 68 from the shaft 71. The gear 72 meshes with the pinion 47, on the motor shaft 46 and is driven from the latter. Journaled in the bearing 42, and also in a bearing 74 suitably supported from the deck 14, is a shaft 75, having its inner end provided with a bevel pinion 76, which meshes with the bevel gear 67 for the purpose

of driving the shaft 56. The shaft 75 is provided with a gear wheel 27 meshing with the pinion 70 to provide for the operation of the shaft 75 when the shaft 68 is clutched to the shaft 71. When the shaft 67 is clutched to the shaft 71, it provides for the operation of the shaft 60 and as the gear 61 meshes with the gear 11, the deck 14 can be turned horizontally upon its pivot or in other words the deck 14 can be adjusted horizontally. When the shaft 58 is clutched to the shaft 71 and driven from the latter, the shaft 56 will be operated and cause thereby the driving of the carriage 9. Secured to the deck 14 and depending therefrom is a plurality of radially disposed shafts 78 which extend at a downward inclination and carry rollers 79, which travel on the track 12 formed by the beveled marginal portion of the upper face of the gear 11. The rollers 79 are bodily carried horizontally for the purpose of adjusting and bodily shifting that part of the structure of the stacker supported from and above the deck.

Connected with and supported by the deck 14, is a superstructure comprising a pair of inverted V-shaped side frames 80, 81 connected together by horizontally extending brace members 82 and also by oppositely disposed inclined brace members 83 arranged below the brace members 82. The upper end of each of the side frames is provided with a bearing 83'. The side members 80, 81 are anchored to the deck 14. The superstructure provides means for pivotally supporting a tiltable stacker element.

The stacker element includes a tower member 84 of substantial height and of skeleton form and which has each side thereof, at its lower end, formed with a trunnion 85 which is journaled in a bearing 83'. The stacker element further includes a conveyor support in the form of a skeleton beam and which extends through and is secured to the tower 84. The conveyor support at a point between its transverse center and its rear end is connected to the tower 84. The conveyor support is positioned with respect to the tower 84 at a point between the transverse center of the latter and its lower end.

The skeleton beam which provides the conveyor support includes a supporting member formed of two spaced sections 86, 87 extending in the same plane throughout. The inner ends of said sections are spaced from each other as shown in Figure 1^a. Each of the sections of the supporting member is formed from a substantially narrow, flat sheet metal of the desired length. The section 86 is of greater length than the section 87 and the latter is positioned at the rear end of the beam.

Arranged at spaced intervals throughout the upper face of each section of the supporting member is a set of aligning spaced

holders 88 disposed transversely with respect to the supporting member and each set is provided for rotatably supporting a set of anti-friction rollers. The number of rollers of each of the sets is three and are indicated at 89, 90 and 91, see Figure 2. The roller 89 is arranged centrally of the set and transversely disposed with respect to the section of the supporting member. The rollers 90, 91 are the outer rollers of the set and extend upwardly at an opposite inclination with respect to each other to provide a trough like arrangement.

The sections of the supporting member are carried by a frame work of a length greater than the length of such supporting member and said frame work comprises a pair of side members, of like construction, coupled together at the top and bottom thereof and further provided throughout with vertical coupling members and oppositely disposed inclined braces. Each side member at a point between its transverse median and rear end includes a top plate 92 which is secured to a side of the tower 84 and also to the inner end of a forwardly extending bar 93 having the rear thereof extending at an upward inclination, as indicated at 94. The bar 93 is termed the forward top bar. Secured to and extending rearwardly from the plate 92 is what is termed a rear top bar 95 positioned above the major portion of the forward top bar 93. Secured to and extending forwardly from the bottom of each side of the tower 84 is a bar 96, which is termed a forward bottom bar and is provided throughout its length with upwardly extending inclined parts 97, 98, 99 and 100. Secured to and extending rearwardly from the bottom of each side of the tower 84 is a bar 101, termed a rear bottom bar and which is formed with an upwardly extending inclined portion 102. The bars 93 and 96 are connected together by spaced, vertically disposed coupling members 103 which maintain said bars in spaced relation. Interposed between the bars 93 and 96 and between the coupling members 103 are oppositely disposed inclined braces 104. The bars 95 and 101 are connected together by spaced coupling members 105 and interposed between the members 105 and the bars 95 and 101 are oppositely disposed inclined braces 106. Inclined braces 107 extending in opposite directions, are interposed between the bars 93, 96 and the inner coupling member 103 and tower 84. Oppositely disposed inclined braces 108 are interposed between the inner coupling member 105, bars 95, 101 and tower 84. The forward top bars 93 of the side members are connected together by transversely extending, spaced braces 109 and oppositely extending inclined braces 110. The forward bottom bars 96 of the side members are con-

nected together by spaced transversely extending braces 111. The rear top bars 95 of the side members are connected together by transverse braces 112 and oppositely disposed inclined braces 113. The rear top bars 95 of the side members are of less length than the rear bottom bars 101 of the side members. The rear bottom bars 101 of the side members are connected together by transverse braces 114. The forward top bars 93 of the side members have offset portions 115 and 116. Each of the rear top bars 95 of the side members is formed with an inset portion 117. The forward bottom bars and the rear bottom bars of the side members conform in contour with respect to the forward and rear bars of the side members that is to say that the bottom bars have offset and inset parts similar to the top bars. The top bars are arranged in superposed alignment with respect to the bottom bars. Mounted on the transverse brace members 109 is a pair of spaced angle irons or angle bars 118, 119, and which are also mounted on the inclined braces 110. The angle bars 118, 119 extend from the forward transverse brace members 109 through the tower 84 and are secured to the inner transverse brace member 112. Arranged between the side members rearwardly of the tower 84 and spaced from the angle bars 118, 119, and further supported from said side members is a pair of spaced angle bars 120, 121. The angle bars 120, 121 are arranged below the braces 112 and 113. The forward top and bottom bars of the side members project forwardly from the forward transverse brace 109 and are connected together as at 122. The forward terminal portion of each side member is reduced see Figure 1. The section 86 of the supporting member is mounted on or rather secured to the angle bars 118 and 119 and the section 87 of the supporting member is secured to the angle bars 120, 121. The section 86 of the supporting member extends through the tower 84.

Supported from the transverse brace members 109 are hangers 124 arranged in pairs and journaled in each pair of hangers 124 is an idler roller 125. The rollers 125 are positioned below the section 86 of the supporting member for the sets of holders 88. Supported from the rear bottom bars 101 are idler rollers 126. The rear bottom bars 101 extend rearwardly from the rear top bars 95 and secured to the bars 101 are vertical brace bars 127 connected together by inclined brace bars 128. Secured to the upper ends of the vertical bars 127, at each side of the conveyer support are top bars 129 and said top bars 129 are connected together by transverse bars 130. The bottom bars 101 are also connected together by transverse members 131. The vertical members 127 at each side of the conveyor supports are connected together by an angle

iron 132. Inwardly extending and upwardly inclined brackets 133 are secured to the members 127 and to the brackets 133 are secured oppositely extending inclined plates 134 which constitute a hopper. The angle bars or irons 132 are provided with opposed bearings 135 for the reception of the pintles of idler rollers 136. Transverse members 131 are provided with spaced bearings 137 for the reception of the pintles of idler rollers 138. The bars 129 are arranged above the bars 95 and the upper ends of the plates 134 are secured against the lower faces of the bars 129. Secured to the bars 129 is a supporting frame 139 provided with bearings 140 for the shaft of a conveyor roller 141. The roller 141 is of greater diameter than the idler rollers 126, 138. Depending from the supports 139 is a tail-wheel or castor 142. Suspended from the bottom bars 101 is a counterweight box 143 which is arranged in proximity to the tail-wheel or castor 142. The wheel or castor 142 is swivelly connected with a support 139.

Mounted in the conveyor support between the inclined portions 102 of the rear bottom bars 101 and the top bars 95 is a motor 144 having suitable electric connections with the controller 32. Mounted on the inclined portions 102 of each of the bottom bars 101 is a rectangular frame 145 in which is slidably mounted a bearing 146 provided with oppositely extending rods 147, which slide through the ends of the frame 145. A shaft 148 is mounted in the bearings 146 and carried by the shaft 148 is a take-up pulley 149. Within the conveyor support, rearwardly of the pulley 149 and further positioned above the latter is a pair of bearings 150, 151, in which is journaled a shaft 152 carrying a drive pulley 153 for an endless conveyor to be presently referred to. The shaft 152 carries a gear wheel 154, which meshes with a pinion 155, mounted on a shaft 156, journaled in bearings 157 and provided with a gear 158 which is driven from a pinion 159, carried by a shaft 160 of the motor. The elements 144 to 160 inclusive, provide a combined driving and take up mechanism for an endless conveyor to be presently referred to.

Travelling around the take-up pulley 149, over the idler rollers 126, 138 around the roller 141, over the idler rolls 136, the sets of rollers mounted over the sections 86, 87 of the supporting member, around the pulley 161 at the forward end of the conveyor support, under the sections 86, 87 of the supporting member, over the idler rollers 125, around the pulley 153 to the pulley 149 is a conveyor 162 in the form of an endless belt. That part of the conveyor which travels over the sets of rollers on the sections of the supporting member, is of trough like form. The conveyor 162 travels below the plates 134 which constitute the hopper whereby the material which is to be conveyed or stacked can be supplied onto

the conveyor for the purpose of conducting to the forward or upper end of the stacker element and then discharged.

Secured to the top bars of the conveyor support are guy ropes or cables 163 which are seated, intermediate their ends, on spools 164, carried by a spindle or shaft 165, mounted at the upper end of the tower 84.

Connected to each side member of the skeleton beam, forwardly and rearwardly, with respect to the tower 84, is a winding cable. The cables, during the winding thereof provide for elevating and lowering of the stacker element, that is to say the tilting of the latter. The cables are indicated at 166, and, wind intermediate their ends, on the shaft 51, as indicated at 167. Each cable has its ends anchored, as indicated at 168, 169. One cable travels over the pulley 48, and the other cable over the pulley 49, to the shaft 51, see Figures 1, 4 and 5. Both cables travel lengthwise of the lower portion of the deck 14. The cables extend upwardly from the pulleys and are anchored to the stacker element at 168, and also extend upwardly from the shaft 51, and are anchored to the stacker element as at 169. The shaft 51 is rotated to provide for the tilting of the stacker element from the manually operated worm shaft 53 which drives the gear 52 carried by the shaft 51.

The controller 31 is in communication with a suitable source of electrical energy.

The conveyor support not only carries and supports the conveyor but also carries and supports the supply hopper, operating and take-up means for the conveyor and the counterbalance.

What I claim is:

1. A stacker comprising, a travelling carriage, a deck revolubly mounted thereon, a supporting structure carried by the deck, a tower member extending over the supporting structure and having at its lower end a trunnion connected to said supporting structure, a conveyor support connected intermediate its ends with the tower member, an endless conveyor carried by the conveyor support, combined operating and take-up means for the conveyor, a rotatable shaft mounted on said deck, a pair of cables, each having its ends secured to the conveyor support on opposite sides of the tower member and further having a central portion coiled around said shaft, and means for rotating said shaft to shift the coiled portions of said cables to selectively tilt said conveyor support in opposite directions.

2. A stacker comprising, a tower member of skeleton form provided at its lower end with a trunnion, a skeleton conveyor support connected intermediate its ends to the lower portion of the tower member, a spindle at the upper end of the tower member, spaced spools carried by the spindle, guy ropes slidably intermediate their ends on the spools and hav-

ing their ends secured to the conveyor support forwardly and rearwardly with respect to the tower member, a mobile supporting structure having said trunnion connected thereto, a rotatable shaft mounted on the mobile supporting structure, means for rotating the shaft, and cables coiled intermediate their ends around said shaft and respectively having their ends secured to the conveyor support on opposite sides of the trunnion to provide for the tilting of the conveyor support.

3. A stacker comprising, a tower member of skeleton form provided at its lower end with a trunnion, a skeleton conveyor support connected intermediate its ends to the lower portion of the tower member, a spindle at the upper end of the tower member, spaced spools carried by the spindle, guy ropes slidable intermediate their ends on the spools and having their ends secured to the conveyor support forwardly and rearwardly with respect to the tower member, a mobile supporting structure having said trunnion connected thereto, a rotatable shaft mounted on the mobile supporting structure, means for rotating the shaft, cables coiled intermediate their ends around said shaft and respectively having their ends secured to the conveyor support on opposite sides of the trunnion to provide for the tilting of the conveyor support, and a conveyor driving and take-up device mounted in the conveyor support in proximity to the lower portion of said tower.

4. A stacker comprising, a tower member of skeleton form provided at its lower end with a trunnion, a skeleton conveyor support connected intermediate its ends to the lower portion of the tower member, a spindle at the upper end of the tower member, spaced spools carried by the spindle, guy ropes slidable intermediate their ends on the spools and having their ends secured to the conveyor support forwardly and rearwardly with respect to the tower member, a mobile supporting structure having said trunnion connected thereto, a rotatable shaft mounted on the mobile supporting structure, means for rotating the shaft, cables coiled intermediate their ends around said shaft and respectively having their ends secured to the conveyor support on opposite sides of the trunnion to provide for the tilting of the conveyor support, and a counter weight receiving means depending from the rear portion of said conveyor support.

In testimony whereof, I affix my signature hereto.

FRED D. COPPOCK.